

City Council
CURTIS W. MORRIS, Mayor
JOHN EBINER, Mayor Pro Tem
EMMETT BADAR
DENIS BERTONE
JEFF TEMPLEMAN

City Manager
BLAINE M. MICHAELIS

Assistant City Manager / Treasurer
KENNETH J. DURAN

City Attorney
J. KENNETH BROWN



**Assistant City Manager of
Community Development**
LAWRENCE STEVENS

Director of Public Works
KRISHNA PATEL

**Director of Development
Services**
DAN COLEMAN

**Director of Parks
and Recreation**
THERESA BRUNS

City Clerk
INA RIOS

July 7, 2010

Mr. Simon Eching
California Department of Water Resources
Post Office Box 942836
Sacramento, California 94236-0001

Dear Mr. Eching,

This letter is to inform the Department of Water Resources that the City of San Dimas has adopted its own Water Efficient Landscape Ordinance. Below are the City's findings showing that the City's Ordinance is "at least as effective" as the State Model Ordinance in conserving water.

No essential element of the States Model has been dropped. The City's ordinance has been re-organized to function more efficiently with the City's existing zoning and municipal ordinances. This letter identifies the significant differences between the City's ordinance and the State Model and provides justification showing how the City ordinance is "at least as effective" as the State Model.

- 1. Grading Design Plan (492.8)** – The State Model requires a Grading Design Plan for every application, however local codes and engineering division specifications for developed pieces of property already provide appropriate regulation for managing projects with significant grading elements. If a property already has a grading plan, a separate plan for landscaping is not required.

Due to the high cost of grading the City Ordinance does not require a grading plan in all circumstances. If a project is limited to replacement planting and/or irrigation to rehabilitate an exiting landscape than a grading plan is not required. Not requiring a grading plan in this circumstance still allows the City Ordinance to be "at least as effective as" the State Model. Also if a project proposes less than 50 cubic yards of earth movement a grading plan is not required. A drainage plan may be submitted instead of a grading plan. In such circumstances a drainage plan will be as sufficient as a grading plan to determine that a landscape property directs the flow of water.

2. **Irrigation Scheduling (492.10)** – The City ordinance removes the prescriptive requirements for parameters used to set the scheduling for automatic irrigation controllers. The City ordinance requires all irrigation controllers to be set to the manufacturer specifications. The manufacturer knows the best way to use their irrigation equipment efficiently and effectively.
3. **Stormwater Management (492.15)** – The section on Stormwater Management was removed because the City currently enforces stormwater regulations established by the National Pollutant Discharge Elimination System (NPDES) and the City's local Stormwater Management Code. Enforcing these existing codes will ensure that the City's efforts are "at least as effective as" the efforts prescribed in the State Model.
4. **Effective Precipitation (494)** – This section is not included in the City ordinance. It was considered optional in the State Model and City staff did not feel it was necessary to include in the City ordinance.
5. **Separation of Ordinance and Guidelines** –The City found it more advantageous to put the technical guidelines in a separate document. This was done so the City would not have to pass a municipal zoning amendment every time a minor technical change was needed. All process-oriented elements, equations, and technology-related components have been removed from the ordinance and placed in a guidelines section. Updating guidelines is a less complicated process, which will better accommodate the rapidly evolving field of irrigation technology.
6. **Budget-Based Tiered-Rate Billing** – The City ordinance uses budget-based tiered-rate billing for all existing metered landscape areas throughout the City. Budget based tiered-rate billing structures are "at least as effective" at achieving outdoor water efficiency as the State model ordinance.

Tiered rates encourage water users to use water wisely by promoting cost savings. Water users who save will benefit by paying less.

Tiered rates work by charging water users for each unit of water they use. Water users who do not exceed the maximum amount of water in tier one will pay the lowest amount. Water users in tier two will pay a 15 percent higher rate than tier one and customers in tier three will pay an additional 15 percent higher rate.

7. **Maximum Applied Water Allowance (MAWA) Calculation** – The MAWA calculation has been simplified while still remaining at least as effective as

the calculation in the State Model Ordinance. The State Model requires MAWA and Estimated Applied Water Use (EAWU) calculations for each valve installed in a landscape area. This requirement causes a significant amount of paperwork and labor and does not increase water efficiency in the landscaped area. By requiring MAWA and EAWU calculations for each meter rather than each valve, the calculations process is simplified while still being "at least as effective" as the calculations in the State Model.

8. **Self-Certification** – The City Ordinance implements a self-certification procedure. Self certification is performed by a licensed professional that is authorized to perform the task required in the Landscape Documentation Package. The licensed professionals certifying the project have professional expertise necessary to ensure the project is "at least as effective" as the State Model. Self certification provides a cost effective method for cities to review plans without increasing the need for in-house technical expertise.
9. **Implementation Procedures** – This section was added to the City Ordinance to instruct the applicant to consult the City before doing any work and to instruct the applicant to refer to other specific City, State, and Federal guidelines before doing any work. This does not make the City Ordinance less or more effective than the State Model.
10. **Enforcement and Penalties** – The State Model gives local agencies the authority to enforce provisions of the Model Ordinance. The City Ordinance added a section on enforcement to delineate the measures which the City may take to enforce its ordinance.
11. **Artificial Turf** – The City Ordinance includes a section on Artificial Turf, which is not included in the State Model. This does not make the City Ordinance less or more effective than the State Model. Artificial turf is another tool that may be used to create a water efficient landscape.
12. **Hydrozones** – The City Ordinance allows plants with different water needs to be mixed within the same hydrozone, with the caveat that low water use plants may only be mixed with moderate water use plants and moderate water use plants may only be mixed with high water use plants. It would not be permissible to mix a low water use plant with a high water use plant. In addition the plant factor of the highest water using plant must be used to determine the water use calculation. Since the plant with the highest water use must be used to determine the water calculation, mixing plants will not significantly alter the calculation to determine the amount of water which may be used to irrigate the landscape.

The City Ordinance also allows hydrozones with newly planted highly drought-tolerant plants to be classified as a very low water use hydrozone, instead of a low water use hydrozone. The City Ordinance allows this because after a brief watering period the hydrozone will transform into a hydrozone that requires little to no watering.

13. Minor Deviations – The City Ordinance includes a section titled Minor Deviations. This section was created to address circumstances unforeseen by the State Model and the City Ordinance. This does not make the City Ordinance less or more effective than the State Model.

Enclosed is the City of San Dimas Water Efficient Landscape Ordinance. The enclosed document has been highlighted to illustrate that no essential part of the State's Model has been removed. The portions of the document which have been changed are highlighted in yellow. Please feel free to contact me regarding this letter by email, phone, or mail.

Sincerely,



Kevin Frey
City of San Dimas
Community Development

kfrey@ci.san-dimas.ca.us
(909) 394-6283

Enclosure

Chapter 18.14

WATER-EFFICIENT LANDSCAPES

Sections:

18.14.010	Purpose and Intent
18.14.020	Definitions
18.14.030	Applicability
18.14.040	Implementation Procedures
18.14.050	Landscape Water Use Standards
18.14.060	Existing Landscapes
18.14.070	Artificial Turf
18.14.080	Minor Deviations
18.14.090	Implementation Guidelines
18.14.100	Enforcement and Penalties

18.14.010 Purpose and Intent

The intent of the water-efficient landscape chapter is:

- A. That this Chapter be at least as effective in conserving water as the State Model ordinance set forth in to Government Code §65595;
- B. To assure beneficial, efficient, and responsible use of water resources;
- C. To retain the land's natural hydrological role and promote the infiltration of surface water into the groundwater;
- D. To recognize that landscapes enhance the aesthetic appearance of developments and communities;
- E. To encourage the appropriate design, installation, maintenance, and management of landscapes so that water demand can be decreased, runoff can be retained, and flooding can be reduced without a decline in the quality or quantity of landscapes; and
- F. To reduce or eliminate water waste.

18.14.020 Definitions

“Applied Water” means the portion of water supplied by the irrigation system to the landscape.

“Artificial Turf” means a man-made material which simulates the appearance of live turf, organic turf, grass, sod, or lawn.

“Chapter” means Chapter 18.14 of the San Dimas Municipal Code.

“Ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“Estimated Applied Water Use” means the average annual total amount of water estimated to be necessary to keep plants in a healthy state, calculated as provided in the Guidelines. It is based

on the reference evapotranspiration rate, the size of the landscape area, plant water use factors, and the relative irrigation efficiency of the irrigation system.

“ET adjustment factor” or “ETAF” is equal to the plant factor divided by the irrigation efficiency factor for a landscape project, as described in the Guidelines. The ETAF is calculated in the context of local reference evapotranspiration, using site-specific plant factors and irrigation efficiency factors that influence the amount of water that needs to be applied to the specific landscaped area.

“Guidelines” refers to the “Guidelines for Implementation” as adopted by the City, which describes procedures, calculations, and requirements for landscape projects subject to this Chapter.

“Hardscapes” means any durable materials or feature (pervious and non-pervious) installed in or around a landscaped area, such as pavements or walls. Swimming pools and other water features are considered part of the landscaped area and not considered hardscapes for purposes of this Chapter.

“Homeowner installed landscape” means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this Chapter, is a person who occupies the dwelling he or she owns. This definition excludes speculative homes, which are not owner-occupied dwellings and which are subject to the requirements applicable to developer-installed residential landscape projects.

“Irrigation efficiency” means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this Chapter is 0.71.

“Landscaped area” means all the planting areas, turf areas, and water features in a landscaped design plan subject to the “Maximum Applied Water Allowance” and “Estimated Applied Water Use” calculations. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g. open spaces and existing native vegetation).

“Landscape Documentation Package” means the documents required to be provided to the City for review and approval of landscape design projects, as described in the Guidelines.

“Landscape project” means total area of landscape in a project, as provided in the definition of “landscaped area”.

“Maximum Applied Water Allowance” or “MAWA” means the upper limit of annual applied water for the established landscaped area. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor, and the size of the landscaped area. The “Estimated Applied Water” use shall not exceed the “Maximum Applied Water Allowance”.

“Mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

“Permit” means an authorizing document issued by the City for new construction or rehabilitated landscape.

“Rehabilitated landscape” means any re-landscaping project that is greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are planned to occur within one year.

“Special landscape area” means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play such as parks, sports field, golf courses, and where turf provides a playing surface.

“Turf” means a ground cover surface of mowed grass.

“Water feature” means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscaped area. Constructed wetlands used for on-site wastewater treatment, habitat protection, or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

18.14.030 Applicability

A. All landscaping projects subject to this Chapter shall obtain a permit from the Department of Development Services prior to installation of any landscaping. All planting, irrigation, and landscape related improvements required by this Chapter shall apply to the following landscape projects:

1. Installation of new and rehabilitated landscaping for industrial, commercial, office and institutional developments; parks and other public recreational areas; multi-family residential; with a landscape area equal to or greater than 2,500 square feet.
2. Installation of new landscaping at single family dwellings which are developer installed with a landscape area equal to or greater than 2,500 square feet.
3. Installation of new landscaping at single family dwellings, which are homeowner installed, with a landscape area equal to or greater than 5,000 square feet.
4. Special Landscaped Areas, such as areas dedicated to edible plants, irrigated with recycled water, or dedicated to active play, shall prepare a water efficient landscape worksheet and landscape documentation package according to specifications for Special Landscaped Areas;
5. New and rehabilitated cemeteries shall be required to comply with this Chapter;

6. Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements, and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and implemented by the local water purveyor or as mutually agreed by the local water purveyor and the City of San Dimas.
7. Existing landscapes that are one acre or more shall not exceed their Maximum Applied Water Allowance.

B. This Chapter does not apply to:

1. Registered local, state, or federal historical sites;
2. Ecological restoration projects that do not require a permanent irrigation system;
3. Mined-land reclamation projects that do not require a permanent irrigation system; or
4. Plant collections, as part of botanical gardens and arboretums open to the public.

C. Except as provided in this Chapter a permit is required before the installation or rehabilitation of a landscape. Before a permit is issued the Director of Development Services or his designee must ensure the proposed landscape is in conformity with the conditions set forth in this Chapter.

18.14.040 Implementation Procedures

A. Prior to installation, a "Landscape Documentation Package" shall be submitted to the Development Services Department for review and approval of all landscape projects subject to the provisions of this Chapter. Any "Landscape Documentation Package" submitted shall comply with the adopted Guidelines.

B. Prior to assembling the landscape documentation Package, applicants are advised to consult the Development Services Department to ascertain if the subject property is located within an area subject to additional landscape requirements including, but not limited to various custom lot areas and scenic corridors. Information regarding additional landscape requirements shall be made available upon request.

C. Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:

1. State of California Section 65595;
2. National Pollutant Discharge Elimination Permit for the Municipal Separate Sewer System;
3. Water Conservation and Drought Response Regulations of the Local Water Purveyor;
4. Zoning Code;
5. Building Code;
6. Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
7. Conditions of approval for a specific project.

- D. Landscape and irrigation plans submitted to the Development Services Department for review and approval shall include appropriate water use calculations.
- E. The "Landscape Documentation Package" shall bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. This ordinance shall not be deemed to prohibit any person from preparing any plans, drawings, or specifications for any property owned by that person.

F. Verification of compliance of the landscape installation with the approved plans shall be obtained through a "Certificate of Completion" in conjunction with the final permit process, as provided in the Guidelines and are certified to be in compliance with the provisions of a Chapter and Guidelines and that the landscaping has been completed in accordance with the approved plans.

18.14.050 Landscape Water Use Standards

- A. For applicable landscape installation or rehabilitation projects subject to this Chapter, the "Estimated Applied Water" use allowed for the landscaped areas shall not exceed the "Maximum Applied Water Allowance" calculated using an "ET adjustment factor" of .07, except for special landscaped areas where the "Maximum Applied Water Allowance" is calculated using an "ET adjustment factor" of 1.0; or the design of the landscaped area shall otherwise be shown to be equivalently water-efficient in a manner acceptable to the City as provided in the Guidelines.

18.14.060 Existing Landscapes

A. Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and waste prevention, as determined and implemented by the local water purveyor and as may be mutually agreed by the City.

- B. The City and/or local water purveyor may administer programs such as irrigation water use analyses, irrigation surveys and/or irrigation audits, tiered meter rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a MAWA calculated with an ETAF of 0.8 to all landscaped areas in the City over one acre in size.
- C. The architectural guidelines of a common interest development, including apartments, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

D. Water Waste Prevention

1. Water waste resulting from inefficient landscape irrigation leading to excessive runoff, low head drainage, overspray and other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures is prohibited.
2. All landscape areas, whether installed pursuant to this chapter or not, shall be maintained in a healthful and sound condition. Irrigation systems and their components shall be maintained in a fully functional manner consistent with the originally approved design and the provisions of this chapter.
3. Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule should include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; and weeding in all landscaped areas.

18.14.070 Artificial Turf

- A. Artificial or synthetic turf is an appropriate substitute for natural turf in some cases for the purposes of water conservation. The use and maintenance of artificial turf shall be governed by Guidelines which shall be adopted as set forth in section 18.14.090.

18.14.080 Minor Deviations

- A. The Director of Development Services or his or her designee may grant minor deviations from the requirements of this chapter limited to the following:
 1. Minor modifications to approved landscaping irrigation or grading plans, which comply with the spirit and intent of this chapter and the accompanying Guidelines;
 2. Modifications of planting, installation, and/or preparation details;
 3. Final of permits prior to installation of landscaping due to exceptional and unforeseen circumstance, subject to the deposit of an appropriate performance guarantee with the Development Services Department.
- B. In granting a minor deviation, the Director of Development Services or his or her designee may impose conditions, as deemed necessary, to comply with the spirit and intent of this chapter and accompanying Guidelines;
- C. The Director of Development Services Department decision may be appealed to Development Plan Review Board in writing. The Development Plan Review Board shall not be required in granting a minor deviation to this chapter or accompanying Guidelines.

18.14.090 Implementation Guidelines

This Water Efficient Landscape Ordinance Guidelines shall be adopted by resolution of the Planning Commission.

18.14.100 Enforcement and Penalties

- A. Except for the provisions of Section 5.110.030(D)(13)(h), any firm, corporation or person, whether as principal, agent, employee or otherwise, violating or causing the violation of any

of the provisions of this chapter shall be guilty of a misdemeanor, and any conviction thereof shall be punishable as set forth in Chapter 1.12 of the San Dimas Municipal Code.

B. Nothing herein shall prevent or restrict the city from taking such other lawful action in any court of competent jurisdiction as is necessary to prevent or remedy any violation or noncompliance. Such other lawful actions shall include, but shall not be limited to, an equitable action for injunctive relief or an action at law for damages.

C. Further, nothing in this section shall be construed to prohibit the city from prosecuting any violation of this chapter by means of code enforcement established pursuant to the authority as provided by the laws of the state of California and the City of San Dimas.

D. Any violation of the provisions of this chapter shall constitute a separate offense for each and every day during which such violation is committed or continued.

Water Efficient Landscape Ordinance Guidelines

Table of Contents

Purpose and Applicability page 1

Submittal Requirements for New Landscape Installations or Landscape Rehabilitation ... page 3

Water Efficient Landscape Calculations and Alternatives page 4

Soil Management Report page 5

Landscape Design Plan page 5

Irrigation Design Plan page 8

Recycled Water page 10

Grading Design Plan page 11

Certification of Completion page 11

Post-Installation Irrigation Scheduling page 12

Post-Installation Landscape and Irrigation Maintenance page 12

Provisions for Existing Landscapes page 13

Artificial Turf page 13

Minor Deviations page 14

Definitions page 14

Municipal Code Provisions Receipt page 21

Landscape Plan and Instruction Sheet and Checklist page 23

Maximum Applied Water Allowance Calculation Worksheet page 25

Estimated Applied Water Use Calculation Worksheet page 27

Certification of Landscape Design page 33

Landscape Installation Certificate of Completion page 35

Purpose and Applicability

A. Purpose

1. The primary purpose of these Guidelines is to provide procedural and design guidance for project applicants proposing landscape installation or rehabilitation projects that are subject to the requirements of the Water Efficient Landscape Ordinance pursuant to Government Code Section 65595. This document is also intended for use and reference by staff in reviewing and improving designs and verifying compliance with the Water Efficient Landscape Ordinance. The general propose of the Water Efficient Landscape Ordinance is to promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources by ensuing that landscaping projects are not unduly water-needy and that irrigation systems are appropriately designed to minimize water waste.
2. Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:
 - (a) State of California Government Code Section 65595;
 - (b) National Pollutant Discharge Elimination Permit for the Municipal Separate Sewer System;
 - (c) Water Conservation and Drought Response Regulations of the Local Water Purveyor;
 - (d) Zoning Code;
 - (e) Building Code;
 - (f) Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
 - (g) Conditions of approval for a specific project.

B. Applicability

1. These requirements shall be applicable to:
 - (a) Installation of new and rehabilitated landscaping for industrial, commercial, office and institutional developments; parks and other public recreational areas; multi-family residential; with a landscape area equal to or greater than 2,500 square feet.
 - (b) Installation of new landscaping at single family dwellings which are developer installed with a landscape area equal to or greater than 2,500 square feet.
 - (c) Installation of new landscaping at single family dwellings, which are homeowner installed, with a landscape area equal to or greater than 5,000 square feet.
 - (d) Special Landscaped Areas, such as areas dedicated to edible plants, irrigated with recycled water, or dedicated to active play, shall prepare a water efficient landscape worksheet and landscape documentation package according to specifications for Special Landscaped Areas;
 - (e) New and rehabilitated cemeteries shall be required to comply with this Chapter;
 - (f) Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements, and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and implemented by the local

- water purveyor or as mutually agreed by the local water purveyor and the City of San Dimas.
- (g) Existing landscapes that are one acre or more shall not exceed their Maximum Applied Water Allowance.
 - (h) The section on artificial shall apply to all landscaped areas regardless of size.
2. Unless otherwise determined by the City, Chapter 18.14 of the Municipal Code and these Guidelines do not apply to:
- (a) Registered local, state, or federal historical sites;
 - (b) Ecological restoration projects that do not require a permanent irrigation system;
 - (c) Mined-land reclamation projects that do not require a permanent irrigation system; or
 - (d) Plant collections, as part of botanical gardens and arboretums open to the public.

Submittal Requirements for New Landscape Installations or Landscape Rehabilitation

A. Discretionary approval is required for landscape projects that are subject to site plan reviews or other procedural processes apply such that standard or special conditions of approval may be required by the City. Discretionary projects with conditions of approval may be approved administratively by city staff, or acted on formally by the Planning Commission or City Council.

Landscape or water features that typically require a permit (i.e. a building, plumbing, electrical, other similar permits), hereby triggering compliance with the Water Efficient Landscape Ordinance requirements independently of the need for discretionary approval include, but are not limited to, swimming pools, fountains or ponds, retaining walls, and overhead trellises.

B. A Landscape Documentation Package is required to be submitted by the project applicant for review and approval prior to the issuance of permits for landscape or water features by the City, and prior to start of construction. Unless otherwise directed by the City, the *Landscape Documentation Package* shall include the following elements:

1. Checklist or index of all documents in the *Landscape Documentation Package*;
2. Project contacts, including contact information for the project applicant and property owner;
3. Certification of Landscape Design;
4. Landscape Installation Certificate of Completion;
5. Any other information the City deems relevant for determining whether the landscape project complies with the Water Efficient Landscape Ordinance and these Guidelines;
6. Maximum Applied Water Allowance (MAWA) calculation worksheet;
7. Estimated Applied Water Allowance (EAWU) calculation worksheet;
8. Hydrozone information table for the landscaped project;
9. A soil management report;
10. A landscape design plan for the landscaped project;
11. An irrigation design plan for the landscaped project;

12. A grading design plan, unless grading information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area. If a project proposes less than 50 cubic yards of earth movement, a drainage plan may be submitted instead of a grading plan; and
13. Irrigation water schedules or procedures for programming of irrigation controllers.

Water Efficient Landscape Calculations and Alternatives

- A. The project applicant shall provide the calculated *Maximum Applied Water Allowance (MAWA)* and *Estimated Applied Water Use (EAWU)* for the landscaped area as part of the *Landscaped Documentation Package* submittal to the City. The *MAWA* and *EAWU* shall be calculated based on completing the *Water Efficient Landscape Worksheets*.
- B. The *EAWU* allowable for the landscaped areas shall not exceed the *MAWA*. The *MAWA* shall be calculated using an *Evapotranspiration Adjustment Factor (ETAF)* of 0.7 except for the portion of the *MAWA* applicable to any special landscaped areas with the landscape project, which shall be calculated using an *ETAF* of 1.0.
- C. Water budget calculations shall adhere to the following requirements:
 1. The *MAWA* shall be calculated using the *Water Efficient Landscape Worksheets*;
 2. The *EAWU* shall be calculated using the *Water Efficient Landscape Worksheets*;
 3. For the calculation of the *MAWA* and *EAWU*, a project applicant shall use the *ETo* value of 47.5. This value was established by a weather station operated by the California Irrigation Management Information System, located in the City of Glendora;
 4. For calculation of the *EAWU*, the plant water use factor shall be determined as appropriate to the project location from the *Water Use Classification of Landscape Species (WUCOLS)* species evaluation list. The plant factor is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants;
 5. For calculating the *EAWU*, the plant water use factor shall be determined for each valve hydrozone based on plant species within the zone. The *plant factor* for each hydrozone may be required to be further refined as a "landscape coefficient," according to protocols defined in detail in the *WUCOLS* document, to reflect planting density and microclimate effects on water need at the option of the City;
 6. For calculation of the *EAWU*, the area of a water feature shall be defined as a high water use hydrozone with a plant factor of 1.0.
 7. For calculation of the *EAWU*, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use hydrozone with a *plant factor* of 0.1.
 8. For calculation of the *MAWA*, the *ETAF* for special landscaped areas shall be set at 1.0. For calculation of the *EAWU*, the *ETAF* for special landscaped areas shall be calculated as the *Special Landscaped Area (SLA) plant factor* divided by the *SLA irrigation efficiency factor*.

9. Irrigation efficiency shall be calculated using the Water Efficient Landscape Worksheets.
- D. The Maximum Applied Water Allowance shall be calculated using the equation presented in the worksheets in the *Landscape Documentation Package*. For scheduling, automatic irrigation controllers are required and shall use current *ETo* data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

Soil Management Report

- A. In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:
1. Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations;
 2. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants;
 3. The soil analysis may include, but is not limited to:
 - (a) Soil texture;
 - (b) Infiltration rate determined by laboratory test or soil texture infiltration rate table;
 - (c) pH;
 - (d) Total soluble salts;
 - (e) Sodium;
 - (f) Percent organic matter; and
 - (g) Recommendations.
- B. The project applicant, or his/her designee, shall comply with one of the following:
1. If a grading permit is not required, the soil analysis report shall be submitted to the City as part of the *Landscape Documentation Package*; or
 2. If a grading permit is required, the soil analysis report shall be submitted to the City as part of the *Certification of Completion*.
- C. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans in order to make any necessary adjustments to the design plans.
- D. The project applicant, or his/her designee, shall submit documentation verifying implementation of the soil analysis report recommendation to the City with the *Certification of Completion*.

Landscape Design Plan

- A. For the efficient use of water, a landscape should be carefully designed and planned for the intended function of the project. To encourage the efficient use of water, the following is highly recommended:
1. Protection and preservation on non-invasive water-conserving plant species and water-conserving turf;

2. Selection of water-conserving plant species and water-conserving turf;
 3. Selection of plants based on disease and pest resistance;
 4. Selection of trees based on applicable zoning ordinances and tree guidelines and/or conditions of approval; and
 5. Selection of plants from local and regional landscape program plant lists.
- B. **Hydrozones:** The landscape area shall be divided into hydrozones. Each hydrozone shall be selected and planted appropriately based upon their adaptability to the climate, soil conditions, and site topography. Each hydrozone shall have plant materials with similar water use, with the following exception: hydrozones may mix plants with different water needs provided that individual hydrozones mix plants of moderate and low water use, or moderate and high water use. Hydrozones that mix low and high water use plants shall not be permitted. The water use calculation for mixed hydrozones must be based on one of the following:
1. Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
 2. Plant factor of the highest water using plant is used for the calculation.
- C. **Plants** shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended for inclusion in the landscape design plan:
1. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate.
 2. Recognize the horticultural attributes of plants (e.g., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); and
 3. Consider the solar orientation for plant placement to minimize summer shade and winter solar gain.
- D. **Turf** is discouraged on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape.
- E. **Fire Prone Areas:** A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is recommended pursuant to Title 32 of the County of Los Angeles entitled "Fire Code of the County of Los Angeles", where applicable.
- F. **Invasive and/or noxious plant species** is strongly discouraged.
- G. **Common Interested Developments:** The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of water efficient plant species as a group.

H. Water Features

1. Recirculation water systems shall be used for water features.
2. Where available and consistent with public health guidelines, recycled water shall be used as a source for decorative water features.
3. The surface area of a water features shall be included in the high water use hydrozone area of the water budget calculation.
4. Pool and spa covers are highly recommended.

I. Mulch and Amendments

1. 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.
2. Stabilizing mulching products shall be used on slopes.
3. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
4. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for plants selected.

J. The Landscape Design Plan, at a minimum, shall:

1. Be drawn to scale in a clear and legible fashion.
2. Delineate and label each hydrozone by number, letter, or other method.
3. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscaped area shall be included in the low water use hydrozone for the water budget calculation;
4. Identify recreational areas;
5. Identify areas permanently and solely dedicated to edible plants;
6. Identify areas irrigated with recycled water;
7. Identify type of mulch and application depth;
8. Identify soil amendments, type, and quantity;
9. Identify type and surface area of water features;
10. Identify hardscapes (pervious and non-pervious);
11. Identify location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Storm water best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
 - (a) Infiltration beds, swales, and basins that allow water to collect and soak into the ground;
 - (b) Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
 - (c) Pervious or porous surfaces (e.g. permeable pavers or blocks, pervious or porous concrete, etc.).
12. Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc);

Irrigation Design Plan

For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and in the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the *Landscape Documentation Package*:

- A. **Water meters** dedicated to the landscape are recommended, when feasible, to facilitate water management.
- B. **Automatic irrigation** controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.
- C. **Water Pressure.** 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.
 - 1. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulator, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
 - 2. 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. The measurements shall be conducted at installation.
- D. **Sensors** (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy, freezing weather, or during rain.
- E. **Manual Shut-Off Valves** (such as a gate valve, ball valve, or butterfly valve) shall be required as close as possible to the point of connection of the water supply to minimize water loss in case of an emergency (such as a main line break) or routine repair.
- F. **Backflow Prevention Devices** shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable City code for additional backflow prevention requirements.
- G. **High flow Sensors** that detect and report high flow conditions created by system damage or malfunction are recommended.
- H. **The Irrigation System** shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

- I. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- J. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- K. Average irrigation efficiency for the project shall be determined in accordance with the EAWU calculation sheet. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant, the irrigation efficiency of the irrigation heads used within each hydrozone shall be assumed to be:

Pop-up stream rotator heads = 75%

Stream rotor heads = 75%

Microspray = 75%

Bubbler = 80%

Drip emitter = 85%

Soaker hose = 85%

Subsurface irrigation = 90%

- L. It is highly recommended that the project applicant inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- M. In **Mulched Planting Areas**, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- N. **Sprinkler Heads** and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- O. **Head to Head** coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- P. **Swing Joints** or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.
- Q. **Check Valves** or anti-drain valves are required for all irrigation systems.
- R. **Narrow or irregularly shaped areas**, including turf, less than eight feet (8') in width in any direction shall be irrigated in a manner that precludes overspray.
- S. **Overhead Irrigation** shall not be permitted within 24-inches of any non-permeable surface unless:
 - 1. The landscape area is adjacent to permeable surfacing and no runoff occurs; or
 - 2. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

3. The irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package, that clearly demonstrates how the irrigation system will be designed to prevent runoff low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways or structures. Prevention of overspray and runoff must be confirmed during the irrigation audit.

T. Hydrozones

1. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
2. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
3. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
4. Individual hydrozones that mix plants of moderate and low water use or moderate and high water use may be allowed if:
 - (a) The plant factor calculation is based on the proportions of the respective plant water uses and their respective plant factors; or
 - (b) The plant factor of the higher water using plant is used for the calculations.
5. Individual hydrozones that mix high and low water use plants shall not be permitted.
6. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. The irrigation design plan shall designate the areas irrigated by each valve and assign a number to each valve.

U. The Irrigation Design Plan, at a minimum, shall contain:

1. The location and size of separate water meters for the landscape;
2. The location, type, and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler head, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
3. Static water pressure at the point of connection to the public water supply;
4. Flow rate (gallons per minute), application rate (inches per hour), and design operation pressure (pressure per square inch) for each station;
5. Irrigation schedule parameters necessary to program smart timers specified in the landscape design;
6. On the irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation;
7. The signature of a professional authorized to design an irrigation system.

Recycled Water

- A. If and when a recycled water program becomes available irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the local water purveyor stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.

- B. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.
- C. Landscapes using recycled water are considered Special Landscaped Areas. The ET Adjustment Factor for Special Landscaped Areas shall not exceed 1.0.

Grading Design Plan

- A. For the efficient use of water, grading of the landscape project site shall be designed to minimize soil erosion, runoff, and water waste. Finished grading configuration of the landscaped area, including pads, slopes, drainage, post-construction erosion control, storm water control Best Management Practices, as applicable, shall be shown on the Landscape Plan unless this information is fully included in separate grading plans for the project, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.
- B. A grading design plan is not needed if the information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.
- C. If a project proposes less than 50 cubic yards of earth movement, a drainage plan may be submitted instead of a grading plan.
- D. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscaped area including:
 - 1. Height of graded slopes;
 - 2. Drainage patterns;
 - 3. Pad elevations;
 - 4. Finish grade; and
 - 5. Storm water retention improvements, if applicable.
- E. To prevent excessive erosion and runoff, it is highly recommended that the project applicant:
 - 1. Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
 - 2. Avoid disruption of natural drainage patterns and undisturbed soil; and
 - 3. Avoid soil compaction in landscaped areas.

Certification of Completion

Upon completion of the installation of the landscape, the designer shall certify that the landscape complies with all the requirements of the City of San Dimas Water Efficient Landscape Ordinance and the requirements as stated in the *Landscape Documentation Package*.

- A. Landscape project installation shall not proceed until the *Landscape Documentation Package* has been approved by the City and any required permits are issued.

- B. The project applicant shall notify the City at the beginning of the installation work and at intervals, as necessary, for the duration of the landscape project work to schedule all required inspections.
- C. *Certification of Completion* of the landscape project shall be obtained through a final permit. The requirements for the final inspection and permit include submittal of:
1. **Landscape Installation Certificate of Completion** found in the *Landscape Documentation Package*.
 2. **Irrigation Schedule**. Submit irrigation scheduling parameters used to set the controller (may be included with the Irrigation Plan and Details).
 3. **Landscape and Irrigation Maintenance Schedule**. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aeration and dethatching of turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing obstructions to sprinklers and emitters.
 4. **Soil Management Report**. Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations.

Post-Installation Irrigation Scheduling

- A. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:
1. Irrigation scheduling shall be regulated by automatic irrigation controllers.
 2. Overhead irrigation shall be scheduled in accordance with the *Water Efficient Landscape Ordinance*.

Post-Installation Landscape and Irrigation Maintenance

- A. Landscapes shall be maintained to ensure water use efficiency in accordance with the City's current property maintenance code found in Chapter 8.14 of the Municipal Code.
- B. A regular maintenance schedule shall be submitted with the Certificate of Completion.
1. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf area; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing obstructions to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
- C. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.
- D. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

Provisions for Existing Landscapes

- A.** Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and waste prevention, as determined and implemented by the local water purveyor and as may be mutually agreed by the City.
- B.** The City and/or local water purveyor may administer programs such as irrigation water use analyses, irrigation surveys and/or irrigation audits, tiered meter rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a MAWA calculated with an ETAF of 0.8 to all landscaped areas in the City over one acre in size.
- C.** The architectural guidelines of a common interest development, including apartments, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

D. Water Waste Prevention

1. Water waste resulting from inefficient landscape irrigation leading to excessive runoff, low head drainage, overspray and other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures is prohibited.
2. All landscape areas, whether installed pursuant to this chapter or not, shall be maintained in a healthful and sound condition. Irrigation systems and their components shall be maintained in a fully functional manner consistent with the originally approved design and the provisions of this chapter.
3. Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule should include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; and weeding in all landscaped areas.

Artificial Turf

- A.** Artificial or synthetic turf is an appropriate substitute, in some cases, for natural turf for the purposes of water conservation. The use and maintenance of artificial turf shall be governed by the following guidelines as set forth in Chapter 18.14.070:
1. Artificial turf shall consist of lifelike individual blades of grass that emulate real grass in look and color and have a minimum pile height of 1 ¾ inches.
 2. Artificial turf shall be prepared in a manner that allows water to permeate and pass through the turf so as not to cause runoff onto adjacent properties, flooding, or pooling of water.
 3. Artificial turf shall be installed and maintained to effectively simulate the appearance of a well-maintained lawn.
 4. The use of indoor or outdoor plastic or nylon carpeting as a replacement for artificial turf or natural turf shall be prohibited.

5. Artificial turf shall be installed in combination with only natural plant materials (trees, shrubs, and groundcover) to enhance the overall landscaping design.
6. Artificial turf must be professionally installed by a licensed company.
7. Artificial turf which looks worn or faded must be replaced or repaired.
8. Artificial turf area shall be kept free of weeds, debris, tears, stains, holes, mildew, and impressions.
9. Artificial turf shall not exceed 60% of the landscaped area.

Minor Deviations

- A. The Director of Development Services or his or her designee may grant minor deviations from the requirements of this chapter limited to the following:
 1. Minor modifications to approved landscaping irrigation or grading plans which comply with the spirit and intent of this chapter and the accompanying Guidelines;
 2. Modifications of planting, installation, and/or preparation details;
 3. Final of permits prior to installation of landscaping due to exceptional and unforeseen circumstance, subject to the deposit of an appropriate performance guarantee with the Development Services Department.
- B. In granting a minor deviation, the Director of Development Services or his or her designee may impose conditions as deemed necessary to comply with the spirit and intent of this chapter and accompanying Guidelines;
- C. The Director of Development Services Department decision may be appealed to the Development Plan Review Board in writing. The Development Plan Review Board shall not be required in granting a minor deviation to this chapter or accompanying Guidelines.

Definitions

“Applied water” means the portion of water supplied by the irrigation system to the landscape.

“Artificial Turf” means a man-made material which simulates the appearance of live turf, organic turf, grass, sod, or lawn.

“Automatic irrigation controller” means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

“Backflow prevention device” means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

“Check valve” or “anti-drain valve” means a valve located under a sprinkler head or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

“Certified irrigation designer” means a person certified to design irrigation systems by an accredited academic institution or a professional trade organization.

“Certified Landscape Irrigation Auditor” means a person certified to perform landscape irrigation audits by an accredited academic institution or a professional trade organization.

“Certification of Design” means the certification included in the *Landscape Documentation Package*.

“Common interest developments” means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

“Conversion factor” (0.62) means the number that converts acre-inches per acre per year to gallons per square foot per year.

“Distribution Uniformity” or “DU” is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges from zero to 100 percent.

“Drip Irrigation” means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“Emitter” means a drip irrigation emission device that delivers water slowly from the system to the soil.

“Established Landscape” means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

“Estimated Applied Water Use” or “EAWU” means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as reference evapotranspiration rate, the size of the landscaped area, plant water use factors, and the irrigation efficiency within each hydrozone.

“ET” adjustment factor” (ETAF) means a factor of 0.7, that when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.

“Evapotranspiration rate” means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

“Flow rate” means the rate at which water flows through pipes, valves, and emission devices measured in gallons per minute, gallons per hour, or cubic feet per second.

“Hardscapes” means any durable material or feature (pervious and non-pervious) installed in or around a landscaped area, such as pavements or walls. Swimming pools and other water features are considered part of the landscaped area and not considered hardscapes for purposes of these Guidelines.

“Homeowner-provided landscaping” means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. This excludes speculative homes, which are not owner-occupied dwellings.

“Hydrozone” means a portion of the landscaped area having plants with similar water needs and typically irrigated by one valve/controller station. A hydrozone may be irrigated or non-irrigated.

“Infiltration rate” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g. inches per hour).

“Invasive plant species” or “noxious” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive plant species may be regulated by county agricultural agencies as noxious species.

“Irrigation audit” means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

“Irrigation Management Efficiency” or “IME” means the measurement used to calculate the irrigation efficiency of the irrigation system of a landscaped project. A 90% IME can be achieved by using evapotranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

“Irrigation efficiency” or “IE” means the measurement of the amount of water beneficially used divided by the amount of water applied to a landscaped area. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

- (a) Pop-up stream rotator heads = 75%
- (b) Stream rotor heads = 75%
- (c) Microspray = 75%
- (d) Bubbler = 80%
- (e) Drip emitter = 85%
- (f) Soaker hose = 85%
- (g) Subsurface irrigation = 90%

“Irrigation survey” means an evaluation of an irrigation system. An irrigation survey includes, but is not limited to an inspection, system test, and written recommendations to improve performance of the irrigation system.

“Irrigation water use analysis” means an analysis of water use data based on meter readings and billing data.

“Landscape coefficient” (K_L) is the product of a plant factor multiplied by a density factor and a microclimate factor. The landscape coefficient is derived to estimate water loss from irrigated landscaped areas and special landscaped areas.

“Landscape Documentation Package” means the package of documents that a project applicant is required to submit to the City pursuant to these Guidelines.

“Landscape Installation Certificate of Completion” means the certificate included in these guidelines that must be submitted to the City.

“Landscape professional” means a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of the Title 16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

“Landscaped area” means all the planting areas, turf areas, and water features in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated from non-development (e.g. open spaces and existing native vegetation).

“Lateral line” means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

“Low volume irrigation” means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Main line” means the pressurized pipeline that delivers water from the water source to the valve or outlet.

“Maximum Applied Water Allowance” or “MAWA” means the upper limit of annual applied water for the established landscaped area as specified in these Guidelines. It is based upon the area’s reference evapotranspiration, the ETAF, and the size of the landscaped area. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.

“Microclimate” means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

“Mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface mining and Reclamation Act of 1975.

“Mulch” means any organic material such as leaves, bark, straw or compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

“New Construction” means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

“Non-pervious” means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

“Operation pressure” means the pressure at which the parts of an irrigation system of sprinklers are designed to operate by the manufacturer.

“Overhead sprinkler irrigation systems” means systems that deliver water through the air (e.g., spray heads and rotors).

“Overspray” means the irrigation water which is delivered beyond the target area.

“Permit” means an authorizing document issued by the City for new construction or rehabilitated landscapes.

“Person” means any natural person, firm, joint venture, joint company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the local water purveyor, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

“Pervious” means any surface or material that allows the passage of water through the material and into the underlying soil.

“Plant factor” or “plant water use factor” is a factor, when multiplied by ETo, that estimates the amount of water needed by plants. For purpose of this Water Efficient Landscape Ordinance, the plant factor range for low water use plants is 0 to 0.3; the plant factor range for moderate water use plants is 0.4 to 0.6; and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in these Guidelines are derived from the Department of Water Resources 2000 publication “Water Use Classification of Landscape Species.”

“Precipitation rate” means the rate of application of water measured in inches per hour.

“Project applicant” means the individual or entity submitting a *Landscape Documentation Package* to request a permit, plan check, or design review from the City. A project applicant may be the property owner or his/her designee.

“Property owner” or “owner” means the record owner of real property as shown on the most recently issued equalized assessment roll.

“Rain sensor” or “rain sensing shutoff device” means a component which automatically suspends irrigation when it rains.

“Recreational area” means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

“Reference evapotranspiration” or “ETo” means a standard measurement of environmental parameters which affect the water use of plants. ETo is given expressed in inches per day, month, or year and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the *Maximum Applied Water Allowance*.

“Recycled water” or “reclaimed water” means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

“Rehabilitated landscape” means any re-landscaping project that requires a permit, plan check, or design review, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

“Runoff” means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

“SMART irrigation controller” means a weather-based or soil moisture-based irrigation controller that monitors and uses information about the environmental conditions at a specific location and landscape to automatically adjust watering schedules.

“Soil moisture sensing device” or “soil moisture sensor” means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

“Soil texture” means the classification of soil based on its percentage of sand, silt, and clay.

“Special Landscaped Areas” or “SLA” means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play such as parks, sports field, golf courses, and where turf provides a playing surface.

“Sprinkler head” means a device which delivers water through a nozzle.

“Static water pressure” means the pipeline or municipal water supply pressure when water is not flowing.

“Station” means an area served by one valve or by a set of valves that operate simultaneously.

“Swing joint” means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

“Turf” means a ground cover surface of mowed grass.

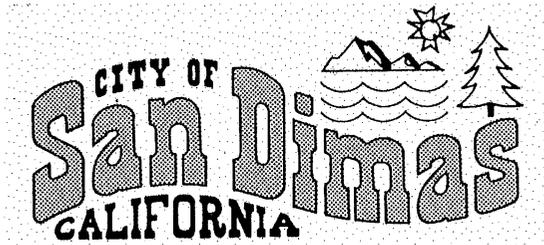
“Valve” means a device used to control the flow of water in an irrigation system.

“Water Efficient Landscape Ordinance” means Chapter 18.14 of the San Dimas Municipal Zoning Code.

“Water Efficient Landscape Worksheet” means the worksheet which calculates a site’s water budget.

“Water feature” means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscaped area. Constructed wetlands used for on-site wastewater treatment, habitat protection, or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

“WUCOLS” means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation.



City of San Dimas
 245 E. Bonita Avenue
 San Dimas, California 91773
 (909) 394-6200, Fax (909) 394-6209

Municipal Code Provisions Receipt

Applicant Portion:

Please fill out and sign this form and return to the City of San Dimas acknowledging that you have received a copy of the San Dimas Municipal Code for your review. Please keep the enclosed law.

Date: _____

Re: *Water Efficient Landscape Ordinance*

I hereby acknowledge receiving Chapter 18.14 of the San Dimas Municipal Zoning Code and receiving the Water Efficient Landscape Guidelines.

Applicant Name: _____
 Please print name

Applicant signature: _____

Date: _____

Return this form to:
City of San Dimas
Development Services Department
245 E. Bonita Avenue
San Dimas, CA 91773-3002

Landscape Plan Instruction Sheet and Checklist

The following items are required to be submitted to the Development Services Department for review:

- Certification of Landscape Design;
 - Maximum Applied Water Allowance Calculation Worksheet;
 - Estimated Applied Water Use Calculation Worksheet;
 - Landscape Installation Certificate of Completion;
 - Municipal Code Provision Receipt;
 - Landscape design including information on hydrozones;
 - Irrigation design plan;
 - Irrigation schedule;
 - Soil management report;
 - Grading plan, unless grading information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area. If a project proposes less than 50 cubic yards of earth movement, a drainage plan may be submitted instead of a grading plan.
-

Suggested Steps

I. Gather Design Ideas

- Look at “Water Use Classification of Landscaped Species” (WUCOLS) found at <http://www.water.ca.gov/wateruseefficiency/docs/wucols00.pdf>
- Use WUCOLS to find plants which meets your aesthetic and water needs.
- Look at the San Dimas Water Efficient Landscape Ordinance and the accompanying Guidelines.

II. Develop Your Plan

- Measure your property.
- Describe the setting:
 - (a) Size, slope, soil type, sun, climate, views, etc.
 - (b) What plants currently exist?

III. Develop your design

- Develop your design with the least impact to the land and to water resources.
- Minimize grading/clearing of native vegetation.
- How will you use your landscape? What purpose will it serve?
- Minimize turf areas to the amounts of lawn you will actually use, such as that used for play or recreation.

IV. Start making decisions about what you would like to do.

- What existing plants will you keep in place?
- What existing plants will you relocate/transplant on site?
- What existing plants will you eliminate and why?
- What type of constant ground cover will you use?
- Plan your design to retain as much water on the site as possible.
- Think about permeable products, such as porous concrete, interlocking pavers, flagstone, which allow water to infiltrate into the ground versus running off.
- Think about using light colors that reflect heat versus dark colors that absorb heat.

V. Irrigation

- Consider using a Smart Irrigation Controller.
- Design the irrigation system to prevent runoff, over-spray, low-head drainage, etc.

VI. Plant Selection

- Review WUCOLS before choosing plants.
- Think about plant size when full grown.
- Think about planting trees for:
 - (a) Erosion control;
 - (b) Carbon (CO₂) sequestering benefits;
 - (c) Shade and cooling effects.
- Think about fire safety.
- Build in colors/textures.
- Do you need plant material that screens for privacy from neighbors, streets, or unwanted views?
- Consider microclimates/hydrozones/seasons.

Maximum Applied Water Allowance (MAWA) Water Calculation Worksheet

This worksheet is filled out by the project applicant for each hydrozone. Attach additional sheets if necessary.

Total MAWA = $(53.1 \times 0.7 \times LA \times 0.62)$ and/or $(53.1 \times 1.0 \times SLA \times 0.62)$

Where:

MAWA = Maximum Applied Water Allowance (gallons per year)

53.1 = The Evapotranspiration Adjustment Factor (ETo) determined by the nearest weather station, operated by California Irrigation Management Information System, located in the City of Glendora

0.7 = Evapotranspiration Adjustment Factor

1.0 = The Evapotranspiration Adjustment Factor for Special Landscaped Areas

LA = Landscaped Area in square feet

0.62 = Conversion factor to convert acre-inches per acre per year to gallons per square foot per year

SLA = Special Landscaped Area (square feet) which is an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play such as parks, sports, field, golf courses, and where turf provides a playing surface

Regular Landscaped Area		LA			MAWA		
Hydrozone # 1	53.1	X	0.7	X	0.62	=	
Hydrozone # 2	53.1	X	0.7	X	0.62	=	
Hydrozone # 3	53.1	X	0.7	X	0.62	=	
Hydrozone # 4	53.1	X	0.7	X	0.62	=	
Hydrozone # 5	53.1	X	0.7	X	0.62	=	

Total #1

Special Landscaped Area		SLA			MAWA		
Hydrozone # 1	53.1	X	1.0	X	0.62	=	
Hydrozone # 2	53.1	X	1.0	X	0.62	=	

Total #2

Total #1	+	Total #2	=	Total MAWA
	+		=	

gallons per year

Estimated Applied Water Use (EAWU)

$$EAWU = 53.1 \times K_L \times LA \times 0.62 \div IE$$

Where:

- EAWU** = Estimated Applied Water Use (gallons per year)
53.1 = The Evapotranspiration Adjustment Factor (ETo) determined by the nearest weather station, operated by California Irrigation Management Information System, located in the City of Glendora
K_L = Landscape Coefficient (see below for determining K_L)
LA = Landscaped Area in square feet
0.62 = Conversion factor to convert acre-inches per acre per year to gallons per square foot per year
IE = The standard unit for this measurement is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained from the listed irrigation heads:

Pop-up stream rotator heads:	0.75
Stream rotor heads:	0.75
Microspray:	0.75
Bubbler:	0.80
Drip emitter:	0.85
Soaker hose	0.85
Subsurface irrigation:	0.90

Determining the Landscape Coefficient: $K_L = K_s \times K_d \times K_{mc}$

Species Factor (K_s)

K_s is determined by referring to the 2000 Water Use Classification of Landscaped Species (WUCOLS). By going to region 4 on the WUCOLS and searching for a particular plant species it can be determined if a plant uses a very low (VL), low (L), moderate (M) or high (H) amount of water. A numerical value will be assigned to each category as shown below.

High (H):	0.7 - 0.9
Moderate (M):	0.4 - 0.6
Low (L):	0.1 - 0.3
Very Low (VL):	< 0.1

Density Factor (K_d)

K_s will be given a value ranging from 0.5 to 1.3 based on the following:

Average Density:	1.0
Low Density:	0.5 to 0.9
High Density:	1.1 to 1.3

Average Density: (1.0)

Canopy cover of 70% to 100% constitutes an average condition. For shrubs or groundcovers, a canopy cover of 90% to 100% is considered to be an average condition.

Low Density: (0.5 to 0.9)

Low density plantings are characterized largely by canopy covers less than those specified for the average density condition. For instance, a tree planting with less than 70% canopy cover would be assigned a K_d value less than 1.0. The precise value assigned (between 0.5 and 0.9) would be based on the canopy cover assessment: a lower K_d value for a thinner canopy cover.

Plantings with mixed vegetation types generally have greater canopy covers than those of a single type. For instance, a groundcover planting with a canopy cover of 50% constitutes a low density condition and a K_d of 0.7 might be assigned. If an occasional tree occurs in the planting, then the principal effect is one of increasing canopy cover, and an upward adjustment in K_d to 0.8 or 0.9 would be warranted.

High Density: (1.1 to 1.3)

When canopy cover is full for any vegetation type, then increases in density result from increases in the number of plants of other vegetation types. For example, by adding trees to a mature groundcover planting (groundcover canopy cover – 100%), an increase in vegetation density occurs. The addition of shrubs to the planting further increases the density. This mix of vegetation types creates a layering or tiering of vegetation which represents potential increases in water loss. Upward adjustment of K_d can be made to account for vegetation tiering. The highest density condition, where all three vegetation types occur in substantial numbers in a planting, would be assigned a K_d of 1.3. In plantings where lesser degrees of vegetation of tiering occurs (e.g. a two-tiered planting), then a K_d value of 1.1 or 1.2 is appropriate.

Microclimate Factor (K_{mc})

K_{mc} will be given a value ranging from 0.5 to 1.3 based on the following:

Low:	0.5 to 0.9
Average:	1.0
High:	1.1 to 1.4

Average Microclimate: (1.0)

Site conditions equivalent to those used for reference evapotranspiration measurements represent an average microclimate. Reference evapotranspiration is measured in an open-field setting which is not exposed to extraordinary winds or heat inputs from nearby buildings, structures, or vehicles. Large plantings of groundcover, groves of trees, and mixtures of shrubs, turf, and trees in relatively open areas represent examples of an average microclimate conditions. Areas with adjacent buildings, extensive hardscapes, or exposed to extraordinary winds would not be included in this category.

Low Microclimate: (0.5 to 0.9)

Sites which are shaded or protected from winds typical to the area are considered to be in the low microclimate category. Features of the site modify the microclimate such that evaporative conditions are less than those found in the average microclimate. Plantings located on the north side or northeast side of buildings, shaded by overhead structures, or within courtyard settings are typically assigned a K_{mc} value in the low range. Plantings protected from winds by buildings, structures, or other vegetations also would be assigned to the low category. The specific value assigned for the microclimate factor will depend on the specific site conditions. For example, a planting in a courtyard which is shaded most of the day and protected from winds may be assigned a value of 0.6, while a similar planting is located on the northeast side of a building may be assigned a value of 0.8.

High Microclimate: (1.1 to 1.4)

Sites which are exposed to direct winds typical for the area, heat inputs from nearby sources, and/or reflected light would be considered to be in the high microclimate category. These features of the site increase evaporative conditions above those found in an average microclimate condition. Plantings located in medians, parking lots, or adjacent to south or southwest facing walls which are exposed to higher canopy temperatures than those found in a well-vegetated setting would be in the high category. Plantings in wind tunnel locations and those receiving reflected light from nearby windows, cars, or other reflective surfaces are also in high microclimate conditions. The specific value assigned will depend on the specific conditions. For example, a shrub planting located next to a southwest facing wall may be assigned a K_{mc} value of 1.2, while a similar planting next to a southwest wall which is composed of reflective glass and is exposed to extraordinary winds may be assigned a value of 1.4.

Summary Table
 Values for Landscape Coefficient Factors

	High	Moderate	Low	Very Low
Species Factor (K_s)	0.7 - 0.9	0.4 - 0.6	0.1 - 0.3	< 0.1
Density (K_d)	1.1 - 1.3	1.0	0.5 - 0.9	
Microclimate (K_{mc})	1.1 - 1.4	1.0	0.5 - 0.9	

Estimated Applied Water Use Worksheet

This worksheet is filled out by the project applicant for each hydrozone. Attach additional sheets of necessary.

$$EAWU = 53.1 \times K_L \times LA \times 0.62 \div IE$$

Where:

EAWU = Estimated Applied Water Use (gallons per year)

53.1 = The Evapotranspiration Adjustment Factor (ETo) determined by the nearest weather station, operated by California Irrigation Management Information System, located in the City of Glendora

K_L = Landscape Coefficient

LA = Landscaped Area in square feet

0.62 = Conversion factor to convert acre-inches per acre per year to gallons per square foot per year

IE = The standard unit for this measurement is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained from the listed irrigation heads:

Pop-up stream rotator heads:	0.75
Stream rotor heads:	0.75
Microspray:	0.75
Bubbler:	0.80
Drip emitter:	0.85
Soaker hose	0.85
Subsurface irrigation:	0.90

Certification of Landscape Design

To be completed and signed by a licensed landscape architect, licensed landscape contractor or any other person authorized to design a landscape.

Project Information Sheet		
Date:	Project Name:	
Name of Project Applicant:		
Profession:	License No.	
Company:		
Telephone No.:	Fax No.:	
Email Address:		
Street Address:		
City:	State:	Zip:

Project Address and Location		
Street Address:		
City:	State:	Zip:
Parcel, tract, or lot number, if available:		

Property Owner or his/her Designee		
Name:		
Company:		
Telephone No.:	Fax No.:	
Email Address:		
Street Address:		
City:	State:	Zip:

I hereby certify that:

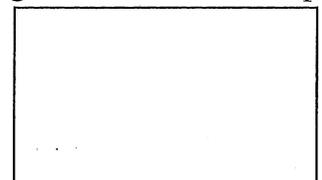
- (1) I am a professional appropriately licensed in the State of California to provide professional landscape design services, or I am the owner of the home in which the landscape was installed.
- (2) The landscape design and water use calculations for the identified property were prepared by me or under my supervision.
- (3) The landscape design and water use calculations for the identified property comply with the requirements of the City of San Dimas Water Efficient Landscape Chapter 18.14 and the City of San Dimas Guidelines for Implementation of the City of San Dimas Water Efficient Landscape Ordinance.
- (4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the City of San Dimas Guidelines for Implementation of the City of San Dimas Water Efficient Landscape Ordinance.

Signature

Date

Print Name

Landscape Design Professional's Stamp
(if applicable)



Landscape Installation Certificate of Completion

To be completed and signed by a licensed landscape architect, licensed landscape contractor or any other person authorized to design a landscape.

Project Information Sheet		
Date:	Project Name:	
Name of Project Applicant:		
Profession:	License No.	
Company:		
Telephone No.:	Fax No.:	
Email Address:		
Street Address:		
City:	State:	Zip:

Project Address and Location		
Street Address:		
City:	State:	Zip:
Parcel, tract, or lot number, if available:		

Property Owner or his/her Designee		
Name:		
Company:		
Telephone No.:	Fax No.:	
Email Address:		
Street Address:		
City:	State:	Zip:

I hereby certify that:

- (1) I am a professional appropriately licensed in the State of California to provide professional landscape design services or I am the owner of the home in which the landscape was installed.
- (2) The landscape project for the identified project was installed by me or under my supervision.
- (3) The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of the City of San Dimas Water Efficient Landscape Chapter 18.14 and the City of San Dimas Guidelines for implementation of the Ordinance for the efficient use of water in the landscape.
- (4) The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with the City of San Dimas Guidelines for Implementation of the Water Efficient Landscape Chapter 18.14.

Signature

Date

Print Name

Landscape Design Professional's Stamp
(if applicable)

