

COMMUNITY DEVELOPMENT AND SUSTAINABILITY DEPARTMENT

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September 13, 2010

Peter Brostrom
California Department of Water Resources
Water Use and Efficiency Branch
Post Office Box 942836
Sacramento, CA 94236-0001

SUBJECT: Water Efficient Landscape Ordinance Adoption Update

Dear Mr. Brostrom,

Pursuant to the letter dated August 30, 2010 reminding local agencies to notify the California Department of Water Resources (DWR) of their compliance with the Water Conservation in Landscaping Act of 2006, the City of Davis is sending this status update.

The City of Davis intends to adopt its own local ordinance and has developed a Water Efficient Landscape Ordinance consistent with the model ordinance provided by DWR. The city has been undergoing the adoption process, but has not yet completed our required review which includes the following schedule:

- July 28, 2010 - The Planning Commission reviewed the draft ordinance and recommended adoption by the City Council.
- September 27, 2010 - The Natural Resources Commission is scheduled to review the draft ordinance.
- October 26, 2010 - The City Council is scheduled to consider adoption of the ordinance.

A copy of the draft ordinance is attached. Once the city completes the process, the adopted ordinance will be submitted to DWR.

It should also be noted that consistent with the state standards, the city has implemented the new requirements on applicable landscaping projects since January 1, 2010. Please feel free to contact me with any questions at: (530) 757-5610, or by email at: elee@cityofdavis.org.

Sincerely,

Eric Lee
Assistant Planner

Attachments: Draft City of Davis Water Efficient Landscape Ordinance

ORDINANCE NO. _____

AN ORDINANCE AMENDING CHAPTER 40 ZONING OF THE MUNICIPAL CODE OF THE CITY OF DAVIS TO UPDATE CITY STANDARDS FOR WATER EFFICIENT LANDSCAPING BY DELETING EXISTING STANDARDS IN SECTIONS 40.26.190 THROUGH 40.26.240 AND ADDING UPDATED STANDARDS AS ARTICLE 40.42

WHEREAS, the purpose of the Zoning Ordinance Chapter 40 of the Municipal Code of the City of Davis is to establish clear standards and processes for orderly development in the city; and

WHEREAS, state requirements mandate that local jurisdictions comply with the Water Conservation in Landscaping Act of 2006, Government Code Sections 65591 et. seq. and adopt standards and procedures that promote the design, installation and management of water efficient landscaping consistent with state requirements; and

WHEREAS, water consumption for landscaping represents a substantial amount and the design of landscapes and irrigation systems significantly impact water use and consumption and it is the policy of the city to minimize increases in water use, require water conservation in landscaping, and maintain surface water quality; and

WHEREAS, the updated standards contained in this ordinance comply with state requirements and are consistent with the Water Conservation in Landscaping Act of 2006; and

WHEREAS, existing standards for water conservation located in Sections 40.26.190 through 40.26.240 would be replaced by these updated standards as Article 40.42 of the City Code; and

WHEREAS, the Planning Commission held a public hearing on July 28, 2010 to consider the ordinance and recommended that the City Council adopt these amendments to Chapter 40 of the Municipal Code; and

WHEREAS, the Natural Resources Commission held a public meeting on _____, 2010 to consider the ordinance and recommended that the City Council adopt these amendments to the Municipal Code; and

WHEREAS, the City Council of the City of Davis held a public hearing on _____, 2010 to consider adoption of these amendments to the Municipal Code; and

WHEREAS, these proposed amendments are categorically exempt from further environmental review pursuant to CEQA Guidelines Section 15307 and 15308 for actions taken by regulatory agencies as authorized by state law to assure the maintenance, restoration, enhancement of natural resources and the protection of the environment.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF DAVIS DOES HEREBY ORDAIN AS FOLLOWS:

SECTION 1. ARTICLE 40.26 SPECIAL USES SECTIONS LIST.

Delete section references to Section 40.26.190 Water Conservation Standards for New Construction, Section 40.26.200 Definitions, Section 40.26.210 Purpose, Section 40.26.220 Applicability, Section 40.26.230 Compliance, and Section 40.26.240 Variances, in the list of sections in Article 40.26 Special Uses of Chapter 40 of the Municipal Code of the City of Davis, as amended..

SECTION 2. SECTIONS 40.26.190 THROUGH 40.26.240 FOR WATER CONSERVATION STANDARDS.

Delete Water Conservation Standards in Sections 40.26.190 through 40.26.240 of Chapter 40 of the Municipal Code of the City of Davis, as amended.

SECTION 3. ARTICLE 40.42 WATER EFFICIENT LANDSCAPING STANDARDS.

Amend Chapter 40 of the Municipal Code of the City of Davis, as amended, to add updated standards for water efficient landscaping as Article 40.42, as follows:

Article 40.42

WATER EFFICIENT LANDSCAPING

Sections:

Section 40.42.010	Purpose
Section 40.42.020	Applicability
Section 40.42.030	Definitions
Section 40.42.040	Provisions for Existing Landscapes Installed Prior to Effective Date
Section 40.42.050	Provisions for New Construction or Rehabilitated Landscapes
Section 40.42.060	Landscape Documentation Package Requirements
Section 40.42.070	Water Efficient Landscape Worksheet
Section 40.42.080	Soil Management Report
Section 40.42.090	Landscape Design Plan
Section 40.42.100	Irrigation Design Plan
Section 40.42.110	Grading Design Plan
Section 40.42.120	Certificate of Completion
Section 40.42.130	Irrigation Scheduling
Section 40.42.140	Landscape and Irrigation Maintenance Schedule
Section 40.42.150	Irrigation Audits
Section 40.42.160	Irrigation Efficiency
Section 40.42.170	Recycled Water
Section 40.42.180	Stormwater Management
Section 40.42.190	Public Education
Section 40.42.200	Effective Precipitation
Section 40.42.210	Fees
Section 40.42.220	Penalties

Section 40.42.010 Purpose.

The purpose of the landscaping standards contained in this chapter is to comply with the Water Conservation in Landscaping Act of 2006, Government Code Sections 65591 et. seq. and to establish standards and procedures that promote the design, installation and management of water efficient landscaping. These standards may be reviewed and updated, as required.

Section 40.42.020 Applicability

(a) The provisions of this chapter shall apply to all of the following landscape projects within the City of Davis, except as otherwise noted:

- (1) **Non-Residential Projects and Public Agency Projects.** New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review.
- (2) **Residential Projects With Developer-Installed Landscaping.** New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects with a landscape area equal to or greater than 2,500 square feet per lot requiring a building or landscape permit, plan check, or design review.
- (3) **Residential Projects With Homeowner-Provided Landscaping.** New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or design review.
- (4) **Existing Landscaping.** Requirements for existing landscapes installed prior to the effective date of this ordinance and not rehabilitated are limited to Section 40.26.040.
- (5) **Cemeteries.** Recognizing the special landscape management needs of cemeteries, requirements for new and rehabilitated cemeteries are limited to Sections 40.42.070, 40.42.140 and 40.42.150. Requirements for existing cemeteries are limited to Section 40.42.040.

(b) The provisions of this chapter do not apply to:

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

Section 40.42.030 Definitions.

The terms used in this chapter have the meaning set forth below:

Applied Water. The portion of water supplied by the irrigation system to the landscape.

Automatic Irrigation Controller. 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. A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

Certificate of Completion. The document required under Section 40.42.120.

Certified Irrigation Designer. A person certified to design irrigation systems by an accredited academic institution a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Irrigation Designer program.

Certified Landscape Irrigation Auditor. A person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

Check Valve or Anti-Drain Valve. A valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

Common Interest Developments. Community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

Conversion Factor (0.62). The number that converts acre-inches per acre per year to gallons per square foot per year.

Developer-Installed Landscaping. Landscape area on a property installed by the developer of the property or licensed contractor hired by the developer of the property. A developer, for the purposes of this chapter, includes anyone or any group not defined as a homeowner by this chapter.

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

Ecological Restoration Project. A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

Effective Precipitation (Eppt) or Usable Rainfall. The portion of total precipitation which becomes available for plant growth.

Emitter. A drip irrigation emission device that delivers water slowly from the system to the soil.

Established Landscape. 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.

Establishment Period of the Plants. The first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.

Estimated Total Water Use (ETWU) The total water used for the landscape as described in Section 40.42.070(a).

ET Adjustment Factor (ETAF). 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. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is $(0.7) = (0.5/0.71)$. ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

Evapotranspiration Rate. The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

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

Hardscapes. Any durable material (pervious and non-pervious).

Homeowner-Provided Landscaping. Any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this chapter, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

Hydrozone. A portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

Infiltration Rate. The rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

Invasive Plant Species. Species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

Irrigation Audit. An in-depth evaluation of the 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 Efficiency (IE). 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. Greater irrigation efficiency can be expected from well designed and maintained systems.

Irrigation Survey. An evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

Irrigation Water Use Analysis. An analysis of water use data based on meter readings and billing data.

Landscape Architect. A person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

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

Landscape Contractor. A person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

Landscape Documentation Package. The documents required under Section 40.42.060.

Landscape Project. The total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance, meeting requirements under Section 40.42.020.

Lateral Line. The water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

Local Water Purveyor. Any entity, including a public agency, city, county, or private water company that provides retail water service.

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

Main Line. The pressurized pipeline that delivers water from the water source to the valve or outlet.

Maximum Applied Water Allowance (MAWA). The upper limit of annual applied water for the established landscaped area as specified in Section 40.42.070. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.

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

Mined-Land Reclamation Projects. Any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

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

New Construction. For the purposes of this chapter, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

Operating Pressure. The pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

Overhead Sprinkler Irrigation Systems. Systems that deliver water through the air (e.g., spray heads and rotors).

Overspray. The irrigation water which is delivered beyond the target area.

Permit. An authorizing document issued by local agencies for new construction or rehabilitated landscapes.

Pervious. Any surface or material that allows the passage of water through the material and into the underlying soil.

Plant Factor or Plant Water Use Factor. A factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this chapter, 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 this chapter are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

Precipitation Rate The rate of application of water measured in inches per hour.

Project Applicant. The individual or entity submitting a Landscape Documentation Package, to request a permit, plan check, or design review from the City of Davis. A project applicant may be the property owner or his or her designee.

Rain Sensor or Rain Sensing Shutoff Device. A component which automatically suspends an irrigation event when it rains.

Record Drawing or As-Builts. A set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

Recreational Area. Areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

Recycled Water, Reclaimed Water, or Treated Sewage Effluent Water. 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.

Reference Evapotranspiration or ETo. A standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Section, 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 so that regional differences in climate can be accommodated.

Rehabilitated Landscape. Any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Section 40.42.020, and the modified landscape area is equal to or greater than 2,500 square feet and is 50% or more of the total landscape area.

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

Soil Moisture Sensing Device or Soil Moisture Sensor. A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

Soil Texture. The classification of soil based on its percentage of sand, silt, and clay.

Special Landscape Area (SLA). An area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

Sprinkler Head. A device which delivers water through a nozzle.

Static Water Pressure. The pipeline or municipal water supply pressure when water is not flowing.

Station. An area served by one valve or by a set of valves that operate simultaneously.

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

Turf. A ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

Valve. A device used to control the flow of water in the irrigation system.

Water Conserving Plant Species. A plant species identified as having a low plant factor.

Water Feature. A design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and

used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

Watering Window. The time of day irrigation is allowed.

WUCOLS. The Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

Section 40.42.040. Provisions for Existing Landscapes Installed Prior to Effective Date.

(a) This section shall apply to all existing landscapes that were installed prior to the effective date of this ordinance. However, existing landscapes installed between January 1, 2010 and the effective date of this ordinance are subject to the requirements of the Water Conservation in Landscaping Act of 2006.

(b) All existing landscapes installed prior to the effective date of this ordinance and over one acre in size that have a water meter are subject to programs administered by the City of Davis that may include, but are not limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes.

(c) The Maximum Applied Water Allowance for existing landscapes shall be calculated in accordance with section 40.42.070 and using the following equation:

$$MAWA = (0.8)(ETo)(LA)(0.62)$$

Where:

0.8 = ET Adjustment Factor (ETAF) for existing non-rehabilitated landscapes

ETo = Reference Evapotranspiration for City of Davis (Annual ETo in inches per year)

LA = Landscape Area (square feet)

0.62 = Conversion Factor

(d) All existing landscapes that do not have a meter are subject to programs administered by the City of Davis that may include, but are not limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

(e) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

Section 40.42.050 Provisions for New Construction or Rehabilitated Landscapes.

(a) Prior to construction or issuance of permits, the project applicant for a new construction or rehabilitated landscape project, as described in Section 40.42.020, shall submit a complete Landscape Documentation Package to the Department of Community Development and Sustainability for review and approval.

(b) Upon approval of the Landscape Documentation Package by the Department of Community Development and Sustainability, the project applicant shall:

- (1) Receive a permit or approval of the plan check or design review and record the date of the permit in the Certificate of Completion; and
- (2) Submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee.

(c) Upon completion of the landscape project and prior to final of the permit or occupancy, the project applicant shall submit a completed Certificate of Completion, as described in Section 40.42.120, to the Department of Community Development and Sustainability for review and approval.

Section 40.42.060 Landscape Documentation Package Requirements.

(a) The Landscape Documentation Package shall include the following six (6) elements and as detailed in the subsequent sections:

- (1) Project Information. The project applicant shall provide the following minimum required project information:
 - (A) Date.
 - (B) Project Applicant.
 - (C) Project Address (if available, parcel and/or lot number(s)).
 - (D) Total Landscape Area (square feet).
 - (E) Project Type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed).
 - (F) Water Supply Type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well.
 - (G) Checklist of all documents in Landscape Documentation Package.
 - (H) Project contacts to include contact information for the project applicant and property owner.
 - (I) Applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package."
- (2) Water Efficient Landscape Worksheet;
- (3) Soil Management Report;
- (4) Landscape Design Plan;
- (5) Irrigation Design Plan; and
- (6) Grading Design Plan.

(b) Project applicant shall provide the required information on state-recommended forms or city-equivalent forms if available. All required reports and plans shall be provided in a form determined acceptable by the Director of Community Development and Sustainability and shall be subject to city review and approval.

Section 40.42.070 Water Efficient Landscape Worksheet.

(a) **Landscape Worksheet Components.** In order to determine the water budget and water needs for project landscaping, the project applicant shall complete the City's Water Efficient Landscape Worksheet which contains two sections:

- (1) Hydrozone Information Table; and
- (2) Water Budget Calculations for the Maximum Applied Water Allowance (MAWA) and

the Estimated Total Water Use (ETWU).

(b) **Water Budget Calculation Requirements.** Water budget calculations shall adhere to the following requirements:

- (1) The plant factor used shall be from WUCOLS. The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.
- (2) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.
- (3) All Special Landscape Areas shall be identified and their water use calculated as described below.
- (4) ETAF for Special Landscape Areas shall not exceed 1.0.
- (5) For the purposes of determining these water calculations, average irrigation efficiency is assumed to be 0.71.
- (6) For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the following ETo values, or as may be updated, for the City of Davis:

Reference Evapotranspiration (ETo) Table for City of Davis

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
1.0	1.9	3.3	5.0	6.4	7.6	8.2	7.1	5.4	4.0	1.8	1.0	52.5

(c) **Maximum Applied Water Allowance (MAWA).** The Maximum Applied Water Allowance shall be calculated using the equation:

$$MAWA = (ETo) (0.62) [(0.7 \times HA) + (0.3 \times SLA)]$$

(d) **Estimated Total Water Use (ETWU).** The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed Maximum Applied Water Allowance.

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

Where:

- ETWU = Estimated Total Water Use per year (gallons)
- ETo = Reference Evapotranspiration for City of Davis (Annual ETo in inches per year)
- PF = Plant Factor from WUCOLS
- HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
- SLA = Special Landscape Area (square feet)
- 0.62 = Conversion Factor
- IE = Irrigation Efficiency (minimum 0.71)

Section 40.42.080 Soil Management Report.

(a) **Soil Report Requirements.** In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or designee, and submitted, as follows:

- (1) Project applicant shall submit soil samples to a qualified laboratory for analysis and recommendations to be included in the soil report.
 - (A) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
 - (B) The soil analysis may include:
 - i. Soil Texture;
 - ii. Infiltration rate determined by laboratory test or soil texture infiltration rate table;
 - iii. pH;
 - iv. Total Soluble Salts;
 - v. Sodium;
 - vi. Percent organic matter; and
 - vii. Recommendations for preparing, amending and treating the soil.
- (2) The project applicant, or designee, shall comply with one of the following:
 - (A) If significant mass grading is not planned, the soil analysis report shall be submitted to the Department of Community Development and Sustainability for review as part of the Landscape Documentation Package; or
 - (B) If significant mass grading is planned, the soil analysis report shall be submitted to the Department of Community Development and Sustainability for review as part of the Certificate of Completion.
- (3) The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
- (4) The project applicant, or designee, shall submit documentation verifying implementation of soil analysis report recommendations to the Department of Community Development and Sustainability with the Certificate of Completion.

Section 40.42.090 Landscape Design Plan.

(a) **Landscape Design Criteria.** For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

- (1) Plant Material.
 - (A) Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance. To encourage the efficient use of water, the following is highly recommended:
 - i. Protection and preservation of native species and natural vegetation;
 - ii. Selection of water-conserving plant and turf species;
 - iii. Selection of plants based on disease and pest resistance;
 - iv. Selection of trees based on the City's Master Tree List; and
 - v. Selection of plants from city, local, and regional landscape program plant lists.

- (B) Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 40.42.100(a)(2)(D).
- (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:
- i. 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;
 - ii. Recognize the horticultural attributes of plants (i.e. mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; and
 - iii. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
- (D) Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).
- (E) 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 required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.
- (F) The use of invasive and/or noxious plant species is strongly discouraged.
- (G) 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 low-water use plants as a group.
- (2) Water Features.
- (A) Recirculating water systems shall be used for water features.
 - (B) Where available, recycled water shall be used as a source for decorative water features.
 - (C) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.
 - (D) Pool and spa covers are highly recommended.
- (3) Mulch and Amendments.
- (A) A minimum two inch (2") 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) Stabilizing mulching products shall be used on slopes.
 - (C) The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
 - (D) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected.

(b) **Landscape Plan Requirements.** The landscape design plan, at a minimum, shall:

- (1) Delineate and label each hydrozone by number, letter, or other method;

- (2) Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
- (3) Identify recreational areas;
- (4) Identify areas permanently and solely dedicated to edible plants;
- (5) Identify areas irrigated with recycled water;
- (6) Identify type of mulch and application depth;
- (7) Identify soil amendments, type, and quantity;
- (8) Identify type and surface area of water features;
- (9) Identify hardscapes (pervious and non-pervious);
- (10) Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater 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.) that minimize runoff.
- (11) Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);
- (12) Contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan."; and
- (13) Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape.

Section 40.42.100 Irrigation Design Plan.

(a) **Irrigation Design Criteria.** For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' 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.

(1) Irrigation System Requirements.

- (A) Dedicated landscape water meters are highly recommended on landscape areas smaller than 5,000 square feet 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) 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.
 - i. 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.

- ii. 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.
- (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 or 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 local agency code (i.e., public health) 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) The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 40.42.160 regarding the Estimated Total Water Use calculation.
- (L) It is highly recommended that the project applicant or local agency 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 (8) feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.
- (S) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. 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 runoff occurs; or
 - ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
 - iii. The irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria. Prevention of overspray and runoff must be confirmed during the irrigation audit.
- (T) 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 during the irrigation audit.

(2) Hydrozone.

- (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, or moderate and high water use, may be allowed if:
 - i. Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
 - ii. The plant factor of the higher water using plant is used for calculations.
- (E) Individual hydrozones that mix high and low water use plants shall not be permitted.
- (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 Hydrozone Information Table on the city-provided form. This table can also assist with the irrigation audit and programming the controller.

(b) **Irrigation Plan Requirements.** The irrigation design plan, at a minimum, shall contain:

- (1) Location and size of separate water meters for landscape;
- (2) Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, 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 operating pressure (pressure per square inch) for each station;
- (5) Recycled water irrigation systems as specified in Section 40.42.170;
- (6) The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and
- (7) The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system.

Section 40.42.110 Grading Design Plan.

(a) **Grading Plan Requirements.** For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for other local agency permits satisfies this requirement.

- (1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
 - (A) Height of graded slopes;
 - (B) Drainage patterns;
 - (C) Pad elevations;
 - (D) Finish grade; and
 - (E) Stormwater retention improvements, if applicable.
- (2) To prevent excessive erosion and runoff, it is highly recommended that project applicants:
 - (A) Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
 - (B) Avoid disruption of natural drainage patterns and undisturbed soil; and
 - (C) Avoid soil compaction in landscape areas; and
 - (D) Decomact and break up compacted soil in landscape areas.
- (3) The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

Section 40.42.120 Certificate of Completion.

(a) **Certificate of Completion Elements.** The Certificate of Completion shall include the following six (6) elements in a form determined acceptable to the Director of Community Development and Sustainability:

- (1) Project information sheet that contains:
 - (A) Date;
 - (B) Project name;
 - (C) Project applicant name, telephone, and mailing address;
 - (D) Project address and location; and
 - (E) Property owner name, telephone, and mailing address;
- (2) Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;

- (A) Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
- (3) Irrigation scheduling parameters used to set the controller (see Section 40.42.130);
- (4) Landscape and irrigation maintenance schedule (see Section 40.42.140);
- (5) Irrigation audit report (see Section 40.42.150); and
- (6) Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations.

(b) **Certificate of Completion Submittal.** Upon completion of the landscape project and prior to final of the permit or occupancy, the project applicant shall:

- (1) Submit the signed Certificate of Completion to the Department of Community Development and Sustainability for review;
- (2) Ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor and property owner or his or her designee,

(c) **City Review Procedures.** Upon submittal of the completed Certificate of Completion, the Department of Community Development and Sustainability shall:

- (1) Receive the signed Certificate of Completion from the project applicant;
- (2) Upon review of the Certificate of Completion, approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the City of Davis shall not be obligated to issue an occupancy permit and shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

Section 40.42.130 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 between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from the local water purveyor, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
- (3) For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.
- (4) Parameters used to set the automatic controller shall be developed and submitted for each of the following:
 - (A) The plant establishment period;
 - (B) The established landscape; and
 - (C) Temporarily irrigated areas.
- (5) Each irrigation schedule shall consider for each station all of the following that apply:
 - (A) Irrigation interval (days between irrigation);
 - (B) Irrigation run times (hours or minutes per irrigation event to avoid runoff);

- (C) Number of cycle starts required for each irrigation event to avoid runoff;
- (D) Amount of applied water scheduled to be applied on a monthly basis;
- (E) Application rate setting;
- (F) Root depth setting;
- (G) Plant type setting;
- (H) Soil type;
- (I) Slope factor setting;
- (J) Shade factor setting; and
- (K) Irrigation uniformity or efficiency setting.

Section 40.42.140 Landscape and Irrigation Maintenance Schedule.

(a) Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.

(b) 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 areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction 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.

Section 40.42.150 Irrigation Audits.

(a) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

(b) For new construction and rehabilitated landscape projects installed after adoption of this chapter, as described in Section 40.42.020:

- (1) The project applicant shall submit an irrigation audit report with the Certificate of Completion to the City of Davis that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule.
- (2) The City of Davis will maintain a reference list of certified water service auditors. The list shall be provided to project applicants upon request.
- (3) The City of Davis may administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

Section 40.42.160 Irrigation Efficiency.

(a) For the purposes of determining the water calculations, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

Section 40.42.170 Recycled Water.

(a) The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in Section 40.42.170(b).

(b) 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.

(c) All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.

(d) Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0.

Section 40.42.180 Stormwater Management.

(a) Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged.

(b) Projects shall comply with applicable city requirements for stormwater best management practices as detailed in the city's stormwater runoff ordinance or equivalent. Measures shall be incorporated and shown in the applicable plans subject to review and approval.

(c) Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.

Section 40.42.190 Public Education.

(a) The City of Davis or the project developer shall provide information to owners of new, single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes in a form determined acceptable to the City.

(b) Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this chapter.

(1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme.

(2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

Section 40.42.200 Effective Precipitation.

(a) The city may consider Effective Precipitation (up to a maximum of 25% of annual precipitation) in tracking water use. The following equation may be used to calculate Maximum Applied Water Allowance where E_{ppt} is the Effective Precipitation:

$$\text{MAWA} = (\text{ETo} - \text{Eppt}) (0.62) [(0.7 \times \text{LA}) + (0.3 \times \text{SLA})].$$

Section 40.42.210. Fees.

The City of Davis may establish fees for necessary review and inspections related to the requirements of this chapter.

Section 40.42.220. Penalties.

Failure to comply with the requirements of this chapter may result in enforcement and penalties in accordance with Municipal Code Chapter 23.

SECTION 4. PURPOSE.

The purpose of this ordinance is to comply with the Water Conservation in Landscaping Act of 2006, Government Code Sections 65591 et. seq. and to establish standards and procedures that promote the design, installation and management of water efficient landscaping consistent with state requirements.

SECTION 5. FINDINGS.

The City Council of the City of Davis hereby finds:

1. That the Planning Commission held a public hearing on July 28, 2010 to receive comments and consider the ordinance amendments.
2. That the Natural Resources Commission held a public meeting on _____ to receive comments and consider the ordinance amendments.
3. That the ordinance amendments are in general conformance with the City of Davis General Plan.
4. That the public necessity, convenience and general welfare require the adoption of the proposed ordinance amendments, in that, the ordinance amendments are necessary to comply with state requirements and to implement city policies for water conservation.
5. That the ordinance amendments are exempt from further environmental review pursuant to CEQA Guidelines Section 15307 and 15308 for actions taken by regulatory agencies as authorized by state law to assure the maintenance, restoration, enhancement of natural resources and the protection of the environment..

SECTION 6. EFFECTIVE DATE.

These ordinance amendments shall become effective on and after the thirtieth (30th) day following its adoption.

INTRODUCED on _____, 2010, AND PASSED AND ADOPTED on _____, 2010, by the following vote:

AYES:

NOES:
ABSENT:

ATTEST:

Don Saylor
Mayor

Zoe S. Mirabile, CMC
City Clerk

DRAFT

