



## **Supplemental Informational Reference**

### **Water Efficient Landscape Ordinance Livermore Municipal Code 13.25**

#### **Informational Reference**

This reference document is an informational supplement to the requirements of Livermore Municipal Code (LMC) Chapter 13.25 (Water Efficient Landscape). LMC 13.25 requirements take precedence over any information in this document. The topics covered in this document are:

- Applicability and Purpose
- Submittal requirements
- Landscape Design
- Water Budget Calculations
- Plant Factors
- Irrigation Efficiency
- Grading and site design
- Soil management
- Irrigation design and scheduling
- Maintenance and water waste prevention
- Water Efficient Landscape Ordinance 1956 Outline
- Standard Design Review Condition of Approval

#### **Attachments**

- Design Review Intake Form
- Post-Installation Certification Form

#### **Applicability and Purpose**

The ordinance is applicable to projects that require a permit and include new or renovated landscapes over 2,500 square feet, except that for single family homes, renovations are exempt and only newly constructed landscapes over 5,000 square feet in landscape area are subject to the ordinance.

The ordinance is a water budget ordinance. This means it specifies a method for calculating a water budget and estimating water use and requires that the estimated applied water use shall not exceed the maximum applied water allowance. It also contains related standards for landscape and irrigation design to improve landscape water efficiency including but not limited to, plant materials, soil health, grading, and irrigation design and maintenance.

The goal of the Water Efficient Landscape Ordinance is to save water, which in turn saves the landowner in long-term water costs and is good for the environment. All other jurisdictions in the State have a similar ordinance or use the State model.

## **Submittal requirements**

The ordinance specifies items to submit with an application (LMC 13.25.040). Check with the city staff for any submittal forms for design review or post-installation certification.

For initial submittal, it may help you focus your approach to conserving water in landscape and irrigation design, and help the city staff reviewing the application, to include a water conservation concept statement, which is a written statement describing the project's approach to planting and irrigation to conserve water (e.g., what types of irrigation equipment will be used where depending on the grouping of plants by water needs).

For your initial submittal, remember to consult other ordinances, policies, and regulations with landscaping-related requirements applicable in the city which may apply to your project including but not limited to:

1. Tree preservation ordinance (see Chapter 12.20 Livermore Municipal Code, Article II);
2. The current Alameda Countywide Clean Water Program requirements and published associated technical guidance;
3. The current California building standards applicable in the city of Livermore; and
4. The landscape sections of any checklists or scorecards which may be required by city ordinance including but not limited the civic bay-friendly landscaping ordinance (see Chapter LMC Chapter 15.80);
5. The Livermore Development Code (see Chapter 4.05 (General Landscape Standards); the landscape standards applicable to the property zoning district; and any standards in Part 10 (Subdivisions) which may apply to your project);
6. The landscaping section in the City of Livermore design standards and guidelines chapter which may be applicable to your project type;
7. The landscape standards in any applicable specific plan if your property is in a specific plan.

## **Landscape Design**

The Water Efficient Landscape Ordinance contains landscape design standards (LMC 13.25.050). The following are additional recommended design considerations.

Consider becoming familiarized with and utilizing Bay Friendly Landscaping, a whole systems approach to the design, construction and maintenance of the landscape, to conserve water. Designers may do this by using the Bay-Friendly Landscape Guidelines, Bay-Friendly Landscape Scorecards and Bay-Friendly Gardening Guide, as they may be amended from time to time. Bay Friendly Guidelines may be found at [www.stopwaste.org](http://www.stopwaste.org).

To encourage the efficient use of water and other resources, the following are recommended:

- Protect and preserve existing native species, natural vegetation, and mature trees;
- Select plants based on disease and pest resistance;
- Select trees that fit their space and provide shade where most needed (e.g., south and west exposures, pedestrian areas, parking lots).
- Select California native plants from local and regional landscape program plant lists using local natural plant communities as models. Native, climate adapted or "Mediterranean" plants tend to be relatively more disease- and pest-resistant in California's climate and tend to need less water and survive when stressed by inevitable hot and/or dry spells.
- 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;

- Locate plants with room to reach mature size to reduce the need for frequent trimming and hedging. In addition to the additional maintenance time and cost, plants that don't fit their space well and have to be frequently trimmed use water to grow to their size before trimming as well as to re-grow. A cycle of wasted water use, excessive plant debris generated, and extra maintenance time and effort can result.
- Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
- Avoid specifying turf in street medians, traffic islands or bulbouts of any size unless irrigated with subsurface or low volume irrigation
- Avoid installing turf on slopes exceeding 10:1 (horizontal to vertical) or 10%
- Consider special treatments for trees allowing enhanced oxygen and water infiltration to their root zones to promote their survival and vigor, especially in areas adjacent to compacted soils such as tree wells next to pavement. Such measures may include, but not be limited to, engineered (or "structural") soil, or provision of larger root volumes (excavated areas backfilled with amended soils in which new trees are planted).
- Remember turf tends to require relatively larger amounts of water and often more frequent maintenance than other plant materials, and how and where turf is placed in the landscape can significantly reduce the amount of irrigation water needed to support the landscape. Use turf where it aesthetically highlights the house or buildings and where it has practical function, such as in play or recreation areas. Grouping turf areas can increase watering efficiency and significantly reduce evaporative and runoff losses. Select a type of grass that can withstand drought periods and become dormant during hot, dry seasons. Reducing or eliminating turf areas altogether further reduces water use.
- Consider preserving existing trees or planting more than the minimum required number of trees, even if not subject to the Tree Preservation Ordinance (LMC Chapter 12.20 Article II) whose purpose includes assisting in the continuous development and maintenance within the city of Livermore of a healthy urban forest and sustainable tree cover with trees of various species and age classes; preserving and enhancing the aesthetic and quality of life values provided by Livermore's urban forest; and preserving and enhancing the environmental benefits provided by Livermore's urban forest, including the reduction of air and noise pollution, the conservation of energy resources through shade and cooling, and the provision of wildlife habitat.

Stormwater best management practices are encouraged in the landscape design plan and some may be required to meet current stormwater regional permit requirements based on your project size. Examples include, but are not limited to:

- rain gardens, infiltration beds, swales, and basins that allow water to collect and soak into the ground;
- constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
- pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

Remember to check the City's General Plan Climate Change element. City of Livermore general plan Climate Element (CLI) policies encourage considering rainwater harvesting, recycled water use and planting more trees to provide a larger carbon sink (e.g., Objectives CLI-1.4 and CLI-1.6).

Additionally, the following landscaping-related best management practices are intended for new developments of 50 residential units or greater and/or 50,000 square feet of commercial/industrial use however are encouraged for all landscape projects.

- Climate BMP No. 8 – Include recycling facilities to provide for commercial and/or community recycling of plastic, paper, green waste, and food waste.
- Climate BMP No. 9 – Incorporate “heat island” treatments including cool roofs, cool pavements, and strategically placed shade trees.

For fire prone areas avoid fire-prone plant materials and highly flammable mulches such as shredded redwood bark, e.g., “gorilla hair” mulch.

### **Water Budget Calculations.**

The Water Efficient Ordinance maximum applied water allowance (MAWA) and estimated applied water use (EAWU) specifications are reprinted below, followed by some examples of their use. Terms such as landscape area, special landscape area, hydrozone, plant factor, and irrigation efficiency are defined in the Ordinance Section 13.25.030. Special landscape areas receive a higher water budget.

#### **Maximum Applied Water Allowance (MAWA) (LMC 13.25.050(A)(13)(a))**

$$\text{MAWA} = (47.2)(0.62) \times [(0.7 \times \text{LA}) + (0.3 \times \text{SLA})]$$

- MAWA = Maximum applied water allowance (gallons per year)
- 47.2 = Livermore reference evapotranspiration (ET<sub>o</sub>) in inches per square foot per year
- 0.62 = Conversion factor from inches to gallons per square foot
- 0.7 = Evapotranspiration (ET) Adjustment Factor (ETAF)
- LA = Landscape area (square feet)
- 0.3 = Additional water allowance for special landscape area (SLA)
- SLA = Landscape area that meets this chapter’s definition of special landscape area (square feet)

#### **Estimated Applied Water Use (EAWU) (LMC 13.25.050(A)(13)(b))**

The total estimated applied water use shall not exceed the maximum applied water allowance. The total estimated applied water use shall be the sum of the estimated applied water use calculated for each of the landscape design plan hydrozones using the following formula. Hydrozones are briefly described below.

$$\text{EAWU} = \text{EAWU (non-SLA hydrozones)} + \text{EAWU (SLA hydrozones)}$$

- EAWU = Total project estimated applied water use in gallons per year
- EAWU (non-SLA hydrozones) = [(47.2)(0.62)] x [(PF x HA)/IE] calculated separately for each hydrozone not meeting the definition of special landscape area (SLA), then added together for all such hydrozones.
- EAWU (SLA hydrozones) = [(47.2)(0.62)] x (SLA)
- 47.2 = Livermore reference evapotranspiration (ET<sub>o</sub>) in inches per square foot per year
- 0.62 = Conversion factor from inches to gallons per square foot
- HA = Hydrozone area (in square feet)

- PF = Hydrozone plant factor selected per subsection (B)(4) of this section
- IE = Hydrozone irrigation efficiency elected per subsection (B)(5) of this section
- SLA = Landscape area that meets this chapter’s definition of special landscape area (square feet)

Hydrozone Summaries.

Hydrozones group plants with closely similar water needs that can be watered with similar irrigation equipment and application rates to improve irrigation efficiency.

On the landscape design plan and irrigation design plan, hydrozone areas should be designated by number, letter, or other designation. On the irrigation design plan the areas irrigated by each valve can be used to designate the hydrozone. It’s helpful in planning your landscape and an efficient irrigation system to create a hydrozone summary table. Such a table can also assist with the irrigation audit and programming the controller. Such a table can include the following information for each hydrozone. Three examples follow.

- Each hydrozone area in square feet and a designation (e.g., a number or letter) matching each hydrozone to the corresponding landscape and irrigation design plan hydrozones).
- Each hydrozone’s highest water requirement category of its plant material and corresponding plant factor (see Plant Factor information below).
- Each hydrozone’s proposed type of irrigation equipment and corresponding irrigation efficiency number (see Irrigation Efficiency information below).

1. Example One - Water Budget Calculations/Hydrozone Summary  
10,000 square-foot landscape with no special landscape area

Maximum applied water allowance. – no special landscape area

An example calculation of the maximum applied water allowance for a hypothetical total project landscape area of 10,000 square feet, with no special landscape area, is below.

$$\begin{aligned} \text{MAWA} &= (47.2)(0.62) \times [(0.7 \times 10,000 \text{ sq ft}) + 0 \text{ sq ft}] \\ &= (29.264)(7,000) \text{ gallons per year} \\ &= 204,848 \text{ gallons per year} \end{aligned}$$

Estimated applied water use and hydrozone table – no special landscape area

An example hydrozone table and calculation of the estimated applied water use for a hypothetical total project landscape area of 10,000 square feet, with no special landscape area, is below.

Hydrozone designation	(HA) Hydrozone area in square feet	Water use level	(PF) Plant Factor	Type of irrigation equipment	(IE) Irrigation Efficiency
1	4000	Low	0.2	Bubbler	0.85
2	4000	Moderate	0.5	Stream rotor in planter ≥8 feet wide	0.75
3	2000	Moderate	0.5	Stream rotor in planter < 8 feet wide	.71
Total	10,000	N/A	N/A	N/A	N/A

Estimated applied water use based on the above table:

$$\begin{aligned}\text{Hydrozone 1} &= ((29.264)(\text{HA})(\text{PF})) / \text{IE} \\ &= ((29.264)(4000)(0.3)) / 0.85 \\ &= ((29.264)(1,200)) / 0.85 = 35,117 / 0.85 \\ &= 41,314 \text{ gallons/year}\end{aligned}$$

$$\begin{aligned}\text{Hydrozone 2} &= ((29.264)(\text{HA})(\text{PF})) / \text{IE} \\ &= ((29.264)(4000)(0.5)) / 0.75 \\ &= ((29.264)(2000)) / 0.75 = 58,528 / 0.75 \\ &= 78,037 \text{ gallons/year}\end{aligned}$$

$$\begin{aligned}\text{Hydrozone 3} &= ((29.264)(\text{HA})(\text{PF}))/\text{IE} \\ &= (29.264)(2000)(.5)/0.71 \\ &= (29.264)(1000)/0.71 = 29,264 / 0.71 \\ &= 41,217 \text{ gallons/year}\end{aligned}$$

$$\begin{aligned}\text{Total estimated applied water use (all hydrozones)} & \\ &= 41,314 + 78,037 + 41,217 \\ &= 160,568 \text{ gallons/year}\end{aligned}$$

The EAWU of 160,568 gallons/year does not exceed the MAWA of 204,848 gallons/year, complying with the ordinance.

2. Example Two - Water Budget Calculations/ Hydrozone Summary  
10,000 square-foot landscape with some special landscape area

Maximum applied water allowance - some special landscape area

An example hydrozone table and calculation of the maximum applied water allowance for a hypothetical total project landscape area of 10,000 square feet, including 2,000 square feet of special landscape area, is below.

$$\begin{aligned}\text{MAWA} &= (47.2)(0.62) \times [(0.7 \times 10,000 \text{ sq ft}) + (0.3 \times 2,000 \text{ sq ft})] \\ &= 29.264 \times [(0.7 \times 10,000 \text{ sq ft}) + (0.3 \times 2,000 \text{ sq ft})] \\ &= 29.264 \times (7,000 + 600) \text{ gallons per year} \\ &= 29.264 \times 7,600 \text{ gallons per year} \\ &= 222,406 \text{ gallons per year}\end{aligned}$$

Estimated applied water use and hydrozone table - some special landscape area

An example calculation of the estimated applied water use for a hypothetical total project landscape area of 10,000 square feet, including 2,000 square feet of special landscape area, is below

Hydrozone	(HA) Hydrozone area in square feet	Water use level	(PF) Plant factor	Type of irrigation equipment	(IE) Irrigation Efficiency
1	4000	Low	0.3	Bubbler	0.85
2	4000	Moderate	0.5	Stream in planter ≥8 feet wide	0.75
3 (SLA)	2,000 Special Landscape Area (SLA)	Moderate	0.5	Stream rotor in planter ≥8 feet wide	0.75
Total	10,000	N/A	N/A	N/A	N/A

Estimated applied water use based on the above table:

$$\begin{aligned}
 \text{Hydrozone 1} &= ((29.264)(\text{HA})(\text{PF})) / \text{IE} \\
 &= ((29.264)(4000)(0.3)) / 0.85 \\
 &= ((29.264)(1,200)) / 0.85 = 35,117 / 0.85 \\
 &= 41,314 \text{ gallons/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Hydrozone 2} &= ((29.264)(\text{HA})(\text{PF})) / \text{IE} \\
 &= ((29.264)(4000)(0.5)) / 0.75 \\
 &= ((29.264)(2000)) / 0.75 = 58,528 / 0.75 \\
 &= 78,037 \text{ gallons/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Hydrozone 3} &= (29.264)(2000) \\
 &= 58,528 \text{ gallons/year}
 \end{aligned}$$

$$\begin{aligned}
 \text{Total estimated applied water use (all hydrozones)} \\
 &= 41,314 + 78,037 + 58,528 \\
 &= 177,879 \text{ gallons/year}
 \end{aligned}$$

The EAWU of 177,879 gallons/year does not exceed the MAWA of 222,406 gallons/year, complying with the ordinance.

3. Example Three - Water Budget Calculations  
10,000 square-foot landscape that is entirely special landscape area

Maximum applied water allowance - some special landscape area

An example calculation of the maximum applied water allowance for a hypothetical total project landscape area of 10,000 square feet, all of which is special landscape area, is below. An example of a landscape that is entirely special landscape area is one which is entirely irrigated with a recycled water supply.

$$\begin{aligned}
 \text{MAWA} &= (47.2)(0.62) \times [(0.7 \times 10,000 \text{ sq ft}) + (0.3 \times 10,000 \text{ sq ft})] \\
 &= 29.264 \times (7,000 + 3,000) \text{ gallons per year} \\
 &= 29.264 \times 10,000 \text{ gallons per year} \\
 &= 292,640 \text{ gallons per year}
 \end{aligned}$$

## Estimated applied water use - all special landscape area

An example calculation of the estimated applied water use for a hypothetical total project landscape area of 10,000 square feet, all of which is special landscape area, is below. Note that the estimated applied water use is the same as the MAWA for projects in which 100% of the landscaping is special landscape area. A hydrozoa summary table is not necessary for helping calculate estimated applied water use, but is still recommended to help plan the landscape and irrigation design.

Total estimated applied water use  
= (29.264)(10,000 square feet)  
= 292,640 gallons/year

The EAWU of 292,640 gallons/year does not exceed the MAWA of 292,640 gallons/year, complying with the ordinance.

## **Plant Factors.**

A plant factor is a number referencing the estimated water needs of a plant species, ranging from 1 or less (very low water needs) to 10 (very high).

All plant species should be adapted to the climate in which they will be planted. If plants are given a range of water needs from “occasional to moderate” for example, the landscape designer should determine if the plant will require either occasional or moderate watering based on site, soil, and climate conditions and categorize the plant appropriately. The Water Efficient Landscape Ordinance requires that 75% of the number of plants planted have water use level characterized as low or less.

In determining a proposed plan material's water use level and plant factor, project applicants should reference a published source or other data submitted to and approved by the director. An initial reference to be consulted for determining the water use level of a plant is the plant list in the Water Use Classification of Landscape Species (WUCOLS), as defined in LMC 13.25.040. As to plant selection, the WUCOLS list is not comprehensive, and the designer may use plants not on the list or alternative plant factors; provided that appropriate information is referenced to substantiate the water requirements of those plants, such as reference material from a published source or other data acceptable to the director.

Other sources used to determine climate adaptation and watering requirements may include the following. The nomenclature which would satisfy the 75% low-water requirement in these references are also noted.

1. Sunset Publishing Corporation Sunset Western Garden Book.  
Lower water use designations include: “little or no water”
2. East Bay Municipal Utility District's publication Plants and Landscapes for Summer Dry Climates.  
Lower water use designations include: “occasional”, “infrequent” or “no summer water”
3. Bornstein, Carol, David Fross and Bart O'Brien, California Native Plants for the Garden.  
Lower water use designations include: “occasional”, “infrequent”, or “drought tolerant”
4. University of California Cooperative Extension's Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA.  
Lower water use designations include: “Low” or “Very Low”
5. Perry, Bob, Landscape Plants for California Gardens: An illustrated Reference of Plants for California Landscapes.  
Lower water use designations include: “L”, “L/VL”, or “M/L”

The following plant factors are based on average plant densities and general microclimate conditions of Livermore. Plants are divided into high (H), moderate (M), low (L) and very low (VL) water requirement categories.

<b>Plant/Feature Type</b>	<b>Plant Factor</b>
Recirculating water features (use surface area)	1.0
Uncovered pools and spas	0.9
Cool-season grasses	0.8
High water using trees, shrubs and groundcovers	0.8
Warm-season grasses	0.7
Moderate water using trees, shrubs and groundcovers	0.5
Covered pools and spas	0.5
Low water using trees, shrubs and groundcovers	0.3
Temporarily irrigated areas	0.3
Very low or extra drought-tolerant water using trees, shrubs and groundcovers	0.1

**Irrigation Efficiency.**

Project applicants can propose irrigation efficiency numbers for specific equipment, provided the request is substantiated by reference material from a published source or other data. Alternatively, the following irrigation efficiency numbers can be used for each of the following irrigation equipment categories.

<b>Irrigation Equipment Type</b>	<b>Irrigation Efficiency</b>
Drip irrigation (both above and below ground)	0.9
Bubblers and/or micro-spray	0.85
Rotor head sprinklers in planter areas 8 feet or wider	0.75
Rotor head sprinklers in planter areas less than 8 feet wide	0.71
Spray head sprinklers in planter areas 8 feet or wider	0.71
Spray head sprinklers in planter areas less than 8 feet wide	Not permitted
Water features	based on how water is applied

Note: Rotor head means the same as rotary and stream; there are impact rotors and gear rotors which create pinwheel patterns with typically less misting and water loss than spray sprinklers.

## **Grading and site design**

As stated in the Water Efficient Landscape Ordinance, “The grading plan shall be designed to minimize soil erosion; maximize water retention and infiltration; and confine runoff to the property and direct it to permeable surfaces.” (LMC 13.25.050(A)(9)). To prevent excessive erosion and runoff, design site grading:

- so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
- to avoid disruption of natural drainage patterns and undisturbed soil; and
- to avoid soil compaction in landscape areas.

Implementation of stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration in natural ways are encouraged. Bioswales are a typical method used. Other examples include:

1. rain gardens, infiltration beds, swales and basins that allow water to collect and soak into the ground;
2. constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants;
3. pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff; and
4. Rain harvesting or catchment technologies such as cisterns for storage and use of rainwater to satisfy a percentage of the landscape irrigation requirements.

## **Soil management**

The capacity of soil to retain and release water depends on a broad range of factors such as soil texture, soil depth, soil architecture (physical structure including pores), organic matter content and biological activity. However, appropriate soil management can improve this capacity.

Because soils vary from site to site, it's required and important to test your soil before beginning your landscape improvements. A soil test can analyze the pH levels; nutrient levels (e.g., nitrogen, phosphorus, potassium); and the sand, silt, clay, and organic matter content of your soil. It can also suggest ways to improve your soil's ability to support plants and retain water (e.g., through aeration or the addition of soil amendments or fertilizers). These steps are intended to help the soils retain more water and promote plant health, making the most of your landscape investment.

Practices that increase soil moisture content can be categorized in three groups: (i) those that increase water infiltration; (ii) those that manage soil evaporation; and (iii) those that increase soil moisture storage capacities. All three are related to soil organic matter. Compost added into the soil help increase water infiltration and soil moisture capacity. Mulches help manage soil evaporation.

In addition to reducing evaporation, mulches help reduce weed growth, moderate soil temperatures, and prevent erosion. Organic mulches also improve the condition of your soil as they decompose. In addition to increased water penetration, compost improves root access to air at the root level, and assists biological processes in decomposing organic material.

Recommendations for compost and mulch include:

- Consider compost and mulch recycled from local organic materials such as plant or wood waste
- Consider compost purchased from processors who participate in the US Composting Council's Standard Testing Assurance Program.
- Make sure to check the compost you intend to purchase is finished compost that has reached a well decomposed, stable state that possesses no objectionable odors and does not resemble the raw material from which it was derived, and consider having your landscape professional obtain a lab test of the compost to ensure its quality.
- Keep mulch replenished to maintain a minimum covering of three inches to help retain soil moisture and reduce weed growth.
- If using stabilizing mulching products on slopes, its recommended that bio based products are used and petroleum based products are avoided.
- For fire prone areas avoid highly flammable mulches such as shredded redwood bark, e.g., "gorilla hair" mulch.

### **Irrigation design and scheduling**

The ordinance requires smart irrigation controllers. At a minimum the controller should have the capability to create at least three independent programs with three cycle start times per program; allow run times from 1 to 180 minutes; allow schedule intervals of up to 30 days; ability to step the irrigation level of all programs up or down the same percent (percent switch); have a battery backup to protect the program in the case of power failure; and contain a rain switch to interrupt the program in the case of rain.

The goal of irrigation is to get water to root zone without it turning into run-off from the landscape or otherwise missing the target landscape area

Some general irrigation design recommendations include:

- Use high flow sensors (flow meters) that detect and report high flow conditions created by system damage or malfunction are recommended.
- Place trees on separate valves from shrubs, groundcovers, and turf.
- Whenever possible use drip irrigation to water trees and shrubs.
- Use head to head coverage for sprinklers

Some general irrigation scheduling recommendations include:

- Automatic irrigation should be done during the cooler parts of the day and avoided during windy or freezing weather or during rain.
- Only water after the sun has gone down or in the early morning.
- Check with the local water supplier about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- Adjust the watering times (number of minutes) and the frequency of watering (daily, twice a week, etc.) based on weather conditions.
- Adjust for seasonal differences and reset the timer when needed.
- Make sure your spray and sprinkler heads are properly adjusted to avoid watering pavements and other non-landscape areas.
- Remember to apply less water to areas in the shade less than to sunny areas.

- To avoid runoff, set your clock to cycle 2-4 start times (no longer than 5 minutes each), 1 to 2 hours apart to allow water to soak into the soil. For example: water three times for 5 minutes, instead of 15 minutes all at once.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants which require smaller amounts of water more often.

### **Maintenance and water waste prevention**

It's important to monitor and maintain irrigation equipment to avoid water loss through broken or malfunctioning equipment and maintain the landscape in a way that avoids runoff, overspray or other water waste and to preserve water quality.

To conserve landscape water:

- Regularly check or have an irrigation professional check for leaks, broken heads and other problems. Any problem in one area of an irrigation system can mean the entire system is wasting water.
- Consider varying the cutting height of turf to conserve water; the proper cutting height varies, however, with the type of grass, so contact your county extension service or local nursery or landscape professional to find out the ideal cutting height for your lawn.
- Avoid shearing plants or giving them high nitrogen fertilizers during dry periods because these practices can encourage water-demanding new growth.
- Remember to cover pools and spas to reduce water waste through evaporation.

To protect water quality, it's recommended to:

- select pest-resistant plants to help avoid dependence on pesticides.
- If using pesticides and herbicides use ones that are narrow spectrum that target specific types of pests and break down relatively quickly instead of ones that are more indiscriminately broad spectrum and remain in the environment longer.
- Control run-off when using pesticides to avoid polluting the stormwater drainage system.
- Keep mulch replenished as a form of weed control
- Consider entirely non-chemical approaches to landscape maintenance collectively known as integrated pest management (IPM) which encourages the use of cultural, mechanical and physical controls and using the least toxic pesticide as a last resort; helps avoid introducing more chemicals into the environment; and can reduce water treatment costs.
- Contact the City of Livermore Water Resources division to learn more about IPM or about specific more harmful pesticides to try and avoid (e.g., organophosphates, copper based).

### **Water Efficient Landscape Ordinance 1956 Outline**

#### 13.25.010 Authority – Findings - Purpose.

- A. Authority
- B. Findings
- C. Purpose

#### 13.25.020 Applicability.

- A. (Statement compelling compliance with ordinance; exceptions to requirements for some types of projects)
- B. (Applicability criteria)
- C. (Exemptions from Ordinance)
- D. (Existing Landscapes)

- [13.25.030](#) Definitions.
- [13.25.040](#) Submittal Requirements.
  - A. (Statement requiring landscape design package and installation certification)
- [13.25.050](#) Landscape design package.
  - A. Permit Review requirement
  - B. Design review
    - 1. Certification statement
    - 2. Hydrozone (plant grouping by water use) requirements
    - 3. Turf limits
    - 4. Low water using plant requirement
    - 5. Plants selection appropriate to location
    - 6. Invasive plant species restriction
    - 7. Fire prone areas
    - 8. Turf limits on slopes
    - 9. Grading design plan
    - 10. Landscape plan and context information
    - 11. Landscape area calculations
    - 12. Plant information
    - 13. Water budget calculations
  - C. Construction permit review
    - 1. Elements of subsection B required
    - 2. Soil management plan
    - 3. Grading plan topsoil protection
    - 4. Compost and mulch requirements
    - 5. Water features
    - 6. Irrigation design criteria
    - 7. Irrigation equipment specifications
    - 8. Irrigation design plan submittal requirements
    - 9. Homeowners associations (restriction on prohibiting use of low water plants or removal of turf)
- [13.25.060](#) Landscape Installation certification package.
  - A. (Signed certification package requirements)
  - B. Certification statement
  - C. Soil management plan verification
  - D. Record drawings
  - E. Irrigation evaluation
  - F. Irrigation scheduling
  - G. Landscape and irrigation maintenance schedules
  - H. (Water purveyor requests for copy of certification elements)

- [13.25.070](#) Public education and model home complexes.
  - A. Publication (City-provided information)
  - B. Model home complexes (developer-provided information)
- [13.25.080](#) Water waste prevention.
  - A. Maintenance standards
  - B. Landscapes one acre or larger (cooperation with water purveyor in audits)
  - C. Homeowners associations (restriction on prohibiting use of low water plants or removal of turf)
- [13.25.090](#) Supplemental materials.
  - A. (Authorizes director to prepare supplemental materials (e.g., forms, guidelines, plant lists))
- [13.25.100](#) Violation.

### **Standard Design Review Condition of Approval**

1. Prior to the following permit actions by the City, the applicant shall demonstrate compliance with the Water Efficient Landscape Ordinance (Municipal Code Chapter 13.25) as stated below.
  - a. Prior to issuance of a building permit, the applicant shall demonstrate compliance with Section 13.25.050(C) of Chapter 13.25 in the drawings and materials submitted for a building permit. The exception is that if the project includes rough grading (e.g., that will remove approximately a foot or more of existing grade), then submittal of the soil management plan per Section 13.25.050(C)(2) may be deferred until after rough grading is complete and its recommendations shall be incorporated into the planting plan.
  - b. Prior to issuance of a certificate of occupancy, the applicant shall submit a complete landscape installation certification package in compliance with Section 13.25.060 of Municipal Code Chapter 13.25 consisting of a Certification Form provided by the Community Development Department, completed and with all required attachments.