

H1/ 2015 Model Water Efficient Landscape Ordinance Guidebook

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## H1/Preface

The *Model Water Efficient Landscape Guidebook (MWELo Guidebook)* was produced by the California Department of Water Resources for use by local building and planning departments, water providers, designers, builders, and applicants to comply with the 2015 Model Water Efficient Landscape Ordinance (MWELo), Chapter 2.7, Division 2, Title 23, California Code of Regulations.

Comments and questions regarding the MWELo Guidebook may be submitted to [welo@water.ca.gov](mailto:welo@water.ca.gov).

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## H1/1.0 Introduction

PLACEHOLDER Photo 1 Sustainable Yard

PLACEHOLDER Photo 2 Sustainable City Park

PLACEHOLDER Photo 3 Plan Checker

PLACEHOLDER Photo 4 Inspector in Yard

Landscapes are complex living spaces. Those that thrive with fewer resources and maintenance are more sustainable and contribute to the built environment. They involve the right balance of soil, water, plants, and other design elements. They are a combination of art, biology, and engineering. Putting the landscape puzzle pieces together takes knowledge, skill, and experience. It requires an understanding of the dynamic components of soil that provides a home and nourishment for plants; the mechanics of irrigation devices and technologies that will uniformly apply just the right amount of water; and, the vision of how the plants and elements will function over time.

For far too long, landscaping and irrigation have been ignored as a vital and essential component of the built-environment, which has led to incredible waste of water and other resources; the premature replacement of public and private property such as roads, sidewalks, fences, and building facades because of irrigation runoff and overspray; erosion of soil causing damage to neighboring properties and downstream waterways; and, money wasted on plants and equipment that failed because they were not suited for site-specific conditions.

The Model Water Efficient Landscape Ordinance (MWELo) brings these issues to light and provides a path to design, install, manage, and maintain landscapes that conserve water. In turn, MWELo helps improve the wellbeing, health, safety, and resiliency of California communities.

The MWELo was created by the California Department of Water Resources (DWR) as a model for local agencies to enforce minimum standards in landscape design, construction, and management. It achieves this through specific requirements related to soil, plants, irrigation, stormwater, and non-potable water supplies. It sets an upper limit for the water budgets of landscape projects, thereby driving water-efficiency through the thoughtful selection of climate-appropriate plants, organic soil amendments, water-

saving irrigation devices, and the use of alternative water supplies. MWELO encourages landscapes that require less water than the water budget's upper limit. It also encourages the innovation of landscaping equipment, products, and materials that use resources as efficiently as possible.

A landscape designed, built, and managed to meet MWELO standards is inherently more sustainable. They provide multiple benefits which can be sustained with little to no negative impacts to the environment due to the limited resources required. For example, landscapes designed and installed following MWELO standards could save 1.3 million acre-feet per year in addition to many other benefits that are explained in detail in Chapter 2, Purpose.<sup>1</sup>

PLACEHOLDER Figure 1 Urban Landscape Water Use:<sup>2</sup>

The Model Water Efficient Landscape Ordinance (MWELO) is in effect in every city and county unless a local or regional Water Efficient Landscape Ordinance (WELO) has been adopted. Landscape Ordinances are triggered when a building or landscape permit, design review, or plan check is required, and the size thresholds are met. Local WELOs may have additional or different applicability standards. The local agency (city or county) is responsible for reviewing projects and enforcing MWELO unless a cooperative agreement is made with the local water provider or other agency to enforce it. Departments or Divisions that might be involved in MWELO enforcement include planning, community development, building and safety, engineering, city arborist, public works and/or water. For the *MWELO Guidebook* the term "local agency" refers to the enforcing agency, which usually would be the appropriate local land use authority, and the term "ordinance" applies to either MWELO or a local WELO. In a few locations, the local water purveyor has assumed the administrator role for landscape

The California Green Building Standards Code (Part 11 of Title 24, also known as "CALGreen") makes reference to MWELO in Chapters 5.3 (non-residential) and 4.3 (residential). MWELO is also enforced by the Division of State Architect for public schools and community colleges using modified requirements.

Water providers (public agencies or private utilities) are included in MWELO. At minimum water providers are involved after the permit is issued and at the completion of the project. However, water providers may find it



beneficial to be part of the project's design phase to ensure adequate services can be provided by the utility and the project incorporates the necessary materials and specifications. Water providers will receive water budget documentation related to the project after design approval and after project completion. Water providers are also involved when the project requires a new meter or service upgrade, and they may review the MWELO documents approved by the local agency to ensure the service line and meter can handle the estimated water demand. If non-potable water supplies are included in the project, the local health department will also be involved.

MWELLO requires specific design construction documents, an irrigation audit, and post completion documents for each applicable new or rehabilitated landscape project. An implementation report from local agencies is due to DWR by January 31<sup>st</sup> each year.

The next update of MWELLO will occur, in-step with the triennial California Building Code cycles. A voluntary Landscape Stakeholders Advisory Group (LSAG) has been established by DWR to provide input for future updates. LSAG efforts contributed to the information contained in this Guidebook.

MWELLO is a set of minimum standards for landscape design and installation. Due to local water supply condition, climate or other reasons, some local agencies have adopted more stringent requirements that achieve higher water savings. Some agencies enforcing their own WELO achieve this by requiring all new construction projects to comply regardless of size; further limit the amount of high water-use plants that can be installed by adopting a more stringent water budget; and require more water-efficient irrigation; etc.

## H2/1.1 Purpose

There are four main drivers for requiring water-efficient landscapes: public health and safety, sustainability and resiliency, livability, and affordability. In California, water supplies are limited and subject to ever increasing demands from development, a growing population, agriculture and the effects of climate change, drought, emergencies, and natural disasters. Water is essential for health, safety, life, and prosperity of California, and landscapes are essential to the quality of life in the State. The use of water is required to be efficient and beneficial, and that includes its use for landscapes.

### H3/1.1.1 Public Health and Safety

Proper design, installation, management, and maintenance of landscapes ensures the public's health, safety, and wellbeing. Access to clean water is essential to life. The construction of new and renovated landscapes and buildings affects future water supplies for the entire service area, which goes beyond the health and safety at the project site. Establishing, enforcing, and setting minimum water-efficiency standards benefits the entire community.

MWELO eliminates or minimizes environmental and health dangers such as:

- \*Contaminated water due to the improper design and installation of backflow prevention devices. MWELO requires these devices to be included in the construction documents for review and irrigation audits inspect proper installation. Corrections must be made to meet compliance.

- \*Wildfires that spread due to flammable and dry plants. MWELO requires landscapes to follow local fire fuel modification plans and encourages the use of appropriate native and climate-adapted plants and efficient irrigation equipment and practices. These design elements create landscapes that are less likely to burn, because they specify fire-resistant plants and irrigation that keeps plants appropriately hydrated. This concept is called "firescaping."

- \*Increased temperatures that contribute to landscape heat island affects. MWELO encourages the use of materials and plants that provide shade and retain more moisture in the soil.

- \*Slip and fall accidents as well as flooding and ponding of streets, sidewalks, and walkways due to irrigation runoff. MWELO prohibits spray irrigation in narrow landscape areas and medians less than 10 feet wide to minimize runoff. Check valves and swing joints reduce the incidence of leaking irrigation heads and prevents perpetually wet surfaces. The irrigation audit

inspects irrigation equipment for leaks, low head drainage, overspray and runoff. Corrections must be made to meet compliance.

\*Trip and fall accidents as a result of exposed tree roots due to improper irrigation. When feasible, MWELo requires trees be watered separately from other plants that do not need deep watering, such as lawn.

\*Injuries sustained by landscape maintenance crews working in street medians. MWELo prohibits high water use plants, including lawn in medians in order to save water and reduce the amount of time and exposure of maintenance crews to traffic hazards.

PLACEHOLDER Photo 5

PLACEHOLDER Photo 6

PLACEHOLDER Photo 7

#### *H3/1.1.2 Sustainability and Resiliency*

Maximizing water efficiency is critical in order to meet the growing need for clean and affordable water as population and business demands increase and climate conditions impact supplies. MWELo establishes a resiliency and sustainability approach to landscaping to ensure that multiple benefits to property owners, local agencies, the State, and the environment are achieved and sustained.

#### *H4/1.1.2.1 Water Efficiency*

Research shows sustainable landscapes use 80 percent less water; require 60 percent less mowing and other maintenance; and, produce 50 percent less yard waste.<sup>3</sup> Reducing the water needed for landscaping reduces per capita water use to help meet "Water Conservation as a California Way of Life" Legislation SB 606 and AB1668 (2018).

PLACEHOLDER Figure 2 Sustainable Landscapes Use Less Resources

#### *H4/1.1.2.2 Energy Efficiency and Air Quality<sup>4</sup>*

The water needed for landscapes requires energy for pumping, treatment, and delivery. Most water used for landscape irrigation is treated to drinking water standards with a high energy footprint. Energy requirements for delivery vary depending on the water supply distance to the water customer.

A study in Sacramento (Dimoudi and Niolopoulou 2003) found that shade trees generated a 30 percent reduction in energy needed for cooling a building. Trees also cool outdoor spaces, reducing urban heat islands and

making outdoor spaces more functional and enjoyable, even in areas where solar panels compel the planting of shorter trees.

Landscapes that need less maintenance with power equipment, consume less fuel and produce less air pollution. The California Air Resources Board found that the 14.1 million lawn mowers, leaf blowers and other small engine-powered garden equipment in the State, which exceeds the number of passenger cars by over 1 million, operating for one hour each day is equivalent to a car driving 300 miles (mowers) and up to 1100 miles (gas leaf blowers), resulting in 50 tons of smog forming emissions. Spills and evaporation of fuel waste significant amounts of energy each year and add to air pollution. To combat poor air quality, battery operated, solar-powered maintenance equipment is widely available and more frequently used.

PLACEHOLDER Photo 8

*H4/1.1.2.3 Climate Adaptability*

PLACEHOLDER Photo 9

There are many unknowns about all the ways climate change will affect California's diverse landscapes and cities, but we are facing the impacts now — drier winters, heavier floods, larger fires, sea level rise, etc. Each of these events impacts our state's infrastructure and resources but combined can have lasting and devastating effects.

MWELo strives to create landscapes that are "future proof" and adaptable to changing local climates and water resources through holistic design, installation, management, and maintenance standards. MWELo's comprehensive approach to landscaping considers a site's condition including soil, sun exposure, grading, rainwater, etc., and includes practices that encourage the formation of healthy living soil and the use of plants and water-efficient irrigation equipment that are best-suited for those conditions.

MWELo fosters the selection of native and adapted plants that are more likely to withstand climatic disruptions such as drought, increasing temperatures, and fire while providing the food and habitat needed for native animals and insects to thrive. MWELo encourages the use of plants that need little irrigation water. Choosing native flora also increases biodiversity. MWELo requires the efficient use of water through water budgets and water-saving equipment. And MWELo is in step with local agencies' fire fuel modification plans so that every effort is made to protect property and life through the appropriate selection and placement of landscaping elements. Landscapes designed and installed to MWELo

standards with healthy soils and mulch are also better able to absorb heavy rainfall and are less prone to erosion and runoff.

MWELo cultivates collaboration amongst a wide range of stakeholders to better understand these potential impacts to work together and adapt so California's communities are more resilient. Building resiliency into landscapes by encouraging the use of climate-adapted plants and water-saving irrigation equipment and healthy living soil benefits the property owner and the community by reducing the need for limited and strained resources.

#### H3/1.1.3 Livability & Wellbeing

##### PLACEHOLDER Photo 11

Several studies show that sustainable landscaping increases property values by up to 7 percent for commercial rental property; increases wellbeing compared to lawns; increases the willingness of consumers to spend more, stay longer, pay more for parking, and travel further to shopping centers, business parks and other commercial sites with sustainable landscaping; and, is what homeowners really want at their own homes.<sup>5</sup> A 2010 study, found that homes with street trees in the parkway increased the sale price between \$7,000 to \$13,000.<sup>6</sup> This reinforces the value of trees.

Research shows that sustainable development, including landscaping, has a positive effect on the psychology, physiology, and general well-being for people in addition to wider societal benefits.<sup>7</sup>

##### PLACEHOLDER Photo 12

#### H3/1.1.4 Affordability

During the 2014 drought, CBS Sacramento reported that homes with lawns that could not be sustained because of watering restrictions saw a decline in home price sales of \$9,000. One owner backed out of a sale because of the costs to maintain the lawn.<sup>8</sup> Sustainable landscaping can lower maintenance cost while increasing property and rent values.

##### PLACEHOLDER Photo 13

Conserving water extends supplies for the future and can eliminate or defer costly water supply infrastructure projects that increase rates.<sup>9</sup> Conservation is a cost-effective means to increase water supply portfolios. MWELo requirements inherently conserve water.

##### PLACEHOLDER Photo 14

PLACEHOLDER Photo 15

[H2/1.2 One Water Approach](#)

PLACEHOLDER Photo 10

MWELo takes a One Water approach that values all water (drinking, wastewater, graywater, rainwater, stormwater, recycled water) and encourages the holistic management of water, which has far reaching positive impacts. While water conservation is at the core of MWELo by limiting water-thirsty plants and water-wasting irrigation, it encourages the use of non-potable water to irrigate plants. This in turn frees up potable water for drinking and sanitation. This holistic approach brings the silos of the water industry together as "one water."

[H2/1.3 History](#)

California has a long history of recognizing the importance of sustainable and resilient landscaping with the first landscape legislation adopted in 1990. As the regulations advanced, the green building industry evolved and customer demand for these types of climate and water-appropriate landscapes has increased.

\*1990 - AB 325 Water Conservation in Landscaping Act.

\*\*Stakeholder group formed to draft the MWELo.

\*1993 – First MWELo adopted.

\*\*Charter cities and agencies with abundant water supply could claim an exemption.

\*\*Implemented by few local agencies.

\*2006 - AB 1881 Water Conservation in Landscaping Act

\*\*Common interest developments cannot prohibit low water using plants.

\*\*Applies to Charter Cities and Charter Counties

\*\*Agencies no longer able to exempt themselves.

\*2010 – MWELo updated.

\*Revised water budgets.

\*California Building Standards Code CALGreen references MWELo.

\*2015 - MWELo update was required by Governor's Executive Order Number B-29\_15 (April 1, 2015) through expedited regulation due to the statewide drought.

\*\*Limits high water use plants including cool season turf grasses.

\*2016 - AB 2515.

\*\*Requires MWELo to be updated, if necessary, in sync with the CALGreen, cycle every three years.

## H1/2.0 Effective Use of This Guidebook

The *MWELo Guidebook* is designed for local agency building officials, plan checkers, inspectors, irrigation auditors, and applicants. Resources available in the *MWELo Guidebook* include:

\*Sample documents that can be customized by the local agency.

\*Educational materials for applicants designed to provide easy to follow instructions and explanations to help them develop and submit the requested documents, thus reducing staff time.

It is highly recommended that you read the Landscape, Irrigation, and Water Budget Overview in Appendix C, which explains key terms and provides basic information regarding soil, plants, and irrigation equipment. It also explains how to develop a water budget. For definitions and additional technical terms, see MWELo §491. The *MWELo Guidebook* is formatted as follows:

\*Ordinance section: Ordinance section numbers from the 2015 MWELo.

\*Summary: Explanation of the requirement.

\*Intent: Explanation of the catalyst for the requirement.

\*Compliance: Recommendations, suggestions or notes about the requirement.

\*\*Design: Explanation for the design team.

\*\*Applicant: Explanation for the applicant which may or may not be the designer.

\*Enforcement: Explanations for the local agency staff performing plan review/check and inspections.

\*\*Plan review: Recommendations or suggestions for construction documents.

\*\*Inspection: Recommendations or suggestions for on-site inspections during and after construction.

## H2/2.1 MWELo Sections

Model Water Efficient Landscape Ordinance, Chapter 2.7, Division 2, Title 23, California Code of Regulations sections include:

§490 Purpose.

§491 Definitions.

§492 Provisions for New Construction and Rehabilitated Landscapes.

§493 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.

§494 Effective Precipitation.

§495 Reporting.

**Note:** The entire Model Water Efficient Landscape Ordinance can be found in Appendix B.

## H2/2.2 Guidebook Layout

The *MWELo Guidebook* is categorized into the following sections:

### H3/2.2.1 Compliance Pathways

MWELo has two compliance pathways: Performance and Prescriptive.

#### H4/2.2.1.1 Performance Pathway

Performance Pathway is intended for both small and larger projects.

\*Water budget.

\*Design construction documents.

\*Post-construction documents.

#### H4/2.2.1.2 Prescriptive Pathway (MWELo Appendix D)

The Prescriptive pathway is for small projects up to 2,500 sq.ft., typically single-family homes or light commercial.

\*Checklist approach.

\*Simplified plans and post-construction documents.

**Note:** The section of MWELo that pertains to the Prescriptive Pathway is found in Appendix D within the ordinance. This Guidebook also contains appendices which include templates and resources. The Guidebook Appendix D is not the MWELo Prescriptive Pathway. The complete MWELo can be found in this Guidebook in Appendix B – 2015 MWELo.



### H3/2.2.2 Considerations for Enforcing MWELO

There are many considerations the local agency needs to define prior to implementing MWELO, e.g. is a landscape or building permit required for rehabilitated landscapes and who will track data and submit the annual report?

### H3/2.2.3 Role of Water Purveyors

Water purveyor means any entity, including a public agency, city, county, or private water company that provides retail water service. MWELO has only two requirements for water purveyors but encourages them to build a relationship with the local agencies in their service area to enhance water conservation efforts, improve water management and customer service. MWELO allows the local agency to partner with the water purveyor, whereby the water provider implements some or all of MWELO.

The water purveyor's two requirements pertain to projects that must conform to the Performance Pathway and:

- \*Receive copy of approved Water Efficient Landscape Worksheet from both the local agency and the applicant.

- \*Receive copy of the approved Certificate of Completion from the applicant.

MWELO encourages water purveyors to implement incentives that promote the efficient use of water such as tiered-rate structures, and provide peak water operating demands and/or restrictions, such as allowable days/hours of irrigation to the local agency that might impact the landscape design and installation. In addition, water purveyors may implement public education regarding sustainable landscaping on behalf of the local agency.

### H3/2.2.4 Resources (Appendices)

The appendices provide sample forms to help applicants and agencies comply. These templates are in Word, PDF, and Excel and can be customized to meet the local agencies' needs. MWELO does not require the use of these forms, however using these will save an agency from creating their own versions from scratch. The appendices include project decision tree, process flowcharts, plan check and inspection checklists, sample plans, sample soil and audit reports, sample irrigation schedule, water budget worksheet, irrigation schedule, applicant brochure, and more.

**Note:** See Appendix A for a complete list of forms.

## H1/3.0 Compliance Pathways

There are two compliance pathways: Performance and Prescriptive for new and rehabilitated landscape projects that meet the size threshold. Most agencies allow either Performance or Prescriptive pathways; however, some agencies have not adopted Appendix D, Prescriptive Pathway. MWELo has a few exemptions and compliance limitations for specific landscapes and situations.

### H2/3.1 Performance Pathway

The Performance Pathway requires more detailed construction documents and specific design requirements for planting, irrigation, and grading. It is intended for larger scale, residential and commercial projects. It also allows more flexibility in design than the Prescriptive Pathway. It applies to public and private projects that require a building or landscape permit, plan check or design review for the following:

- \*New construction projects with an aggregate landscape area equal to or greater than 500 sq. ft. New construction is defined as a new building with a landscape or other new landscape, such as a park, playground or greenbelt without an associated building.

- \*Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sq. ft. Rehabilitated landscape is defined as any relandscaping project that requires a permit, plan check, or design review, and the modified landscape area (all planting areas, turf areas, and water features) is equal to or greater than 2,500 sq.ft.

### H2/3.2 Prescriptive Pathway

The Prescriptive Pathway (found in MWELo Appendix D) is intended for smaller scale, single-family and light commercial projects to comply by meeting minimum requirements in a cost-effective way. It applies to public projects, private residential and non-residential landscape projects that require a permit, plan check or design review for the following:

- \*New construction and rehabilitated landscapes 500 to 2,500 sq. ft.

New construction is defined as a new building with a landscape or other new landscape, such as a park, playground or greenbelt without an associated building.

Rehabilitated landscape is defined as any relandscaping project that requires a permit, plan check, or design review, and the modified landscape area (all

planting areas, turf areas, and water features) is equal to or greater than 2,500 square feet.

### H2/3.3 Exemptions, Limitations, Existing Landscapes

#### H3/3.3.1 Exemptions

\*Registered local/regional, state, or federal historical sites.

\*Ecological restoration projects that do not require a permanent irrigation system.

\*Mined-land reclamation projects that do not require a permanent irrigation system.

\*Existing plant collections, as part of botanical gardens and arboretums, open to the public.

#### H3/3.3.2 Compliance Limitations

Due to the special landscape management needs of cemeteries, compliance is limited to Sections 492.4, 492.11, 492.12 (Title 23, Ch. 2.7, MWELo) for new and rehabilitated cemeteries and Sections 493, 493.1, 493.2 (Title 23, Ch. 2.7, MWELo) for existing cemeteries.

#### H3/3.3.3 Existing Landscapes

Proper management and maintenance of existing landscapes are required to ensure they are operating effectively and efficiently.

Local agencies are required to implement programs for existing landscapes or partner with another agency or water purveyor for implementation and at minimum:

\*Implement water audits or surveys for landscapes one acre or larger installed before December 1, 2015.

\*Prohibit irrigation water runoff onto adjacent properties, establish penalties, and enforce it.

### H2/3.4 Determining Applicability and Compliance Pathway

To help the local agency and applicant understand when and how to comply, a decision tree has been included (see Figure 3).

**Recommendation:** Determine if the Prescriptive Pathway will be allowed for applicable projects. If not, all projects must follow the Performance Pathway.

**Note:** The MWELo Compliance Pathways form can be found in Appendix D.

**Note:** Projects that are ReScapeCA Rated meet MWELO 2015 requirements. Information can be found at [www.ReScapeCA.org/rated-landscapes/](http://www.ReScapeCA.org/rated-landscapes/)

PLACEHOLDER Figure 3 MWELO Compliance Pathways

## H1/4.0 Performance Pathway

### H2/4.1 Applicability §490.1

**Summary:** Landscape projects that require a building or landscape permit, plan check or design review and meet the following criteria:

\*New construction projects: aggregate landscape area equal to or greater than 500 sq. ft.

\*Rehabilitated landscape projects: aggregate landscape area equal to or greater than 2,500 sq. ft.

\*Any landscape project: aggregate landscape area 500 to 2,500 sq. ft. (or follow Prescriptive Method).

**Note:** The rehabilitated area is the portion of the landscape at least 2,500 sq.ft. that will be renovated/modified.

Example: If a homeowner wants to remodel 4,500 sq. ft. of a 10,000 sq. ft. yard, only that 4,500 sq. ft. needs to comply, because: 1) the renovation size triggers compliance and 2) MWELO does not require the non-renovated areas to come into compliance. This is similar to a homeowner remodeling their master bed and bath. Only the bedroom and bathroom would need to comply with the current building code (electrical, plumbing, etc.) for the renovation, because the code does not require the entire house to be upgraded.

**Note:** New construction would include a parcel that has never been developed and/or a parcel where the existing structures and landscaping are demolished and will be replaced.

Example: A home will be demolished, and replaced. The construction equipment and construction will cover nearly the entire parcel; the irrigation equipment will be removed or cut making it inoperable; and the remaining plants will not be irrigated and are decades old. This will result in new irrigation and new plants. The yard (front, back, side) is 5,000 sq. ft. This project would be considered new construction and would trigger compliance, because the landscape area is greater than 500 sq.ft.

**Note:** Aggregated landscape areas are most common in retail centers and production home developments, because the entire development is considered one project. To determine applicability, all of the separated and unconnected landscape areas within one project are aggregated (added) together.

**Note:** Landscape area includes all irrigated areas and water features like swimming pools, spas, fountains, etc.

**Note:** For terms and definitions, see Landscape Irrigation Water Budget Overview in Appendix C.

#### [H2/4.2 Compliance with Landscape Documentation Package §492.1](#)

**Summary:** This section outlines what is required of the applicant and local agency regarding construction documents. Upon approval of the Landscape Documentation Package, the **local agency** must submit a copy of the Water Efficient Landscape Worksheet to the appropriate water provider. The **applicant** must submit a copy of the approved Package and construction documents to the property owner/designee and a copy of the Water Efficient Landscape Worksheet to the water provider. Signatures and specific notations are required.

**Intent:** To clarify the roles and responsibilities of applicants and permitting agencies prior to construction.

**Note:** Construction documents may include plans, specifications, details, and notes.

#### PLACEHOLDER Figure 4 MWELO Performance Pathway Flowchart

**Enforcement:**

**Recommendation:** Customize and utilize the sample process flowchart to help staff and applicants know what and when specific steps and documents are required.

**Recommendation:** In some cases, such as entitlement or conditional use permit, preliminary landscape designs may be required. In this case, the preliminary Landscape Design Plan and Water Efficiency Landscape Worksheet could be requested to provide an initial layout, hydrozones, design features, and water budget.

**Note:** The template Performance Pathway Flowchart can be found in Appendix E. This template can be edited to reflect the local agency's specific process flow and requirements. Consider including the number or website to schedule inspection(s) and other types of relevant customer friendly information.

**Plan review:** Table 1 below shows the different requirements for residential and non-residential landscape projects.

**Table 1. Performance Pathway Requirements for Residential and Non-residential Landscape Projects.**

PLACEHOLDER Table 1 Performance Pathway Requirements

[H2/4.3 Elements of the Landscape Documentation Package §492.3](#)

**Summary:** A complete Landscape Documentation Package is required as part of the plan check and review process prior to construction.

**Intent:** This package ensures that the applicant and/or the designer(s) understands the intent of MWELO and sustainable principles related to the design, installation and maintenance of soils, plants, irrigation, stormwater and non-potable water supplies for use in landscapes. These requirements not only strive to save water but incorporate multiple benefits such as preventing runoff and erosion that can contribute to polluted waterways and affect adjacent properties.

**Table 2. Performance Pathway Landscape Documentation Package Preparation**

PLACEHOLDER Table 2 Performance Landscape Package Preparation

**Compliance:**

**Applicant:** The applicant must submit the Landscape Documentation Package and include the following:

1. Project Information.
2. Water Efficient Landscape Worksheet.  
\*Hydrozone Information Table.  
\*Water Budget Calculations.
3. Soil Management Report (mass grading projects may submit with Certificate of Completion Package).
4. Landscape Design Plan.
5. Irrigation Design Plan.
6. Grading Design Plan.

**Note:** Terms and definitions, like “hydrozone,” can be found in Appendix C, the Landscape Irrigation Water Budget Overview. See §492.7 for additional information regarding hydrozones.

**Note:** Landscape Design Plans and Irrigation Design Plans must be signed by a licensed landscape architect, licensed landscape contractor, or other authorized person per California Business and Professions Code in the California Code of Regulations. Grading Plan must be signed by a licensed professional. For additional guidance, see Appendix Z, Permitted Practice in California chart.

**Note:** Each planting area is called a hydrozone, where all plants within the hydrozone have similar water and sun needs. Hydrozones will be shown on the landscape plan, and corresponding hydrozones will be shown on the irrigation plan, where the irrigation within in each hydrozone or “valve” irrigates all of the plants within the hydrozone with “matching” equipment. Some hydrozones are large enough to require several “valves” to irrigate the area.

**Recommendation:** Including the following:

- \*Cover Sheet.
- \*Site Plan showing parcel lines.
- \*Details.
- \*Specifications/Notes.
- \*Assessor’s parcel number (APN) on each page.

**Note:** Sample forms can be found in the Appendices. For a complete list, see Appendix A.

**Plan review:** The reviewer should in-take the Package and confirm that these 6 elements are included.

**Recommendation:** These additional documents are highly recommended to provide all the necessary information for plan review and installation.

1. Cover Sheet.
2. Site Plan.
3. Details.
4. Specifications or notes.

**Note:** Samples can be found in the Appendices.



**Note:** Plan checkers/reviewers do not need to be experts in landscape and irrigation design, installation and maintenance. This compliance pathway sets specific instructions for applicants to follow to provide construction documents.

**Note:** Sample Standard Correction Checklist can be found in Appendix T.

H3/4.3.1 Project Information Form §492.3(a)(1)

**Summary:** This form includes basic information about the project scope, applicant, owner, and water provider.

**Intent:** Plan reviewers will understand the scope of the project and determine which MWELo requirements apply and if other laws apply, e.g. non-potable water supplies will trigger additional review by local health agency.

**Compliance:**

**Design:** Total Landscape Area includes the aggregate of all proposed irrigated landscape areas. For common interest developments (neighborhoods, planned developments, tract developments, campuses, etc.), the project includes all of the landscaping that will be designed and installed by the developer, and does **not** include what the individual homeowner is responsible for designing and installing.

**Design:** The landscape area also includes water features like swimming pools, spas and fountains.

**Note:** The water provider may request from the applicant the total irrigable area including homeowner installed areas in tract developments in order to size the meter correctly. Irrigable area is the area that is irrigated or could be irrigated in the future.

Example: A homeowner builds a new custom home but does not have the money to install plants and irrigation. They install only three inches of mulch over the entire yard. They plan to install plants and irrigation in a few years. The water provider needs to size the service line and meter for the future water supply and may require or formulate a water budget for the irrigable (current and future) area.

**Note:** The Performance Submittal Checklist which includes Project Information can be found in Appendix F.

**Enforcement:**

**Plan review:** Check that the total landscape area includes all the irrigated areas listed on the site plan, landscape design plan, and irrigation design plan.

**Note:** Track data for annual MWELo implementation (§495) report.

**Note:** Submit approved Landscape Documentation Package to local water provider and property owner/designee.

#### H3/4.3.2 Water Efficient Landscape Worksheet §492.4

**Summary:** This is the water budget for the new or rehabilitated landscape. It caps water use by requiring water-efficient irrigation and plants. It lists the different areas of the landscape according to plant type, watering needs, and irrigation equipment. Each planting area is called a hydrozone, where all plants within the hydrozone have similar water and sun needs. Hydrozones will be shown on the landscape plan, and corresponding hydrozones will be shown on the irrigation plan, where the irrigation within in each hydrozone or “valve” irrigates all of the plants within the hydrozone with “matching” equipment. Some hydrozones are large enough to require several “valves” to irrigate the area. This Worksheet shows each hydrozone and its attributes as well as the calculations for determining the amount of water the landscape will need each year.

**Intent:** The water budget is developed to drive water-efficiency through the selection of climate-appropriate plants, water-saving irrigation devices, and alternative water supplies. Limiting water use in landscapes allows more water for other necessary uses such as sanitation and drinking. The Worksheet is a quick way to check if the applicant understands MWELo; soil, plant, water relationships; and the appropriate irrigation equipment for the plants and site conditions. It easily shows if the proposed new or rehabilitated landscape is designed within the allowed budget.

#### **Compliance:**

**Design:** The water budget is the total use of water by hydrozone based on plant factor, irrigation method and efficiency, local climate, and landscape area. The Maximum Applied Water Allowance (MAWA) is the upper limit (ceiling) of water needed annually for an established landscape and is calculated using the size of the landscape and local evapotranspiration. The Estimated Total Water Use (ETWU) is the amount of water the landscape needs based on plants and irrigation type. ETWU cannot exceed the MAWA.

**Design:** For Plant Factors, use the Water Use Classification of Landscape Species (WUCOLS) developed by the University of California. This is the only approved reference to-date. Check WUCOLS at the California Center For Urban Horticulture for the newest version (current edition is IV). Plant Factors range from 0 (needs no irrigation because rain provides all the water it needs) to 1.0 (needs high amount of irrigation). For more information see the Plant Materials section. MWELo encourages the use of plants that need less irrigation.

Plant Factors in WUCOLS IV:

\*Very low: 0 to 0.1.

\*Low: 0.1 to 0.3.

\*Moderate: 0.4 to 0.6.

\*High: 0.7 to 1.0.

**Note:** WUCOLS IV is an online plant database found at <https://ucanr.edu/sites/WUCOLS/>. Recently, WUCOLS has been enhanced with photos and cultural information for the lower water using plants within the database.

**Designer:** Use the Irrigation Efficiency set by MWELo and ASABE/ICC 802-2014:

\*Drip, dripline, multiple outlet: 0.81.

\*Bubbler: 0.81.

\*Sprinklers: spray, rotor, multi-stream: 0.75.

\*Water feature: 1.0.

**Note:** Special Landscape Areas (SLA) are provided under certain conditions and allow more water for those sections of the landscape.

**Design:** Special Landscape Areas are limited for single-family homes. Single-family homes **cannot** have recreational areas **but can** have Special Landscape Areas for edible plants, areas irrigated with recycled water, and water features that use recycled water. The water budget for residential landscapes allows for approximately 25 percent of the area to be planted with high water-use plants, such as turfgrass lawns.

**Design:** Check to see if the local agency requires Effective Precipitation (EPPT) to be used in the MAWA calculation. It is 25 percent of the annual

rainfall for the area. When calculating EPPT, it is important to determine “usable rain” or the amount of rain that promotes plant growth by reaching the soil, not an amount that will stay trapped in the mulch. Some WELO’s include provisions for 0.25 inches or more of rain. Local agencies may require the use of specific weather data such as previous year or average over a certain period from a specific source such as NOAA’s National Weather Service or the closest California Irrigation Management Information System (CIMIS) station or the water purveyor’s Urban Water Management Plan rainfall data.

NOAA National Weather Service website: <https://www.weather.gov/>

CIMIS website: <https://cimis.water.ca.gov/>

**Design:** According to ASABE/ICC 802-2014 standard for irrigation emission devices which is referenced in MWELO, microspray is considered “low volume irrigation” and in the same category as drip irrigation. Microspray is not overhead spray irrigation. To-date, there are **not any** microspray irrigation devices that meets this standard, and therefore cannot be specified or installed as part of a MWELO/WELO compliant project.

**Design:** Artificial/synthetic turf is not part of the landscape area and does not figure into the water budget calculation.

**Note:** Some irrigation manufactures have provided a list of MWELO compliant devices. DWR does not endorse nor recommend any products, materials, or services. These lists are for informational purposes only.

\*Hunter -

[https://www.hunterindustries.com/sites/default/files/california\\_mwelo\\_lit-682\\_dom.pdf](https://www.hunterindustries.com/sites/default/files/california_mwelo_lit-682_dom.pdf)

\*HydroRain - <https://www.hydorain.com/>

\*Orbit - <https://www.orbitonline.com/>

\*Rain Bird - <https://www.rainbird.com/agency/mwelo>

\*TORO – contact TORO for PDF file.

**Recommendation:** Use the Water Efficient Landscape Worksheet required by the local agency.

**Note:** A complete step-by-step guide to calculating the water budget is in Appendix C. DWR provides an online water budget calculator found on the MWELO webpage: <https://water.ca.gov/Programs/Water-Use-And->

[Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance. A sample can be also be found in Appendix G.](#)

**Enforcement:**

**Plan review:** The plan reviewer should review the Worksheet and confirm the calculations are correct. The Estimated Total Water Use (ETWU) must be equal or less than the Maximum Applied Water Allowance (MAWA).

**Recommendation:** These are the documents the reviewer may need in addition to the Worksheet:

- \*Project Information Form.
- \*Site Plan.
- \*Landscape Design Plan.
- \*Irrigation Plan.
- \*WUCOLS.

**Suggestion:** A complete step-by-step guide to calculating the water budget is in Appendix C. DWR provides an online water budget calculator found on the MWELo webpage: <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance. A sample can be also be found in Appendix G.>

**Recommendation:** The local agency should determine which Water Efficient Landscape Worksheet to require. The Water Efficient Landscape Worksheet included in the MWELo Appendix B is a simple form which lacks all the required fields necessary and does not provide definitions. This form has led to a lot of confusion and has required a lot of staff time to explain it to the designer/applicant. An updated Worksheet can be found in Appendix G.

**Recommendation:** Determine if you will require Effective Precipitation as part of the water budget calculations. If so, determine and provide a link to the source of the weather data and value such as previous annual precipitation or average annual rainfall over a specific time period. With climate change, determining "normal" rainfall may be a challenge. Examples of weather data include NOAA's National Weather Service and the closest California Irrigation Management Information System (CIMIS) station. Local agencies may also consider asking the water purveyor for their Urban Water Management Plan rainfall data.

NOAA National Weather Service website: <https://www.weather.gov/>

CIMIS website: <https://cimis.water.ca.gov/>

**Plan review:** Check for these common errors:

- \*Total square footage of irrigated areas not correctly added.
- \*Special Landscape Areas such as edible plants, recreational areas, areas watered with recycled water, water features using recycled water not included.
- \*Recreational areas for single-family homes such as pools and lawn. Single family landscapes do not have designated recreation areas because the water budget already allows for 25 percent high water plants.
- \*Hardscapes (driveways, pathways, sidewalk, artificial turf) included in landscape area.
- \* Total square footage not the same on the Project Information form.
- \* ETo not correct for that project site.
- \* Plant Factors not correct.
- \* ETAF for residential not correct. Should be 0.55.
- \* ETAF for non-residential not correct. Should be 0.45.
- \* ETAF for Special Landscape Area is not 1.0.
- \*Water features not included with a Plant Factor of 1.0.
- \*EPPT is required but not included in MAWA.
- \* ETWU not less than the MAWA.

**Note:** ETo can be found in the MWELo Appendix A or from CIMIS <https://cimis.water.ca.gov/>. Effective Precipitation is optional unless required by the local agency.

H3/4.3.3 Soil Management Report §492.5

**Summary:** This is the analysis done by a soil testing laboratory and their recommendations to achieve optimal soil conditions for plants. This is not the Geotech or geology report. This report must include an analysis of soil texture, infiltration rate, pH, total soluble salts, sodium, and the percent of organic matter. MWELo requires that soil be friable or loose enough to allow newly planted roots to spread easily. To achieve the requirement, the following must be met:

- \*Compost applied 4 cu. yd. per 1,000 sq. ft. and 6 in. deep OR.

\*Compost applied at the rate recommended by the soil lab to achieve organic matter of 6 percent which could be more or less than 4 cu. yd. per 1,000 sq. ft.

PLACEHOLDER Photo 16 Compost

**Note:** A sample soil report can be found in Appendix J.

**Intent:** Optimal soil conditions are necessary for healthy plants. When soils have the right mixture of air, water, organic matter and minerals, water infiltrates better thus reducing the likelihood of irrigation runoff while providing the plants with the correct balance of nourishment making them more resistant to pests and diseases. The soil analysis report provides information for the landscape designer to choose appropriate plants for the site conditions.

**Compliance:**

**Design/Applicant:**

1. Perform soil sample according to soil lab recommendations.
2. Include the Soil Management Report in the Landscape Documentation Package or submit with the Certificate of Completion, if mass grading is performed.
3. Keep and provide documentation (photos, receipts, or delivery tags) showing soil analysis report recommendations were met.

**Note:** For projects with multiple landscape installations, e.g. tract or production homes, a soil sample of 1 in 7 lots or 15 percent meets compliance.

**Note:** Mass grading is typically defined as the movement or redistribution of large quantities of earth over a large area (typically one acre or more) which requires a grading permit. This is typically done for large commercial projects and tract developments not a single home.

**Note:** Stormwater infiltration rates may be required by local regulations and/ or the Regional Water Resources Control Board.

**Recommendation:** Ask the soil lab for a "MWEL0" or "organic" compliant analysis.

**Recommendation:** Provide specifications, notes and details for the application of compost and materials based on the report recommendations.

**Recommendation:** Documentation must be submitted with the Certificate of Completion showing the soil analysis recommendations were implemented. This could be a receipt for the purchase and installation of the compost, delivery tags/bill of lading or photos.

**Recommendation:** See Appendix J for a sample soil report.

**Recommendation:** See Appendix C for detailed information regarding compost.

**Suggestion:** Using quality organic compost such as CDFA-registered Organic Compost or OMRI-certified Compost should be considered.

**Enforcement:**

**Plan review:** The reviewer will need to check that the Soil Management Report was provided or will be submitted with the Certificate of Completion, if mass grading is planned.

**Recommendations:** These are the documents the reviewer may need for review:

- \* Soil Management Report.
- \*Planting Plan.
- \*Specifications or notes.
- \*Details.
- \* Soil Preparation Plan.
- \*Site Plan.
- \*Irrigation Design Plan.

**Plan review:** Check for the following:

Is the correct compost application rate provided in the specifications, notes and/or details?

Is the correct depth provided in the plans, specifications, notes and/or details?

**Enforcement:**

**Recommendation:** If existing trees are to be retained in a new or rehabilitated landscape, the tilling requirement for compost incorporation may be waived to preserve tree roots. Compost can be applied as a top dressing over soil, under the mulch.



**Note:** SB 1383 requires cities to procure compost and mulch every year which can help meet MWELo requirements. Annual reporting is required.

**Inspection:** Is the compost installed per the approved plan? Do they have photos or delivery tags or receipts?

#### H3/4.3.4 Landscape Design Plan §492.6

**Summary:** The Landscape Design Plan is a construction document or set of documents that lays out the elements of the landscape including plants, hardscapes, water features, water sources, compost, and mulch for the new or rehabilitated landscape project. MWELo requires specific information on these construction documents. The Landscape Design Plan dovetails with the Irrigation Design Plan and Grading Design Plan. A change in one plan can have subsequent consequences in the other plans and should be reviewed as a whole set.

**Intent:** The Landscape Plan demonstrates an understanding of sustainable landscaping principles including soil, plant, water relationships. A well-designed plan provides enough detail for the property owner, plan checker, inspector, auditor, and installer to visualize the complete project and follow its specific instructions — ultimately saving time, money, and resources. The Landscape Design Plan must include at minimum:

1. Delineate and label each hydrozone by number, letter, or other method.
2. Identify each hydrozone as very low, 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. Include square footage of each hydrozone.
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, installation details, and 24-hour retention or infiltration capacity of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Project applicants

shall refer to the local agency or Regional Water Quality Control Board for information on any applicable stormwater technical requirements. Stormwater best management practices are encouraged in the landscape design plan and examples are provided in Section 492.16.

11. Identify any applicable rain harvesting or catchment technologies as discussed in Section 492.16 and their 24-hour retention or infiltration capacity.

12. Identify any applicable graywater discharge piping, system components and area(s) of distribution.

13. 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."

14. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape.

**Note:** See Appendix Z, Permitted Practice in California, for information regarding the authorization of individuals to perform design and installation of landscapes and irrigation systems, and grading.

**Note:** See Appendix F for Performance Submittal Checklist.

Recommendation: Add these to the Landscape Design Plan:

\*North arrow, scale.

\*Plants and plant legend.

\*Soil, compost and mulch specifications or notes.

#### *H4/4.3.4.1 Plant Material §492.6(1)*

**Summary:** Plant material includes groundcovers, turf, shrubs, vines, trees, and edible plants. Plants may be native to California, non-native, non-native but adapted to dry-summer climates (plants from Mediterranean climates). Plants that are native to California or climate-appropriate plants often need less irrigation water and expect rain in the fall and winter and little, occasional or no water during the summer.

**Intent:** Thoughtful selection of plant materials reduces water waste and maintenance thus creating a resilient and sustainable landscape which saves time, money and resources. Sustainable landscapes create shade and habitat for insects, birds and other animals.

**Compliance:**

**Design:** Use the submittal checklist provided by the local agency.

**Note:** A Landscape Design Plan is required even if permanent irrigation is not proposed for the entire landscape or the irrigation is from a non-potable irrigation system such as graywater, stormwater, and/or recycled water. This is to ensure that plants selected are carefully planned for the purpose of the project.

**Note:** Temporary irrigation is an irrigation system in place for a maximum of two years to establish native and other dry summer climate adapted plants. Consideration for a permanent irrigation system should be taken into account, even for native plants and especially for larger areas that cannot be easily hand-watered, because droughts and rising temperatures can severely impact plants that rely solely on rain for the watering needs. Periodic hydration of plants not normally irrigated can reduce plant flammability.

**Recommendation:** For Plant Factors, use the Water Use Classification of Landscape Species (WUCOLS) developed by the University of California. This is the only approved reference to-date. Check WUCOLS at the California Center For Urban Horticulture for the newest version. WUCOLS IV is an online plant database found at <https://ucanr.edu/sites/WUCOLS/>. MWELO encourages the use of plants that need less irrigation.

Plants are categorized by very low, low, moderate, and high-water use and given a corresponding Plant Factor number:

\*Very low: 0 to 0.1.

\*Low: 0.1 to 0.3.

\*Moderate: 0.4 to 0.6.

\*High: 0.7 to 1.0.

PLACEHOLDER Photo 17 California Poppy

**Recommendation:** Invasive plants should not be specified or planted, because they can overpower other plants and spread, causing problems like destruction of native plants and habitats, soil erosion, act as fire kindling and flash fuels, and contribute to aquatic disruption. Some plants may be more invasive in one part of the state than another. Applicants, designers and local agencies should follow guidance found with the [California Invasive Plant Council](#) or [Plant Right](#) .

**Note:** Invasive plants cause environmental and economic harm to California, however AB 2470 adopted in 2014, prohibits a city, county, or district from adopting or enforcing an ordinance that regulates plants, crops, or seeds without consent from the Secretary of Food and Agriculture.

**Suggestion:** Include thumbnail photos on the plan or create an inspection reference sheet of plants and photos for the inspector to verify during inspection.

**Note:** Additional plant references are listed in the Resources in Appendix W.

**Note:** Non-residential landscape projects can only have very low to moderate plants, except in Special Landscape Areas (SLA) that:

\*Serve a recreational function such as a sports field or public-assembly area where high water use plants are allowed.

\*Area dedicated to edible plants (vegetables, herbs, etc.).

\*Area irrigated by recycled water.

\*Water feature using recycled water.

**Note:** Because the water budget is automatically higher for single-family homes to accommodate areas of play and recreation, single-family landscapes cannot have designated recreational areas; therefore, cannot include Special Landscape Area for that purpose. But single-family homes, can have Special Landscape Area edible gardens, areas irrigated with recycled water, and water features that use recycled water.

Example 1: A single-family home wants to install turf/lawn in the entire backyard. The ETWU calculations limit the size of turf allowed, because it would be more than the MAWA. The designer includes the turf/lawn on the plan and calls it Special Landscape Area. This does not comply.

Example 2: A single-family home wants to install a large vegetable garden in the front yard. The designer includes this vegetable garden as a Special Landscape Area on the plan, and ETWU is less than or equal to MAWA. This complies.

Example 3: A mixed-used residential development is planned with a rooftop pool. The designer includes the pool as a Special Landscape Area on the plan, and ETWU is less than or equal to MAWA. This complies.

**Note:** Planted Area includes plants with mulch around them but does not include open space/native habitat.

Example: A new tract home development has 10 single-family homes on a block, and the backyards abut the native landscape that is owned by the development company but will not be built upon. It will remain “wild.” The developer is landscaping all the backyards with plants and some lawn. Only the bare soil in the irrigated planting area around the shrubs in the backyards need to have 3 inches of mulch. To provide designated habitat for ground nesting bees and other insects, 5 percent of the soil may be left bare.

**Note:** Planted Area may include existing plants where irrigation did not exist before but is being installed.

**Note:** Total Landscape Area is the aggregate of all irrigated landscape areas in the entire project even if it will be installed in phases, including parkways, medians, front yards and common areas of production housing.

**Note:** Turf is prohibited on slopes greater than 25 percent to prevent irrigation runoff and for worker safety during maintenance.

**Note:** Street medians are prohibited from having high water use plants with Plant Factors 0.7 to 1.0. This prohibits many types of turf/lawn. Since these areas are typically not accessible to the public, minimizing water use and maintenance are practical and sustainable design principles. This requirement may be waived for street medians that are wide enough for programmed activities.

PLACEHOLDER: Photo 20 Capitol Mall with Festival

**Note:** Plants, including trees, in fire-prone areas must adhere to State and local regulations, including Fuel Modification Plan Guidelines.

**Suggestion:** Trees need more water as they grow. The Plant Factor for trees can be found in WUCOLS. One way to ensure the tree has enough water at full growth, is use the mature or established tree canopy size in the landscape area calculations.

**Note:** Recycled water is wastewater treated to meet non-potable water standards. It can be on-site or from a water provider. Recycled water is delivered by pipes and irrigation equipment that are colored purple and must not be cross-connected with potable water systems.

**Enforcement:**

**Plan review:** The reviewer should check that all required and necessary information is included in the construction documents or set of documents.

Purple pipe and equipment and warning signage are required for recycled water use.

**Recommendation:** Additional information is often necessary for a thorough review and proper installation. These are highly recommended:

\*Plant list.

\*Specifications/Notes.

\*Details.

**Recommendation:** Check for these common errors:

\*Hydrozones not clearly marked on the plan.

\*Turf on slopes greater than 25 percent or slopes not identified.

\*Prohibited plants in fire-prone areas or in defensible space.

**Inspection:** Check for these common errors:

\*Very low/low mixed with high-water use plants on same irrigation valve.

\*Turf installed in areas not marked on the plan.

\*More turf installed than on the plan.

\*Plants in defensible space.

\*Turf on 25 percent or greater slopes.

*H4/4.3.4.2 Water Features §492.6(2)*

**Summary:** Water features are allowed and include swimming pools, spas, fountains, ponds, lakes, waterfalls, artificial streams where water is artificially supplied. All water features must be identified on the Landscape Design Plan.

PLACEHOLDER Photo 18 Swimming Pool at Home

**Intent:** Including water features in the landscape and water budget calculation, allows the designer to prioritize design elements – whether that’s lawn, edible gardens, pools or privacy hedges, etc. The property owner can enjoy many or all of these elements but in moderation in order to use water efficiently and beneficially.

**Compliance:**

**Applicant:** Include all water features on the plan set and required specifications, notes and details.

**Note:** All water features are considered a high-water use hydrozone due to evaporation.

**Note:** Water features of any size are included in the landscape area. Any new water feature not associated with new or renovated landscapes, that is 500 sq. ft. or larger must comply, e.g. a pool.

**Note:** Pools may be considered Special Landscape Area for multi-family and commercial projects but not single-family homes. Pools for non single-family properties are considered recreational areas and may be assigned an ETAF of 1.0.

Example 1: A homeowner installing a new pool with a surface area of 520 sq. ft. with no changes to the adjacent landscape or irrigation is required to comply with MWELo and submit the Landscape Documentation Package and Certificate of Completion Package. Because MWELo considers water features part of the landscape area and compliance is triggered for areas 500 square feet or larger that require a permit, a proposed new pool greater than 500 square feet must submit the Landscape Documentation Package and the Certificate of Completion. The Water Efficient Landscape Worksheet must include the calculations for the pool. Since there is no irrigation in this case, an irrigation audit is not performed.

Example 2: A homeowner installing a new or enlarged pool with a surface area of 2,590 sq. ft. and renovated plants and irrigation is required to comply and submit the Landscape Documentation Package and Certificate of Completion Package.

**Note:** Recirculating systems are required on all water features in order to reduce water waste.

**Note:** Plant Factor for water features is 1.0 (high water use) and must be included in the high-water use hydrozone on the Landscape Design Plan and in the water budget calculation on the Water Efficient Landscape Worksheet.

**Recommendation:** Where allowed and available, recycled water must be used in ornamental water features. Check local, health department, State, and water provider regulations for recycled water.

**Recommendation:** Additional requirements for water features may be required, e.g. pool/spa covers. Check local health and building department regulations.

**Enforcement:**

**Plan review:** Check that all requirements are met and look for these common errors:

\*Water feature not included on plan, but detail or specification is included.

\*Water feature is not listed as a high-water use hydrozone.

\*Pool is not included in this plan but on a separate construction document.

\*Single-family pool listed as Special Landscape Area.

**Inspection:** Check that water features installed match the approved plans and look for these common errors:

\*Recirculating system not installed.

\*Water feature was not on plan but was installed.

*H4/4.3.4.3 Soil Preparation, Mulch, and Amendments §492.6 (3)*

**Summary:** Requires optimal soil conditions for plants and infiltration.

**Intent:** Healthy plants are less susceptible to disease, live longer, and look better. Ensuring they get the right nourishment (food, water, air) from the start, will likely result in less maintenance and the need for less water. Soils with good infiltration can help prevent water from running off causing pollution or water damage.

**Compliance:**

**Applicant:** Include the following information on the plan, specifications, notes and/or details:

1. List of soil amendments to be incorporated based on soil analysis report.
2. Compost application of 4 cu. yds per 1,000 sq. ft. to a depth of 6 in. or soil lab recommendation to get to 6 percent organic matter.
3. Mulch applied 3 in. on exposed soil surfaces, except for 5 percent for areas designated as beneficial insect habitat.

**Intent:** Beneficial insects like California native bees are ground dwellers and vital for the pollination of the State's native plants. Providing a safe habitat for them helps California's native habitats.

**Note:** In new landscapes, compost should be tilled into the soil to relieve compaction and re-introduce air into the soil. However, a local agency may waive tilling requirements in landscapes with existing trees and shrubs to preserve roots.



**Note:** In fire-prone areas where organic mulch is prohibited, because it may act as kindling, inorganic mulch must be included on the Plan. Some regions have Fuel Modification Guidelines that offer more guidance on landscaping in fire hazard areas.

**Note:** See Appendix C for detailed information on organic and inorganic mulch.

**Note:** Slopes must use stabilizing mulch, so that it prevents erosion and mulch migration that can cause other issues downhill.

**Note:** Mulch is added to bare soil and not on top of groundcovers and open space/native habitat areas.

**Note:** The soil lab recommendations may include amendments in addition to compost for optimal soil health. There are a variety of amendments available to meet specific site conditions.

**Recommendation:** The soil analysis report recommendations should be included in the Plan and/or specifications. If mass grading is planned, the soil analysis should be done for the final topsoil. The report and verification that recommendations were followed must be submitted with the Certificate of Completion. In this case, the Plan, specifications, and/or notes should include information about these steps.

**Note:** In addition to water efficiency requirements, the project must also comply with all applicable stormwater management and discharge requirements by State and local agencies. Subject to project size and other applicability thresholds, the project may be required to apply to the Regional Water Quality Control Board for coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction.

**Enforcement:**

**Plan review:** Check for these on the Landscape Design Plan, specifications, notes, and/or details:

Is the Landscape Design Plan included?

Does it include and identify the following?

\*Hydrozones.

\*Recreational areas.

\*Edible plant areas with permanent and dedicated irrigation.

- \*Mulch type and depth.
- \*Soil amendment types and quantity.
- \*Water feature type and surface area.
- \*Hardscape type (pervious and non-pervious).
- \*Stormwater Best Management Practices location and installation details (this may be found on the Stormwater Pollution Prevention plan set (if required)).
- \*Rainwater harvesting systems.
- \*Graywater systems.

Are mixed plants in same the hydrozone or irrigation zone, e.g. very low plants with high water use plants?

Do non-residential projects have high water use plants that are not part of the Special Landscape Area?

Is mass grading occurring? If so, is that communicated on the Plan?

Is organic, recycled content mulch included? Inorganic mulch?

Is the pool and/or other water features included as a high water use hydrozone? Does it have a Plant Factor of 1.0?

For non-potable water sources, has the local health department reviewed?

**Inspection:** Check that the project was installed per the approved Landscape Design Plan and construction documents, and look for these common errors:

\*Graywater and/or rainwater harvesting system not included on Plan but installed. Graywater and Rainwater Harvesting are regulated in Chapters 15 and 16 of the California Plumbing Code. [CA Plumbing Code](#)

\*Mulch depth less than 3 in., except for designated insect areas (5 percent).

\*No documentation verifying the compost was applied.

**Note:** See Appendix U for Inspection Checklist Template.

H3/4.3.5 Irrigation Design Plan §492.7

**Summary:** The Irrigation Design Plan is a construction document or set of documents that lays out the irrigation system. MWELo requires specific information on these documents and specific irrigation devices and components. These requirements apply to permanent irrigation systems.

**Intent:** The Irrigation Design Plan demonstrates an understanding of sustainable landscaping principles including soil, plant, water relationships. The design must prevent irrigation runoff, low head drainage, and overspray. A well-designed plan provides enough detail for the property owner, plan checker, inspector, auditor and installer to see where it will be installed and connected to the water supply(ies), the components needed for proper operation, and specific installation and maintenance instructions - ultimately saving time, money, and resources.

**Note:** The Irrigation Design Plan must include at minimum:

1. Location and size of landscape meters (private submeter or dedicated customer service meter).
2. Location, type, and size of all irrigation components.
3. Static pressure at point of connection.
4. Flow rate (gallons per minute), application rate (inches per hour) and design operating pressure (pounds per square inch) for each zone/station.
5. Location of recycled water systems.
6. Notation: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan."
7. Signature of a licensed landscape architect, architect, certified irrigation designer, licensed landscape contractor, or any other authorized person to design the irrigation system.

**Note:** See Appendix Z: Permitted Practice in California for information regarding the authorization of individuals to perform design and installation of landscapes and irrigation systems and grading.

**Recommendation:** Additional information is often necessary for a thorough review and proper installation. The following documents are strongly recommended for inclusion in the plan set:

- \*Irrigation legend.
- \*Irrigation notes.
- \*Hydrozone table.
- \*Specifications.
- \*Details.
- \*Location and type of meters.

**Compliance:**

**Design:** Use the submittal checklist required by the local agency.

**Design:** Provide the required and necessary documentation for the irrigation system.

*H4/4.3.5.1 System §492.7(1)*

**Summary:** This section prescribes specific irrigation equipment and prohibits some devices in certain areas.

**Intent:** Requiring water-efficient irrigation equipment saves water which will help keep water costs down for the property owners and lessens the impact on the community’s water supply.

**Compliance:**

**Design:** Design the irrigation system to prevent water waste, runoff, and overspray and to conform to the hydrozones.

**Recommendation:** For detailed explanations of irrigation system components referenced in MWELo, review the Landscape, Irrigation, and Water Budget Overview in Appendix C. Additional resources can be found in Appendix W.

**Note:** Meters are required when these size thresholds are met:

PLACEHOLDER Photo 19 Dedicated Irrigation Water Meter

\*Non-residential: submeters required for irrigated landscapes 1,000 to 5,000 sq. ft. As a condition of new water service, new irrigated landscapes 5,000 sq. ft. or greater will have a dedicated landscape water meter installed by the local water purveyor in accordance with [Water Code §535](#)

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\*Residential: submeter on the irrigation system required for irrigated landscapes 5,000 sq. ft. or larger.

**Note:** Submeters are not required for private wells. They are required for the irrigation systems when size thresholds are met.

**Note:** Dedicated customer service meters or submeters are **not required** for graywater and/or rainwater harvesting systems, even if they supply 100 percent of the irrigation demand.

**Note:** For recycled water, typically the water provider will require a dedicated meter no matter the landscape size.

**Intent:** This is borne from the idea that you can manage what you measure. This gives the property owner/manager and those responsible for maintaining the landscape the information they need to ensure the landscape meets the water budget and make adjustments to the irrigation schedule, as needed.

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**Note:** The meter can either be a dedicated irrigation meter, one that is owned, read and maintained by the water provider (can cost thousands of dollars) or a submeter, owned, read and maintained by the property owner/designee (can cost a few hundred dollars).

**Note**The water purveyor will have criteria in place for the installation of dedicated irrigation meters in multi-parcel developments.

**Design:** Identify the point of connection(s), where the irrigation system(s) connects to the water supply main, well or on-site non-potable supply. Identify backflow prevention/cross-connection control.

**Recommendation:** Specify control valves that are compatible with the emission device's flow rate and zone pressure.

#### *H4/4.3.5.2 Manual Shut-off Valve*

**Note:** Manual shut-off valve is required. Identify location and include necessary specifications, notes and details.

**Intent:** These valves allow quick access to turn-off the entire system if there is a problem like a leak or repairs need to be made.

#### *H4/4.3.5.3 Backflow Prevention*

**Note:** Backflow prevention device is required. Identify location and include necessary specifications, notes and details.

**Intent:** This device is solely for public health and safety to stop contaminated irrigation water from reverse flowing back into the main supply line or building.

**Recommendation:** When specifying backflow prevention devices such as anti-siphon valves, it is especially important to include the correct height and location to ensure that it will function properly. Improper height is one of the

most common installation errors that can create the biggest health and safety risk. Required minimum heights:

\*RP, DCVA: 12 in. above ground.

\*ASV, AVB, PVB: 6 in. above highest sprinkler/bubbler/drip.

**Recommendation:** The local health department and/or water provider may have specific backflow requirements for potable and non-potable water supplies. Check with the local agencies for additional requirements.

#### *H4/4.3.5.4 Pressure Regulation*

**Note:** Pressure regulation is required if static pressure is too low or too high for equipment manufacturers' operating pressure recommendation.

**Intent:** Equipment will not function or will function poorly where pressure is too low or too high. For instance, sprinklers under high pressure will mist sending the water into the air instead of to the target area, thus creating water waste. Booster pumps may be needed if there is inadequate water pressure to operate irrigation equipment. This is common on large turf areas like parks and sports fields.

Below are typical operating pressure and pressure ranges for different emission devices.

\*Sprinklers with rotary nozzles ~ 40-45 psi; operating range 25 to 55 psi.

\*Rotors ~45 psi; operating range 25 to 60 psi.

\*Dripline/Inline Drip ~ 40 psi; operating range 20 to 60 psi.

\*Point-source Drip ~ 30 psi; operating range 15 to 60 psi.

#### *H4/4.3.5.5 Master Shut-off Valve*

**Note:** Master Shut-off Valve (Master Valves) required unless a valve-in-head device (used primarily in golf courses) is installed in which case individual sprinklers are controlled. For projects that require a flow sensor, the master valve must work in conjunction with the flow sensor.

**Intent:** To save water if a valve fails to close, leaks, or the flow sensor detected abnormal flow.

#### *H4/4.3.5.6 Flow Sensor*

**Note:** Flow sensor required to detect high flow and low flow conditions caused by malfunction or damage. Required for these projects:

\*Non-residential: all projects.

\*Residential: 5,000 sq. ft. or larger.

**Intent:** A flow sensor is used to both: alert the person responsible for maintaining the landscape that an abnormal flow event has occurred and when used in conjunction with a master valve, has the ability to shut down the irrigation system. Mainline breaks that go undetected and uncorrected can cause significant property damage and if flowing onto streets, serious traffic hazards.

**Note:** A flow sensor combined with the master valve and automatic controller will automatically shut-off the system or zone when high or low flows are detected.

#### *H4/4.3.5.7 Automatic Controller*

**Note:** Automatic controller must have non-volatile memory and one of these functionalities:

\*Weather-based using evapotranspiration.

\*Soil moisture sensing.

**Intent:** To use appropriate data and information about the weather, site conditions and plants to provide the right amount of water when it is needed. Think of this as the thermostat for the landscape.

**Recommendation:** Include an onsite rain sensor (required) along with controller.

#### *H4/4.3.5.8 Sensors*

**Note:** At minimum, a rain sensor is required. Depending on local weather conditions, wind and/or freeze sensors may be required as follows:

\*Rain Sensor: During rain events, the sensor must suspend the ability of the control valves to operate while the sensor is activated.

\*Wind Sensor: For high wind areas, the sensor must suspend the ability of the control valves to operate while the sensor is activated.

\*Freeze Sensor: For areas prone to freezing, the sensor must suspend the ability of the control valves to operate while the sensor is activated.

**Intent:** To avoid water waste and other potential risks such as damage due to freezing or wind driven irrigation that over sprays onto walkways wasting water and creating slip and fall hazards.

**Note:** State law Executive Order B-40-17 that required irrigation be suspended during and 48-hours after measurable rain is **no** longer in effect.

#### *H4/4.3.5.9 Emission Devices*

**Note:** Irrigation Emission Devices must meet American National Standards Institute (ANSI) Standard, American Society of Agricultural and Biological Engineers'/International Code Council's ASABE/ICC 802-2014. This is a testing standard that manufacturers use during design and manufacture of equipment. The Standard can be found at <https://www.iccsafe.org/products-and-services/standards/is-iedc/>

**Note:** Effective October 1, 2020 all spray sprinkler bodies specified must include an internal pressure regulating device.

**Intent:** Equipment Performance standards met by manufacturers are important to ensure the devices are water efficient and will work properly under normal conditions.

#### *H5/4.3.5.9.1 Sprinklers*

**Note:** The ANSI/ASABE/ICC 802-2014 Standard calls all overhead irrigation "sprinklers" and defines two types of sprinklers: spray and rotors. Spray irrigation is what the public generally calls "sprinklers" that pop-up or remain stationary and commonly found in single-family homes and smaller landscapes. Typically, rotors are found in sports fields, parks and larger estates or properties.

**Intent:** Requiring water-efficient sprinklers saves water while providing necessary coverage for large areas planted with groundcovers and turf.

Spray and Rotors must meet the following according to MWEL0 and/or ASABE/ICC 802-2014:

\*Must emit equal to or more than 0.5 gpm at 30 psi at the largest area of coverage or more with a full-circle pattern.

\*Irrigation efficiency is set at 0.75 for overhead irrigation when calculating Estimated Total Water Use. Irrigation efficiency is set at 0.81 for drip irrigation systems.

\*Distribution uniformity lower quarter must be 0.65 or higher.

\*Sprinkler must have a nozzle.

\*Pressure regulation required. This may be from a pressure reducer or a pressure booster depending on the site static pressure and manufacturer's specifications of the chosen equipment



\*Check valve or anti-drain valve required where low point drainage would occur.

\*Must have matched precipitation (application rate in inches per hour).

\*On slopes greater than 25 percent, the precipitation rate cannot exceed 0.75 inches per hour.

\*Swing joints or other riser protection device required in high traffic areas adjacent to hardscapes or lawn/turfgrass.

\*Prohibited within 24 inches of any non-permeable surface (e.g. sidewalk, driveway, concrete walking path, etc.); unless the design shows there will be no runoff and overspray or drains entirely to landscaping. The setback may be planted or unplanted and may have gravel, mulch or other porous material.

\*Prohibited in mulched planting areas.

\*Prohibited in areas less than 10 feet wide.

**Recommendation:** Head-to-head coverage is necessary for proper water coverage. In windy areas, reduce spacing between sprinklers to effectively irrigate target area.

**Recommendation:** Different sprinkler brands and models should not be mixed on the same zone unless they have the same precipitation rate and the same operational pressure requirements. Incompatible equipment results in uneven coverage with potentially overly dry or overly wet spots. To improve coverage, these types of actions are commonly taken: the zone is programmed to run longer; an additional spray (sprinkler) might be added, or it is hand watered. While these actions can help, they will not fix the inherent design flaw and may lead to uneven coverage, and excessive water waste.

**Note:** Limiting sprinkler irrigation in small areas, reduces the potential for overspray and runoff which wastes water and can create hazards such as slip and fall and water damage to fences, buildings, etc.

**Note:** Because of the limitation against sprinkler irrigation for areas less than 10 feet in any dimension and within two feet of an impervious surface, sprinkler irrigation will generally be barred from nearly all parkway strips.

**Note:** Artificial/synthetic turf systems may need a sprinkler system for maintenance – cleaning and cooling.

**Note:** Some irrigation manufactures have provided a list of MWELO compliant devices. DWR does not endorse nor recommend any products, materials, or services. These lists are for informational purposes only.

\*Hunter -

[https://www.hunterindustries.com/sites/default/files/california\\_mwelo\\_lit-682\\_dom.pdf](https://www.hunterindustries.com/sites/default/files/california_mwelo_lit-682_dom.pdf)

\*Rain Bird - <https://www.rainbird.com/agency/mwelo>

\*TORO – contact TORO for PDF file

H5/4.3.5.9.2 Microirrigation:

**Note:** The ASABE/ICC 802-2014 Standard calls drip irrigation and microspray irrigation “microirrigation” and considers them low volume irrigation.

**Intent:** Microirrigation is considered the most water-efficient irrigation, as it can apply water uniformly and directly to the plant root zone.

Types include:

\*Drip tubing with evenly spaced, built-in emitters. .

\*Multi-outlet emitter with more than one emission point from a central component.

\*Drip emitter that discharges water at a single point.

\*Microbubblers, microspinners, and micro-spray jets.

**Note:** It does not include drip tape or soaker hoses which do not keep the pressure and flow rate even throughout the tubing.

**Note:** Microirrigation must follow these regulations:

\*Flow rate less than 30 gph (0.5 gpm) at 30 psi.

\*Irrigation efficiency must be 0.81 when calculating Estimated Total Water Use.

\*On slopes 25 percent or greater, the precipitation rate cannot exceed 0.75 inches per hour.

\*Allowed in mulched planting areas.

\*Allowed in areas less than 10 feet in width and must be buried underground or under mulch.

\*Non-spray, drip or emission devices are allowed within 24 inches of any non-permeable surface (e.g. sidewalk, driveway, concrete walking path, etc.). The setback may be planted or unplanted and may have gravel, mulch or other porous material. The 24 inch setback may be waived to allow spray irrigation along sidewalks in the interior of a landscape where any overspray will flow back into the landscape, for example, spray or rotor sprinklers along a sidewalk within the interior of a public park.

**Note:** According to ASABE/ICC 802-2014 standard for irrigation emission devices which is referenced in MWELo, microspray is considered “low volume irrigation” and in the same category as drip irrigation. Microspray is not overhead spray irrigation. To-date, there are **not any** microspray irrigation that meets this standard.

**Note:** Drip tubing may not be the best choice in certain areas prone to gophers and other animals that disturb or break the tubing to get water.

**Note:** Not all brands and models of drip irrigation are recommended for subsurface installation.

**Note:** Some irrigation manufactures have provided a list of MWELo compliant devices. DWR does not endorse nor recommend any products, materials, or services. These lists are for informational purposes only.

\*Hunter -

[https://www.hunterindustries.com/sites/default/files/california\\_mwelo\\_lit-682\\_dom.pdf](https://www.hunterindustries.com/sites/default/files/california_mwelo_lit-682_dom.pdf)

\*Rain Bird - <https://www.rainbird.com/agency/mwelo>

\*TORO – contact TORO for PDF file

H5/4.3.5.9.3 Bubblers:

**Note:** The ASABE/ICC 802-2014 Standard considers bubblers a device that floods the soil through capillary action. These are **not** considered low volume irrigation. The following MWELo requirements apply:

\*Must emit more than 6.3 gph (0.105 gpm) at 30 psi.

\*On slopes the precipitation rate cannot exceed 0.75 inches per hour.

\*Swing joints or other riser protection device required in high traffic areas adjacent to hardscapes or lawn/turfgrass.

\*Prohibited within 24 inches of any non-permeable surface (e.g. sidewalk, driveway, concrete walking path, etc.).

\*Allowed in mulched planting areas if emits between 6.4 gph (0.106 gpm) to 29 gph (0.5 gpm) at 30 psi.

**Note:** Because many bubblers are adjustable with a maximum flow rate higher than 0.5 gpm, the use of these devices is limited.

*H3/1.1 Hydrozone §492.7 (2):*

**Summary:** A hydrozone is an area with plant materials that have similar water needs and similar site, slope, sun exposure and soil conditions.

**Intent:** Delineating areas based on common conditions and watering needs saves water, because the system is providing the group with the amount of water needed instead of watering for the highest need plant in the zone when the other plants don't need or want that extra water. It also prevents underwatering. When a tree and turf are on the same zone and the system is designed to water for the turf, the tree may not get the amount of water it needs to establish deep, strong roots. The tree will grow shallow feeder roots. Without adequate water, trees may be more vulnerable to pests and diseases resulting in their death. The loss of trees also includes the loss of the important environmental benefits such as carbon sequestration, oxygen production, etc.

Example: Parkways with lawn and sycamore trees are watered for the shallower rooted lawn resulting in the tree roots growing near or at the surface. Shallow and surface rooting trees create tripping hazards, are not drought resistant and may die if lawn watering is cutback or stopped.

**Note:** Shallow-rooted trees are at risk during drought watering restrictions and windstorms.

**Compliance:**

**Design:** The irrigation system must match the hydrozones established in the Landscape Design Plan.

**Design:** Design the irrigation system to meet these minimum requirements:

1. Group plants into hydrozones based on water needs and plant factors. Mixing moderate and low and moderate and high plants on the same valve is allowed if:

\*The Plant Factor is based on the proportion of the respective plant water uses and their plant factor.

\*The Plant Factor of the highest water using plant is used for the calculation.

2. Do not include very low and low mixed with high-water use plants on the same hydrozone.
3. Include separate valve for each hydrozone. Large hydrozones may have more than one valve serving the area.
4. Select emission devices appropriate for selected plants and soil type in the landscape.
5. Design the system so each valve irrigates a hydrozone with similar site, slope, sun exposure, soil conditions, and plants with similar water use.

**Recommendation:** Provide color-coded hydrozones and the hydrozone table as part of the Water Efficient Landscape Worksheet. See Appendix G for an example.

**Recommendation:** Stormwater or bioretention areas should be on a separate hydrozone, because those areas are designed to receive more rainwater and need less supplemental water or have different watering needs than conventional landscape areas.

**Recommendation:** Trees should be on a valve separate from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone should be considered when designing irrigation for the tree. This is important because tree water needs and scheduling intervals are different from turfgrass, shrubs, vines, and groundcovers. During a drought or water shortage, it is critical to water trees because of the tremendous benefits they provide and to avoid potential hazards due to limb loss and/or tree failure that can damage nearby property, e.g. house, cars, streets, etc.

**Recommendation:** Tree bubblers should be avoided. Trees do not take-up water near their trunk where bubblers are installed. Almost all of the water is taken-up closer to the tree dripline, usually a long distance from the tree bubbler at maturity. As trees age, almost no water is taken-up near the trunk, so tree bubble water located there is wasted and soggy soil near the trunk can cause crown rot and tree death. Ideally, the irrigation system would apply water evenly to the active rootzone adjacent to the tree dripline (but not close to the trunk). Irrigation should be applied slowly and with multiple cycles to encourage deep root growth of 12 inches or more. As trees grow, additional emitters should be added farther from the trunk to irrigate the growing root system.

**Recommendation:** Quick coupling valves and hose bibs are often included in a new or rehabilitated landscape. Water providers need to know the location, quantity, and backflow prevention type of these devices. These should be included on the construction documents.

**Note:** All of these irrigation devices will be inspected during the irrigation audit and corrections noted on the report. This report will be included in the Certificate of Completion before the permit is completed.

**Enforcement:**

**Plan review:** The reviewer should check that all the required elements are included in the Irrigation Design Plan and individual components are appropriate for the plants, soil, and grading.

**Plan review:** Check for these elements:

Is the Irrigation Design Plan included?

Does the legend match the irrigation parts in the Plan?

Does the hydrozone table include all the necessary information?

Are very low and low mixed with high-water use plants on the same valve?

Do the emission devices have the correct pressure, flow rates, precipitation rates?

Do the zones have the flow rate, application rate, and operating pressure?

Is the proper backflow device included?

Is there an automatic controller (WBIC and/or soil sensor)?

Are there other sensors (rain, wind, freeze)?

Is the necessary pressure regulation included?

Are sprinklers or bubblers on slopes?

Is the precipitation rate 0.75 inches per hour or less on slopes greater than 25 percent?

Is turf on a slope that is greater than 25 percent?

Are sprinklers or microirrigation around hardscapes or within an area less than 10 feet?

Is the static pressure at the point of connection included?

Is recycled water included?

Is a landscape water meter (customer service meter or irrigation submeter) included for non-residential landscapes 1,000 to 5,000 square feet or residential landscapes 5,00 square feet or larger?

Is this notation included "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan?"

Is it signed by a licensed landscape architect, certified irrigation designer, licensed landscape contractor or other authorized person?

**Note:** See Appendix Z: Permitted Practice in California for information regarding the authorization of individuals to perform design and installation of landscapes, irrigation systems, and grading.

**Note:** Check to see where the irrigation ties into to the water supply. Is it from a well, the main service line from the water provider, a graywater system, rainwater harvesting system, recycled water? If non-potable water is included, the local health department may also need to review the plans.

**Inspection:** The inspector should check that any irrigation system issues found in the irrigation audit were corrected and there are no leaks, overspray and/or runoff. Check for these:

Is a copy of the irrigation map and printed schedule/scheduling parameters stored with the controller?

Is a meter installed per size requirements?

When the irrigation system is turned on, is there overspray and/or runoff?

[H3/4.3.6 Grading Design Plan §492.8](#)

**Summary:** The grading design plan shows any reshaping of the land as grading for irrigation, drainage, and design features.

**Intent:** Grading is done to minimize soil erosion, runoff, and water waste. It can have multiple benefits including keeping water from buildings; preventing polluted runoff from entering local waterways; preventing ponding and thus a breeding ground for mosquitos; and allowing for the capture and use of stormwater or drainage water to irrigate plants thus offsetting the need for potable water.

**Recommendation:** Requiring grading specifications, notes and details are highly recommended for proper installation.

**Note:** For some local/regional agencies, mass grading may trigger additional grading requirements and permitting.

**Compliance:**

**Design:** Check with the local agency to see if a grading plan is required.

**Design:** Include the following on the Grading Design Plan:

\*Finished configurations and elevations of the landscape area including:

\*\*Height of graded slopes.

\*\*Drainage patterns.

\*\*Pad elevations.

\*\*Finish grade.

\*\*Stormwater retention improvements.

**Recommendation:** Include these Specifications:

\*Measures to minimize compaction during construction.

\*Avoid natural drainage areas.

\*Tree projection areas.

**Recommendation:** Design the grade so all irrigation and normal rainfall remain on the property to prevent runoff.

**Recommendation:** Design to avoid disrupting natural drainage areas which reduces the project scope, saves money, and takes advantage of the site conditions.

**Recommendation:** Design to avoid compacting the soil during construction to keep soil friable.

**Enforcement:**

**Note:** Stormwater Best Management Programs may be included on the Stormwater Pollution Prevention plan.

**Plan review:** The reviewer should ensure the Grading Design Plan, specifications, notes, and details include the required and necessary information. Check for the following:

Is the Grading Design Plan included in the Landscape Documentation Package?

Does it indicate finished configurations and elevations of the landscape?



Height of graded slopes?

Drainage patterns?

Pad elevations?

Finish grade?

Stormwater retention improvements?

Is this notation included "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan?"

Signed by a licensed professional authorized by the state or local agency?

**Note:** See Appendix Z, Permitted Practice in California, for information regarding the authorization of individuals to perform design and installation of landscapes and irrigation systems, and grading.

**Inspection:** Confirm the grading complies with MWELo and approved plans.

[H2/3.4 Certificate of Completion §492.9](#)

**Summary:** The Certificate of Completion is a package of documents that verifies the completed landscape project meets the intent of MWELo and was built according to the approved plans. The local agency shall require as-built at completion if significant changes were made during construction. The applicant must provide copies of the approved Certificate of Completion to the property owner or his or her designee and the water purveyor.

**Intent:** Because sustainable and water-efficient landscaping is a relatively new concept to some and many landscape installers are not familiar with the principles and equipment, there is a disconnect between concept and execution. Often times, the compost, mulch, plants and irrigation equipment listed on the plans are not installed or improperly installed. Including this verification step in plan review and inspection is critical. It ensures that the property owner received everything they expected and paid for; the landscape was built to maximum efficiency and sustainability standards; and drives the transformation of the landscape and building industry to a more sustainable and resilient community.

**Note:** A sample Certificate of Completion can be found in Appendix R.

### **Table 3. Performance Pathway Certificate of Completion Preparation**

PLACEHOLDER Table 3 Performance Cert Completion Preparation

**Recommendation:** The Certificate of Completion should be submitted after the project is complete and irrigation audit performed but before the final inspection, if separate from the audit.

**Compliance:**

**Applicant:** Include the required documents in the Certificate of Completion and follow irrigation audit and inspection instructions provided by the local agency. The package must include:

1. Project Information Form.
2. Certificate of Installation.
3. Irrigation Schedule and Parameters.
4. Landscape and Irrigation Maintenance Schedule.
5. Irrigation Audit Report.
6. Irrigation Hydrozone Map.
7. Soil Management Report, if not previously included in the Landscape Documentation Package.

**Note:** The installation can be certified by the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor of the landscape project. A sample Certificate of Installation is included in Appendix R.

**Recommendation:** Use the Certificate of Completion Checklist provided by the local agency.

**Note:** See sample Irrigation Hydrozone Map in Appendix K.

**Note:** See sample Irrigation Schedule and Parameters in Appendix L.

**Note:** See sample Irrigation Schedule Appendix M.

**Note:** See sample Maintenance Schedule in Appendix N.

**Note:** An irrigation audit performed by a Certified Irrigation Auditor is required prior to permit completion and sign-off. Follow the local agency instructions for the audit. The local agency may perform the audit, or the applicant/designee must hire the auditor at their own expense and risk. The audit report will show the results of the audit and describe any corrections to the irrigation system that need to be made to comply with MWELD.

**Note:** All corrections must be made prior to permit completion.

**Intent:** The irrigation audit is an unbiased verification that installation was done according to the approved plans and MWELO. It is a complete system check for the proper installation and function of all equipment. It checks if there are any leaks, uneven coverage, irrigation runoff or overspray.

**Note:** The Water Efficient Landscape Worksheet can be used as a guide to program the irrigation controller. An example can be found in Appendix G as well as within MWELO in Appendix B.

**Note:** The local agency may require as-builts if significant changes are made. The local agency will determine the definition of significant. They may require a revised Water Efficient Landscape Worksheet.

**Enforcement:**

**Review:** The reviewer should ensure the Certificate of Completion is complete.

**Inspection:** Inspections are necessary to verify the minimum standards are met and the equipment and plants installed match the approved plans.

**Recommendation:** An open-trench inspection may be needed to check lateral pipes, electric wiring to sensors and controllers, non-potable water systems before the trenches are covered with soil, irrigation devices, and plants. The person who designed the irrigation and the contractor should be present to see the issues and correct them at this stage which will potentially save a lot of time and money. Once everything is completed, it is extremely expensive to fix issues.

**Note:** An irrigation audit is required after the project is completed. The audit can be the final inspection if no corrections are required or corrections are made at that time and verified.

**Note:** An irrigation audit must be performed by a certified irrigation auditor. The auditor cannot be the irrigation designer or installer. The certified auditor can be an employee of the local agency, hired by the local agency or hired by the applicant. The auditor must be certified by U.S. Environmental Protection Agency's WaterSense Certification program (QWEL, CLCA-WMCP, IA-CLIA, G3WWLP) <https://lookforwatersense.epa.gov/pros/>, or other [accredited academic institution or professional trade organization](#).

**Note:** For multiple landscape installations as part of a common use development or production housing, audits must be completed for 1 out of 7 parcels or 15 percent of the parcels.

**Note:** See Appendix O for Irrigation Audit Checklist. The audit must be in-depth and include at least:

\*System inspection.

\*Distribution uniformity test for sprinklers.

\*System tune-up.

\*Report with recommendations including runoff and overspray corrections needed.

\*Irrigation schedule.

**Plan review:** Review the Certificate of Completion.

**Recommendation:** The following documents are needed:

\*Completed Certificate of Completion Checklist.

**Recommendation:** Items to check in the Certificate of Completion Package:

Is the Certificate of Installation included? Is it signed by the landscape designer, irrigation designer or landscape contractor?

As-builts if substantial changes were made? How is substantial defined by the local agency? Is the revised Water Efficient Landscape Worksheet included?

NOTE: Many landscape maintenance contractors cite the lack of as-builts, irrigation system maps and written controller schedules making proper maintenance, repair and irrigation scheduling more difficult.

Audit report

Landscape and irrigation maintenance schedule?

Irrigation system diagram?

Irrigation system programming parameters including plant establishment period and temporarily irrigated areas, and irrigation hours between 8:00 p.m. to 10:00 a.m.

Soil Management Report included if it was not submitted with Landscape Documentation Package

Is there a copy of receipt or invoice, photos or delivery tags for compost and mulch or other document showing the recommendations from the Soil Management Report were followed?

**Note:** Track data for annual report.

**Inspection:** Perform final inspection(s).

**Note:** The applicant must correct the issues before submitting the Certificate of Completion package.

**Note:** The Inspection Checklist form can be found in Appendix U.

**Recommendation:** Final inspection should check for these common errors:

Do the installed plants match the approved plan?

Is there turf on slopes 25 percent or greater?

Is there turf in parkways less than 10 feet wide unless used for pedestrian access to vehicles?

Did you receive delivery tags/receipt for compost that shows a rate of 4 cubic yards per 1,000 square feet or prescribed by soil lab to reach organic matter content of 6 percent?

Is there 3 inches of mulch in non-turf planting areas, unless prohibited by fire code?

Is the mulch aged tree trimmings, pallet mulch, or composted mulch?

Do the water features match the approved plan?

Do all non-potable systems (rainwater, graywater, etc.) match the approved plan?

[H2/ 3.5 Irrigation Scheduling §492.10](#)

**Summary:** The Irrigation Schedule includes the information needed for the automatic controller that shows when and how much water should be applied during plant establishment and beyond.

**Intent:** The most water efficient plants and equipment may be designed and installed, but the water savings can be eroded by improper irrigation scheduling. Requiring a base schedule and ensuring that the controller is programmed to not exceed the water budget during auditing and inspection will prevent waste.

**Compliance:**

**Design:** The designer, auditor or other authorized person can develop the irrigation schedule.

**Design:** The following are required:

1. System must be regulated by an automatic irrigation controller using evapotranspiration or soil moisture sensor.
2. Overhead irrigation must be scheduled to run between 8:00 p.m. and 10:00 a.m., unless weather conditions prevent it and/or stricter regulations are in place locally.

3. Parameters to set the schedule must include:

- \*Plant establishment period.
- \*Established landscape.
- \*Temporarily irrigated areas.

4. Each schedule must factor in the following:

- \*Intervals or days between irrigation events.
- \*Run times in hours or minutes per irrigation event to avoid runoff.
- \*Cycles for each irrigation event to prevent runoff.
- \*Monthly amount of water needed.
- \*Application rate.
- \*Root depth.
- \*Plant type.
- \*Slope.
- \*Shade.
- \*Irrigation uniformity or efficiency.

**Note:** Use the Irrigation Schedule Parameter template provided by the local agency.

**Note:** There are several online irrigation scheduling calculators available.

**Note:** Temporary irrigation is irrigation used for a maximum of two years to establish native plants and other dry summer adapted plants.

**Enforcement:**

**Plan review:** The reviewer should check that the irrigation parameters are included in the Certificate of Completion.

**Inspection:** The audit should check that the schedule provided by the designer was programmed correctly or the auditor must develop the

schedule. The final inspection should ensure that the controller is operational, and the hydrozone map is in the controller cabinet.

[H2/ 3.6 Landscape and Irrigation Maintenance Schedule §492.11](#)

**Summary:** The Landscape and Irrigation Maintenance Schedule provides a step-by-step instruction for landscape care and management.

**Intent:** This schedule promotes maintenance that keeps the plants and soil healthy and the irrigation system performing effectively and efficiently. Landscaping is a big investment, and proper care and maintenance is money and time well spent. Unmaintained landscapes are not only eyesores prompting code enforcement calls, but can pose hazards: tripping over misaligned sprinklers; unprotected main water lines if backflow prevention devices are not working; runoff causing erosion or polluted water to flow into waterways, etc.

**Compliance:**

**Design:** The designer must develop a maintenance schedule and include it in the Certificate of Completion.

**Design:** The Landscape and Irrigation Maintenance Schedule must include:

\*Routine inspection, auditing, adjustments, and repair of the irrigation system.

\*Aerating and dethatching turf areas.

\*Topdressing with mulch.

\*Fertilizing.

\*Pruning.

\*Weeding.

\*Removing obstructions that block sprinklers, drip, bubblers.

**Recommendation:** Use the Maintenance Schedule template provided by the local agency.

**Design:** Add a note that the owner/operator may run the irrigation outside of normal watering hours for system maintenance.

**Design:** Add a note that best management practices for maintenance should be followed.

**Enforcement:**

**Plan review:** The reviewer should check that the Certificate of Completion includes the maintenance schedule.

**Note:** A sample Maintenance Schedule can be found in Appendix N.

## H1/ 5.0 Prescriptive Path MWELO Appendix D Applicability

Landscape projects that require a building or landscape permit, plan check or design review and meet the following criteria:

\*Any landscape project: aggregate landscape area 500 sq. ft. to 2,500 sq. ft.

\*Any landscape project: aggregate landscape area 500 sq. ft. to 2,500 sq. ft. and 100 percent of Estimated Total Water Use is provided by on-site graywater or rainwater is subject to only Appendix D (5) Prescriptive Pathway. Non-potable water distribution systems must comply with Chapters 15 and 16 of the California Plumbing code  
<http://epubs.iapmo.org/2019/CPC/#p=12>

**Note:** Landscape area includes all irrigated areas and water features like swimming pools, spas, fountains etc.

**Note:** The local agency will determine if eligible applicants follow the Prescriptive Pathway or the Performance Pathway.

**Summary:** This is a simplified plan review and verification process for small landscape projects.

**Intent:** This simplified process is designed for small projects to drive water-efficiency while keeping costs down. A final inspection is required by the local agency. While this makes the plan review process streamlined, it puts the onus on the applicant (typically the homeowner) to understand basic landscaping design, installation, and maintenance principles in order to develop the Plan, an irrigation schedule and landscape, and irrigation maintenance schedule.

**Note:** The Prescriptive Pathway Flowchart can be found in Appendix Q.

Figure 5. Prescriptive Pathway Flowchart

PLACEHOLDER Figure 5 Prescriptive Pathway Flowchart



## H2/5.1 Landscape Documentation Package Requirements:

**Note:** A complete Landscape Documentation Package is required as part of the plan check and review process for an applicant. The applicant must submit a copy of the Certificate of Completion to the property owner/designee at the time of the final inspection. The applicant signature and one notation are required on the Project Information Form. The Permitted Practice of California (Appendix Z) describes the authorizations to perform design and installation services.

The Landscape Documentation Package must include the following:

- \*Project Information.
- \*Landscape Plan.
- \*Soil Analysis Report, if desired.

### **Compliance:**

**Design:** The designer must include the minimum requirements on the Landscape Design Plan. A separate irrigation plan is not required; however, there are specific irrigation requirements that can be noted on the landscape plan.

**Recommendation:** Review the Landscape, Irrigation and Water Budget Overview (Appendix C) which explains key terms and provides basic information regarding soil, plants, and irrigation equipment including an anatomy of an irrigation system. Because the plant mix specifications of the Prescriptive Pathway results in a design that meets MAWA (water budget), water budget calculations **are not** required.

**Recommendation:** Follow the local agency's Prescriptive Pathway Submittal Checklist.

## H2/5.2 Landscape Plan Requirements:

### **Table 4. Prescriptive Pathway Requirements for Residential and Non-residential Landscape Projects.**

PLACEHOLDER Table 4 Prescriptive Pathway Requirements

### **Table 5. Prescriptive Pathway Landscape Documentation Package Preparation**

PLACEHOLDER Table 5 Prescriptive Landscape Package Preparation

### **Table 6. Prescriptive Pathway Certificate of Completion Preparation**

## PLACEHOLDER Table 6 Prescriptive Cert Completion Preparation

**Note:** A sample residential landscape plan is included in Appendix S.

**Design:** A soil test may be performed to determine the compost application rate. If the test shows the soil needs more or less than 4 cu. yd. per 1,000 sq. ft., submit the soil analysis report. Otherwise, indicate that the 4 cu. yd. per 1,000 sq. ft. at a depth of 6 in. will be applied.

**Applicant:** At the time of the final inspection, the applicant will provide an approved Certificate of Completion to the owner of the property. The Certificate of Completion must include the following:

\*Certificate of Installation

\*Irrigation Schedule

\*Schedule of Landscape and Irrigation Maintenance

**Intent:** Because sustainable and water efficient landscaping is relatively new and many property owners and landscape installers are not familiar with the principles and equipment, there is a disconnect. Often times, the soil, plants and irrigation equipment listed on the plans are not installed or improperly installed. Including this verification step, is critical and ensures that the property owner ends up with a landscape built to maximum efficiency and sustainability standards and performs well with no runoff and overspray.

**Recommendation.** Use the Irrigation Schedule template provided by the local agency or one that includes the necessary information. See a sample in Appendix M.

**Recommendation:** See the Schedule of Landscape and Irrigation Maintenance sample found in Appendix N.

**Note:** All installed irrigation must be replaced with the same type as originally installed or more efficient models.

### **Enforcement:**

**Recommendation:** Use the Prescriptive Submittal Checklist for plan review. It can be found in Appendix P.

**Plan review:** The reviewer should ensure that all the required and necessary elements are included in the Landscape Design Package.

**Plan review:** Check that the Certificate of Completion is complete before final inspection.

**Note:** Track data for inclusion in annual report.

**Inspection:** An irrigation audit is not required.

**Inspection:** The Certificate of Completion should be submitted prior to the final inspection. The inspector should check the following:

Is there 3 in. of mulch on bare soil?

Is turf installed on slopes 25 percent or greater?

Is more than 25 percent of the landscape planted with turf?

Is there any ornamental (non-SLA) turf on non-residential projects?

Is there an automatic controller with non-volatile memory?

Is there pressure regulation?

Is there a manual shut-off valve?

Do the emission devices meet ASABE/ICC 802-2014?

Is there spray, sprinklers, bubbler irrigation in areas less than 10 feet?

Is there a private sub-meter for non-residential projects greater 1,000 sq. ft. or greater?

Is there runoff or overspray? Leaks?

Is the system programmed?

Did the applicant give a copy of the Certificate of Completion to the property water purveyor and owner/designee?

## H1/6.0 Recycled Water, Graywater and Rainwater Harvesting §492.14 §492.15 and §492.16

**Summary:** MWELO does not require graywater or rainwater collection but encourages its use. It does require recycled water to be used in landscape irrigation and ornamental water features, if available and allowed per local and State regulations. MWELO does set specific requirements for calculating the water budget if recycled water, graywater and/or rainwater harvesting systems are included in the project.

**Intent:** MWELO incentivizes the use of these alternate water supplies by increasing the water budget and allowing a simplified Prescriptive Pathway. These alternative non-potable water supplies offset limited potable water supplies.

**Notes:** Local agencies may have additional restrictions related to the use of these water sources as well as the local health agency and water provider. Current standards for non-potable reuse and non-potable rain capture can be found in chapters 15 and 16 of the 2019 California Plumbing Code: <http://epubs.iapmo.org/2019/CPC/>

## H2/6.1 Recycled Water §492.14

**Summary:** Recycled water is wastewater treated to meet non-potable water standards. It can be produced on-site or from a water provider.

### **Compliance:**

**Design:** If including recycled water in the design, follow these MWELO requirements:

1. Must follow all local and State laws.
2. Landscapes using recycled water are Special Landscape Areas (SLA) and the ETAF is 1.0 in the water budget calculation.
3. Water features must use recycled water if available (§492.6 (a) (2) (B))

**Recommendations:** Coordinate with the local water provider and health department in the initial design phase.

**Note:** Recycled water must be on a separate irrigation system and the equipment is colored purple and bear specific markings. Follow health regulations requirements.

**Suggestion:** Recycled water capacity may be an issue in certain circumstances such on-site systems or when water provider supplies are disrupted or not available. Supplemental water supplies should be considered.

**Plan Review:** The reviewer must ensure any recycled water irrigation systems meet the regulations.

**Recommendation:** Coordinate with both the local health department to understand the regulations and the local water provider to understand their process and requirements. This is especially important for back-up or supplemental water. Developing a checklist and permit process flowchart may be helpful for reviewers and designers.

**Inspection:** Inspector should ensure the installation meets MWELO regulations.

**Recommendation:** It may be necessary or helpful to coordinate inspections of these systems with local health department and water provider.

#### [H2/6.2 Graywater Water §492.15](#)

**Summary:** Graywater is untreated wastewater from, but not limited to bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs. It does not include wastewater from kitchen sinks or dishwashers.

#### **Compliance:**

**Design:** Follow the MWELO, local and State laws for graywater. See Chapter 15 of the California Plumbing Code <http://epubs.iapmo.org/2019/CPC/>

**Note:** Landscapes of 2,500 sq.ft. or less with all water requirements met with graywater and/or rainwater are not required to meet any MWELO requirements other than those in Appendix D, section (5) and mulch or soil placed over graywater distribution systems as required by the plumbing code.

#### **Enforcement:**

**Plan Review:** Check that the Plan meets MWELO regulations.

**Recommendation:** Coordinate with both local the health department to understand the rules and regulations and the local water provider to understand their process and requirements. This is especially important for

back-up or supplemental water. Developing a checklist and permit process flowchart maybe helpful for reviewers and designers.

**Inspection:** Check that it meets local requirements.

**Recommendation:** It may be necessary or helpful to coordinate inspections of these systems with local health department and water provider.

#### [H2/6.2 Stormwater Management and Rainwater Retention §492.16](#)

**Summary:** Stormwater management is the effort to minimize rainwater and melted snow from flowing into streets and other areas as it picks up pollutants before entering waterways like streams, rivers, and the ocean. In urban areas that are mostly paved or built out, there is less impervious area to absorb rain thus creating more runoff into waterways.

**Intent:** To prevent pollutants from entering waterways, stormwater best management practices that minimize runoff and erosion should be implemented. MWELo attempts to connect water conservation and stormwater management which are typically siloed. Using rainwater as a supply through harvesting/collection and infiltration, reduces potable water demands, prevents polluted runoff and erosion and increases soil moisture levels and may recharge groundwater.

#### **Compliance:**

**Design:** The only MWELo stormwater management requirement is to make soil friable. This can be accomplished by specifying the recommendations from the soil analysis report. Landscaped stormwater treatments should be indicated in the landscape, irrigation, and grading plans.

**Design:** Refer to the local agency, local stormwater agency and Regional Water Quality Control Board for requirements.

**Recommendation:** Design the landscape to capture and infiltrate one inch of rain over a 24-hour rain event or 85<sup>th</sup> percentile over a 24-hour rain event or meet stricter regulations.

**Recommendation:** These landscape design elements can improve on-site stormwater and dry weather runoff, increase water retention and are recommended:

- \*Grade impervious surfaces such as driveways to drain to vegetated areas.
- \*Minimize impervious areas like driveways.
- \*Incorporate pervious surfaces.

\*Direct roof runoff into vegetated areas.

\*Incorporate rain gardens, cisterns, rain barrels and use to water the landscape.

\*Consider constructed wetlands and pools to retain water, equalize excessive flows, and filter pollutants.

**Suggestion:** Permeable paving options, like concrete, asphalt and pavers, are available for hardscapes like driveways.

**Enforcement:**

**Plan review:** These elements may be required and found in the Stormwater Pollution Prevention plan.

## H1/7.0 Existing Landscape Requirements §493, §493.1 and §493.2

**Summary:** These requirements for existing landscapes are an effective way to enforce the State's no water waste mandate.

**Intent:** Enforcing the prohibition of water waste is effective, especially in times of drought or water shortage as concluded by a study completed in 2020 by the Alliance for Water Efficiency.<sup>10</sup>

**Note:** Cities and counties by agreement may have another agency, such as the water provider or regional agency, administer, and implement these requirements:

\*Prohibit irrigation runoff, except if it drains and is absorbed in adjacent permeable surfaces or landscaped areas. The administrator may impose penalties for violations.

\*Irrigation equipment installed after December 1, 2015 must be replaced with the original type part or a more efficient one.

\*Landscapes installed before December 1, 2015 and larger than one acre:

\*\*Metered landscapes - cities or counties must provide programs that may include irrigation water use analysis, surveys, audits and provide recommendations to not exceed a MAWA =  $(0.8)(ET_o)(LA)(0.62)$ .

\*\*Unmetered landscapes - cities or counties must provide programs that may include irrigation water use surveys and audits and provide recommendations to prevent water waste.

**Note:** Audits must be performed by a certified irrigation auditor.

**Suggestion:** Many water providers provide surveys, audits, and education to their water customers. Consider partnering with the provider(s) in your city, county or region.



## H1/8.0 Reporting §495

**Summary:** Every local agency must submit an annual implementation report by January 31<sup>st</sup> for the previous year. Beginning with the 2020 reporting period (due 1/31/2021) all MWELo § 495 reports will be submitted using the WUE Data online portal: <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency>. Reports for the years of 2015 through 2019 are found on the [MWELo Home Page](#).

**Intent:** To better understand the amount of water needed for landscapes in California and the resources to support the agencies and applicants. This data can be used by water providers to plan for future growth and capacity needs.

**Note:** MWELo does not define the status of projects to be included in the report. The local agency will need to determine and consistently use the status, e.g. projects under review, permitted, completed, to calculate number of projects and total landscape area.

## H1/9.0 Public Education §492.17

**Summary:** Cities, counties or water providers and model homes are required to provide education about water efficient and sustainable landscapes.

**Intent:** Research has shown the numerous benefits to sustainable landscaping – from increased property values to wellbeing to cleaner air. Educating the public about the intrinsic value of these landscapes will help transform the market and increase the desire for these beautiful and resilient landscapes. This goal is to make these landscapes and irrigation the “new normal.” For more information, see the Watershed Approach to Landscaping <https://calwep.wpengine.com/programs/#sustainable-landscaping>

The following are required:

1. The local agency or water provider shall provide educational information to owners of permitted landscapes on the design, installation, management, and maintenance of water budget-based landscapes.
2. Model homes must display signs and written information to demonstrate the principles of water efficient landscapes.

**Note:** The *MWELO Guidebook* and the resources herein can help achieve the goals of this section.

**Recommendation:** This is an opportunity for the local agency to collaborative with the water purveyor. Many water purveyors have educational materials and/or classes related to sustainable landscaping. The local agency could partner to take advantage of these materials and resources and promote them in order to comply with this section.

## H1/10.0 Considerations for Enforcing MWELO

Below are questions to help the local agency prepare for enforcing MWELO.

### \*What is MWELO?

Simply stated, it sets a water budget for new or renovated landscapes and requires specific water-efficient design, construction and maintenance criteria.

### \*Why is MWELO Necessary?

Traditionally designed landscapes incorporate plants and irrigation that wastes water; contribute to polluted water runoff into streams, lakes, and the ocean; overspray causing water damage to buildings, fences, streets; and create a lot of plant and trimming green waste.

Sustainable landscapes can be beautiful and functional. Research shows that creating and maintaining landscapes that meet MWELO use 80 percent less water; require 60 percent less maintenance; produce 50 percent less yard waste and reduce runoff by 70 percent, in addition to many other benefits.<sup>11</sup>

### \*Do You Need to Enforce MWELO?

Yes, if:

1. Your city or county has not adopted a local ordinance that is at least as effective as the State MWELO and submitted that ordinance to DWR via email at [welo@water.ca.gov](mailto:welo@water.ca.gov) and;

2. Your city/county requires a permit, plan check or design review for the following types of residential and non-residential projects:

\*New construction projects with an aggregate landscape area equal to or greater than 500 sq. ft.

\*Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sq. ft.

### \*How Do You Enforce MWELO?

Local agency staff enforces it through plan check/design review to ensure the design meets the requirements and through verification that the project was constructed in accordance with the approved plans or.

\*\*Local agency hires qualified individual(s)/company(es) to review plans and/or perform audits and/or inspections or

\*\*Combination of staff and contracted services.

\*What Expertise Do You Need To Enforce MWELo?

No specific landscape or irrigation expertise is needed. Of course, there is a learning curve. The *MWELo Guidebook* includes recommendations and resources for quick and effective enforcement.

\*Do You Need To Report Enforcement?

YES, you are required to submit an annual report to DWR with specific data. If you have not reported to-date, you should submit reports going back to 2015. Report templates can be found at [www.water.ca.gov](http://www.water.ca.gov) or email [welo@water.ca.gov](mailto:welo@water.ca.gov).

\*Are There Penalties for Not Complying?

No, DWR does not penalize agencies for non-compliance. However, several agencies have been sued by third parties for not complying.

\*How Will The Local Agency Educate Applicants?

1. Will you use templates provided by DWR? Will you create your own? Who will create, produce, and disperse the information?
2. Will you create a new webpage or add to an existing one?
3. Will you host trainings for applicants?
4. For the water budget calculations, will you provide the applicable ETo to applicants to help them avoid errors in calculating the budget?

\*How Will The Agency Perform Plan Check/Review And Permitting?

1. Who on your staff will review the plans? Do you need more than one person trained? Do you hire a consultant to review the plans instead?
2. Do you need to adjust your fee schedule for review and inspections?
3. Do you need to update your permitting software? Is there funding available? Who will make the updates and when?
4. Will you require the applicant to provide more detailed information than what is required in the ordinance? Will you require a cover sheet, site plan, specifications, notes, and details to facilitate quick review of all the landscape elements?
5. Do you need to revise the sample checklists provided in this *Guidebook*?
6. What if substantial changes were made during construction or need to be made, do you require a re-submittal of plans or as-built plans? What triggers

re-submittals and/or as-builts? What is your agency's definition of significant changes? How and when will this be related to the applicant?

7. When do you need to coordinate with the water agency? Do you know who to contact at that agency? Are they enforcing any part of this ordinance?

8. Who will submit the Landscape Documentation Package to the water provider and property owner/designee?

9. Who will review the Certificate of Completion?

\*How Will The Agency Perform Audits and Inspections?

1. Do you need to update your permitting system to include these inspections?

2. Do you flag a project so the permit cannot be closed until the project passes the final inspection?

3. Will you require open-trench inspections? If so, who will perform those, e.g. staff or vendor? When and how does the applicant request it?

4. Will your staff perform the irrigation audit? Will you hire a certified auditor? Or will you require the applicant to hire a certified auditor?

5. Will you accept the water audit/survey as the final inspection/verification? If so, how will you ensure that the applicant made all the necessary corrections?

6. Will you require a final inspection before you close the permit? If so, will you require the Certificate of Completion to be submitted before the final inspection? Who will do the inspections? When and how does the applicant request it?

7. If the soil management report is issued post-construction, what additional information will you require, e.g. receipts for compost?

8. Is there special training that your inspectors need? Who will provide it?

\*How Will the Agency Track and Report Project?

1. How will you track the annual reporting data, e.g. Excel spreadsheet or update your permit tracking software?

2. Who will create the tracking system, and is there funding needed to update it?

3. For consistent data collection, you will need to decide if you are tracking and reporting the total number of projects permitted or permits closed (received certificate of occupancy) that calendar year.

4. Who will run the report, and who will provide it to DWR by January 31<sup>st</sup> each year?

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<sup>1</sup> Pacific Institute. (2014). *Urban Water Conservation and Efficiency Potential in California*. <https://pacinst.org/wp-content/uploads/2014/06/ca-water-urban.pdf>

<sup>2</sup> California Department of Water Resources (2009). [https://www.ppic.org/content/pubs/report/R\\_211EHChapter2R.pdf](https://www.ppic.org/content/pubs/report/R_211EHChapter2R.pdf)

<sup>3</sup> City of Santa Monica (2013). *Sustainable Landscape: The Numbers Speak for Themselves*. <https://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Landscape/garden-garden-2013.pdf>

<sup>4</sup> California Water Efficiency Partnership. (2020). *Multi-Benefits of Landscape Transformation: Energy and Greenhouse Gases*. [https://calwep.org/wp-content/uploads/2020/05/CalWEP\\_Multi-Benefits\\_Energy-GHG.pdf](https://calwep.org/wp-content/uploads/2020/05/CalWEP_Multi-Benefits_Energy-GHG.pdf)

<sup>5</sup> Pacific Institute. (2019). *Moving Toward a Multi-Benefit Approach for Water Management*.

<sup>6</sup> California Water Efficiency Partnership. (2020). *Multi-Benefits of Landscape Transformation: People & Community: Property Value*. [https://calwep.org/wp-content/uploads/2020/03/CalWEP\\_Multi-Benefits\\_Property-Value-w-Trees.pdf](https://calwep.org/wp-content/uploads/2020/03/CalWEP_Multi-Benefits_Property-Value-w-Trees.pdf)

<sup>7</sup> Parker, J.; Simpson, G.D. Public Green Infrastructure Contributes to City Livability: A Systematic Quantitative Review. *Land* 2018, 7, 161.

<sup>8</sup> [https://calwep.org/wp-content/uploads/2020/03/CalWEP\\_Multi-Benefits\\_Property-Value-w-Trees.pdf](https://calwep.org/wp-content/uploads/2020/03/CalWEP_Multi-Benefits_Property-Value-w-Trees.pdf)

<sup>9</sup> Pacific Institute (2010), *California's Next Million Acre-Feet: Saving Water, Energy and Money*.

<sup>10</sup> Alliance for Water Efficiency. (2020). *Use and Effectiveness of Municipal Irrigation Restrictions During Drought*.

<sup>11</sup> City of Santa Monica (2013). *Sustainable Landscape: The Numbers Speak for Themselves*. <https://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Landscape/garden-garden-2013.pdf>