CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

THE CITY OF SIGNAL HILL
WELCOMES YOU TO A REGULAR
PLANNING COMMISSION MEETING
October 13, 2015

The City of Signal Hill appreciates your attendance. Citizen interest provides the Planning Commission with valuable information regarding issues of the community. Meetings are held on the 2nd Tuesday of every month.

Meetings commence at 7:00 p.m. There is a public comment period at the beginning of the regular meeting, as well as the opportunity to comment on each agenda item as it arises. Any meeting may be adjourned to a time and place stated in the order of adjournment.

The agenda is posted 72 hours prior to each meeting on the City's website and outside of City Hall and is available at each meeting. The agenda and related reports are available for review online and at the Community Development office and Library on the Friday afternoon prior to the Commission meeting. Agenda and staff reports are also available at our website at www.cityofsignalhill.org.

During the meeting, the Community Development Director presents agenda items for Commission consideration. The public is allowed to address the Commission on all agenda items. The Chair will announce when the period for public comment is open on each agenda item. The public may speak to the Commission on items that are not listed on the agenda. This public comment period will be held at the beginning of the public portion of the meeting. You are encouraged (but not required) to complete a speaker card prior to the item being considered, and give the card to a City staff member. The purpose of the card is to ensure speakers are correctly identified in the minutes. However, completion of a speaker card is voluntary, and is not a requirement to address the Commission. The cards are provided at the rear of the Council Chamber. Please direct your comments or questions to the Chair.

CALL TO ORDER

ROLL CALL

CHAIR FALLON
VICE-CHAIR AUSTIN
COMMISSIONER BENSON
COMMISSIONER MURPHY
COMMISSIONER RICHÁRD

PLEDGE OF ALLEGIANCE

The Chair will lead the audience in reciting the Pledge of Allegiance.

PUBLIC BUSINESS FROM THE FLOOR ON ITEMS NOT LISTED ON THIS AGENDA

PRESENTATIONS

a. The Planning Commission will present the Beautification Award to Century Calibrating at Lemon Avenue and 25th Street for landscaping, fencing and other improvements to the property.
b. In celebration of Planning Month, staff will highlight a recent visit to the After-school Recreation Club to explain the benefits of planning to the children.

PUBLIC WORKSHOP

(1) Adding Finance and Conveyance Map to Chapter 18.13 of the Signal Hill Municipal Code

Summary: SummerHill Homes is requesting a workshop to review a draft ordinance adding Finance and Conveyance Maps to the Title 18, Subdivisions of the Signal Hill Municipal Code (SHMC). The Subdivision Map Act provides local jurisdiction with the option to process Finance and Conveyance Maps. Finance and Conveyance Maps are becoming more and more common and utilized by developers to obtain financing to develop or convey a portion of the property to another party for development.

Recommendation: Provide direction as deemed appropriate.

PUBLIC HEARING

(2) Ordinance Amendment 15-04 Repealing Chapter 13.10 of the Municipal Code and Replacing It With Revised State Mandated Water Conservation Regulations, Limiting Turf, Improving Irrigation Efficiency and Refining On-Site Storm Water Capture In New Development and Amending Title 20 by Adding Landscaping And Hardscape Standards for Turf Replacement in Existing Development

Summary: In response to current drought conditions, the State has revised their Model Water Efficient Landscape Ordinance for new development and mandated that local agencies adopt the model or, an equivalent ordinance, by December 1, 2015. The Planning Commission will review Ordinance Amendment 15-04 which replaces the City's existing "Water Conservation in Landscaping" Ordinance with the revised State Model Ordinance. The Ordinance Amendment also establishes regulations to promote turf replacement in existing development and establishes limits on the amount of hardscape in setbacks.

Recommendation: Waive further reading and adopt a resolution recommending City Council approval of Ordinance Amendment 15-04.

COMMUNITY DEVELOPMENT DIRECTOR'S REPORT

(3) Changes to Meeting Schedule

Summary: At the October 6, 2015 City Council meeting, the second reading of the ordinance to change City Council dates was approved by a vote of 4/1. Effective November, 2015, meetings will now be held on the 2nd and 4th Tuesdays of the month. Accordingly, meeting dates for the Planning Commission and Sustainable City Committee will change.

Recommendation: Receive and file.

CONSENT CALENDAR

The following Consent Calendar items are expected to be routine and non-controversial. Items will be acted upon by the Commission at one time without discussion. Any item may be removed by a Commissioner or member of the audience for discussion.

(4) Minutes of the Following Meeting

Regular Meeting of September 8, 2015

Recommendation: Approve.

(5) Save the Dates – Fall Events

Summary: Mayor's Clean-Up, Halloween Carnival and Mulch Day

Recommendation: Receive and file.

(6) City Council Follow-up

Summary: Attached for review is a brief summary on the City Council's action from the September 15, 2015 and October 6, 2015 meetings.

Recommendation: Receive and file.

(7) Development Status Report

Summary: Attached for review is the monthly Development Status Report which highlights current projects.

Recommendation: Receive and file.

(8) In the News

Summary: Articles compiled by staff that may be of interest to the Commission.

Recommendation: Receive and file.

COMMISSION NEW BUSINESS

COMMISSIONER RICHÁRD
COMMISSIONER MURPHY
COMMISSIONER BENSON
VICE-CHAIR AUSTIN
CHAIR FALLON

ADJOURNMENT

Adjourn tonight's meeting to the next regular meeting to be held Tuesday, November 10, 2015 at 7:00 p.m. in the Council Chambers located at City Hall.

CITIZEN PARTICIPATION

If you need special assistance beyond what is normally provided to participate in City meetings, the City will attempt to accommodate you in every reasonable manner. Please call the City Clerk's office at (562) 989-7305 at least 48 hours prior to the meeting to inform us of your particular needs and to determine if accommodation is feasible.

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **GINNY HELLERUD**
ADMINISTRATIVE ASSISTANT

SUBJECT: **PRESENTATION - BEAUTIFICATION AWARD**

Summary:

This quarter's Beautification Award is being presented to Century Calibrating at Lemon Avenue and 25th Street for landscaping, fencing and other improvements to the property. The property was purchased in 2012 and renovation began within a few months. The owner has:

- Replaced the fencing for the parking lot, painted the interior and installed new flooring.
- Upgraded the landscaping by removing 65% of the turf (450 sq.ft.).
- Planted vines along the front and sides of the building and along the inside of the parking area.
- Replaced the turf with rocks, bark, several trees, and flowering garlic which are more water efficient plants.
- Placed a small sized pump jack on the front of the property which at one time operated at more shallow oil fields (typically a depth up to 2,500 feet below the surface).

Recommendation:

Present the Award.

Approved by:

_____
Scott Charney

1127 E. 25th Street

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **NATIONAL COMMUNITY PLANNING MONTH**

Summary:

On October 6, 2015, Mayor Larry Forester proclaimed October 2015 as National Community Planning Month. Each year the American Planning Association, its members, chapters, divisions, and professional institute sponsor National Community Planning Month to raise the visibility of the important role of planners and planning in communities across the nation. Staff will highlight a recent visit to the After-school Recreation Club to explain the benefits of planning to the children.

October

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CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

PROCEDURES RELATIVE TO PUBLIC HEARINGS/WORKSHOPS

1. At the request of the Mayor/Chair, the City Clerk/Secretary reports on the Form of Notice given:

   a. Notice was published in the *Signal Tribune* newspaper on October 2, 2015.
   b. Notice was posted in accordance with Signal Hill Municipal Code Section 1.08.010 on October 2, 2015.

2. Mayor/Chair asks for a staff report, which shall be included in written materials presented to the City Council/Commission so that they can be received into evidence by formal motion.

   In addition, the staff report shall include the following:

   a. Summarize the resolution/ordinance;
   b. The specific location of the property, and/or use, the surrounding properties;
   c. The criteria of the Code which applies to the pending application; and
   d. The recommendation of the Council/Commission and/or other legislative body of the City and staff recommendation.

3. Mayor/Chair declares the public hearing open.

4. Mayor/Chair invites those persons who are in favor of the application to speak.

5. Mayor/Chair invites those persons who are in opposition to the application to speak.

6. Applicant or their representative is provided a brief rebuttal period.

7. Mayor/Chair declares the public hearing closed.

8. Discussion by Council/Commission only.

9. City Attorney reads title of resolutions and/or ordinances.

10. City Clerk/Secretary conducts Roll Call vote.

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SELENA ALANIS**
ASSOCIATE PLANNER

SUBJECT: **WORKSHOP – ADDING FINANCE AND CONVEYANCE MAP TO CHAPTER 18.13 OF THE SIGNAL HILL MUNICIPAL CODE**

Summary:

SummerHill Homes is requesting a workshop to review a draft ordinance adding Finance and Conveyance Maps to the Title 18, Subdivisions of the Signal Hill Municipal Code (SHMC). The Subdivision Map Act provides local jurisdiction with the option to process Finance and Conveyance Maps. Finance and Conveyance Maps are becoming more and more common and utilized by developers to obtain financing to develop or convey a portion of the property to another party for development.

Recommendation:

Provide direction as deemed appropriate.

Background:

The Subdivision Map Act gives the City the power to regulate and control the design and improvements of subdivisions. The City can adopt subdivision regulations as long as they are not more restrictive than the regulations set forth in the Map Act. The City's Subdivision Ordinance regulates and controls the division of land in the City and includes provisions for processing Tentative Parcel Maps, Tentative Tract Maps, Lot Lines Adjustments, and Lot Mergers.

Presently, the City's Subdivision Ordinance does not define or have provisions for processing Finance and Conveyance Maps. The Maps will provide developers and the

business community with mechanism to phase projects, obtain financing or sell portions of the project to other developers. A Finance Map will not create legal building sites for construction of buildings or dwellings. An amendment to the Subdivision Ordinance requires City Council review and approval, but does not require Planning Commission review. However, staff will overview the draft ordinance with the Commission as the Commission will be the reviewing and approving body for the maps (Attachment A).

Staff has researched the provisions of the Subdivision Map Act, researched other jurisdiction's subdivision regulations and reviewed how they process finance maps. Several cities such as Irvine, Hemet, Moreno Valley and Moorpark have adopted procedures for processing Finance and Conveyance Maps in their municipal code. Other cities such as Beaumont, Tustin, Lake Forest and American Canyon have processed finance maps based on internal policies. Adopting an ordinance for Finance and Conveyance Maps, provides more certainty to the development and business community and allows developers to structure projects in a way that can be broken down into manageable development sites for financing purposes.

The City of Signal Hill has a history of oilfield activity and heavy industrial uses such as refineries and tank farms. Just over 400 wells are still in operation and many properties include wells, pipelines, tank farms and/or underground storage tanks. In the past, developers have expressed difficulty in obtaining financing for development projects that include active oil operations. Finance and Conveyance Maps can be used as a tool for developers to secure financing or allow for sale of a portion of the property to another entity. For example, it can be used to isolate the oil field parcels from the area of development.

Analysis:

The draft ordinance for Finance and Conveyance Maps will apply to both residential and commercial properties, but will only apply to properties that already have a previously approved tentative parcel or tract map. The Finance Map will not create a legal building site and a final map must be processed for development to occur.

Applicants must submit all of the information normally required for tentative tract map as specified in SHMC Section 18.12.030. However, the applicant may request and Director of Community Development may waive submittal requirements that may not be necessary during early review stages. Any submittal requirement that is waived shall be submitted concurrently with the next discretionary application that is submitted (i.e., with an application for a future final map, conditional use permit or site plan and design review).

In addition, all maps must be clearly labeled:

> "Finance and Conveyance Purposes Only"

> "This map does not create a legal building site. Further applications are necessary to develop this property."
>
> "This map does not remove any conditions of approval set forth with approval of Site Plan and Design Review (insert case number), which must be satisfied with continued development of the property."

The Finance Map will be processed in the same manner as tentative tract and parcel maps, which will require a duly noticed Planning Commission public hearing. Criteria and required findings are also listed in the ordinance. No development may occur without conditions of approval being met or approval of a subsequent map or entitlements.

Approved:

_____

Scott Charney

Attachment

Chapter 18.13

FINANCE AND CONVEYANCE MAPS

18.13.010 Purpose and intent. A. The purpose of this chapter is to set forth the process for the approval of financial maps and final maps and/or conveyances on sites, which already gave an approved tentative maps or tentative parcel maps. The financial maps shall not create and legal building site(s); a future final map or parcel map shall be processed in order for any development to occur.

B. This criteria shall govern the filing and processing of tentative maps for finance and/or conveyance purposes. Applications for finance and/or conveyance maps (collectively referred to as "financing maps") may only be accepted under one of the following criteria:

1. A future final map for development purposes must be processed and recorded in order for any development on the site to occur, and this fact is clearly stated on the face of the map; or

2. An approved site plan and design review or conditional use permit is approved for the site, has not expired, and all conditions of approval, expected exactions, and mitigation measures associated with the underlying approval(s) shall be implemented as previously prescribed, or as properly modified, for any development on the property to occur.

18.13.020 Definitions. A. "Finance and Conveyance map" means a map used to parcelize undivided undeveloped land, parcel maps, or tract maps for non-buildable reasons.

18.13.030 Procedures. A. Filing and Processing. The finance and conveyance map and all other information required for processing shall be filed with the Community Development Department. Filing fees and deposits shall be those prescribed by resolution of the city council.

18.13.040 Submittal Requirements. A. The form, content and supplementary information that must accompany a finance and conveyance map shall conform to the submittal requirements for tentative maps set forth in Section 18.12.030 of this code except as hereafter provided.

1. Notwithstanding the requirements set forth in Section 18.12.030, the director of community development or designee may waive the following requirements in writing if requested in advance by the applicant:

a. Internal streets and access ways within the boundary of the map (with concurrence of the city engineer);

b. Dimensions and location of sidewalks and common areas;

c. Soils and geology report;

d. Regional housing needs statement; and/or

e. Other submittal requirements set forth in Chapter 18.12 Preliminary and Tentative Maps – Filing and Review Procedures, or the Subdivision Map Act, provided, the city engineer determines in advance, that the proposed map continues

to comply with the spirit and intent of the Subdivision Map Act, the Subdivision Ordinance, and these subdivision regulations.

2. The following statement must be clearly printed on the face of the proposed financing map: “FOR FINANCE AND CONVEYANCE PURPOSES ONLY.”

3. If a future map is required for any development, the face of the map must include the following additional statement: “THIS MAP DOES NOT CREATE A LEGAL BUILDING SITE. FURTHER APPLICATIONS ARE NECESSARY TO DEVELOP THIS PROPERTY.”

4. If a previously approved tentative map, vesting tentative map, site plan and design review or conditional use permit is in place on the property, the face of the map must include the following additional statement in addition to the statement required in Section 18.13.040(2): “THIS MAP DOES NOT REMOVE ANY CONDITIONS OF APPROVAL SET FORTH WITH APPROVAL OF SITE PLAN AND DESIGN REVIEW OR TENTATIVE TRACT {insert case number(s)}, WHICH MUST BE SATISFIED WITH CONTINUED DEVELOPMENT OF THE PROPERTY.”

18.13.050 Review Procedure. A. Except as otherwise noted herein, finance maps shall be processed in the same manner and shall be subject to the same requirements as specified for tentative maps in Section 18.12.060 of the municipal code. The community development department will distribute copies of the financing map to the appropriate reviewing bodies to determine whether the map conforms to the requirements of this chapter, and the Subdivision Map Act.

1. Criteria. The reviewing authority shall base its decision to approve, conditionally approve, or disapprove the proposed financing map on the information required under this chapter, and any additional information reasonably necessary to determine that the property covered by the map can be feasibly developed under the existing zoning and general plan designations for the site. At a minimum, the advisory agency/reviewing authority must ensure the following:

a. The parcel (or parcels) of land covered by the map meet the minimum size requirements to ensure that future development can meet all applicable site development standards imposed by Title 20 of the municipal code.

b. The parcel (or parcels) of land have access from a public road, or access is both feasible and required by a condition of approval for the proposed map.

c. The parcel lines do not conflict with any public easements.

d. There are not physical constraints or other issues which may affect the feasibility of future development on the site (e.g., vehicular access, utility service extensions). If necessary in order to adequately evaluate the map, additional technical studies (e.g., access study) should be required prior to finding the application complete.

e. The map provides sufficient information on future uses and feasibility of future uses to ensure consistency with the general plan and zoning designations for the site.

f. The site is suitable for the future permitted or proposed uses.

g. The map provides sufficient information on the subdivision design and future improvements to evaluate its potential impact on the environment in compliance with the California Environmental Quality Act.

h. There is sufficient information on the subdivision design and future improvements to enable the city to determine whether the map complies with applicable water quality standards, particularly with respect to future discharge of waste into the sewer system.

2. Findings. A tentative map for finance and conveyance purposes shall be approved or conditionally approved only if the advisory agency can make the following findings:

a. That the proposed map is consistent with applicable general and specific plans and the zoning ordinance.

b. That the design or improvement of the proposed subdivision is consistent with applicable general and specific plans and zoning ordinance.

c. That the site is physically suitable for the type of development.

d. That the site is physically suitable for the proposed density of development.

e. That the design of the subdivision or the proposed improvements are not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat.

f. That the design of the subdivision or type of improvements is not likely to cause serious public health problems.

g. That the design of the subdivision or the type of improvements will not conflict with easements, acquired by the public at large, for access through or use of, property within the proposed subdivision.

h. That the requirements of the California Environmental Quality Act have been satisfied.

B. Mandatory Conditions of Approval. In addition to the standard subdivision conditions of approval applied to all maps for development purposes, the following shall apply to all financing maps:

1. Any submittal requirements which were waived in connection with the financing map in accordance with subsection Section 18.13.040(1) shall be submitted concurrently with the first discretionary application for development of the property covered by the map (i.e., with an application for a future map, a conditional use permit, site plan and design review or specific plan), or shall be submitted as prescribed by conditions of approval already in place with underlying entitlement approvals that govern continued or subsequent development of the property as described on the face of the map per Section 18.13.040(4).

2. This map is approved for finance and land conveyance purposes only. No applications for building or grading permits shall be accepted for the parcel or parcels created by this map until a (future map/conditional use permit/site plan design and review/specific plan) for development has been approved by the city, or as prescribed by conditions of approval already in place with underlying entitlement approval that govern continued or subsequent development of the property as described on the face of the map per Section 18.13.040(4).

18.13.060 Appeal. A. The approval or conditional approval of a vesting tentative map shall expire at the end of the same time period, and shall be subject to the same extensions as are set forth for tentative maps under Section 18.12.070 of this title.

18.13.070 Expiration. A. The approval or conditional approval of a vesting tentative map shall expire at the end of the same time period, and shall be subject to the same extensions as are set forth for tentative maps under Section 18.12.090 of this title.

October 2

Ordinance Amendment 15-04
Water Conservation
Regulations

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

PROCEDURES RELATIVE TO PUBLIC HEARINGS/WORKSHOPS

1. At the request of the Mayor/Chair, the City Clerk/Secretary reports on the Form of Notice given:

   a. Notice was published in the *Signal Tribune* newspaper per Gov't Code §65091(a)(4) on October 2, 2015.
   b. Notice was posted in accordance with Signal Hill Municipal Code Section 1.08.010 on October 2, 2015.

2. Mayor/Chair asks for a staff report, which shall be included in written materials presented to the City Council/Commission so that they can be received into evidence by formal motion.

   In addition, the staff report shall include the following:

   a. Summarize the resolution/ordinance;
   b. The specific location of the property, and/or use, the surrounding properties;
   c. The criteria of the Code which applies to the pending application; and
   d. The recommendation of the Council/Commission and/or other legislative body of the City and staff recommendation.

3. Mayor/Chair declares the public hearing open.

4. Mayor/Chair invites those persons who are in favor of the application to speak.

5. Mayor/Chair invites those persons who are in opposition to the application to speak.

6. Applicant or their representative is provided a brief rebuttal period.

7. Mayor/Chair declares the public hearing closed.

8. Discussion by Council/Commission only.

9. City Attorney reads title of resolutions and/or ordinances.

10. City Clerk/Secretary conducts Roll Call vote.

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **COLLEEN DOAN**
SENIOR PLANNER

SUBJECT: **PUBLIC HEARING – ORDINANCE AMENDMENT 15-04 REPEALING CHAPTER 13.10 OF THE MUNICIPAL CODE AND REPLACING IT WITH REVISED STATE MANDATED WATER CONSERVATION REGULATIONS, LIMITING TURF, IMPROVING IRRIGATION EFFICIENCY AND REFINING ON-SITE STORM WATER CAPTURE IN NEW DEVELOPMENT AND AMENDING TITLE 20 BY ADDING LANDSCAPING AND HARDSCAPE STANDARDS FOR TURF REPLACEMENT IN EXISTING DEVELOPMENT**

Summary:

In response to current drought conditions, the State has revised their Model Water Efficient Landscape Ordinance for new development and mandated that local agencies adopt the model or, an equivalent ordinance, by December 1, 2015. The Planning Commission will review Ordinance Amendment 15-04 which replaces the City's existing "Water Conservation in Landscaping" Ordinance with the revised State Model Ordinance. The Ordinance Amendment also establishes regulations to promote turf replacement in existing development and establishes limits on the amount of hardscape in setbacks.

Recommendation:

Waive further reading and adopt the following resolution, entitled:

> A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF THE SIGNAL HILL RECOMMENDING CITY COUNCIL APPROVAL OF ORDINANCE AMENDMENT 15-04 REPEALING CHAPTER 13.10 OF THE MUNICIPAL CODE AND REPLACING IT WITH REVISED STATE MANDATED WATER CONSERVATION REGULATIONS, LIMITING TURF, IMPROVING IRRIGATION EFFICIENCY AND REFINING ON-SITE

STORM WATER CAPTURE IN NEW DEVELOPMENT AND AMENDING TITLE 20 BY ADDING LANDSCAPING AND HARDSCAPE STANDARDS FOR TURF REPLACEMENT IN EXISTING DEVELOPMENT

Background:

In 1990, the State adopted AB325, the Water Conservation in Landscaping Act, to promote the conservation and efficient use of water in landscape irrigation. The law required local jurisdictions to adopt the State's Model Water Efficient Landscape Ordinance (Model Ordinance) or one providing the same degree of conservation and efficiency standards. Agencies that failed to adopt a local ordinance were required to enforce the Model Ordinance.

On February 16, 1993, in response to the law, the City Council adopted Signal Hill Municipal Code (SHMC) Chapter 13.10, Water Conservation in Landscaping, which incorporated the mandated provisions of the Model Ordinance.

In 2006, the Act was revised with the passage of AB 1881. The update recognized that California was already a leader in water use efficiency but reflected the need to promote further efficiency improvements to meet future water demands. Under the Act, local jurisdictions had to adopt the State's revised Model Ordinance or equivalent.

On December 15, 2009, the City Council approved amendments to Chapter 13.10 based on the revised Model Ordinance.

In 2014, the Governor declared a state of drought in California and called for a reduction of water use.

On May 20, 2014, the City adopted Parkway Design Guidelines to provide guidance to property owners when replacing turf in parkways with drought tolerant materials.

In April 2015, the Governor signed an executive order directing the State Department of Water Resources to prepare another revision to the State's Model Ordinance to further reduce outdoor water use and assist with the drought (Attachment A).

On May 19, 2015, in response to the State Water Resources Control Board emergency regulations implementing a statewide overall reduction in potable water use of 25 percent, the City Council declared a Level 2 water shortage condition in accordance with SHMC Chapter 13.03, and authorized staff to seek a Metropolitan Water District turf replacement rebate for the Civic Center Parkway Demonstration Landscaping Project.

On June 9, 2015, the Planning Commission conducted a study session on water conservation to consider best practices and a potential ordinance amendment to establish regulations for turf replacement. The Commission expressed concerns about some hardscape materials, design applications, proportions and maintenance. The Commission directed staff to conduct a public workshop to engage the community and

obtain feedback on turf replacement alternatives prior to developing an ordinance amendment.

On July 10, 2015, the City was approved for a Metropolitan Water District turf replacement rebate for the Civic Center Parkway Demonstration Landscaping Project.

On July 14, 2015, City staff conducted a public workshop to further educate residents about drought conditions, the State mandate to conserve more water and to engage the public and obtain feedback on alternative turf replacement materials and design applications (Attachment B).

On July 14, 2015, the Planning Commission conducted a second study session regarding turf replacement, alternative landscape materials and existing code requirements for landscape and hardscape in residential yards. *The Commission expressed support for maintaining a variety of choices, for simplified regulations, permeable materials, on-site water retention and methods to avoid excessive hardscape. The Commission also recommended development of flexible guidelines for preferred landscape materials.*

On July 15, 2015, the California Water Commission approved the revisions to the State's Model Ordinance mandated by the Governor (Attachment C). Significant provisions include a deadline for adoption by December 1, 2015 and an annual requirement that all local agencies report the status of implementation and enforcement (first report due by December 31, 2015). Cities that have not adopted their own ordinance by the deadline are required to enforce the State's Model Ordinance.

On August 11, 2015, the Planning Commission conducted a third study session to review the public input received at the turf replacement workshop and consider regulations for residential turf replacement. The regulations focused on limiting hardscape in front yard setbacks while maximizing off-street parking opportunities. The Commission approved the proposed regulation scenarios and direction was given to proceed with consideration of commercial regulations.

On September 8, 2015, the Planning Commission conducted a fourth study session to review the State's revised Model Ordinance for landscaping at new development and consider regulations for turf replacement and hardscape limits for existing commercial development.

On September 15, 2015, the City Council approved an amendment to Chapter 13.03 of the SHMC, the City's Water Conservation Program Ordinance. The amendment updates the six year old ordinance to reflect the latest and best techniques for conserving water, such as making the distinction between standard irrigation sprinkler heads and newly available low flow designs and other changes to enhance community understanding, increase water savings and clarify requirements. Watering dates were revised to be consistent with the City of Long Beach watering days.

On September 22, 2015, the Sustainable City Committee reviewed the State's revised Model Ordinance for landscaping at new development and received a presentation on the proposed turf replacement regulations and hardscape limits for existing commercial and residential development.

Analysis:

State Mandated Water Efficient Landscape Ordinance (new development)

SHMC Chapter 13.10 regulates landscaping for new commercial and residential development and replacement of large existing landscape areas. It incorporates the provisions of the *previous* generation of the State's Model Ordinance.

Standards contained in the *latest* generation of the Model Ordinance include:

- New residential landscape water budgets are *reduced* from current standards by 30%.
- New residential landscape standards *reduce* the amount of landscaped area that can be turf to 25%.
- New commercial landscape standards *do not allow turf*.
- New commercial landscape water budgets are *reduced* from current standards by 40%.
- *Reduced* threshold for compliance for all new construction from 2,500 sq. ft. to 500 sq. ft. and rehabilitated landscape projects of 2,500 sq. ft.
- Landscaped areas less than 10 ft. in width must be irrigated with subsurface drip or other technology and *may not generate over spray or runoff*.
- Turf is *prohibited* in medians or parkways – exception: parkways next to a parking strip with a flat surface to facilitate entry and exiting of vehicles.
- *Strengthened* efficiency regulations for irrigation systems and qualified use of greywater is *promoted*.

The proposed Ordinance Amendment incorporates all of the mandated provisions of the State's most recently revised Model Ordinance. It is important to note that the City is required to submit annual reports to the State Department of Water Resources on the implementation and enforcement of the Ordinance.

Landscape Regulations for Turf Replacement (existing residential)

Recognizing that owners of developed properties are interested in water conservation, the Planning Commission requested that staff develop regulations for replacing residential turf with alternative drought tolerant materials. Feedback from the public workshop and Commission study sessions emphasized the need to maintain flexibility and choice for materials, while establishing limits for the allowable area of hardscape.

Two regulations are proposed for establishing limitations on the use of hardscape in front yard setbacks as follows:

1. Establish hardscape limits.

   Maximum % Hardscape Area – With the exception of the established Driveway Allowance, limit the maximum area of hardscape material (permeable, non-permeable) to 25% of the front setback area (includes walkways, patios and courtyards, but excludes driveways).

   - area of front setback – area of driveway = remaining front setback area
   - remaining front setback area x 25% = total allowed hardscape area

2. Establish a driveway allowance.

   Staff believes it is important to balance the desire for attractive front yards with the need to maximize off-street parking opportunities. Therefore, establishing a driveway allowance that is excluded from the maximum allowed hardscape limit is appropriate.

   Driveway Allowance – Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

   - Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

Landscape Regulations for Turf Replacement (existing commercial)

The City’s existing regulations require a minimum 10’-20’ front setback on all commercial properties. The regulations do not specifically mention turf – it is neither required nor prohibited. Historically however, turf has been the preferred landscape material for commercial setbacks.

Given new attitudes toward water conservation, three regulations are proposed for commercial turf replacement in existing development that include limitations on the amount of hardscape in front and street side setbacks as follows:

Landscape materials and turf replacement.

1. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

2. Turf in new development. Pursuant to Chapter 13.10, only limited turf is allowed in new commercial development with an aggregate landscape area of 500 square feet or greater, except under specified circumstances.

3. Turf replacement.

A. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on-site are strongly encouraged when replacing existing turf.

B. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Landscape Overlay District – Cherry/Spring/Willow Corridor Guidelines

In 1989, the City adopted a Landscape Overlay District (SHMC Chapter 20.46) which is applicable to the Cherry Avenue, Spring Street and Willow Avenue corridors. The purpose of the Overlay District was to encourage upgraded and consistent landscape treatment in front setbacks for all properties in the corridor. These guidelines call for the use of turf in 50% of the front setbacks along each of the streets (Attachment D). This has set the standard for much of the contemporary commercial development, including the Auto Center and Town Center Specific Plans. Although the Landscape Guidelines were an effective tool to establish a unique identity and improve the look of the corridor, the result of todays increased emphasis on water conservation has been for new development to exclude turf. As an example, the landscaping for the Fresh & Easy market on Cherry Avenue has no turf.

Overlay District Guidelines call for 50% turf

Overlay District Guidelines call for 50% turf

An additional element of the ordinance amendment is to repeal the Landscape Overlay District and associated Landscape Guidelines for the Cherry/Spring/Willow Corridors.

Definitions and Maintenance

Three final items in the ordinance amendment include:

- An addition to the definition for landscape noting that landscape can be a combination of plant and non-plant materials such as bark, mulch or gravel.
- The addition of a definition for hardscape, stating that it can include permeable materials such as pavers or grasscrete.
- An addition to the Nuisances chapter of the Code describing how the determination will be made as to whether plant materials are of sufficient proportions to non-plant materials through the use of a "sufficient plant materials" exhibit.

Turf Replacement Alternative Guidelines

Staff will prepare draft turf replacement guidelines for Commission consideration at a future date.

Approved:

_____

Scott Charney

Attachments

Executive Department
State of California

EXECUTIVE ORDER B-29-15

WHEREAS on January 17, 2014, I proclaimed a State of Emergency to exist throughout the State of California due to severe drought conditions; and

WHEREAS on April 25, 2014, I proclaimed a Continued State of Emergency to exist throughout the State of California due to the ongoing drought; and

WHEREAS California's water supplies continue to be severely depleted despite a limited amount of rain and snowfall this winter, with record low snowpack in the Sierra Nevada mountains, decreased water levels in most of California's reservoirs, reduced flows in the state's rivers and shrinking supplies in underground water basins; and

WHEREAS the severe drought conditions continue to present urgent challenges including: drinking water shortages in communities across the state, diminished water for agricultural production, degraded habitat for many fish and wildlife species, increased wildfire risk, and the threat of saltwater contamination to fresh water supplies in the Sacramento-San Joaquin Bay Delta; and

WHEREAS a distinct possibility exists that the current drought will stretch into a fifth straight year in 2016 and beyond; and

WHEREAS new expedited actions are needed to reduce the harmful impacts from water shortages and other impacts of the drought; and

WHEREAS the magnitude of the severe drought conditions continues to present threats beyond the control of the services, personnel, equipment, and facilities of any single local government and require the combined forces of a mutual aid region or regions to combat; and

WHEREAS under the provisions of section 8558(b) of the Government Code, I find that conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions with which local authority is unable to cope; and

WHEREAS under the provisions of section 8571 of the California Government Code, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay the mitigation of the effects of the drought.

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, in particular Government Code sections 8567 and 8571 of the California Government Code, do hereby issue this Executive Order, effective immediately.

IT IS HEREBY ORDERED THAT:

1. The orders and provisions contained in my January 17, 2014 Proclamation, my April 25, 2014 Proclamation, and Executive Orders B-26-14 and B-28-14 remain in full force and effect except as modified herein.

SAVE WATER

2. The State Water Resources Control Board (Water Board) shall impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water suppliers to California's cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water suppliers' service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

3. The Department of Water Resources (the Department) shall lead a statewide initiative, in partnership with local agencies, to collectively replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes. The Department shall provide funding to allow for lawn replacement programs in underserved communities, which will complement local programs already underway across the state.

4. The California Energy Commission, jointly with the Department and the Water Board, shall implement a time-limited statewide appliance rebate program to provide monetary incentives for the replacement of inefficient household devices.

5. The Water Board shall impose restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order.

6. The Water Board shall prohibit irrigation with potable water of ornamental turf on public street medians.

7. The Water Board shall prohibit irrigation with potable water outside of newly constructed homes and buildings that is not delivered by drip or microspray systems.

8. The Water Board shall direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions. The Water Board is directed to adopt emergency regulations, as it deems necessary, pursuant to Water Code section 1058.5 to implement this directive. The Water Board is further directed to work with state agencies and water suppliers to identify mechanisms that would encourage and facilitate the adoption of rate structures and other pricing mechanisms that promote water conservation. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

INCREASE ENFORCEMENT AGAINST WATER WASTE

9. The Water Board shall require urban water suppliers to provide monthly information on water usage, conservation, and enforcement on a permanent basis.

10. The Water Board shall require frequent reporting of water diversion and use by water right holders, conduct inspections to determine whether illegal diversions or wasteful and unreasonable use of water are occurring, and bring enforcement actions against illegal diverters and those engaging in the wasteful and unreasonable use of water. Pursuant to Government Code sections 8570 and 8627, the Water Board is granted authority to inspect property or diversion facilities to ascertain compliance with water rights laws and regulations where there is cause to believe such laws and regulations have been violated. When access is not granted by a property owner, the Water Board may obtain an inspection warrant pursuant to the procedures set forth in Title 13 (commencing with section 1822.50) of Part 3 of the Code of Civil Procedure for the purposes of conducting an inspection pursuant to this directive.

11. The Department shall update the State Model Water Efficient Landscape Ordinance through expedited regulation. This updated Ordinance shall increase water efficiency standards for new and existing landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. It will also require reporting on the implementation and enforcement of local ordinances, with required reports due by December 31, 2015. The Department shall provide information on local compliance to the Water Board, which shall consider adopting regulations or taking appropriate enforcement actions to promote compliance. The Department shall provide technical assistance and give priority in grant funding to public agencies for actions necessary to comply with local ordinances.

12. Agricultural water suppliers that supply water to more than 25,000 acres shall include in their required 2015 Agricultural Water Management Plans a detailed drought management plan that describes the actions and measures the supplier will take to manage water demand during drought. The Department shall require those plans to include quantification of water supplies and demands for 2013, 2014, and 2015 to the extent data is available. The Department will provide technical assistance to water suppliers in preparing the plans.

13. Agricultural water suppliers that supply water to 10,000 to 25,000 acres of irrigated lands shall develop Agricultural Water Management Plans and submit the plans to the Department by July 1, 2016. These plans shall include a detailed drought management plan and quantification of water supplies and demands in 2013, 2014, and 2015, to the extent that data is available. The Department shall give priority in grant funding to agricultural water suppliers that supply water to 10,000 to 25,000 acres of land for development and implementation of Agricultural Water Management Plans.

14. The Department shall report to Water Board on the status of the Agricultural Water Management Plan submittals within one month of receipt of those reports.

15. Local water agencies in high and medium priority groundwater basins shall immediately implement all requirements of the California Statewide Groundwater Elevation Monitoring Program pursuant to Water Code section 10933. The Department shall refer noncompliant local water agencies within high and medium priority groundwater basins to the Water Board by December 31, 2015, which shall consider adopting regulations or taking appropriate enforcement to promote compliance.

16. The California Energy Commission shall adopt emergency regulations establishing standards that improve the efficiency of water appliances, including toilets, urinals, and faucets available for sale and installation in new and existing buildings.

INVEST IN NEW TECHNOLOGIES

17. The California Energy Commission, jointly with the Department and the Water Board, shall implement a Water Energy Technology (WET) program to deploy innovative water management technologies for businesses, residents, industries, and agriculture. This program will achieve water and energy savings and greenhouse gas reductions by accelerating use of cutting-edge technologies such as renewable energy-powered desalination, integrated on-site reuse systems, water-use monitoring software, irrigation system timing and precision technology, and on-farm precision technology.

STREAMLINE GOVERNMENT RESPONSE

18. The Office of Emergency Services and the Department of Housing and Community Development shall work jointly with counties to provide temporary assistance for persons moving from housing units due to a lack of potable water who are served by a private well or water utility with less than 15 connections, and where all reasonable attempts to find a potable water source have been exhausted.

19. State permitting agencies shall prioritize review and approval of water infrastructure projects and programs that increase local water supplies, including water recycling facilities, reservoir improvement projects, surface water treatment plants, desalination plants, stormwater capture, and greywater systems. Agencies shall report to the Governor's Office on applications that have been pending for longer than 90 days.

20. The Department shall take actions required to plan and, if necessary, implement Emergency Drought Salinity Barriers in coordination and consultation with the Water Board and the Department of Fish and Wildlife at locations within the Sacramento - San Joaquin delta estuary. These barriers will be designed to conserve water for use later in the year to meet state and federal Endangered Species Act requirements, preserve to the extent possible water quality in the Delta, and retain water supply for essential human health and safety uses in 2015 and in the future.

21. The Water Board and the Department of Fish and Wildlife shall immediately consider any necessary regulatory approvals for the purpose of installation of the Emergency Drought Salinity Barriers.

22. The Department shall immediately consider voluntary crop idling water transfer and water exchange proposals of one year or less in duration that are initiated by local public agencies and approved in 2015 by the Department subject to the criteria set forth in Water Code section 1810.

23. The Water Board will prioritize new and amended safe drinking water permits that enhance water supply and reliability for community water systems facing water shortages or that expand service connections to include existing residences facing water shortages. As the Department of Public Health's drinking water program was transferred to the Water Board, any reference to the Department of Public Health in any prior Proclamation or Executive Order listed in Paragraph 1 is deemed to refer to the Water Board.

24. The California Department of Forestry and Fire Protection shall launch a public information campaign to educate the public on actions they can take to help to prevent wildfires including the proper treatment of dead and dying trees. Pursuant to Government Code section 8645, $1.2 million from the State Responsibility Area Fire Prevention Fund (Fund 3063) shall be allocated to the California Department of Forestry and Fire Protection to carry out this directive.

25. The Energy Commission shall expedite the processing of all applications or petitions for amendments to power plant certifications issued by the Energy Commission for the purpose of securing alternate water supply necessary for continued power plant operation. Title 20, section 1769 of the California Code of Regulations is hereby waived for any such petition, and the Energy Commission is authorized to create and implement an alternative process to consider such petitions. This process may delegate amendment approval authority, as appropriate, to the Energy Commission Executive Director. The Energy Commission shall give timely notice to all relevant local, regional, and state agencies of any petition subject to this directive, and shall post on its website any such petition.

26. For purposes of carrying out directives 2–9, 11, 16–17, 20–23, and 25, Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are hereby suspended. This suspension applies to any actions taken by state agencies, and for actions taken by local agencies where the state agency with primary responsibility for implementing the directive concurs that local action is required, as well as for any necessary permits or approvals required to complete these actions. This suspension, and those specified in paragraph 9 of the January 17, 2014 Proclamation, paragraph 19 of the April 25, 2014 proclamation, and paragraph 4 of Executive Order B-26-14, shall remain in effect until May 31, 2016. Drought relief actions taken pursuant to these paragraphs that are started prior to May 31, 2016, but not completed, shall not be subject to Division 13 (commencing with section 21000) of the Public Resources Code for the time required to complete them.

27. For purposes of carrying out directives 20 and 21, section 13247 and Chapter 3 of Part 3 (commencing with section 85225) of the Water Code are suspended.

28. For actions called for in this proclamation in directive 20, the Department shall exercise any authority vested in the Central Valley Flood Protection Board, as codified in Water Code section 8521, et seq., that is necessary to enable these urgent actions to be taken more quickly than otherwise possible. The Director of the Department of Water Resources is specifically authorized, on behalf of the State of California, to request that the Secretary of the Army, on the recommendation of the Chief of Engineers of the Army Corps of Engineers, grant any permission required pursuant to section 14 of the Rivers and Harbors Act of 1899 and codified in section 48 of title 33 of the United States Code.

29. The Department is directed to enter into agreements with landowners for the purposes of planning and installation of the Emergency Drought Barriers in 2015 to the extent necessary to accommodate access to barrier locations, land-side and water-side construction, and materials staging in proximity to barrier locations. Where the Department is unable to reach an agreement with landowners, the Department may exercise the full authority of Government Code section 8572.

30. For purposes of this Executive Order, chapter 3.5 (commencing with section 11340) of part 1 of division 3 of the Government Code and chapter 5 (commencing with section 25400) of division 15 of the Public Resources Code are suspended for the development and adoption of regulations or guidelines needed to carry out the provisions in this Order. Any entity issuing regulations or guidelines pursuant to this directive shall conduct a public meeting on the regulations and guidelines prior to adopting them.

31. In order to ensure that equipment and services necessary for drought response can be procured quickly, the provisions of the Government Code and the Public Contract Code applicable to state contracts, including, but not limited to, advertising and competitive bidding requirements, are hereby suspended for directives 17, 20, and 24. Approval by the Department of Finance is required prior to the execution of any contract entered into pursuant to these directives.

This Executive Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

I FURTHER DIRECT that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this Order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 1st day of April 2015.

EDMUND G. BROWN JR.
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

July 14, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **COLLEEN DOAN**
SENIOR PLANNER

SUBJECT: **DIRECTOR'S REPORT – WATER CONSERVATION & OPTIONS FOR TURF REPLACEMENT ON RESIDENTIAL PROPERTIES**

Summary:

Drought conditions in Southern California are recurring events. The State is in the fourth year of current drought conditions. Water conservation and water quality are a continued priority for the City. Recently the Governor issued an executive order mandating a further reduction in water use and the City has declared a level 2 water supply shortage. Data shows that more than half of outdoor water is used for turf, therefore many residents are replacing their turf with lower water use landscape materials. Staff will review the current code requirements for landscape and hardscape in residential yards and present options for regulating the proportions of hardscape to landscape materials.

Recommendation:

Provide direction as deemed appropriate.

Background:

Current Water Restrictions

In response to recurring water conservation and water quality concerns the City has adopted the following regulations and guidelines:

Year	Regulations/Guidelines	Description
2009	Water Conservation Program	Establish a water conservation and supply shortage program
2009	Water Conservation in Landscaping regulations	New development and large landscape regulations
2013	Low Impact Development (L.I.D.) regulations	Reduce stormwater runoff and protect water quality
2014	Level 1 Water Supply Shortage Reinstated	Restricts watering in outdoor landscape areas and excessive runoff
2014	Parkway Landscape Guidelines	Replacement of turf within the public right-of-way
2015	Level 2 Water Supply Shortage	Further restricts watering in outdoor landscape areas and excessive runoff

Analysis:

Landscape and Hardscape Regulations

The City's residential development regulations typically require a 20' building setback from the front property line, creating a large front yard. The front yard is required to be fully landscaped with the exception of driveways and walkways. The regulations do not specify the type of landscaping materials, but the overwhelming public preference has been turf. Driveways have minimal regulations but are typically located in the front setback and provide access to either a one or two car garage.

Setback = Front Yard

Typical Front Yards

Residential Regulations (including specific plans) – Turf not required

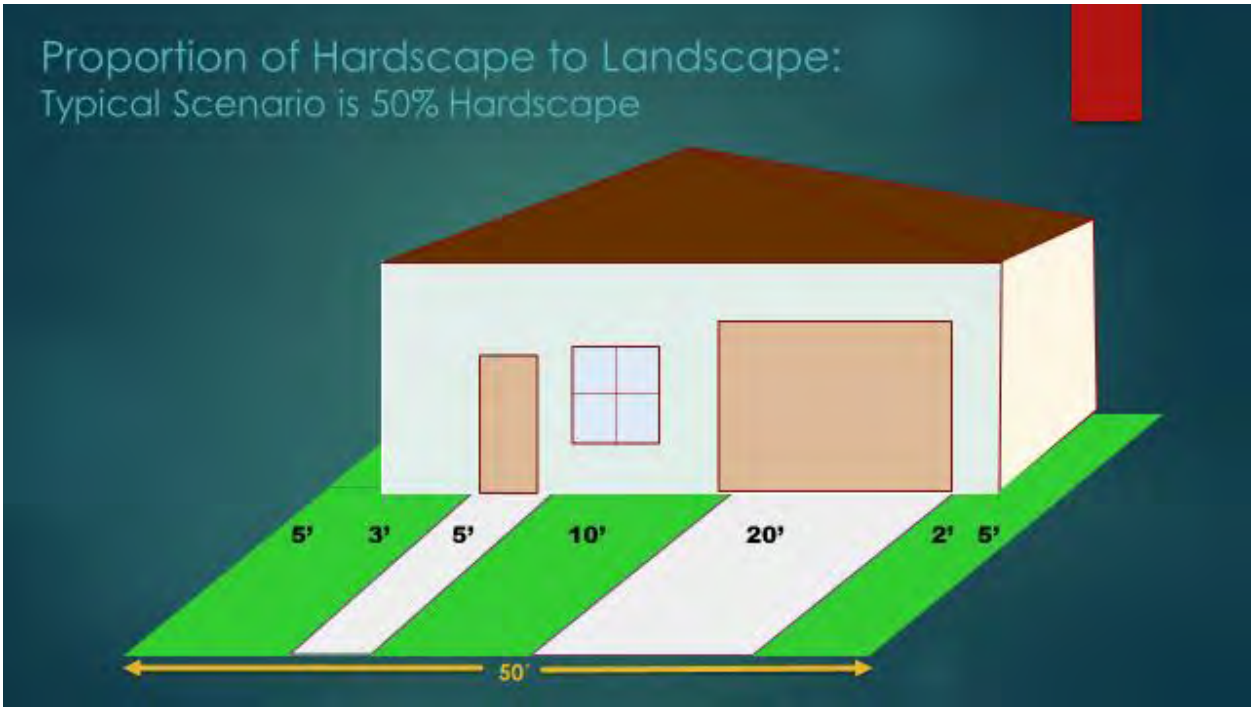
- 20 foot setbacks
- Shall be fully landscaped and irrigated
- No hardscape standards

Driveways (Residential and Commercial) – Allowed in setbacks and yards

- Yards shall extend the full depth and width of the lot and shall be open from ground to sky, however driveways and walkways are an exception
- No standards for driveway length or width
- No standards for permeable versus non-permeable materials

Proportion of Landscape to Hardscape

A typical residential property has a 50' wide frontage with a two car driveway and a walkway to the front door. Driveways and walkways are usually made of non-permeable hardscape material such as cement and make up approximately 50% of the property frontage.



The most extreme alternative for replacing turf in front yards is to replace the entire landscape area with non-permeable hardscape. This is not the most aesthetically pleasing alternative and it increases stormwater runoff. A more common scenario is to replace turf with a mix of alternative landscape and hardscape materials.

At the meeting staff will present the following topics for discussion:

- An overview of alternative landscape materials (plants, mulch, rock).
- An overview of hardscape materials (permeable and non-permeable).
- Scenarios for a mix of landscape and hardscape materials.
- Options for limiting the maximum allowed area for hardscape.

Approved:

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Scott Charney

Attachment C

Model Water Efficient Landscape Ordinance

~~**September 10, 2009**~~

July 9, 2015 (Draft to California Water Commission)

California Code of Regulations
Title 23. Waters
Division 2. Department of Water Resources
Chapter 2.7. Model Water Efficient Landscape Ordinance

§ 490. Purpose.

(a) The State Legislature has found:

(1) that the waters of the state are of limited supply and are subject to ever increasing demands;

(2) that the continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;

(3) that it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

(4) that landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; ~~and~~

(5) that landscape design, installation, maintenance and management can and should be water efficient; and

(6) that Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

(b) Consistent with these legislative findings, the purpose of this model ordinance is to:

(1) promote the values and benefits of landscaping practices that integrate and go beyond the conservation and efficient use of water; ~~landscapes while recognizing the need to invest water and other resources as efficiently as possible;~~

(2) establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects by encouraging the use of a watershed approach that requires cross-sector collaboration of industry, government and property owners to achieve the many benefits possible;

(3) establish provisions for water management practices and water waste prevention for existing landscapes;

(4) use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount;

(5) promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;

(6) encourage local agencies and water purveyors to use economic incentives that promote the efficient use of water, such as implementing a tiered-rate structure; and

(7) encourage local agencies to designate the necessary authority that implements and enforces the provisions of the Model Water Efficient Landscape Ordinance or its local landscape ordinance.

(c) Landscapes that are planned, designed, installed, managed and maintained with the watershed based approach can improve California's environmental conditions and provide benefits and realize sustainability goals. Such landscapes will make the urban environment resilient in the face of climatic extremes. Consistent with the legislative findings and purpose of the Ordinance, conditions in the urban setting will be improved by:

(1) Creating the conditions to support life in the soil by reducing compaction, incorporating organic matter that increases water retention, and promoting productive plant growth that leads to more carbon storage, oxygen production, shade, habitat and esthetic benefits.

(2) Minimizing energy use by reducing irrigation water requirements, reducing reliance on petroleum based fertilizers and pesticides, and planting climate appropriate shade trees in urban areas.
(3) Conserving water by capturing and reusing rainwater and graywater wherever possible and selecting climate appropriate plants that need minimal supplemental water after establishment.
(4) Protecting air and water quality by reducing power equipment use and landfill disposal trips, selecting recycled and locally sourced materials, and using compost, mulch and efficient irrigation equipment to prevent erosion.
(5) Protecting existing habitat and creating new habitat by choosing local native plants, climate adapted non-natives and avoiding invasive plants. Utilizing integrated pest management with least toxic methods as the first course of action.

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Note: Authority cited: Section 65593, Government Code. Reference: Sections 65591, 65593, 65596, Government Code.

§ 490.1 Applicability

(a) After ~~January 1, 2010~~ December 1, 2015, and consistent with Executive Order No. B-29-15, this ordinance shall apply to all of the following landscape projects:

(1) new development projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;
(2) rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
~~(1) new construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review;~~
~~(2) new construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;~~
~~(3) new construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or design review;~~
(3) ~~(4)~~ existing landscapes limited to Sections 493, 493.1 and 493.2; and
(4) ~~(5)~~ cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 492.4, 492.11 and 492.12; and existing cemeteries are limited to Sections 493, 493.1 and 493.2.

(b) For local land use agencies working together to develop a regional water efficient landscape ordinance, the reporting requirements of this ordinance shall become effective December 1, 2015 and the remainder of this ordinance shall be effective no later than February 1, 2016.
(c) Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this ordinance or conform to the prescriptive measures contained in Appendix D.
(d) For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2500 sq. ft of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D section (5).
(~~b~~e) This ordinance does not apply to:

(1) registered local, state or federal historical sites;
(2) ecological restoration projects that do not require a permanent irrigation system;

(3) mined-land reclamation projects that do not require a permanent irrigation system; or
(4) existing plant collections, as part of botanical gardens and arboretums open to the public.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 491. Definitions.

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

(a) "applied water" means the portion of water supplied by the irrigation system to the landscape.

(b) "automatic irrigation controller" means a~~n automatic~~ timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

(c) "backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

(d) "Certificate of Completion" means the document required under Section 492.9.

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

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

(g) "check valve" or "anti-drain valve" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

(h) "common interest developments" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

(i) "compost" means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

(~~i~~j) "conversion factor (0.62)" means the number that converts acre-inches per acre per year to gallons per square foot per year.

(k) "distribution uniformity" means the measure of the uniformity of irrigation water over a defined area.

(~~j~~l) "drip irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

(~~k~~m) "ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(~~l~~n) "effective precipitation" or "usable rainfall" (Eppt) means the portion of total precipitation which becomes available for plant growth.

(~~m~~o) "emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.

(~~n~~p) "established landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

(~~o~~q) "establishment period of the plants" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

(~~p~~r) "Estimated Total Water Use" (ETWU) means the total water used for the landscape as described in Section 492.4.

(~~q~~s) "ET adjustment factor" (ETAF) means a factor of ~~0.7~~0.55 for residential areas and 0.45 for non-residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. ~~A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is (0.7)=(0.5/0.71).~~ The ETAF for ~~a~~ new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

(~~r~~t) "evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

(~~s~~u) "flow rate" means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

(v) "flow sensor" means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

(w) "friable" means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

(x) "Fuel Modification Plan Guideline" means guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.

(y) "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers. Health and Safety Code Section 17922.12.

(~~t~~z) "hardscapes" means any durable material (pervious and non-pervious).

~~(u) "homeowner-provided landscaping" means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.~~

(aa) ~~(v)~~ "hydrozone" means a portion of the landscaped area having plants with similar water needs and rooting depth. A hydrozone may be irrigated or non-irrigated.

(bb) ~~(w)~~ "infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

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

(dd) ~~(y)~~ "irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association's Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency "Watersense" labeled auditing program.

(ee) ~~(z)~~ "irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates

of irrigation system characteristics and management practices. The ~~minimum average~~ irrigation efficiency~~ies~~ for purposes of this ordinance are 0.75 for overhead spray devices and 0.81 for drip systems. ~~is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems~~.

(ff) ~~(aa)~~ "irrigation survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

(gg) ~~(bb)~~ "irrigation water use analysis" means a review of water use data based on meter readings and billing data.

(hh) ~~(cc)~~ "landscape architect" means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

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

(jj) ~~(ee)~~ "landscape contractor" means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

(kk) ~~(ff)~~ "Landscape Documentation Package" means the documents required under Section 492.3.

(ll) ~~(gg)~~ "landscape project" means total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance, meeting requirements under Section 490.1.

(mm) "landscape water meter" means an inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

(nn) ~~(hh)~~ "lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

(oo) ~~(ii)~~ "local agency" means a city or county, including a charter city or charter county, that is responsible for adopting and implementing the ordinance. The local agency is also responsible for the enforcement of this ordinance, including but not limited to, approval of a permit and plan check or design review of a project.

(pp) ~~(jj)~~ "local water purveyor" means any entity, including a public agency, city, county, or private water company that provides retail water service.

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

(rr) ~~(ll)~~ "main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

(ss) "master shut-off valve" is an automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.

(tt) ~~(mm)~~ "Maximum Applied Water Allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 492.4. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0. MAWA = (ETo) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)],

(uu) "median" is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.

(vv) ~~(nn)~~ "microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.
(ww) ~~(oo)~~ "mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
(xx) ~~(pp)~~ "mulch" means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, ~~and~~ or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.
(yy) ~~(qq)~~ "new construction" means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.
(zz~~xx~~)"non-residential landscape" means landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.
(aaa) ~~(rr)~~ "operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
(bbb) ~~(ss)~~ "overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., spray heads and rotors).
(ccc) ~~(tt)~~ "overspray" means the irrigation water which is delivered beyond the target area.
(ddd) ~~(uu)~~ "permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.
(eee) ~~(vv)~~ "pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.
(fff) ~~(ww)~~ "plant factor" or "plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is ~~0~~0.1 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the ~~Department of Water Resources 2000~~ publication "Water Use Classification of Landscape Species". Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).
~~(xx) "precipitation rate" means the rate of application of water measured in inches per hour.~~
(ggg) ~~(yy)~~ "project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section 492.3 to request a permit, plan check, or design review from the local agency. A project applicant may be the property owner or his or her designee.
(hhh) ~~(zz)~~ "rain sensor" or "rain sensing shutoff device" means a component which automatically suspends an irrigation event when it rains.
(iii) ~~(aaa)~~ "record drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.
(jjj) ~~(bbb)~~ "recreational area" means areas, excluding private single family residential areas, ~~dedicated~~ designated ~~to~~ for active play, recreation or public assembly ~~such as~~ in parks, sports fields, picnic grounds, amphitheaters ~~and~~ or golf course~~s~~ tees, fairways, roughs, surrounds and greens.
(kkk) ~~(ccc)~~ "recycled water", "reclaimed water", or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.
(lll) ~~(ddd)~~ "reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Appendix A ~~Section 495.1~~, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as

the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.
(mmm) Regional Water Efficient Landscape Ordinance" means a local Ordinance adopted by two or more local agencies, water suppliers and other stakeholders for implementing a consistent set of landscape provisions throughout a geographical region. Regional ordinances are strongly encouraged to provide a consistent framework for the landscape industry and applicants to adhere to.
(nnn) ~~(eee)~~ "rehabilitated landscape" means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Section 490.1, and the modified landscape area is equal to or greater than 2,500 square feet~~. is 50% of the total landscape area, and the modifications are completed within one year.~~
(ooo) "residential landscape" means landscapes surrounding single or multifamily homes.
(ppp) ~~(fff)~~ "runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.
(qqq) ~~(ggg)~~ "soil moisture sensing device" or "soil moisture sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.
(rrr) ~~(hhh)~~ "soil texture" means the classification of soil based on its percentage of sand, silt, and clay.
(sss) ~~(iii)~~ "Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water ~~and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface~~.
(ttt) ~~(jjj)~~ "sprinkler head" means a device which delivers water through a nozzle.
(uuu) ~~(kkk)~~ "static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.
(vvv) ~~(lll)~~ "station" means an area served by one valve or by a set of valves that operate simultaneously.
(www) ~~(mmm)~~ "swing joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.
(xxx) "submeter" means a metering device to measure water applied to the landscape that is installed after the primary utility water meter.
(yyy) ~~(nnn)~~ "turf" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.
(zzz) ~~(ooo)~~ "valve" means a device used to control the flow of water in the irrigation system.
(aaaa) ~~(ppp)~~ "water conserving plant species" means a plant species identified as having a very low or low plant factor.
(bbbb) ~~(qqq)~~"water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.
(cccc) ~~(rrr)~~ "watering window" means the time of day irrigation is allowed.
(dddd) ~~(sss)~~ "WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension~~,~~ and the Department of Water Resources ~~and the Bureau of Reclamation, 2000~~ 2014.

Note: Authority Cited: Section 65595, Government Code. Reference: Sections 65592, 65596, Government Code.

§ 492. Provisions for New Construction or Rehabilitated Landscapes.
(a) A local agency may designate by mutual agreement, another agency, such as a water purveyor, to implement some or all of the requirements contained in this ordinance. Local agencies may collaborate with water purveyors to define each entity's specific responsibilities relating to this ordinance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.1 Compliance with Landscape Documentation Package.
(a) Prior to construction, the local agency shall:
(1) provide the project applicant with the ordinance and procedures for permits, plan checks, or design reviews;
(2) review the Landscape Documentation Package submitted by the project applicant;
(3) approve or deny the Landscape Documentation Package;
(4) issue a permit or approve the plan check or design review for the project applicant; and
(5) upon approval of the Landscape Documentation Package, submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.
(b) Prior to construction, the project applicant shall:
(1) submit a Landscape Documentation Package to the local agency.
(c) Upon approval of the Landscape Documentation Package by the local agency, the project applicant shall:
(1) receive a permit or approval of the plan check or design review and record the date of the permit in the Certificate of Completion;
(2) submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee; and
(3) submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.2 Penalties.
(a) A local agency may establish and administer penalties to the project applicant for non-compliance with the ordinance to the extent permitted by law.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.3 Elements of the Landscape Documentation Package.
(a) The Landscape Documentation Package shall include the following six (6) elements:
(1) project information;
(A) date
(B) project applicant
(C) project address (if available, parcel and/or lot number(s))
(D) total landscape area (square feet)
(E) project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)
(F) water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
(G) checklist of all documents in Landscape Documentation Package
(H) project contacts to include contact information for the project applicant and property owner

(I) applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package".

(2) Water Efficient Landscape Worksheet;

(A) water budget calculations

1. Maximum Applied Water Allowance (MAWA)
2. Estimated Total Water Use (ETWU)

(3) soil management report;

(4) landscape design plan;

(5) irrigation design plan; and

(6) grading design plan.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.4 Water Efficient Landscape Worksheet.

(a) A project applicant shall complete the Water Efficient Landscape Worksheet in Appendix B which contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the evapotranspiration adjustment factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of Special Landscape Areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected. The Maximum Applied Water Allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The Estimated Total Water Use (ETWU) is calculated based on the plants used and irrigation method selected for the landscape design. ETWU must be below the MAWA. ~~two sections (see sample worksheet in Appendix B):~~

~~(1) a hydrozone information table (see Appendix B, Section A) for the landscape project; and~~
~~(2) a water budget calculation (see Appendix B, Section B) for the landscape project. For the calculation of the~~

(1) In calculating the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the ETo values from the Reference Evapotranspiration Table in Appendix A. For geographic areas not covered in Appendix A, use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.

(b) Water budget calculations shall adhere to the following requirements:

(1) The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR). The plant factor ranges from 0 to 0.1 for very low water using plants, 0.1 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

(2) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

(3) All Special Landscape Areas shall be identified and their water use calculated as shown in Appendix B ~~described below~~.

(4) ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.

~~(c) Maximum Applied Water Allowance~~

~~The Maximum Applied Water Allowance shall be calculated using the equation:~~

~~MAWA = (ETo) (0.62) [(0.70.5 x LA) + (0.3 x SLA)]~~

The example calculations below are hypothetical to demonstrate proper use of the equations and do not represent an existing and/or planned landscape project. The ETo values used in these calculations are from the Reference Evapotranspiration Table in Appendix A, for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

(1) Example MAWA calculation for a residential landscape project: a hypothetical landscape project in Fresno, CA with an irrigated landscape area of 50,000 square feet without any Special Landscape Area (SLA= 0, no edible plants, recreational areas, or use of recycled water). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches as listed in the Reference Evapotranspiration Table in Appendix A.
MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 = Conversion Factor (to gallons)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)
MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 0)]
= 1,108,870 gallons per year
To convert from gallons per year to hundred-cubic-feet per year:
= 1,108,870 /748 = 482 hundred-cubic-feet per year
(100 cubic feet = 748 gallons)

(2) In this next hypothetical example, the landscape project in Fresno, CA has the same ETo value of 51.1 inches and a total landscape area of 50,000 square feet. Within the 50,000 square foot project, there is now a 2,000 square foot area planted with edible plants. This 2,000 square foot area is considered to be a Special Landscape Area.
MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 2,000 square feet)]
= 31.68 x [35,000 + 600] gallons per year
= 31.68 x 35,600 gallons per year
=1,127,808 gallons per year or 508 hundred-cubic-feet per year

(d) Estimated Total Water Use.
The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

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

Where:

ETWU = Estimated Total Water Use per year (gallons)
ETo = Reference Evapotranspiration (inches)
PF = Plant Factor from WUCOLS (see Section 491)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor

IE = Irrigation Efficiency (minimum 0.71)

(1) Example ETWU calculation: landscape area is 50,000 square feet; plant water use type, plant factor, and hydrozone area are shown in the table below. The ETo value is 51.1 inches per year. There are no Special Landscape Areas (recreational area, area permanently and solely dedicated to edible plants, and area irrigated with recycled water) in this example.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	10,000	7,000
3	Medium	0.5	16,000	8,000
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	24,700

*Plant Factor from WUCOLS

$$ETWU = (51.1)(0.62)\left(\frac{17,500}{0.85} + 0\right)$$

= 1,102,116 gallons per year

Compare ETWU with MAWA: For this example MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 0)] = 1,108,870 gallons per year. The ETWU (1,102,116 gallons per year) is less than MAWA (1,108,870 gallons per year). In this example, the water budget complies with the MAWA.

(2) Example ETWU calculation: total landscape area is 50,000 square feet, 2,000 square feet of which is planted with edible plants. The edible plant area is considered a Special Landscape Area (SLA). The reference evapotranspiration value is 51.1 inches per year. The plant type, plant factor, and hydrozone area are shown in the table below.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	9,000	6,300
3	Medium	0.5	15,000	7,500
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	23,500
6	SLA	1.0	2,000	2,000

*Plant Factor from WUCOLS

$$ETWU = (51.1)(0.62)\left(\frac{16,300}{0.85} + 2,000\right)$$

= (31.68) (33,099 + 2,000)
= 1,111,936 gallons per year

Compare ETWU with MAWA. For this example:

~~MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 2,000)]~~
~~= 31.68 x [35,000 + 600]~~
~~= 31.68 x 35,600~~
~~= 1,127,808gallons per year~~

~~The ETWU (1,111,936 gallons per year) is less than MAWA (1,127,808 gallons per year). For this example, the water budget complies with the MAWA.~~

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.5 Soil Management Report.

(a) In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:

(1) Submit soil samples to a laboratory for analysis and recommendations.

(A) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

(B) The soil analysis ~~may~~ shall include:

1. soil texture;
2. infiltration rate determined by laboratory test or soil texture infiltration rate table;
3. pH;
4. total soluble salts;
5. sodium;
6. percent organic matter; and
7. recommendations

(C) In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.

(2) The project applicant, or his/her designee, shall comply with one of the following:

(A) If significant mass grading is not planned, the soil analysis report shall be submitted to the local agency as part of the Landscape Documentation Package; or

(B) If significant mass grading is planned, the soil analysis report shall be submitted to the local agency as part of the Certificate of Completion.

(3) The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

(4) The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with Certificate of Completion.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.6 Landscape Design Plan.

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

(1) Plant Material

(A) Any plant may be selected for the landscape providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance. ~~To~~

~~encourage the efficient use of water, the following is highly recommended~~ Methods to achieve water efficiency shall include one or more of the following:

1. protection and preservation of native species and natural vegetation;
2. selection of water-conserving plant, tree and turf species, especially local native plants;
3. selection of plants based on local climate suitability, disease and pest resistance;
4. selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and
5. selection of plants from local and regional landscape program plant lists.
6. selection of plants from local Fuel Modification Plan Guidelines.

(B) Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 492.7(a)(2)(D).

(C) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. ~~To encourage the efficient use of water, the following is highly recommended~~ Methods to achieve water efficiency shall include one or more of the following:

1. use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
2. recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; allow for adequate soil volume for healthy root growth and
3. consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

(D) Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

(E) High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.

(F) ~~(E)~~ A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches. Refer to the local Fuel Modification Plan guidelines.

(G) ~~(F)~~ The use of invasive ~~and/or noxious~~ plant species, such as those listed by the California Invasive Plant Council, is strongly discouraged.

(H) ~~(G)~~ The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

(2) Water Features

(A) Recirculating water systems shall be used for water features.

(B) Where available, recycled water shall be used as a source for decorative water features.

(C) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

(D) Pool and spa covers are highly recommended.

(3) Soil Preparation, Mulch and Amendments

(A) Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.

(B) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 492.5).

(C) For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

(D) ~~(A)~~ A minimum ~~two~~ three inch (~~2~~3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to 5 % of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.

(E) ~~(B)~~ Stabilizing mulching products shall be used on slopes that meet current engineering standards.

(F) ~~(C)~~ The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

(G) Organic mulch materials made from recycled or post-consumer shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local Fuel Modification Plan Guidelines or other applicable local ordinances.

~~(D) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 492.5).~~

(b) The landscape design plan, at a minimum, shall:

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

(2) identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;

(3) identify recreational areas;

(4) identify areas permanently and solely dedicated to edible plants;

(5) identify areas irrigated with recycled water;

(6) identify type of mulch and application depth;

(7) identify soil amendments, type, and quantity;

(8) identify type and surface area of water features;

(9) identify hardscapes (pervious and non-pervious);

(10) identify location, 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 ~~include, but are not limited to:~~ are provide in Section 492.16.

~~(A) infiltration beds, swales, and basins that allow water to collect and soak into the ground;~~

~~(B) constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and~~

~~(C) pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.~~

(11) identify any applicable rain harvesting or catchment technologies ~~(e.g., rain gardens, cisterns, etc.)~~ 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) ~~(12)~~ contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan"; and
(14) ~~(13)~~ bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code and Section 1351, Civil Code.

§ 492.7 Irrigation Design Plan.

(a) This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

(1) System

(A) ~~Dedicated~~ Landscape water meters, defined as either a dedicated water service meter or private submeter, ~~are highly recommended on landscape areas smaller than 5,000 square feet to facilitate water management~~ shall be installed for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000 sq.ft. (the level at which *Water Code* 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:

1. a customer service meter dedicated to landscape use provided by the local water purveyor; or
2. a privately owned meter or submeter.

(B) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.

(C) If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is required ~~The irrigation systems shall be designed~~ to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

1. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

2. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

(D) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.
(E) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.
(F) Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable local agency code (i.e., public health) for additional backflow prevention requirements.
(G) ~~High~~ Fflow sensors that detect ~~and report~~ high flow conditions created by system damage or malfunction are ~~recommended~~ required for all on non-residential landscapes and residential landscapes of 5000 sq. ft. or larger.
(H) Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.
(I) ~~(H)~~ The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.
(J) ~~(I)~~ Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
(K) ~~(J)~~ The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
(L) ~~(K)~~ The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 492.4 regarding the Maximum Applied Water Allowance.
(M) All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard, All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

(N) ~~(L)~~ It is highly recommended that the project applicant or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
(O) ~~(M)~~ In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
(P) ~~(N)~~ Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
(Q) ~~(O)~~ Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
(R) ~~(P)~~ Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
(S) ~~(Q)~~ Check valves or anti-drain valves are required ~~for all irrigation systems~~ on all sprinkler heads where low point drainage could occur.
(T) ~~(R) Narrow or irregularly shaped areas, including turf,~~ Areas less than ten~~eight~~ (~~8~~10) feet in width in any direction shall be irrigated with subsurface irrigation or ~~low volume irrigation system.~~ other means that produces no runoff or overspray.

(U) ~~(S)~~ Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

1. the landscape area is adjacent to permeable surfacing and no runoff occurs; or
2. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
3. the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in Section 492.7 (a)(1)(I~~H~~). Prevention of overspray and runoff must be confirmed during the irrigation audit.

(V) Slopes greater than 25% shall not be irrigated with an irrigation system with a ~~precipitation~~ application rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

(2) Hydrozone

(A) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

(B) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

(C) Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.

(D) Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

1. plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
2. the plant factor of the higher water using plant is used for calculations.

(E) Individual hydrozones that mix high and low water use plants shall not be permitted.

(F) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table (see Appendix B Section A). This table can also assist with the irrigation audit and programming the controller.

(b) The irrigation design plan, at a minimum, shall contain:

(1) location and size of separate water meters for landscape;

(2) location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;

(3) static water pressure at the point of connection to the public water supply;

(4) flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;

(5) recycled water irrigation systems as specified in Section 492.14;

(6) the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and

(7) the signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections

5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.8 Grading Design Plan.

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

(1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

(A) height of graded slopes;
(B) drainage patterns;
(C) pad elevations;
(D) finish grade; and
(E) stormwater retention improvements, if applicable.

(2) To prevent excessive erosion and runoff, it is highly recommended that project applicants:

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

(3) The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.9 Certificate of Completion.

(a) The Certificate of Completion (see Appendix C for a sample certificate) shall include the following six (6) elements:

(1) project information sheet that contains:

(A) date;
(B) project name;
(C) project applicant name, telephone, and mailing address;
(D) project address and location; and
(E) property owner name, telephone, and mailing address;

(2) certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;

(A) where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
(B) A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.

(3) irrigation scheduling parameters used to set the controller (see Section 492.10);

(4) landscape and irrigation maintenance schedule (see Section 492.11);

(5) irrigation audit report (see Section 492.12); and

(6) soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations (see Section 492.5).

(b) The project applicant shall:

(1) submit the signed Certificate of Completion to the local agency for review;

(2) ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor and property owner or his or her designee.

(c) The local agency shall:

(1) receive the signed Certificate of Completion from the project applicant;

(2) approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the local agency shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.10 Irrigation Scheduling.

(a) For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

(1) Irrigation scheduling shall be regulated by automatic irrigation controllers.

(2) Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from the local water purveyor, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

(3) For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

(4) Parameters used to set the automatic controller shall be developed and submitted for each of the following:

(A) the plant establishment period;

(B) the established landscape; and

(C) temporarily irrigated areas.

(5) Each irrigation schedule shall consider for each station all of the following that apply:

(A) irrigation interval (days between irrigation);

(B) irrigation run times (hours or minutes per irrigation event to avoid runoff);

(C) number of cycle starts required for each irrigation event to avoid runoff;

(D) amount of applied water scheduled to be applied on a monthly basis;

(E) application rate setting;

(F) root depth setting;

(G) plant type setting;

(H) soil type;

(I) slope factor setting;

(J) shade factor setting; and

(K) irrigation uniformity or efficiency setting.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.11 Landscape and Irrigation Maintenance Schedule.

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

(b) A regular maintenance schedule shall include, but not be limited to, routine inspection; auditing, adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; topdressing with compost, replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing ~~and~~ obstructions to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
(c) Repair of all irrigation equipment shall be done with the originally installed components or their equivalents or with components with greater efficiency.
(d) A project applicant is encouraged to implement established landscape industry sustainable Best Practices ~~or environmentally-friendly practices~~ for ~~overall~~ all landscape maintenance activities.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.12 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.
(a) All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape
(b) In large projects or projects with multiple landscape installations (i.e. production home developments) an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.
~~(b)~~ (c)For new construction and rehabilitated landscape projects installed after ~~January 1, 2010~~December 1, 2015, as described in Section 490.1:

(1) the project applicant shall submit an irrigation audit report with the Certificate of Completion to the local agency that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;

(2) the local agency shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.13 Irrigation Efficiency.
(a) For the purpose of determining ~~Maximum Applied Water Allowance~~ Estimated Total Water Use, average irrigation efficiency is assumed to be 0.75 ~~0.71~~ for overhead spray devices and 0.81 for drip system devices. ~~Irrigation systems shall be designed, maintained, and managed to meet or exceed a site-wide~~n average landscape irrigation efficiency of 0.71.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.14 Recycled Water.
(a) The installation of recycled water irrigation systems shall allow for the current and future use of recycled water~~, unless a written exemption has been granted as described in Section 492.14(b)~~.
~~(b) Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the local water purveyor stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.~~
~~(c)~~ (b) All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.
~~(d)~~ (c) Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.15 Graywater Systems.

(a) Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards. Refer to § 490.1 (d) for the applicability of this ordinance to landscape areas less than 2,500 square feet with the Estimated Total Water Use met entirely by graywater.

§ 492.16~~5~~ Stormwater Management and Rainwater Retention.

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

(b) Project applicants shall refer to the local agency or Regional Water Quality Control Board for information on any applicable stormwater technical requirements ~~ordinances and stormwater management plans~~.

(c) All planted landscape areas are required to have friable soil to maximize water retention and infiltration. Refer to § 492.6(a)(3).

(d) It is strongly recommended that landscape areas be designed for capture and infiltration capacity that is sufficient to prevent runoff from impervious surfaces (i.e. roof and paved areas) from either: the one inch, 24-hour rain event or (2) the 85th percentile, 24-hour rain event, and/or additional capacity as required by any applicable local, regional, state or federal regulation.

(e) It is recommended that storm water projects incorporate any of the following elements to improve on-site storm water and dry weather runoff capture and use:

- Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.
- Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.
- Incorporate pervious or porous surfaces (e.g., gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.
- Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water capture and reuse.
- Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.
- Incorporate infiltration beds, swales, basins and drywells to capture storm water and dry weather runoff and increase percolation into the soil.
- Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

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

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.17~~6~~ Public Education.

(a) Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.

(1) A local agency or water supplier/purveyor shall provide information to owners of permitted renovations and new single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes based on a water budget.

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

(1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use as designed per the local ordinance; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.

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

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 492.18~~7~~ Environmental Review.

(a) The local agency must comply with the California Environmental Quality Act (CEQA), as appropriate.

Note: Authority cited: Section 21082, Public Resources Code. Reference: Sections 21080, 21082, Public Resources Code.

§ 493. Provisions for Existing Landscapes.

(a) A local agency may by mutual agreement, designate another agency such as a water purveyor, to implement some or all of the requirements contained in this ordinance. Local agencies may collaborate with water purveyors to define each entity's specific responsibilities relating to this ordinance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

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

(a) This section, 493.1, shall apply to all existing landscapes that were installed before ~~January 1, 2010~~ December 1, 2015 and are over one acre in size.

(1) For all landscapes in 493.1(a) that have a water meter, the local agency shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as: MAWA = (0.8) (ETo)(LA)(0.62).

(2) For all landscapes in 493.1(a), that do not have a meter, the local agency shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

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

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 493.2 Water Waste Prevention.

(a) Local agencies shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally.

(b) Restrictions regarding overspray and runoff may be modified if:

(1) the landscape area is adjacent to permeable surfacing and no runoff occurs; or
(2) the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

Note: Authority cited: Section 65594, Government Code. Reference: Section 65596, Government Code.

§ 494. Effective Precipitation.

(a) A local agency may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:
MAWA= (ETo - Eppt) (0.62) [(~~0.7~~0.55 x LA) + (~~0.3~~0.45 x SLA)] for residential areas.
MAWA= (ETo - Eppt) (0.62) [(0.45 x LA) + (0.55 x SLA)] for non-residential areas.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

§ 495. Reporting.

(a) Local agencies shall report on implementation and enforcement by December 31, 2015. Local agencies responsible for administering individual ordinances shall report on their updated ordinance, while those agencies developing a regional ordinance shall report in their existing ordinance. Those agencies crafting a regional ordinances shall also report on their new ordinance by March 1, 2016. Subsequently, reporting for all agencies will be due by January 31st of each year. Reports should be submitted as follows.

(b) Local agencies are to address the following:

(1) State whether you are adopting a single agency ordinance or a regional agency alliance ordinance, and the date of adoption or anticipated date of adoption.
(2) Define the reporting period. The reporting period shall commence on December 1, 2015 and the end on December 28, 2015. For local agencies crafting regional ordinances with other agencies, there shall be an additional reporting period commencing on February 1, 2016 and ending on February 28, 2016. In subsequent years, all local agency reporting will be for the calendar year.
(3) State if using a locally modified Water Efficient Landscape Ordinance (WELO) or the MWELO. If using a locally modified WELO, how is it different than MWELO, is it at least as efficient as MWELO, and are there any exemptions specified?
(4) State the entity responsible for implementing the ordinance.
(5) State number and types of projects subject to the ordinance during the specified reporting period.
(6) State the total area (in square feet or acres) subject to the ordinance over the reporting period, if available.
(7) Provide the number of new housing starts, new commercial projects, and landscape retrofits during the reporting period.
(8) Describe the procedure for review of projects subject to the ordinance.
(9) Describe actions taken to verify compliance. Is a plan check performed; if so, by what entity? Is a site inspection performed; if so, by what entity? Is a post-installation audit required; if so, by whom?
(10) Describe enforcement measures.
(11) Explain challenges to implementing and enforcing the ordinance.
(12) Describe educational and other needs to properly apply the ordinance.

Appendices.

Appendix A. Reference Evapotranspiration (ETo) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
ALAMEDA													
Fremont	1.5	1.9	3.4	4.7	5.4	6.3	6.7	6.0	4.5	3.4	1.8	1.5	47.0
Livermore	1.2	1.5	2.9	4.4	5.9	6.6	7.4	6.4	5.3	3.2	1.5	0.9	47.2
Oakland	1.5	1.5	2.8	3.9	5.1	5.3	6.0	5.5	4.8	3.1	1.4	0.9	41.8
Oakland Foothills	1.1	1.4	2.7	3.7	5.1	6.4	5.8	4.9	3.6	2.6	1.4	1.0	39.6
Pleasanton	0.8	1.5	2.9	4.4	5.6	6.7	7.4	6.4	4.7	3.3	1.5	1.0	46.2
Union City	1.4	1.8	3.1	4.2	5.4	5.9	6.4	5.7	4.4	3.1	1.5	1.2	44.2
ALPINE													
Markleeville	0.7	0.9	2.0	3.5	5.0	6.1	7.3	6.4	4.4	2.6	1.2	0.5	40.6
AMADOR													
Jackson	1.2	1.5	2.8	4.4	6.0	7.2	7.9	7.2	5.3	3.2	1.4	0.9	48.9
Shanandoah Valley	1.0	1.7	2.9	4.4	5.6	6.8	7.9	7.1	5.2	3.6	1.7	1.0	48.8
BUTTE													
Chico	1.2	1.8	2.9	4.7	6.1	7.4	8.5	7.3	5.4	3.7	1.7	1.0	51.7
Durham	1.1	1.8	3.2	5.0	6.5	7.4	7.8	6.9	5.3	3.6	1.7	1.0	51.1
Gridley	1.2	1.8	3.0	4.7	6.1	7.7	8.5	7.1	5.4	3.7	1.7	1.0	51.9
Oroville	1.2	1.7	2.8	4.7	6.1	7.6	8.5	7.3	5.3	3.7	1.7	1.0	51.5
CALAVERAS													
San Andreas	1.2	1.5	2.8	4.4	6.0	7.3	7.9	7.0	5.3	3.2	1.4	0.7	48.8
COLUSA													
Colusa	1.0	1.7	3.4	5.0	6.4	7.6	8.3	7.2	5.4	3.8	1.8	1.1	52.8
Williams	1.2	1.7	2.9	4.5	6.1	7.2	8.5	7.3	5.3	3.4	1.6	1.0	50.8
CONTRA COSTA													
~~Benicia~~	~~1.3~~	~~1.4~~	~~2.7~~	~~3.8~~	~~4.9~~	~~5.0~~	~~6.4~~	~~5.5~~	~~4.4~~	~~2.9~~	~~1.2~~	~~0.7~~	~~40.3~~
Brentwood	1.0	1.5	2.9	4.5	6.1	7.1	7.9	6.7	5.2	3.2	1.4	0.7	48.3
Concord	1.1	1.4	2.4	4.0	5.5	5.9	7.0	6.0	4.8	3.2	1.3	0.7	43.4
Courtland	0.9	1.5	2.9	4.4	6.1	6.9	7.9	6.7	5.3	3.2	1.4	0.7	48.0
Martinez	1.2	1.4	2.4	3.9	5.3	5.6	6.7	5.6	4.7	3.1	1.2	0.7	41.8
Moraga	1.2	1.5	3.4	4.2	5.5	6.1	6.7	5.9	4.6	3.2	1.6	1.0	44.9
Pittsburg	1.0	1.5	2.8	4.1	5.6	6.4	7.4	6.4	5.0	3.2	1.3	0.7	45.4
Walnut Creek	0.8	1.5	2.9	4.4	5.6	6.7	7.4	6.4	4.7	3.3	1.5	1.0	46.2
DEL NORTE													
Crescent City	0.5	0.9	2.0	3.0	3.7	3.5	4.3	3.7	3.0	2.0	0.9	0.5	27.7
EL DORADO													
Camino	0.9	1.7	2.5	3.9	5.9	7.2	7.8	6.8	5.1	3.1	1.5	0.9	47.3
FRESNO													
Clovis	1.0	1.5	3.2	4.8	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.4
Coalinga	1.2	1.7	3.1	4.6	6.2	7.2	8.5	7.3	5.3	3.4	1.6	0.7	50.9
Firebaugh	1.0	1.8	3.7	5.7	7.3	8.1	8.2	7.2	5.5	3.9	2.0	1.1	55.4
FivePoints	1.3	2.0	4.0	6.1	7.7	8.5	8.7	8.0	6.2	4.5	2.4	1.2	60.4
Fresno	0.9	1.7	3.3	4.8	6.7	7.8	8.4	7.1	5.2	3.2	1.4	0.6	51.1
Fresno State	0.9	1.6	3.2	5.2	7.0	8.0	8.7	7.6	5.4	3.6	1.7	0.9	53.7
Friant	1.2	1.5	3.1	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
Kerman	0.9	1.5	3.2	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.2
Kingsburg	1.0	1.5	3.4	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.6
Mendota	1.5	2.5	4.6	6.2	7.9	8.6	8.8	7.5	5.9	4.5	2.4	1.5	61.7
Orange Cove	1.2	1.9	3.5	4.7	7.4	8.5	8.9	7.9	5.9	3.7	1.8	1.2	56.7

Appendix A. Reference Evapotranspiration (ETo) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
Panoche	1.1	2.0	4.0	5.6	7.8	8.5	8.3	7.3	5.6	3.9	1.8	1.2	57.2
Parlier	1.0	1.9	3.6	5.2	6.8	7.6	8.1	7.0	5.1	3.4	1.7	0.9	52.0
Reedley	1.1	1.5	3.2	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
Westlands	0.9	1.7	3.8	6.3	8.0	8.6	8.6	7.8	5.9	4.3	2.1	1.1	58.8
GLENN													
Orland	1.1	1.8	3.4	5.0	6.4	7.5	7.9	6.7	5.3	3.9	1.8	1.4	52.1
Willows	1.2	1.7	2.9	4.7	6.1	7.2	8.5	7.3	5.3	3.6	1.7	1.0	51.3
HUMBOLDT													
Eureka	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
Ferndale	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
Garberville	0.6	1.2	2.2	3.1	4.5	5.0	5.5	4.9	3.8	2.4	1.0	0.7	34.9
Hoopa	0.5	1.1	2.1	3.0	4.4	5.4	6.1	5.1	3.8	2.4	0.9	0.7	35.6
IMPERIAL													
Brawley	2.8	3.8	5.9	8.0	10.4	11.5	11.7	10.0	8.4	6.2	3.5	2.1	84.2
Calipatria/Mulberry	2.4	3.2	5.1	6.8	8.6	9.2	9.2	8.6	7.0	5.2	3.1	2.3	70.7
El Centro	2.7	3.5	5.6	7.9	10.1	11.1	11.6	9.5	8.3	6.1	3.3	2.0	81.7
Holtville	2.8	3.8	5.9	7.9	10.4	11.6	12.0	10.0	8.6	6.2	3.5	2.1	84.7
Meloland	2.5	3.2	5.5	7.5	8.9	9.2	9.0	8.5	6.8	5.3	3.1	2.2	71.6
Palo Verde II	2.5	3.3	5.7	6.9	8.5	8.9	8.6	7.9	6.2	4.5	2.9	2.3	68.2
Seeley	2.7	3.5	5.9	7.7	9.7	10.1	9.3	8.3	6.9	5.5	3.4	2.2	75.4
Westmoreland	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Yuma	2.5	3.4	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.6
INYO													
Bishop	1.7	2.7	4.8	6.7	8.2	10.9	7.4	9.6	7.4	4.8	2.5	1.6	68.3
Death Valley Jct	2.2	3.3	5.4	7.7	9.8	11.1	11.4	10.1	8.3	5.4	2.9	1.7	79.1
Independence	1.7	2.7	3.4	6.6	8.5	9.5	9.8	8.5	7.1	3.9	2.0	1.5	65.2
Lower Haiwee Res.	1.8	2.7	4.4	7.1	8.5	9.5	9.8	8.5	7.1	4.2	2.6	1.5	67.6
Oasis	2.7	2.8	5.9	8.0	10.4	11.7	11.6	10.0	8.4	6.2	3.4	2.1	83.1
KERN													
Arvin	1.2	1.8	3.5	4.7	6.6	7.4	8.1	7.3	5.3	3.4	1.7	1.0	51.9
Bakersfield	1.0	1.8	3.5	4.7	6.6	7.7	8.5	7.3	5.3	3.5	1.6	0.9	52.4
Bakersfield/Bonanza	1.2	2.2	3.7	5.7	7.4	8.2	8.7	7.8	5.7	4.0	2.1	1.2	57.9
Bakersfield/Greenlee	1.2	2.2	3.7	5.7	7.4	8.2	8.7	7.8	5.7	4.0	2.1	1.2	57.9
Belridge	1.4	2.2	4.1	5.5	7.7	8.5	8.6	7.8	6.0	3.8	2.0	1.5	59.2
Blackwells Corner	1.4	2.1	3.8	5.4	7.0	7.8	8.5	7.7	5.8	3.9	1.9	1.2	56.6
Buttonwillow	1.0	1.8	3.2	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.5	0.9	52.0
China Lake	2.1	3.2	5.3	7.7	9.2	10.0	11.0	9.8	7.3	4.9	2.7	1.7	74.8
Delano	0.9	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.4	0.7	52.0
Famoso	1.3	1.9	3.5	4.8	6.7	7.6	8.0	7.3	5.5	3.5	1.7	1.3	53.1
Grapevine	1.3	1.8	3.1	4.4	5.6	6.8	7.6	6.8	5.9	3.4	1.9	1.0	49.5
Inyokern	2.0	3.1	4.9	7.3	8.5	9.7	11.0	9.4	7.1	5.1	2.6	1.7	72.4
Isabella Dam	1.2	1.4	2.8	4.4	5.8	7.3	7.9	7.0	5.0	3.2	1.7	0.9	48.4
Lamont	1.3	2.4	4.4	4.6	6.5	7.0	8.8	7.6	5.7	3.7	1.6	0.8	54.4
Lost Hills	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
McFarland/Kern	1.2	2.1	3.7	5.6	7.3	8.0	8.3	7.4	5.6	4.1	2.0	1.2	56.5
Shafter	1.0	1.7	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.5	0.9	52.1
Taft	1.3	1.8	3.1	4.3	6.2	7.3	8.5	7.3	5.4	3.4	1.7	1.0	51.2
Tehachapi	1.4	1.8	3.2	5.0	6.1	7.7	7.9	7.3	5.9	3.4	2.1	1.2	52.9

Appendix A. Reference Evapotranspiration (ETo) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
KINGS													
Caruthers	1.6	2.5	4.0	5.7	7.8	8.7	9.3	8.4	6.3	4.4	2.4	1.6	62.7
Corcoran	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Hanford	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.2	5.4	3.4	1.4	0.7	51.5
Kettleman	1.1	2.0	4.0	6.0	7.5	8.5	9.1	8.2	6.1	4.5	2.2	1.1	60.2
Lemoore	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.4	0.7	51.7
Stratford	0.9	1.9	3.9	6.1	7.8	8.6	8.8	7.7	5.9	4.1	2.1	1.0	58.7
LAKE													
Lakeport	1.1	1.3	2.6	3.5	5.1	6.0	7.3	6.1	4.7	2.9	1.2	0.9	42.8
Lower Lake	1.2	1.4	2.7	4.5	5.3	6.3	7.4	6.4	5.0	3.1	1.3	0.9	45.4
LASSEN													
Buntingville	1.0	1.7	3.5	4.9	6.2	7.3	8.4	7.5	5.4	3.4	1.5	0.9	51.8
Ravendale	0.6	1.1	2.3	4.1	5.6	6.7	7.9	7.3	4.7	2.8	1.2	0.5	44.9
Susanville	0.7	1.0	2.2	4.1	5.6	6.5	7.8	7.0	4.6	2.8	1.2	0.5	44.0
LOS ANGELES													
Burbank	2.1	2.8	3.7	4.7	5.1	6.0	6.6	6.7	5.4	4.0	2.6	2.0	51.7
Claremont	2.0	2.3	3.4	4.6	5.0	6.0	7.0	7.0	5.3	4.0	2.7	2.1	51.3
El Dorado	1.7	2.2	3.6	4.8	5.1	5.7	5.9	5.9	4.4	3.2	2.2	1.7	46.3
Glendale	2.0	2.2	3.3	3.8	4.7	4.8	5.7	5.6	4.3	3.3	2.2	1.8	43.7
Glendora	2.0	2.5	3.6	4.9	5.4	6.1	7.3	6.8	5.7	4.2	2.6	2.0	53.1
Gorman	1.6	2.2	3.4	4.6	5.5	7.4	7.7	7.1	5.9	3.6	2.4	1.1	52.4
Hollywood Hills	2.1	2.2	3.8	5.4	6.0	6.5	6.7	6.4	5.2	3.7	2.8	2.1	52.8
Lancaster	2.1	3.0	4.6	5.9	8.5	9.7	11.0	9.8	7.3	4.6	2.8	1.7	71.1
Long Beach	1.8	2.1	3.3	3.9	4.5	4.3	5.3	4.7	3.7	2.8	1.8	1.5	39.7
Los Angeles	2.2	2.7	3.7	4.7	5.5	5.8	6.2	5.9	5.0	3.9	2.6	1.9	50.1
Monrovia	2.2	2.3	3.8	4.3	5.5	5.9	6.9	6.4	5.1	3.2	2.5	2.0	50.2
Palmdale	2.0	2.6	4.6	6.2	7.3	8.9	9.8	9.0	6.5	4.7	2.7	2.1	66.2
Pasadena	2.1	2.7	3.7	4.7	5.1	6.0	7.1	6.7	5.6	4.2	2.6	2.0	52.3
Pearblossom	1.7	2.4	3.7	4.7	7.3	7.7	9.9	7.9	6.4	4.0	2.6	1.6	59.9
Pomona	1.7	2.0	3.4	4.5	5.0	5.8	6.5	6.4	4.7	3.5	2.3	1.7	47.5
Redondo Beach	2.2	2.4	3.3	3.8	4.5	4.7	5.4	4.8	4.4	2.8	2.4	2.0	42.6
San Fernando	2.0	2.7	3.5	4.6	5.5	5.9	7.3	6.7	5.3	3.9	2.6	2.0	52.0
Santa Clarita	2.8	2.8	4.1	5.6	6.0	6.8	7.6	7.8	5.8	5.2	3.7	3.2	61.5
Santa Monica	1.8	2.1	3.3	4.5	4.7	5.0	5.4	5.4	3.9	3.4	2.4	2.2	44.2
MADERA													
Chowchilla	1.0	1.4	3.2	4.7	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.4
Madera	0.9	1.4	3.2	4.8	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.5
Raymond	1.2	1.5	3.0	4.6	6.1	7.6	8.4	7.3	5.2	3.4	1.4	0.7	50.5
MARIN													
Black Point	1.1	1.7	3.0	4.2	5.2	6.2	6.6	5.8	4.3	2.8	1.3	0.9	43.0
Novato	1.3	1.5	2.4	3.5	4.4	6.0	5.9	5.4	4.4	2.8	1.4	0.7	39.8
Point San Pedro	1.1	1.7	3.0	4.2	5.2	6.2	6.6	5.8	4.3	2.8	1.3	0.9	43.0
San Rafael	1.2	1.3	2.4	3.3	4.0	4.8	4.8	4.9	4.3	2.7	1.3	0.7	35.8
MARIPOSA													
Coulterville	1.1	1.5	2.8	4.4	5.9	7.3	8.1	7.0	5.3	3.4	1.4	0.7	48.8
Mariposa	1.1	1.5	2.8	4.4	5.9	7.4	8.2	7.1	5.0	3.4	1.4	0.7	49.0
Yosemite Village	0.7	1.0	2.3	3.7	5.1	6.5	7.1	6.1	4.4	2.9	1.1	0.6	41.4
MENDOCINO													

Appendix A. Reference Evapotranspiration (ETo) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
Fort Bragg	0.9	1.3	2.2	3.0	3.7	3.5	3.7	3.7	3.0	2.3	1.2	0.7	29.0
Hopland	1.1	1.3	2.6	3.4	5.0	5.9	6.5	5.7	4.5	2.8	1.3	0.7	40.9
Point Arena	1.0	1.3	2.3	3.0	3.7	3.9	3.7	3.7	3.0	2.3	1.2	0.7	29.6
Sanel Valley	1.0	1.6	3.0	4.6	6.0	7.0	8.0	7.0	5.2	3.4	1.4	0.9	49.1
Ukiah	1.0	1.3	2.6	3.3	5.0	5.8	6.7	5.9	4.5	2.8	1.3	0.7	40.9
MERCED													
Kesterson	0.9	1.7	3.4	5.5	7.3	8.2	8.6	7.4	5.5	3.8	1.8	0.9	55.1
Los Banos	1.0	1.5	3.2	4.7	6.1	7.4	8.2	7.0	5.3	3.4	1.4	0.7	50.0
Merced	1.0	1.5	3.2	4.7	6.6	7.9	8.5	7.2	5.3	3.4	1.4	0.7	51.5
MODOC													
Modoc/Alturas	0.9	1.4	2.8	3.7	5.1	6.2	7.5	6.6	4.6	2.8	1.2	0.7	43.2
MONO													
Bridgeport	0.7	0.9	2.2	3.8	5.5	6.6	7.4	6.7	4.7	2.7	1.2	0.5	43.0
MONTEREY													
Arroyo Seco	1.5	2.0	3.7	5.4	6.3	7.3	7.2	6.7	5.0	3.9	2.0	1.6	52.6
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Gonzales	1.3	1.7	3.4	4.7	5.4	6.3	6.3	5.9	4.4	3.4	1.9	1.3	45.7
Greenfield	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
King City	1.7	2.0	3.4	4.4	4.4	5.6	6.1	6.7	6.5	5.2	2.2	1.3	49.6
King City-Oasis Rd.	1.4	1.9	3.6	5.3	6.5	7.3	7.4	6.8	5.1	4.0	2.0	1.5	52.7
Long Valley	1.5	1.9	3.2	4.1	5.8	6.5	7.3	6.7	5.3	3.6	2.0	1.2	49.1
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Pajaro	1.8	2.2	3.7	4.8	5.3	5.7	5.6	5.3	4.3	3.4	2.4	1.8	46.1
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1
Salinas North	1.2	1.5	2.9	4.1	4.6	5.2	4.5	4.3	3.2	2.8	1.5	1.2	36.9
San Ardo	1.0	1.7	3.1	4.5	5.9	7.2	8.1	7.1	5.1	3.1	1.5	1.0	49.0
San Juan	1.8	2.1	3.4	4.6	5.3	5.7	5.5	4.9	3.8	3.2	2.2	1.9	44.2
Soledad	1.7	2.0	3.4	4.4	5.5	5.4	6.5	6.2	5.2	3.7	2.2	1.5	47.7
NAPA													
Angwin	1.8	1.9	3.2	4.7	5.8	7.3	8.1	7.1	5.5	4.5	2.9	2.1	54.9
Carneros	0.8	1.5	3.1	4.6	5.5	6.6	6.9	6.2	4.7	3.5	1.4	1.0	45.8
Oakville	1.0	1.5	2.9	4.7	5.8	6.9	7.2	6.4	4.9	3.5	1.6	1.2	47.7
St Helena	1.2	1.5	2.8	3.9	5.1	6.1	7.0	6.2	4.8	3.1	1.4	0.9	44.1
Yountville	1.3	1.7	2.8	3.9	5.1	6.0	7.1	6.1	4.8	3.1	1.5	0.9	44.3
NEVADA													
Grass Valley	1.1	1.5	2.6	4.0	5.7	7.1	7.9	7.1	5.3	3.2	1.5	0.9	48.0
Nevada City	1.1	1.5	2.6	3.9	5.8	6.9	7.9	7.0	5.3	3.2	1.4	0.9	47.4
ORANGE													
Irvine	2.2	2.5	3.7	4.7	5.2	5.9	6.3	6.2	4.6	3.7	2.6	2.3	49.6
Laguna Beach	2.2	2.7	3.4	3.8	4.6	4.6	4.9	4.9	4.4	3.4	2.4	2.0	43.2
Santa Ana	2.2	2.7	3.7	4.5	4.6	5.4	6.2	6.1	4.7	3.7	2.5	2.0	48.2
PLACER													
Auburn	1.2	1.7	2.8	4.4	6.1	7.4	8.3	7.3	5.4	3.4	1.6	1.0	50.6
Blue Canyon	0.7	1.1	2.1	3.4	4.8	6.0	7.2	6.1	4.6	2.9	0.9	0.6	40.5
Colfax	1.1	1.5	2.6	4.0	5.8	7.1	7.9	7.0	5.3	3.2	1.4	0.9	47.9
Roseville	1.1	1.7	3.1	4.7	6.2	7.7	8.5	7.3	5.6	3.7	1.7	1.0	52.2
Soda Springs	0.7	0.7	1.8	3.0	4.3	5.3	6.2	5.5	4.1	2.5	0.7	0.7	35.4
Tahoe City	0.7	0.7	1.7	3.0	4.3	5.4	6.1	5.6	4.1	2.4	0.8	0.6	35.5

Appendix A. Reference Evapotranspiration (ETo) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
Truckee	0.7	0.7	1.7	3.2	4.4	5.4	6.4	5.7	4.1	2.4	0.8	0.6	36.2
PLUMAS													
Portola	0.7	0.9	1.9	3.5	4.9	5.9	7.3	5.9	4.3	2.7	0.9	0.5	39.4
Quincy	0.7	0.9	2.2	3.5	4.9	5.9	7.3	5.9	4.4	2.8	1.2	0.5	40.2
RIVERSIDE													
Beaumont	2.0	2.3	3.4	4.4	6.1	7.1	7.6	7.9	6.0	3.9	2.6	1.7	55.0
Blythe	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Cathedral City	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Coachella	2.9	4.4	6.2	8.4	10.5	11.9	12.3	10.1	8.9	6.2	3.8	2.4	88.1
Desert Center	2.9	4.1	6.4	8.5	11.0	12.1	12.2	11.1	9.0	6.4	3.9	2.6	90.0
Elsinore	2.1	2.8	3.9	4.4	5.9	7.1	7.6	7.0	5.8	3.9	2.6	1.9	55.0
Indio	**3.1**	3.6	6.5	8.3	10.5	11.0	10.8	9.7	8.3	5.9	3.7	2.7	83.9
RIVERSIDE													
La Quinta	2.4	2.8	5.2	6.5	8.3	8.7	8.5	7.9	6.5	4.5	2.7	2.2	66.2
Mecca	2.6	3.3	5.7	7.2	8.6	9.0	8.8	8.2	6.8	5.0	3.2	2.4	70.8
Oasis	2.9	3.3	5.3	6.1	8.5	8.9	8.7	7.9	6.9	4.8	2.9	2.3	68.4
Palm Desert	2.5	3.4	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.6
Palm Springs	2.0	2.9	4.9	7.2	8.3	8.5	11.6	8.3	7.2	5.9	2.7	1.7	71.1
Rancho California	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
Rancho Mirage	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Ripley	2.7	3.3	5.6	7.2	8.7	8.7	8.4	7.6	6.2	4.6	2.8	2.2	67.8
Salton Sea North	2.5	3.3	5.5	7.2	8.8	9.3	9.2	8.5	6.8	5.2	3.1	2.3	71.7
Temecula East II	2.3	2.4	4.1	4.9	6.4	7.0	7.8	7.4	5.7	4.1	2.6	2.2	56.7
Thermal	2.4	3.3	5.5	7.6	9.1	9.6	9.3	8.6	7.1	5.2	3.1	2.1	72.8
Riverside UC	2.5	2.9	4.2	5.3	5.9	6.6	7.2	6.9	5.4	4.1	2.9	2.6	56.4
Winchester	2.3	2.4	4.1	4.9	6.4	6.9	7.7	7.5	6.0	3.9	2.6	2.1	56.8
SACRAMENTO													
Fair Oaks	1.0	1.6	3.4	4.1	6.5	7.5	8.1	7.1	5.2	3.4	1.5	1.0	50.5
Sacramento	1.0	1.8	3.2	4.7	6.4	7.7	8.4	7.2	5.4	3.7	1.7	0.9	51.9
Twitchell Island	1.2	1.8	3.9	5.3	7.4	8.8	9.1	7.8	5.9	3.8	1.7	1.2	57.9
SAN BENITO													
Hollister	1.5	1.8	3.1	4.3	5.5	5.7	6.4	5.9	5.0	3.5	1.7	1.1	45.1
San Benito	1.2	1.6	3.1	4.6	5.6	6.4	6.9	6.5	4.8	3.7	1.7	1.2	47.2
San Juan Valley	1.4	1.8	3.4	4.5	6.0	6.7	7.1	6.4	5.0	3.5	1.8	1.4	49.1
SAN BERNARDINO													
Baker	2.7	3.9	6.1	8.3	10.4	11.8	12.2	11.0	8.9	6.1	3.3	2.1	86.6
Barstow NE	2.2	2.9	5.3	6.9	9.0	10.1	9.9	8.9	6.8	4.8	2.7	2.1	71.7
Big Bear Lake	1.8	2.6	4.6	6.0	7.0	7.6	8.1	7.4	5.4	4.1	2.4	1.8	58.6
Chino	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0	54.6
Crestline	1.5	1.9	3.3	4.4	5.5	6.6	7.8	7.1	5.4	3.5	2.2	1.6	50.8
Lake Arrowhead	1.8	2.6	4.6	6.0	7.0	7.6	8.1	7.4	5.4	4.1	2.4	1.8	58.6
Lucerne Valley	2.2	2.9	5.1	6.5	9.1	11.0	11.4	9.9	7.4	5.0	3.0	1.8	75.3
Needles	3.2	4.2	6.6	8.9	11.0	12.4	12.8	11.0	8.9	6.6	4.0	2.7	92.1
Newberry Springs	2.1	2.9	5.3	8.4	9.8	10.9	11.1	9.9	7.6	5.2	3.1	2.0	78.2
San Bernardino	2.0	2.7	3.8	4.6	5.7	6.9	7.9	7.4	5.9	4.2	2.6	2.0	55.6
Twentynine Palms	2.6	3.6	5.9	7.9	10.1	11.2	11.2	10.3	8.6	5.9	3.4	2.2	82.9
Victorville	2.0	2.6	4.6	6.2	7.3	8.9	9.8	9.0	6.5	4.7	2.7	2.1	66.2

SAN DIEGO													
Chula Vista	2.2	2.7	3.4	3.8	4.9	4.7	5.5	4.9	4.5	3.4	2.4	2.0	44.2
Escondido SPV	2.4	2.6	3.9	4.7	5.9	6.5	7.1	6.7	5.3	3.9	2.8	2.3	54.2
Miramar	2.3	2.5	3.7	4.1	5.1	5.4	6.1	5.8	4.5	3.3	2.4	2.1	47.1
Oceanside	2.2	2.7	3.4	3.7	4.9	4.6	4.6	5.1	4.1	3.3	2.4	2.0	42.9
Otay Lake	2.3	2.7	3.9	4.6	5.6	5.9	6.2	6.1	4.8	3.7	2.6	2.2	50.4
Pine Valley	1.5	2.4	3.8	5.1	6.0	7.0	7.8	7.3	6.0	4.0	2.2	1.7	54.8
Ramona	2.1	2.1	3.4	4.6	5.2	6.3	6.7	6.8	5.3	4.1	2.8	2.1	51.6
San Diego	2.1	2.4	3.4	4.6	5.1	5.3	5.7	5.6	4.3	3.6	2.4	2.0	46.5
Santee	2.1	2.7	3.7	4.5	5.5	6.1	6.6	6.2	5.4	3.8	2.6	2.0	51.1
Torrey Pines	2.2	2.3	3.4	3.9	4.0	4.1	4.6	4.7	3.8	2.8	2.0	2.0	39.8
Warner Springs	1.6	2.7	3.7	4.7	5.7	7.6	8.3	7.7	6.3	4.0	2.5	1.3	56.0
SAN FRANCISCO													
San Francisco	1.5	1.3	2.4	3.0	3.7	4.6	4.9	4.8	4.1	2.8	1.3	0.7	35.1
SAN JOAQUIN													
Farmington	1.5	1.5	2.9	4.7	6.2	7.6	8.1	6.8	5.3	3.3	1.4	0.7	50.0
SAN JOAQUIN													
Lodi West	1.0	1.6	3.3	4.3	6.3	6.9	7.3	6.4	4.5	3.0	1.4	0.8	46.7
Manteca	0.9	1.7	3.4	5.0	6.5	7.5	8.0	7.1	5.2	3.3	1.6	0.9	51.2
Stockton	0.8	1.5	2.9	4.7	6.2	7.4	8.1	6.8	5.3	3.2	1.4	0.6	49.1
Tracy	1.0	1.5	2.9	4.5	6.1	7.3	7.9	6.7	5.3	3.2	1.3	0.7	48.5
SAN LUIS OBISPO													
Arroyo Grande	2.0	2.2	3.2	3.8	4.3	4.7	4.3	4.6	3.8	3.2	2.4	1.7	40.0
Atascadero	1.2	1.5	2.8	3.9	4.5	6.0	6.7	6.2	5.0	3.2	1.7	1.0	43.7
Morro Bay	2.0	2.2	3.1	3.5	4.3	4.5	4.6	4.6	3.8	3.5	2.1	1.7	39.9
Nipomo	2.2	2.5	3.8	5.1	5.7	6.2	6.4	6.1	4.9	4.1	2.9	2.3	52.1
Paso Robles	1.6	2.0	3.2	4.3	5.5	6.3	7.3	6.7	5.1	3.7	2.1	1.4	49.0
San Luis Obispo	2.0	2.2	3.2	4.1	4.9	5.3	4.6	5.5	4.4	3.5	2.4	1.7	43.8
San Miguel	1.6	2.0	3.2	4.3	5.0	6.4	7.4	6.8	5.1	3.7	2.1	1.4	49.0
San Simeon	2.0	2.0	2.9	3.5	4.2	4.4	4.6	4.3	3.5	3.1	2.0	1.7	38.1
SAN MATEO													
Hal Moon Bay	1.5	1.7	2.4	3.0	3.9	4.3	4.3	4.2	3.5	2.8	1.3	1.0	33.7
Redwood City	1.5	1.8	2.9	3.8	5.2	5.3	6.2	5.6	4.8	3.1	1.7	1.0	42.8
Woodside	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
SANTA BARBARA													
Betteravia	2.1	2.6	4.0	5.2	6.0	5.9	5.8	5.4	4.1	3.3	2.7	2.1	49.1
Carpenteria	2.0	2.4	3.2	3.9	4.8	5.2	5.5	5.7	4.5	3.4	2.4	2.0	44.9
Cuyama	2.1	2.4	3.8	5.4	6.9	7.9	8.5	7.7	5.9	4.5	2.6	2.0	59.7
Goleta	2.1	2.5	3.9	5.1	5.7	5.7	5.4	5.4	4.2	3.2	2.8	2.2	48.1
Goleta Foothills	2.3	2.6	3.7	5.4	5.3	5.6	5.5	5.7	4.5	3.9	2.8	2.3	49.6
Guadalupe	2.0	2.2	3.2	3.7	4.9	4.6	4.5	4.6	4.1	3.3	2.4	1.7	41.1
Lompoc	2.0	2.2	3.2	3.7	4.8	4.6	4.9	4.8	3.9	3.2	2.4	1.7	41.1
Los Alamos	1.8	2.0	3.2	4.1	4.9	5.3	5.7	5.5	4.4	3.7	2.4	1.6	44.6
Santa Barbara	2.0	2.5	3.2	3.8	4.6	5.1	5.5	4.5	3.4	2.4	1.8	1.8	40.6
Santa Maria	1.8	2.3	3.7	5.1	5.7	5.8	5.6	5.3	4.2	3.5	2.4	1.9	47.4
Santa Ynez	1.7	2.2	3.5	5.0	5.8	6.2	6.4	6.0	4.5	3.6	2.2	1.7	48.7
Sisquoc	2.1	2.5	3.8	4.1	6.1	6.3	6.4	5.8	4.7	3.4	2.3	1.8	49.2
Solvang	2.0	2.0	3.3	4.3	5.0	5.6	6.1	5.6	4.4	3.7	2.2	1.6	45.6

SANTA CLARA													
Gilroy	1.3	1.8	3.1	4.1	5.3	5.6	6.1	5.5	4.7	3.4	1.7	1.1	43.6
Los Gatos	1.5	1.8	2.8	3.9	5.0	5.6	6.2	5.5	4.7	3.2	1.7	1.1	42.9
Morgan Hill	1.5	1.8	3.4	4.2	6.3	7.0	7.1	6.0	5.1	3.7	1.9	1.4	49.5
Palo Alto	1.5	1.8	2.8	3.8	5.2	5.3	6.2	5.6	5.0	3.2	1.7	1.0	43.0
San Jose	1.5	1.8	3.1	4.1	5.5	5.8	6.5	5.9	5.2	3.3	1.8	1.0	45.3
SANTA CRUZ													
De Laveaga	1.4	1.9	3.3	4.7	4.9	5.3	5.0	4.8	3.6	3.0	1.6	1.3	40.8
Green Valley Rd	1.2	1.8	3.2	4.5	4.6	5.4	5.2	5.0	3.7	3.1	1.6	1.3	40.6
Santa Cruz	1.5	1.8	2.6	3.5	4.3	4.4	4.8	4.4	3.8	2.8	1.7	1.2	36.6
Watsonville	1.5	1.8	2.7	3.7	4.6	4.5	4.9	4.2	4.0	2.9	1.8	1.2	37.7
Webb	1.8	2.2	3.7	4.8	5.3	5.7	5.6	5.3	4.3	3.4	2.4	1.8	46.2
SHASTA													
Burney	0.7	1.0	2.1	3.5	4.9	5.9	7.4	6.4	4.4	2.9	0.9	0.6	40.9
Fall River Mills	0.6	1.0	2.1	3.7	5.0	6.1	7.8	6.7	4.6	2.8	0.9	0.5	41.8
Glenburn	0.6	1.0	2.1	3.7	5.0	6.3	7.8	6.7	4.7	2.8	0.9	0.6	42.1
McArthur	0.7	1.4	2.9	4.2	5.6	6.9	8.2	7.2	5.0	3.0	1.1	0.6	46.8
Redding	1.2	1.4	2.6	4.1	5.6	7.1	8.5	7.3	5.3	3.2	1.4	0.9	48.8
SIERRA													
Downieville	0.7	1.0	2.3	3.5	5.0	6.0	7.4	6.2	4.7	2.8	0.9	0.6	41.3
Sierraville	0.7	1.1	2.2	3.2	4.5	5.9	7.3	6.4	4.3	2.6	0.9	0.5	39.6
SISKIYOU													
Happy Camp	0.5	0.9	2.0	3.0	4.3	5.2	6.1	5.3	4.1	2.4	0.9	0.5	35.1
MacDoel	1.0	1.7	3.1	4.5	5.9	7.2	8.1	7.1	5.1	3.1	1.5	1.0	49.0
Mt Shasta	0.5	0.9	2.0	3.0	4.5	5.3	6.7	5.7	4.0	2.2	0.7	0.5	36.0
Tule lake FS	0.7	1.3	2.7	4.0	5.4	6.3	7.1	6.4	4.7	2.8	1.0	0.6	42.9
Weed	0.5	0.9	2.0	2.5	4.5	5.3	6.7	5.5	3.7	2.0	0.9	0.5	34.9
Yreka	0.6	0.9	2.1	3.0	4.9	5.8	7.3	6.5	4.3	2.5	0.9	0.5	39.2
SOLANO													
Benicia	1.3	1.4	2.7	3.8	4.9	5.0	6.4	5.5	4.4	2.9	1.2	0.7	40.3
Dixon	0.7	1.4	3.2	5.2	6.3	7.6	8.2	7.2	5.5	4.3	1.6	1.1	52.1
Fairfield	1.1	1.7	2.8	4.0	5.5	6.1	7.8	6.0	4.8	3.1	1.4	0.9	45.2
Hastings Tract	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Putah Creek	1.0	1.6	3.2	4.9	6.1	7.3	7.9	7.0	5.3	3.8	1.8	1.2	51.0
Rio Vista	0.9	1.7	2.8	4.4	5.9	6.7	7.9	6.5	5.1	3.2	1.3	0.7	47.0
Suisun Valley	0.6	1.3	3.0	4.7	5.8	7.0	7.7	6.8	5.3	3.8	1.4	0.9	48.3
Winters	0.9	1.7	3.3	5.0	6.4	7.5	7.9	7.0	5.2	3.5	1.6	1.0	51.0
SONOMA													
Bennett Valley	1.1	1.7	3.2	4.1	5.5	6.5	6.6	5.7	4.5	3.1	1.5	0.9	44.4
Cloverdale	1.1	1.4	2.6	3.4	5.0	5.9	6.2	5.6	4.5	2.8	1.4	0.7	40.7
Fort Ross	1.2	1.4	2.2	3.0	3.7	4.5	4.2	4.3	3.4	2.4	1.2	0.5	31.9
Healdsburg	1.2	1.5	2.4	3.5	5.0	5.9	6.1	5.6	4.5	2.8	1.4	0.7	40.8
Lincoln	1.2	1.7	2.8	4.7	6.1	7.4	8.4	7.3	5.4	3.7	1.9	1.2	51.9
Petaluma	1.2	1.5	2.8	3.7	4.6	5.6	4.6	5.7	4.5	2.9	1.4	0.9	39.6
Santa Rosa	1.2	1.7	2.8	3.7	5.0	6.0	6.1	5.9	4.5	2.9	1.5	0.7	42.0
Valley of the Moon	1.0	1.6	3.0	4.5	5.6	6.6	7.1	6.3	4.7	3.3	1.5	1.0	46.1
Windsor	0.9	1.6	3.0	4.5	5.5	6.5	6.5	5.9	4.4	3.2	1.4	1.0	44.2
STANISLAUS													
Denair	1.0	1.9	3.6	4.7	7.0	7.9	8.0	6.1	5.3	3.4	1.5	1.0	51.4
La Grange	1.2	1.5	3.1	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
Modesto	0.9	1.4	3.2	4.7	6.4	7.7	8.1	6.8	5.0	3.4	1.4	0.7	49.7

Newman	1.0	1.5	3.2	4.6	6.2	7.4	8.1	6.7	5.0	3.4	1.4	0.7	49.3
Oakdale	1.2	1.5	3.2	4.7	6.2	7.7	8.1	7.1	5.1	3.4	1.4	0.7	50.3
Patterson	1.3	2.1	4.2	5.4	7.9	8.6	8.2	6.6	5.8	4.0	1.9	1.3	57.3
Turlock	0.9	1.5	3.2	4.7	6.5	7.7	8.2	7.0	5.1	3.4	1.4	0.7	50.2
SUTTER													
Nicolaus	0.9	1.6	3.2	4.9	6.3	7.5	8.0	6.9	5.2	3.4	1.5	0.9	50.2
Yuba City	1.3	2.1	2.8	4.4	5.7	7.2	7.1	6.1	4.7	3.2	1.2	0.9	46.7
TEHAMA													
Corning	1.2	1.8	2.9	4.5	6.1	7.3	8.1	7.2	5.3	3.7	1.7	1.1	50.7
Gerber	1.0	1.8	3.5	5.0	6.6	7.9	8.7	7.4	5.8	4.1	1.8	1.1	54.7
Gerber Dryland	0.9	1.6	3.2	4.7	6.7	8.4	9.0	7.9	6.0	4.2	2.0	1.0	55.5
Red Bluff	1.2	1.8	2.9	4.4	5.9	7.4	8.5	7.3	5.4	3.5	1.7	1.0	51.1
TRINITY													
Hay Fork	0.5	1.1	2.3	3.5	4.9	5.9	7.0	6.0	4.5	2.8	0.9	0.7	40.1
Weaverville	0.6	1.1	2.2	3.3	4.9	5.9	7.3	6.0	4.4	2.7	0.9	0.7	40.0
TULARE													
Alpaugh	0.9	1.7	3.4	4.8	6.6	7.7	8.2	7.3	5.4	3.4	1.4	0.7	51.6
Badger	1.0	1.3	2.7	4.1	6.0	7.3	7.7	7.0	4.8	3.3	1.4	0.7	47.3
Delano	1.1	1.9	4.0	4.9	7.2	7.9	8.1	7.3	5.4	3.2	1.5	1.2	53.6
Dinuba	1.1	1.5	3.2	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
Lindcove	0.9	1.6	3.0	4.8	6.5	7.6	8.1	7.2	5.2	3.4	1.6	0.9	50.6
Porterville	1.2	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.3	3.4	1.4	0.7	52.1
Visalia	0.9	1.7	3.3	5.1	6.8	7.7	7.9	6.9	4.9	3.2	1.5	0.8	50.7
TUOLUMNE													
Groveland	1.1	1.5	2.8	4.1	5.7	7.2	7.9	6.6	5.1	3.3	1.4	0.7	47.5
Sonora	1.1	1.5	2.8	4.1	5.8	7.2	7.9	6.7	5.1	3.2	1.4	0.7	47.6
VENTURA													
Camarillo	2.2	2.5	3.7	4.3	5.0	5.2	5.9	5.4	4.2	3.0	2.5	2.1	46.1
Oxnard	2.2	2.5	3.2	3.7	4.4	4.6	5.4	4.8	4.0	3.3	2.4	2.0	42.3
Piru	2.8	2.8	4.1	5.6	6.0	6.8	7.6	7.8	5.8	5.2	3.7	3.2	61.5
Port Hueneme	2.0	2.3	3.3	4.6	4.9	4.9	4.9	5.0	3.7	3.2	2.5	2.2	43.5
Thousand Oaks	2.2	2.6	3.4	4.5	5.4	5.9	6.7	6.4	5.4	3.9	2.6	2.0	51.0
Ventura	2.2	2.6	3.2	3.8	4.6	4.7	5.5	4.9	4.1	3.4	2.5	2.0	43.5
YOLO													
Bryte	0.9	1.7	3.3	5.0	6.4	7.5	7.9	7.0	5.2	3.5	1.6	1.0	51.0
Davis	1.0	1.9	3.3	5.0	6.4	7.6	8.2	7.1	5.4	4.0	1.8	1.0	52.5
Esparto	1.0	1.7	3.4	5.5	6.9	8.1	8.5	7.5	5.8	4.2	2.0	1.2	55.8
Winters	1.7	1.7	2.9	4.4	5.8	7.1	7.9	6.7	5.3	3.3	1.6	1.0	49.4
Woodland	1.0	1.8	3.2	4.7	6.1	7.7	8.2	7.2	5.4	3.7	1.7	1.0	51.6
Zamora	1.1	1.9	3.5	5.2	6.4	7.4	7.8	7.0	5.5	4.0	1.9	1.2	52.8
YUBA													
Browns Valley	1.0	1.7	3.1	4.7	6.1	7.5	8.5	7.6	5.7	4.1	2.0	1.1	52.9
Brownsville	1.1	1.4	2.6	4.0	5.7	6.8	7.9	6.8	5.3	3.4	1.5	0.9	47.4

* The values in this table were derived from:

1) California Irrigation Management Information System (CIMIS);
2) Reference EvapoTranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999; and
3) Reference Evapotranspiration for California, University of California, Department of Agriculture and Natural Resources (1987) Bulletin 1922,
4) Determining Daily Reference Evapotranspiration, Cooperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426

Appendix B – Sample Water Efficient Landscape Worksheet.

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.
Please complete all sections (A and B) of the worksheet.

SECTION A. HYDROZONE INFORMATION TABLE

Please complete the hydrozone table(s) for each hydrozone. Use as many tables as necessary to provide the square footage of landscape area per hydrozone.

Hydrozone*	**Zone or Valve**	**Irrigation Method****	**Area (Sq. Ft.)**	**% of Landscape Area**
	Total			**100%**

Hydrozone
HW = High Water Use Plants
MW = Moderate Water Use Plants
LW = Low Water Use Plants

****Irrigation Method***
MS = Micro-spray
S = Spray
R = Rotor
B= Bubbler
D= Drip
O = Other

SECTION B. WATER BUDGET CALCULATIONS

Section B1. Maximum Applied Water Allowance (MAWA)

The project's Maximum Applied Water Allowance shall be calculated using theseis equations:

MAWA = (ETo) (0.62) [(0.57 x LA) + (0.3 x SLA)]
where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration from Appendix A (inches per year)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscaped Area includes Special Landscape Area (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
0.3 = the additional ET Adjustment Factors for Special Landscape Area in residential and non-residential areas, respectively (1.0 - 0.7 = 0.3)

Maximum Applied Water Allowance = _____**gallons per year**

Show calculations.

Effective Precipitation (Eppt)

If considering Effective Precipitation, use 25% of annual precipitation. Use the following equation to calculate Maximum Applied Water Allowance:

MAWA= (ETo – Eppt) (0.62) [(0.70.5 x LA) + (0.3 x SLA)]

Maximum Applied Water Allowance = _____**gallons per year**

Show calculations.

Section B2. Estimated Total Water Use (ETWU)

The project's Estimated Total Water Use is calculated using the following formula:

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

where:

ETWU = Estimated total water use per year (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
PF = Plant Factor (see Definitions)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor (to gallons per square foot)
IE = Irrigation Efficiency (minimum 0.71

Hydrozone Table for Calculating ETWU

Please complete the hydrozone table(s). Use as many tables as necessary.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)	Area (HA) (square feet)	PF x HA (square feet)
			Sum	
	SLA			

Estimated Total Water Use = _____gallons

Show calculations.

Appendix B – Sample Water Efficient Landscape Worksheet.

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) _____

Hydrozone # /Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq, ft,)	ETAF x Area	Estimated Total Water Use (ETWU)[e]
Regular Landscape Areas							
				Totals	(A)	(B)	
Special Landscape Areas							
				1			
				1			
				1			
				Totals	(C)	(D)	
						ETWU Total	
						Maximum Allowed Water Allowance (MAWA)[e]	

[a] ***Hydrozone #/Planting Description***
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b] ***Irrigation Method***
overhead spray or drip

[c] ***Irrigation Efficiency***
0.75 for spray head
0.81 for drip

[d] ***ETWU*** **(Annual Gallons Required) =**
Eto x 0.62 x ETAF x Area
where 0.62 is a conversion factor that acre-inches per acre per year to gallons per square foot per year.

[e] ***MAWA (Annual Gallons Allowed) = (****Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]*
where 0.62 is a conversion factor that acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet,
and ETAF is .55 for residential areas and 0.45 for non-residential areas.

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)
Total Area	(A)
Average ETAF	**B ÷ A**

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	(B+D)
Total Area	(A+C)
Sitewide ETAF	**(B+D) ÷ (A+C)**

Appendix C – Sample Certificate of Completion.

CERTIFICATE OF COMPLETION

This certificate is filled out by the project applicant upon completion of the landscape project.

PART 1. PROJECT INFORMATION SHEET

Date		
Project Name		
Name of Project Applicant	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Project Address and Location:

Street Address		Parcel, tract or lot number, if available.
City		Latitude/Longitude (optional)
State	Zip Code	

Property Owner or his/her designee:

Name	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Property Owner

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

_____

Property Owner Signature Date

Please answer the questions below:

1. Date the Landscape Documentation Package was submitted to the local agency_____
2. Date the Landscape Documentation Package was approved by the local agency_____
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the local water purveyor_____

PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

"I/we certify that based upon periodic site observations, the work has been ~~substantially~~ completed in accordance with the ordinance and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package."

Signature*	Date	
Name (print)	Telephone No.	
	Fax No.	
Title	Email Address	
License No. or Certification No.		
Company	Street Address	
City	State	Zip Code

*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor.

PART 3. IRRIGATION SCHEDULING

Attach parameters for setting the irrigation schedule on controller per ordinance Section 492.10.

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

Attach schedule of Landscape and Irrigation Maintenance per ordinance Section 492.11.

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT

Attach Landscape Irrigation Audit Report per ordinance Section 492.12.

PART 6. SOIL MANAGEMENT REPORT

Attach soil analysis report, if not previously submitted with the Landscape Documentation Package per ordinance Section 492.6~~5~~.

Attach documentation verifying implementation of recommendations from soil analysis report per ordinance Section 492.6~~5~~.

Appendix D – Sample Water Efficient Landscape Worksheet.

Appendix D – Prescriptive Compliance Option

(a) This appendix contains prescriptive requirements which may be used as a compliance option to the Model Water Efficient Landscape Ordinance.

(b)Compliance with the following items is mandatory and must be documented on a landscape plan in order to use the prescriptive compliance option:

(1) Submit a Landscape Documentation Package which includes the following elements:

(A) date

(B) project applicant

(C) project address (if available, parcel and/or lot number(s))

(D) total landscape area (square feet), including a breakdown of turf and plant material

(E) project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)

(F) water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well

(G) contact information for the project applicant and property owner

(H) applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to the MWELO".

(2) Incorporate compost at a rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscape area (unless contra-indicated by a soil test);

(3) Plant material shall comply with all of the following;

(A) For residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water; For non-residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

(B) A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.

(4) Turf shall comply with all of the following:

(A) Turf shall not exceed 25% of the landscape area in residential areas, and there shall be no turf in non-residential areas;

(B) Turf shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length;

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

(5) Irrigation systems shall comply with the following:

(A) Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data.

(B) Irrigation controllers shall be of a type which does not lose programming date in the event the primary power source is interrupted.

(C) Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range.

(D) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.

(E) All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC 802-2014. "Landscape Irrigation Sprinkler and Emitter Standard," All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

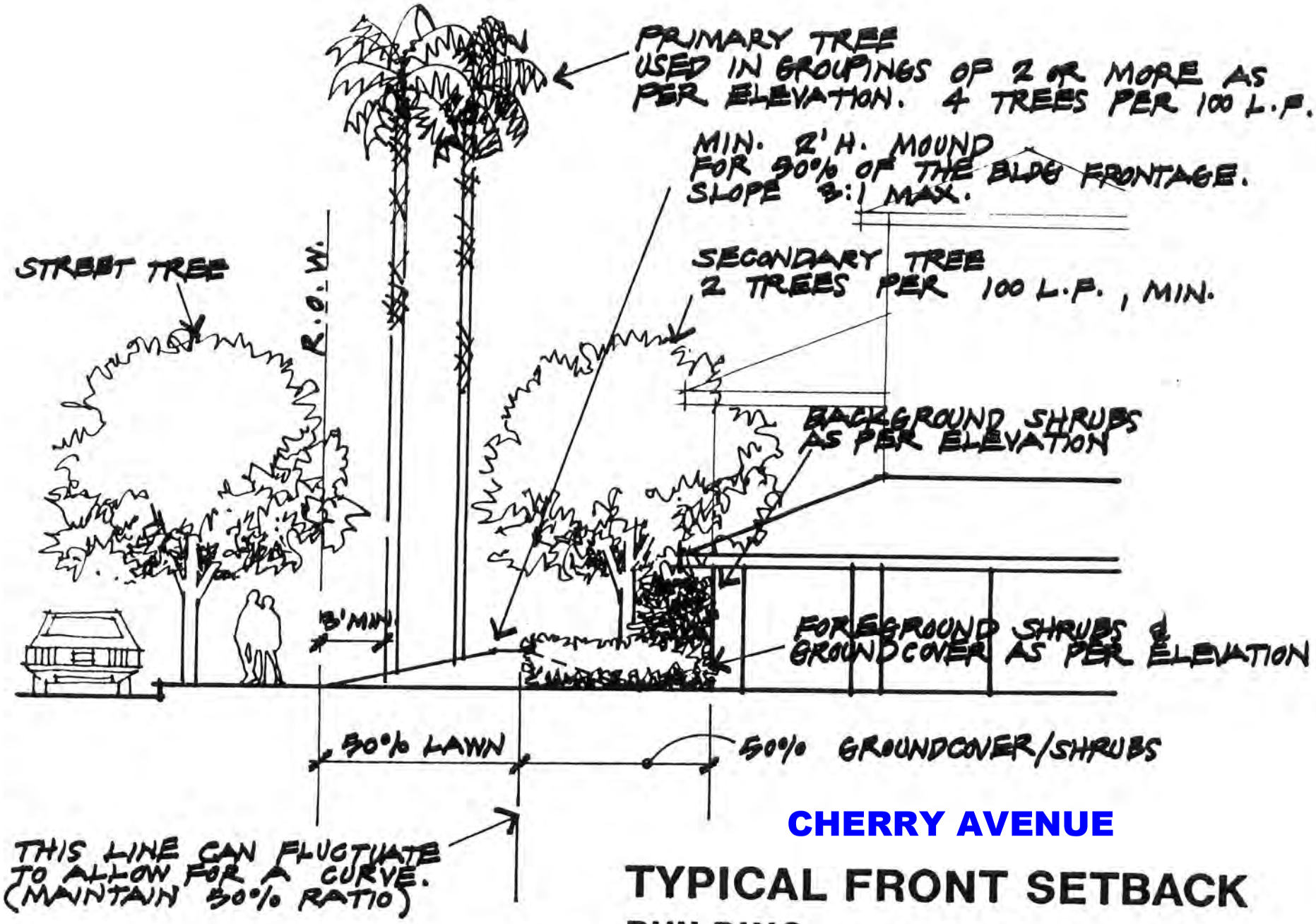
(c) At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule and a schedule of landscape and irrigation maintenance.

LANDSCAPE GUIDELINES

CHERRY/SPRING/WILLOW CORRIDORS

CITY OF SIGNAL HILL

Attachment D



TYPICAL FRONT SETBACK

BUILDING

EXHIBIT B

RESOLUTION NO. _____

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF THE SIGNAL HILL RECOMMENDING CITY COUNCIL APPROVAL OF ORDINANCE AMENDMENT 15-04 REPEALING CHAPTER 13.10 OF THE MUNICIPAL CODE AND REPLACING IT WITH REVISED STATE MANDATED WATER CONSERVATION REGULATIONS, LIMITING TURF, IMPROVING IRRIGATION EFFICIENCY AND REFINING ON-SITE STORM WATER CAPTURE IN NEW DEVELOPMENT AND AMENDING TITLE 20 BY ADDING LANDSCAPING AND HARDSCAPE STANDARDS FOR TURF REPLACEMENT IN EXISTING DEVELOPMENT

WHEREAS, the waters of the State of California are of limited supply and are subject to ever increasing demands; and

WHEREAS, the continuation of the State of California's economic prosperity is dependent on adequate supplies of water being available for future uses; and

WHEREAS, it is the policy of the State of California and the City of Signal Hill to promote conservation and efficient use of water and to prevent the waste of this valuable resource; and

WHEREAS, landscapes are essential to the quality of life in the State of California and the City of Signal Hill by providing areas for active and passive recreation; an aesthetic enhancement of the built environment; and by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; and

WHEREAS, landscape design, installation and maintenance can and should be water efficient; and

WHEREAS, Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use; and

WHEREAS, in 1990, the State adopted AB325, the Water Conservation in Landscaping Act, to promote the conservation and efficient use of water in landscape irrigation. The law required local jurisdictions to adopt the State's Model Water Efficient Landscape Ordinance (Model Ordinance) or one providing the same degree of conservation and efficiency standards. Agencies that failed to adopt a local ordinance were required to enforce the Model Ordinance; and

WHEREAS, On February 16, 1993, in response to the law, the City Council adopted Signal Hill Municipal Code (SHMC) Chapter 13.10, Water Conservation in Landscaping, which incorporated the mandated provisions of the Model Ordinance; and

WHEREAS, in 2006, the Act was revised with the passage of AB 1881. The update recognized that California was already a leader in water use efficiency but reflected the need to promote further efficiency improvements to meet future water demands. Under the Act, local jurisdictions had to adopt the State's revised Model Ordinance or equivalent; and

WHEREAS, on December 15, 2009, the City Council approved amendments to Chapter 13.10 based on the revised Model Ordinance; and

WHEREAS, in 2014, the Governor declared a state of drought in California and called for a reduction of water use and mandated water use reductions; and

WHEREAS, on May 20, 2014, the City adopted Parkway Design Guidelines to provide guidance to property owners planning to replace turf in parkways with drought tolerant materials; and

WHEREAS, in April 2015, the Governor signed an executive order directing the State Department of Water Resources to prepare a model ordinance to reduce outdoor water use and assist with the drought; and

WHEREAS, on May 19, 2015, in response to the State Water Resources Control Board emergency regulations implementing a statewide overall reduction in potable water use of 25 percent, the City Council declared a Level 2 water shortage condition in accordance with SHMC Chapter 13.03, and authorized staff to seek a Metropolitan Water District turf replacement rebate for the Civic Center Parkway Demonstration Landscaping Project; and

WHEREAS, on June 9, 2015, the Planning Commission conducted a study session on water conservation to consider best practices and a potential ordinance amendment to establish regulations for turf replacement. The Commission expressed concerns about some hardscape materials, design applications, proportions and maintenance. The Commission directed staff to conduct a public workshop to engage the community and obtain feedback on turf replacement alternatives prior to developing an ordinance amendment; and

WHEREAS, on July 10, 2015, the City was approved for a Metropolitan Water District turf replacement rebate for the civic center parkway demonstration landscaping project; and

WHEREAS, on July 14, 2015, the City conducted a public workshop to further educate residents about drought conditions, the State mandate to conserve more water, and to engage the public and obtain feedback on alternative turf replacement materials and design applications; and

WHEREAS, on July 14, 2015, the Planning Commission conducted a second study session regarding turf replacement, alternative landscape materials and

existing code requirements for landscape and hardscape in residential yards. The Commission expressed support for maintaining a variety of choices and for simplified regulations as well as for permeable materials and on-site water retention. The Commission expressed support for maintaining a variety of choices, for simplified regulations, permeable materials, on-site water retention and methods to avoid excessive hardscape. The Commission also recommended development of flexible guidelines for preferred landscape materials; and

WHEREAS, on July 15, 2015, the California Water Commission approved the revisions to the State's Model Ordinance mandated by the Governor (Attachment C). Significant provisions include a deadline for adoption by December 1, 2015 and an annual requirement that all local agencies report the status of implementation and enforcement (first report due by December 31, 2015). Cities that have not adopted their own ordinance by the deadline are required to enforce the State's Model Ordinance; and

WHEREAS, on August 11, 2015, the Planning Commission conducted a third study session to review public input from the turf replacement workshop and consider regulations for residential turf replacement. The regulations focused on limiting hardscape in front yard setbacks while maximizing off-street parking opportunities. The Commission approved of the proposed regulation scenarios and direction was given to proceed with consideration of commercial regulations; and

WHEREAS, on September 8, 2015, the Planning Commission conducted a fourth study session to consider regulations for commercial turf replacement. The regulations would emphasize that turf is neither required or preferred in commercial front and street side setbacks, would limited hardscape to driveways and walkways and would repeal the LO Landscape Overlay District and associated landscape guidelines for the Cherry Avenue, Spring Street and Willow Avenue corridors that call for 50% of the front setback to be turf; and

WHEREAS, on September 15, 2015, the City Council approved an amendment to Chapter 13.03 of the SHMC, the City's Water Conservation Program Ordinance. The amendment updates the six year old ordinance to reflect the latest and best techniques for conserving water, such as making the distinction between standard irrigation sprinkler heads and newly available low flow designs and other changes to enhance community understanding, increase water savings and clarify requirements. Watering dates were revised to be consistent with the City of Long Beach watering days; and

WHEREAS, on September 22, 2015, the Sustainable City Committee reviewed the State Mandated Model Water Efficient Landscape Ordinance for new development and received a presentation on the proposed turf replacement regulations and hardscape limits for existing commercial and residential development; and

WHEREAS, the project is exempt from requirements of the California Environmental Quality Act (CEQA) pursuant to Sections 15307 and 15308 of the CEQA Guidelines in that it is an action authorized by the State for protection of natural resources and the environment.

NOW, THEREFORE, BE IT RESOLVED, that the Planning Commission of the City of Signal Hill, California, has considered the public comments and finds as follows:

1. That Ordinance Amendment 15-04 is consistent with applicable State law.

2. That the Planning Commission has reviewed Ordinance Amendment 15-04 and found the proposed amendment to be in the best interest of the community and its health, safety and general welfare in that it is consistent with the following Goals and Policies of the Signal Hill General Plan:

<u>LAND USE ELEMENT GOAL 3</u> – Assure a safe, healthy, and aesthetically pleasing community for residents and businesses.

Land Use Policy 3.12 – Encourage and promote high quality design and physical appearance in all development projects.

Finding regarding Policy 3.12 – The ordinance amendment adopts the State model water efficient landscape ordinance for new development and large landscape renovations. It also allows and encourages turf replacement for existing residential and commercial setbacks with drought resistant landscape materials, while limiting hardscape to improve overall design, function and appearance.

Land Use Policy 3.16 – Review and revise, as necessary, the City's development standards to improve the quality of new development and protect the public health and safety.

Finding regarding Policy 3.16 – The ordinance amendment will protect the public health and safety by providing regulations consistent with State regulations to limit turf, reduce water use and protect water quality for new development.

ENVIRONMENTAL GOAL 5 – Ensure minimal degradation to the physical environment from development or operational activities, and require restoration to the environment where degradation has occurred.

Environmental Policy 5.2 – Protect water quality and conserve water supplies through reducing and eliminating contamination from industrial operations or resource development activities. Cooperate and participate in regional water quality and water supply plans, programs and implementation measures.

Finding regarding Policy 5.2 – The Ordinance complies with the State regulations to conserve water use and protect water quality for both new and existing development throughout the city.

NOW, THEREFORE, BE IT FURTHER RESOLVED, that the Planning Commission does hereby recommend City Council approval of Ordinance Amendment 15-04 as follows:

Section 1. That Chapter 13.10 entitled, WATER CONSERVATION IN LANDSCAPING of the Signal Hill Municipal Code, be repealed and replaced to read as follows:

Chapter 13.10
WATER CONSERVATION IN LANDSCAPING

Sections:

13.10.010 Purpose.
13.10.020 Applicability.
13.10.030 Definitions.
13.10.040 Provisions for new construction or rehabilitated landscapes.
13.10.050 Compliance with landscape documentation package.
13.10.060 Penalties.
13.10.070 Elements of the landscape documentation package.
13.10.080 Water efficient landscape worksheet.
13.10.090 Soil management report.
13.10.100 Landscape design plan.
13.10.110 Irrigation design plan.
13.10.120 Grading design plan.
13.10.130 Certificate of completion.
13.10.140 Irrigation scheduling.
13.10.150 Landscape and irrigation maintenance schedule.
13.10.160 Irrigation audit, irrigation survey, and irrigation water use analysis.
13.10.170 Irrigation efficiency.
13.10.180 Recycled water.
13.10.185 Graywater systems.
13.10.190 Stormwater management and rainwater retention.
13.10.200 Public education.
13.10.210 Irrigation audit, irrigation survey, and irrigation water use analysis for existing landscapes.
13.10.220 Water waste prevention.
13.10.230 Effective precipitation.
13.10.240 Reporting.

13.10.010 Purpose. A. The state legislature has found that:

1. The waters of the state are of limited supply and are subject to ever increasing demands;

2. The continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;

3. It is the policy of the state to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

4. Landscapes are essential to the quality of life in California, by providing areas for active and passive recreation, and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; and

5. Landscape design, installation, maintenance and management can and should be water efficient; and

6. Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

B. Consistent with these legislative findings, the purpose of this chapter is to:

1. Promote the values and benefits of landscaping practices that integrate and go beyond the conservation and efficient use of water;~~landscapes, while recognizing the need to invest water and other resources as efficiently as possible;~~

2. Establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects by encouraging the use of a watershed approach that requires cross-sector collaboration of industry, government and property owners to achieve the many benefits possible;

3. Establish provisions for water management practices and water waste prevention for existing landscapes;

4. Use water efficiently without waste by setting a maximum applied water allowance as an upper limit for water use, and reduce water use to the lowest practical amount;

5. Promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;

6. Encourage the use economic incentives that promote the efficient use of water; and

7. Encourage implementation and enforcement of the provisions of the water conservation in landscaping ordinance.

C. Landscapes that are planned, designed, installed, managed and maintained with the watershed based approach can improve California's environmental conditions and provide benefits and realize sustainability goals. Such landscapes will make the urban environment resilient in the face of climatic extremes. Consistent with the legislative findings and purpose of the Ordinance, conditions in the urban setting will be improved by:

1. Creating the conditions to support life in the soil by reducing compaction, incorporating organic matter that increases water retention, and promoting productive plant growth that leads to more carbon storage, oxygen production, shade, habitat, and esthetic benefits.

2. Minimizing energy use by reducing irrigation water requirements, reducing reliance on petroleum based fertilizers and pesticides, and planting climate appropriate shade trees in urban areas.

3. Conserving water by capturing and reusing rainwater and graywater wherever possible and selecting climate appropriate plants that need minimal supplemental water after establishment.

4. Protecting air and water quality by reducing power equipment use and landfill disposal trips, selecting recycled and locally sourced materials, and using compost, mulch and efficient irrigation equipment to prevent erosion.

5. Protecting existing habitat and creating new habitat by choosing local native plants, climate adapted non-natives and avoiding invasive plants. Utilizing integrated pest management with least toxic methods as the first course of action.

13.10.020 Applicability. A. After ~~January 1, 2010,~~ December 1, 2015, and consistent with Executive Order No. B-29-15, this chapter shall apply to all of the following landscape projects:

1. New development projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;

2. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;

~~1. New construction and rehabilitated landscapes for public agency projects and private development projects, with a landscape area equal to or greater than two thousand five hundred square feet, requiring a building or landscape permit, plan check or design review;~~

~~2. New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects, with a landscape area equal to or greater than two thousand five hundred square feet, requiring a building or landscape permit, plan check or design review;~~

~~3. New construction landscapes that are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects, with a total project landscape area equal to or greater than five thousand square feet, requiring a building or landscape permit, plan check or design review;~~

~~4.~~3. Existing landscapes limited to Sections 13.10.210 and 13.10.220; and

~~5.~~4. Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 13.10.080, 13.10.150 and 13.10.160; and existing cemeteries are limited to Sections 13.10.210 and 13.10.220.

B. The reporting requirements of this chapter ordinance shall become effective no later than February 1, 2016.

C. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this ordinance or conform to the prescriptive measures contained in the Sample Water Efficient Landscape Worksheet, on file and available in the Community Development Department.

D. For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2500 sq. ft of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to the Sample Water Efficient Landscape Worksheet, on file and available in the Community Development Department.

B.E This chapter does not apply to:

1. Registered local, state or federal historical sites;

2. Ecological restoration projects that do not require a permanent irrigation system;

3. Mined-land reclamation projects that do not require a permanent irrigation system; or

4. Existing ~~P~~plant collections, as part of botanical gardens and arboretums open to the public.

13.10.030 Definitions. The terms used in this chapter have the meanings set forth below:

A. "Applied water" means the portion of water supplied by the irrigation system to the landscape.

B. "Automatic irrigation controller" means a~~n automatic~~ timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

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

D. "Certificate of completion" means the document required under Section 13.10.130.

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

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

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

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

I. "Compost" means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

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

K. "Distribution uniformity" means the measure of the uniformity of irrigation water over a defined area.

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

~~K.~~M. "Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

~~L.~~N. "Effective precipitation" or "usable rainfall" ("Eppt") means the portion of total precipitation that becomes available for plant growth.

~~M.~~O. "Emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.

~~N.~~P. "Established landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

~~O.~~Q. "Establishment period of the plants" means the first year after installing the plant in the landscape, or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

~~P.~~R. "Estimated total water use" ("ETWU") means the total water used for the landscape as described in Section 13.10.070.

~~Q.~~S. "ET adjustment factor" ("ETAF") means a factor of ~~0.7~~.55 for residential areas and 0.45 for non-residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.

~~A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET adjustment factor is (0.7) = (0.5/0.71).~~ The ETAF for ~~a~~ new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

~~R.~~T. "Evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

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

V. "Flow sensor" means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

W. "Friable" means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

X. "Fuel Modification Plan Guideline" means guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.

Y. "Graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers. Health and Safety Code Section 17922.12.

~~T.~~Z. "Hardscapes" means any durable material (pervious and non-pervious).

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

~~V.~~AA. "Hydrozone" means a portion of the landscaped area having plants with similar water needs and rooting depth. A hydrozone may be irrigated or non-irrigated.

~~W.~~BB. "Infiltration rate" means the rate of water entry into the soil, expressed as a depth of water per unit of time (e.g., inches per hour).

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

~~Y.~~DD. "Irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a certified landscape irrigation auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association's Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency "Watersense" labeled auditing program.

~~Z.~~EE. "Irrigation efficiency" ("IE") means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The ~~minimum average~~ irrigation efficiencies~~y~~ for purposes of this chapter ~~is 0.71~~are 0.75 for overhead spray devices and 0.81 for drip systems. ~~Greater irrigation efficiency can be expected from well designed and maintained systems.~~

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

~~BB~~GG. "Irrigation water use analysis" means an analysis of water use data based on meter readings and billing data.

~~CC~~HH. "Landscape architect" means a person who holds a license to practice landscape architecture under the California Business and Professions Code, Section 5615.

~~DD~~II. "Landscape area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the maximum applied water allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or

non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

~~EE~~JJ. "Landscape contractor" means a person licensed by the State of California to construct, maintain, repair, install or subcontract the development of landscape systems.

~~FF~~KK. "Landscape documentation package" means the documents required under Section 13.10.070.

~~GG~~LL. "Landscape project" means total area of landscape in a project, as defined in "landscape area" for the purposes of this chapter, meeting requirements under Section 13.10.020.

MM. "Landscape water meter" means an inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

~~HH~~NN. "Lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

~~II~~OO. "Local water purveyor" means any entity, including a public agency, city, county, or private water company that provides retail water service.

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

~~KK~~QQ. "Main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

RR. "Master shut-off valve" is an automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.

~~LL~~SS. "Maximum applied water allowance" ("MAWA") means the upper limit of annual applied water for the established landscaped area as specified in Section 13.10.080. It is based upon the area's reference evapotranspiration, the ET adjustment factor, and the size of the landscape area. The estimated total water use shall not exceed the maximum applied water allowance. Special landscape areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water, are subject to the MAWA with an ETAF not to exceed 1.0. MAWA = (ETo) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)].

TT. "Median" is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.

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

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

~~OO~~WW. "Mulch" means any organic material, such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel ~~and~~ or decomposed granite, left loose and applied to the soil surface for the beneficial purposes of reducing

evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

~~PP~~XX. "New construction" means, for the purposes of this chapter, a new building with a landscape, or other new landscape, such as a park, playground or greenbelt, without an associated building.

YY. "Non-residential landscape" means landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.

~~QQ~~ZZ. "Operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

~~RR~~AAA. "Overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., spray heads and rotors).

~~SS~~BBB. "Overspray" means the irrigation water that is delivered beyond the target area.

~~TT~~CCC. "Permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.

~~UU~~DDD. "Pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.

~~VV~~EEE. "Plant factor" or "plant water use factor" is a factor that, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this chapter, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is ~~0~~ 0.1 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this chapter are derived from the ~~Department of Water Resources' 2000~~ publication "Water Use Classification of Landscape Species." Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).

~~WW. "Precipitation rate" means the rate of application of water measured in inches per hour.~~

~~XX~~FFF. "Project applicant" means the individual or entity submitting a landscape documentation package required under Section 13.10.070, to request a permit, plan check, or site plan and design review approval from the city. A project applicant may be the property owner or his or her designee.

~~YY~~GGG. "Rain sensor" or "rain-sensing shutoff device" means a component that automatically suspends an irrigation event when it rains.

~~ZZ~~HHH. "Record drawings" or "as-builts" means a set of reproducible drawings that show significant changes in the work made during construction, and that are usually based on drawings marked up in the field and other data furnished by the contractor.

~~AAA~~III. "Recreational area" means areas, excluding private single family residential areas, ~~dedicated to~~ designated for active play, recreation or public assembly ~~such as~~ in parks, sports fields, picnic grounds, amphitheaters ~~and~~ or golf course~~s,~~ tees, fairways, roughs, surrounds and greens.~~where turf provides a playing surface.~~

~~BBB~~JJJ. "Recycled water," "reclaimed water," or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for non-potable uses

such as landscape irrigation and water features. This water is not intended for human consumption.

~~CCC~~KKK. "Reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters that affect the water use of plants. ETo is expressed in inches per day, month or year as represented in the reference evapotranspiration table available from the Community Development D~~d~~irector, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the maximum applied water allowance so that regional differences in climate can be accommodated.

LLL. "Regional Water Efficient Landscape Ordinance" means a local Ordinance adopted by two or more local agencies, water suppliers and other stakeholders for implementing a consistent set of landscape provisions throughout a geographical region. Regional ordinances are strongly encouraged to provide a consistent framework for the landscape industry and applicants to adhere to.

~~DDD~~MMM. "Rehabilitated landscape" means any re-landscaping project that requires a permit, plan check or design review, meets the requirements of Section 13.10.020, and the modified landscape area is equal to or greater than two thousand five hundred square feet~~, is fifty per cent of the total landscape area, and the modifications are completed within one year~~.

NNN. "Residential landscape" means landscapes surrounding single or multifamily homes.

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

~~FFF~~PPP. "Soil moisture-sensing device" or "soil moisture sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

~~GGG~~QQQ. "Soil texture" means the classification of soil based on its percentage of sand, silt and clay.

~~HHH~~RRR. "Special landscape area" ("SLA") means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water~~ and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface~~.

~~III~~SSS. "Sprinkler head" means a device that delivers water through a nozzle.

~~JJJ~~TTT. "Static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.

~~KKK~~UUU. "Station" means an area served by one valve or by a set of valves that operate simultaneously.

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

WWW "Submeter" means a metering device to measure water applied to the landscape that is installed after the primary utility water meter.

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

~~NNN~~YYY. "Valve" means a device used to control the flow of water in the irrigation system.

~~OOO~~ZZZ. "Water-conserving plant species" means a plant species identified as having a very low or low plant factor.

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

~~QQQ~~BBBB. "Watering window" means the time of day irrigation is allowed.

~~RRR~~CCCC. "WUCOLS" means the "Water Use Classification of Landscape Species" published in 2000 by the University of California Cooperative Extension, and the Department of Water Resources ~~and the Bureau of Reclamation~~ 2014.

13.10.040 Provisions for new construction or rehabilitated landscapes. The community development director (herein "director") may designate an agent or another agency to implement some or all of the requirements contained in this chapter.

13.10.050 Compliance with landscape documentation package. A. Prior to construction, the director or designee shall:

1. Provide the project applicant with the ordinance and procedures for permits, plan checks, or design reviews;
2. Review the landscape documentation package submitted by the project applicant;
3. Approve or deny the landscape documentation package;
4. Issue a permit or approve the plan check or design review for the project applicant; and
5. Upon approval of the landscape documentation package, submit a copy of the water efficient landscape worksheet to the public works director/city engineer.

B. Prior to construction, the project applicant shall submit a landscape documentation package to the director.

C. Upon approval of the landscape documentation package by the director, the project applicant shall:

1. Receive a permit or approval of the plan check or design review, and record the date of the permit in the certificate of completion;
2. Submit a copy of the approved landscape documentation package, along with the record drawings and any other information, to the property owner or his/her designee; and

3. Submit a copy of the water efficient landscape worksheet to the public works director/city engineer.

13.10.060 Penalties. Violations of this chapter are considered water waste and are subject to the penalties contained in Section 13.03.100.

13.10.070 Elements of the landscape documentation package. A. The landscape documentation package shall include the following six elements:

1. Project information;
   a. Date;
   b. Project applicant;
   c. Project address (if available, parcel and/or lot number(s));
   d. Total landscape area (square feet);
   e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
   f. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
   g. Checklist of all documents in landscape documentation package
   h. Project contacts to include contact information for the project applicant and property owner
   i. Applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete landscape documentation package".
2. Water efficient landscape worksheet;
   a. Hydrozone information table;
   b. Water budget calculations:
      i. Maximum applied water allowance (MAWA);
      ii. Estimated total water use (ETWU);
3. Soil management report;
4. Landscape design plan;
5. Irrigation design plan; and
6. Grading design plan.

13.10.080 Water efficient landscape worksheet. A. A project applicant shall complete the water efficient landscape worksheet that contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the evapotranspiration adjustment factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of Special Landscape Areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected. The Maximum Applied Water Allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The Estimated Total Water Use (ETWU) is calculated based on the plants used and irrigation method selected for the landscape design. ETWU must be below the MAWA~~two sections~~ (sample available from the director):

~~1. A hydrozone information table (sample available from director) for the landscape project; and~~

~~2. A water budget calculation (sample available from director) for the landscape project. For the calculation of~~

1. In calculating the maximum applied water allowance and estimated total water use, a project applicant shall use the ETo values from the reference evapotranspiration table which is on file and available from the Community Development Department ~~director~~.

B. Water budget calculations shall adhere to the following requirements:

1. The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR). The plant factor ranges from 0 to 0.1 for very low water using plants, 0.1 ~~0~~ to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

2. All water features shall be included in the high water use hydrozone, and temporarily irrigated areas shall be included in the low water use hydrozone.

3. All special landscape areas shall be identified and their water use calculated as described below.

4. ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0.

~~C. Maximum Applied Water Allowance. The maximum applied water allowance shall be calculated using the equation:~~

~~MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]~~

~~The example calculations below are hypothetical to demonstrate proper use of the equations and do not represent an existing and/or planned landscape project. The ETo values used in these calculations are from the reference evapotranspiration table available from the director, for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.~~

~~1. Example MAWA calculation: a hypothetical landscape project in Fresno, California, with an irrigated landscape area of fifty thousand square feet, without any special landscape area (SLA) = 0, no edible plants, recreational areas, or use of recycled water). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches as listed in the reference evapotranspiration table.~~

~~MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]~~
~~MAWA = Maximum applied water allowance (gallons per year)~~
~~ETo = Reference evapotranspiration (inches per year)~~
~~0.62 = Conversion factor (to gallons)~~
~~0.7 = ET adjustment factor (ETAF)~~
~~LA = Landscape area including SLA (square feet)~~
~~0.3 = Additional water allowance for SLA~~
~~SLA = Special landscape area (square feet)~~

MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 0)] = 1,108,870 gallons per year

To convert from gallons per year to hundred-cubic-feet per year:

= 1,108,870/748 = 1,482 hundred-cubic-feet per year

(100 cubic feet = 748 gallons)

2. In this next hypothetical example, the landscape project in Fresno, California, has the same ETo value of 51.1 inches and a total landscape area of fifty thousand square feet. Within the fifty-thousand-square-foot project, there is now a two-thousand-square-foot area planted with edible plants. This two-thousand-square-foot area is considered to be a special landscape area.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 2,000 square feet)]

= 31.68 x [35,000 + 600] gallons per year

= 31.68 x 35,600 gallons per year

=1,127,808 gallons per year or 1,508 hundred-cubic-feet per year

D. Estimated Total Water Use. The estimated total water use shall be calculated using the equation below. The sum of the estimated total water use calculated for all hydrozones shall not exceed MAWA.

Where:

ETWU = estimated total water use per year (gallons)

ETo = Reference evapotranspiration (inches)

PF = Plant factor from WUCOLS (see Section 491)

HA = Hydrozone area [high, medium, and low water use areas] (square feet)

SLA = Special landscape area (square feet)

0.62 = Conversion factor

IE = Irrigation efficiency (minimum 0.71)

1. Example ETWU calculation: landscape area is fifty thousand square feet; plant water use type, plant factor, and hydrozone area are shown in the table below. The ETo value is 51.1 inches per year. There are no special landscape areas (recreational area, area permanently and solely dedicated to edible plants, and area irrigated with recycled water) in this example.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	10,000	7,000
3	Medium	0.5	16,000	8,000
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
		Sum		24,700

*Plant factor from WUCOLS

= 1,102,116 gallons per year

Compare ETWU with MAWA: For this example MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 0)] = 1,108,870 gallons per year. The ETWU (1,102,116 gallons per year) is less

~~than MAWA (1,108,870 gallons per year). In this example, the water budget complies with the MAWA.~~

~~2. Example ETWU calculation: total landscape area is fifty thousand square feet, two thousand square feet of which is planted with edible plants. The edible plant area is considered a special landscape area (SLA). The reference evapotranspiration value is 51.1 inches per year. The plant type, plant factor, and hydrozone area are shown in the table below.~~

~~Hydrozone Plant Water Use Type(s) Plant Factor (PF)* Hydrozone Area (HA) (square feet) PF x HA (square feet)~~

~~1~~	~~High~~	~~0.8~~	~~7,000~~	~~5,600~~
~~2~~	~~High~~	~~0.7~~	~~9,000~~	~~6,300~~
~~3~~	~~Medium~~	~~0.5~~	~~15,000~~	~~7,500~~
~~4~~	~~Low~~	~~0.3~~	~~7,000~~	~~2,100~~
~~5~~	~~Low~~	~~0.2~~	~~10,000~~	~~2,000~~
	~~Sum~~			~~23,500~~
~~6~~	~~SLA~~	~~1.0~~	~~2,000~~	~~2,000~~

~~*Plant factor from WUCOLS~~

~~= (31.68) (33,099 + 2,000)~~

~~= 1,111,936 gallons per year~~

~~Compare ETWU with MAWA. For this example: MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 2,000)]~~

~~= 31.68 x [35,000 + 600]~~

~~= 31.68 x 35,600~~

~~= 1,127,808 gallons per year~~

~~The ETWU (1,111,936 gallons per year) is less than MAWA (1,127,808 gallons per year). For this example, the water budget complies with the MAWA.~~

13.10.090 Soil management report. In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows: A. Submit soil samples to a laboratory for analysis and recommendations.

1. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

2. The soil analysis ~~may~~ shall include:

   a. Soil texture;

   b. Infiltration rate determined by laboratory test or soil texture infiltration rate table;

   c. pH;

   d. Total soluble salts;

   e. Sodium;

   f. Percent organic matter; and

   g. Recommendations.

3. In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.

B. The project applicant, or his/her designee, shall comply with one of the following:

1. If significant mass grading is not planned, the soil analysis report shall be submitted to the local agency as part of the landscape documentation package; or

2. If significant mass grading is planned, the soil analysis report shall be submitted to the local agency as part of the certificate of completion.

C. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

D. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with certificate of completion.

13.10.100 Landscape design plan. A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the landscape documentation package.

1. Plant Material.

a. Any plant may be selected for the landscape, provided the estimated total water use in the landscape area does not exceed the maximum applied water allowance. ~~To encourage the efficient use of water, the following is highly recommended~~ Methods to achieve water efficiency shall include one or more of the following:

i. Protection and preservation of native species and natural vegetation;

ii. Selection of water-conserving plant, tree and turf species especially local native plants;

iii. Selection of plants based on local climate suitability, disease and pest resistance;

iv. Selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and

v. Selection of plants from local and regional landscape program plant lists.

vi. Selection of plants from local Fuel Modification Plan Guidelines.

b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 13.10.110A.2.d.

c. Plants shall be selected and planted appropriately, based upon their adaptability to the climatic, geologic and topographical conditions of the project site. ~~To encourage the efficient use of water, the following is highly recommended:~~ Methods to achieve water efficiency shall include one or more of the following:

i. Use the Sunset Western Climate Zone System, which takes into account temperature, humidity, elevation, terrain, latitude and varying degrees of continental and marine influence on local climate;

ii. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); allow for adequate soil volume for healthy root growth; and

iii. Consider the solar orientation for plant placement, to maximize summer shade and winter solar gain.

d. Turf is not allowed on slopes greater than twenty-five per cent, where the toe of the slope is adjacent to an impermeable hardscape, and where twenty-five per cent means one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).

e. High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.

~~e~~.f A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches. Refer to the local Fuel Modification Plan guidelines.

~~f~~g. The use of invasive ~~and/or noxious~~ plant species, such as those listed by the California Invasive Plant Council, is strongly discouraged.

~~g~~h. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

2. Water Features.

a. Recirculating water systems shall be used for water features.

b. Where available, recycled water shall be used as a source for decorative water features.

c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

d. Pool and spa covers are highly recommended.

3. Soil Preparation, Mulch and Amendments.

a. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.

b. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 13.10.090).

c. For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

~~a.~~d. A minimum ~~two~~ three-inch layer of mulch shall be applied on all exposed soil surfaces of planting areas, except in turf areas, creeping or rooting

groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to 5 % of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.

~~b~~e. Stabilizing mulching products shall be used on slopes that meet current engineering standards.

~~c~~f. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

g. Organic mulch materials made from recycled or post-consumer shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local Fuel Modification Plan Guidelines or other applicable local ordinances.

~~d. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 13.10.090).~~

B. At a minimum, the landscape design plan shall:

1. Delineate and label each hydrozone by number, letter or other method;

2. Identify each hydrozone as low, moderate, high water or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;

3. Identify recreational areas;

4. Identify areas permanently and solely dedicated to edible plants;

5. Identify areas irrigated with recycled water;

6. Identify type of mulch and application depth;

7. Identify soil amendments, type, and quantity;

8. Identify type and surface area of water features;

9. Identify hardscapes (pervious and non-pervious);

10. Identify location, ~~and~~ installation details 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 inquire to the Community Development and Public Works Departments for information on any applicable stormwater technical requirements. Stormwater best management practices are encouraged in the landscape design plan. Examples are provided in Section 13.10.190: ~~include, but are not limited to:~~

~~a. Infiltration beds, swales and basins that allow water to collect and soak into the ground;~~

~~b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and~~

~~c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, and the like) that minimize runoff.~~

11. Identify any applicable rain harvesting or catchment technologies ~~(e.g., rain gardens, cisterns, and the like);~~ as discussed in Section 13.10.190 and their 24-hour retention or infiltration capacity;

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

~~12~~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;" and

~~13~~14. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

13.10.110 Irrigation design plan. A. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the landscape documentation package.

1. System

a. To facilitate water management, ~~dedicated~~ landscape water meters defined as either a dedicated water service meter or private submeter,~~are highly recommended on landscape areas smaller than five thousand square feet.~~ shall be installed for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000 sq.ft. (the level at which *State Water Code* 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:

1. A customer service meter dedicated to landscape use provided by the local water purveyor; or

~~2~~. A privately owned meter or submeter.

b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.

c. If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is required ~~The irrigation system shall be designed~~ to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

i. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices, such as inline pressure regulators, booster pumps or other devices, shall be installed to meet the required dynamic pressure of the irrigation system.

ii. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These

pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

d. Sensors (rain, freeze, wind, and the like), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during rain or windy or freezing weather.

e. Manual shut-off valves (such as a gate valve, ball valve or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

f. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to Section 13.05.040 for additional backflow prevention requirements.

g. ~~High F~~flow sensors that detect ~~and report~~ high flow conditions created by system damage or malfunction are ~~recommended~~ required for all non-residential landscapes and residential landscapes of 5000 sq. ft. or larger.

h. Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.

~~h~~i. The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

~~i~~j. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

~~j~~k. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

~~k~~l. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria, as described in Section 13.10.080, regarding the maximum applied water allowance.

m. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard, All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

~~l~~n. It is highly recommended that the project applicant or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

~~m~~o. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

~~n~~p. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

~~o~~g. Head-to-head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

~~p~~r. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turf.

~~q~~s. Check valves or anti-drain valves are required ~~for all irrigation systems~~ on all sprinkler heads where low point drainage could occur.

~~r~~t. ~~Narrow or irregularly shaped areas, including turf~~, Areas less than ~~eight~~ ten feet wide in any direction shall be irrigated with subsurface irrigation or ~~low volume irrigation system~~ other means that produces no runoff or overspray.

~~s~~u. Overhead irrigation shall not be permitted within twenty-four inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel or other porous material. These restrictions may be modified if:

i. The landscape area is adjacent to permeable surfacing and no runoff occurs; or

ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

iii. The irrigation designer specifies an alternative design or technology as part of the landscape documentation package, and clearly demonstrates strict adherence to irrigation system design criteria in Section 13.10.110A.1.h. Prevention of overspray and runoff must be confirmed during the irrigation audit.

~~t~~v. Slopes greater than twenty-five per cent shall not be irrigated with an irrigation system with an application ~~precipitation~~ rate exceeding three-quarters of an inch per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology as part of the landscape documentation package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

2. Hydrozone.

a. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

b. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.

d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

i. Plant factor calculation is based on the proportions of the respective plant water uses and their plant factors; or

ii. The plant factor of the higher water-using plant is used for calculations.

e. Individual hydrozones that mix high and low water use plants shall not be permitted.

f. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the hydrozone information table ~~(~~which is on file and available from the Community Development Department~~director)~~. This table can also assist with the irrigation audit and programming the controller.

B. The irrigation design plan, at a minimum, shall contain:

1. Location and size of separate water meters for landscape;

2. Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture-sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;

3. Static water pressure at the point of connection to the public water supply;

4. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;

5. The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and

6. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

13.10.120 Grading design plan. A. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff and water waste. A grading plan shall be submitted as part of the landscape documentation package. A comprehensive grading plan prepared by a civil engineer for other local agency permits satisfies this requirement.

1. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

a. Height of graded slopes;

b. Drainage patterns;

c. Pad elevations;

d. Finish grade; and

e. Stormwater retention improvements, if applicable.

2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:

a. Grade so that all irrigation and normal rainfall remain within property lines and do not drain onto non-permeable hardscapes;

b. Avoid disruption of natural drainage patterns and undisturbed soil; and

c. Avoid soil compaction in landscape areas.

3. The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan", and shall bear the signature of a licensed professional as authorized by law.

13.10.130 Certificate of completion. A. The certificate of completion (a sample is on file and available from the Community Development Department~~director)~~ shall include the following six elements:

1. Project information sheet that contains:

a. Date;

b. Project name;

c. Project applicant name, telephone number(s), and mailing address;

d. Project address and location; and

e. Property owner name, telephone number(s), and mailing address;

2. a. Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved landscape documentation package;

b. Where there have been significant changes made in the field during construction, these as-built or record drawings shall be included with the certification;

c. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.

3. Irrigation scheduling parameters used to set the controller (see Section 13.10.140);

4. Landscape and irrigation maintenance schedule (see Section 13.10.150);

5. Irrigation audit report (see Section 13.10.160); and

6. Soil analysis report, if not submitted with landscape documentation package, and documentation verifying implementation of soil report recommendations (see Section 13.10.090).

B. The project applicant shall:

1. Submit the signed certificate of completion to the director for review;

2. Ensure that copies of the approved certificate of completion are submitted to the local water purveyor and property owner or his or her designee.

C. The director shall:

1. Receive the signed certificate of completion from the project applicant;

2. Approve or deny the certificate of completion. If the certificate of completion is denied, the director shall provide information to the project applicant regarding reapplication, appeal or other assistance.

13.10.140 Irrigation scheduling. A. For the efficient use of water, all irrigation schedules shall be developed, managed and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

1. Irrigation scheduling shall be regulated by automatic irrigation controllers.

2. Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from any city-imposed water conservation restrictions (such as those contained in Chapter13.03), the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

3. For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the estimated total water use. Total annual applied water shall be less than or equal to maximum applied water allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

4. Parameters used to set the automatic controller shall be developed and submitted for each of the following:

   a. The plant establishment period;
   b. The established landscape; and
   c. Temporarily irrigated areas.

5. Each irrigation schedule shall consider for each station all of the following that apply:

   a. Irrigation interval (days between irrigation);
   b. Irrigation run times (hours or minutes per irrigation event to avoid runoff);
   c. Number of cycle starts required for each irrigation event to avoid runoff;
   d. Amount of applied water scheduled to be applied on a monthly basis;
   e. Application rate setting;
   f. Root depth setting;
   g. Plant type setting;
   h. Soil type;
   i. Slope factor setting;
   j. Shade factor setting; and
   k. Irrigation uniformity or efficiency setting.

13.10.150 Landscape and irrigation maintenance schedule. A. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the certificate of completion.

B. A regular maintenance schedule shall include, but not be limited to, routine inspection; auditing, adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; topdressing with compost, replenishing mulch; fertilizing; pruning; weeding in all landscape areas; and removing ~~any~~ obstructions to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

C. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents or with components with greater efficiency.

D. A project applicant is encouraged to implement established landscape industry sustainable Best Practices ~~or environmentally-friendly practices~~ for ~~over~~all landscape maintenance activities.

13.10.160 Irrigation audit, irrigation survey, and irrigation water use analysis. A. All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.

B. In large projects or projects with multiple landscape installations (i.e., production home developments) an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.

~~B~~C. For new construction and rehabilitated landscape projects installed after ~~January 1, 2010~~ December 1, 2015, as described in Section 13.10.020:

1. The project applicant shall submit an irrigation audit report with the certificate of completion to the director, which may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;

2. The director shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the maximum applied water allowance.

13.10.170 Irrigation efficiency. A. For the purpose of determining ~~maximum applied water allowance~~ estimated total water use, average irrigation efficiency is assumed to be ~~0.71~~ 0.75 for overhead spray devices and 0.81 for drip system devices. ~~Irrigation systems shall be designed, maintained and managed to meet or exceed an average landscape irrigation efficiency of 0.71.~~

13.10.180 Recycled water. A. The installation of recycled water irrigation systems shall not be required ~~as~~ by the city, as the local water purveyor, has determined that

recycled water meeting all public health codes and standards is not and will not be available for the foreseeable future.

13.10.185 Graywater systems. A. Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards. Refer to Chapter 13.10.020 D, for the applicability of this ordinance to landscape areas less than 2,500 square feet with the estimated total water use met entirely by graywater.

13.10.190 Stormwater management and rainwater retention. A. Stormwater management practices minimize runoff and increase infiltration, which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans, to minimize runoff and to increase on-site rainwater retention and infiltration, is encouraged.

B. Project applicants shall refer to Chapter 12.16 for information on applicable stormwater technical requirements.~~regulations and stormwater management plans.~~

C. All planted landscape areas are required to have friable soil to maximize water retention and infiltration. Refer to Chapter 13.10.100.

D. It is strongly recommended that landscape areas be designed for capture and infiltration capacity that is sufficient to prevent runoff from impervious surfaces (i.e. roof and paved areas) from either: the one inch, 24-hour rain event or (2) the 85th percentile, 24-hour rain event, and/or additional capacity as required by any applicable local, regional, state or federal regulation.

E. It is recommended that storm water projects incorporate any of the following elements to improve on-site storm water and dry weather runoff capture and use:

1. Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.

2. Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.

3. Incorporate pervious or porous surfaces (e.g., gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.

4. Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water capture and reuse.

5. Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.

6. Incorporate infiltration beds, swales, basins and drywells to capture storm water and dry weather runoff and increase percolation into the soil.

7. Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

~~C. Rain gardens, cisterns, and other landscape features and practices that increase rainwater capture and create opportunities for infiltration and/or on-site storage are recommended.~~

13.10.200 Public education. A. Publications.

1. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.

2. The director shall provide information to owners of new permitted renovations and new~~,~~ single-family residential homes regarding the design, installation, management and maintenance of water efficient landscapes based on a water budget.

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

1. Signs shall be used to identify the model as an example of a water efficient landscape, featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use as designed per the local ordinance; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.

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

13.10.210 Irrigation audit, irrigation survey, and irrigation water use analysis for existing landscapes. A. This section shall apply to all existing landscapes that were installed before ~~January 1, 2010,~~ December 1, 2015, and are over one acre in size.

1. For all landscapes in this subsection that have a water meter, the director shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys and irrigation audits, to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the maximum applied water allowance for existing landscapes. The maximum applied water allowance for existing landscapes shall be calculated as: MAWA = (0.8) (ETo)(LA)(0.62).

2. For all landscapes in this subsection that do not have a water meter, the director shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits, to evaluate water use and provide recommendations as necessary in order to prevent water waste.

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

13.10.220 Water waste prevention. A. The director shall enforce restrictions to prevent water waste resulting from inefficient landscape irrigation, by prohibiting runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions are contained in Section 13.03.100.

B. Restrictions regarding overspray and runoff may be modified if:

1. The landscape area is adjacent to permeable surfacing and no runoff occurs; or

2. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

13.10.230 Effective precipitation. The director may consider effective precipitation (twenty-five per cent of annual precipitation) in tracking water use, and may use the following equation to calculate maximum applied water allowance:

MAWA = (ETo - Eppt) (0.62) [(~~0.7~~0.55 x LA) + (~~0.3~~0.45 x SLA)] for residential areas. MAWA= (ETo - Eppt) (0.62) [(0.45 x LA) + (0.55 x SLA)] for non-residential areas.

13.10.240 Reporting. A. The director shall prepare a report on implementation and enforcement of the updated ordinance. The report shall be submitted to the State by December 31, 2015. Subsequently, reporting will be due by January 31st of each year.

B. Reports are to address the following:

1. A statement as to whether a single agency ordinance or a regional agency alliance ordinance is being adopted, and the date of adoption or anticipated date of adoption.

2. A description of the reporting period. The reporting period shall commence on December 1, 2015 and the end on December 28, 2015. In subsequent years, reporting will be for the calendar year.

3. A statement as to whether a locally modified Water Efficient Landscape Ordinance (WELO) or the MWELO is being adopted. If using a locally modified WELO, how is it different than MWELO, is it at least as efficient as MWELO, and are there any exemptions specified?

4. A statement as to what entity is responsible for implementing the ordinance.

5. A statement as to the number and types of projects subject to the ordinance during the specified reporting period.

6. A statement as to the total area (in square feet or acres) subject to the ordinance over the reporting period, if available.

7. The number of new housing starts, new commercial projects, and landscape retrofits during the reporting period.

8. The procedure for review of projects subject to the ordinance.

9. A description of the actions taken to verify compliance such as: a plan check, or site inspection and by what entity. Whether a post-installation audit required and if so, by whom.

10. A description of enforcement measures.

11. An explanation of challenges to implementing and enforcing the ordinance.

12. A description of educational and other needs to properly apply the ordinance.

Section 2. That Title 8 Chapter 8.12, entitled “Nuisances,” Section 8.12.010(Q)5, is hereby added to reads as follows:

8.12.010(Q)

5. Failure to maintain a sufficient combination of landscape plant materials to non-plant materials in front and side yards, pursuant to the “Sufficient Materials Exhibit” on file in the Community Development Department.

The determination of whether the combination of plant materials is so insufficient as to be a nuisance, shall be made by the Director of Community Development and shall be based on a comparison of the landscape materials of the exhibit of photographs entitled, Sufficient Plant Materials Exhibit,” dated November 3, 2015.

Section 3. That Title 20 Chapter 20.04, entitled “Definitions,” is hereby amended to add Section 20.04.364 to reads as follows:

20.04.364 Hardscape.

“Hardscape” means paved or installed materials both permeable and non-permeable such as concrete, greencrete, pavers, asphalt, or a combination of such materials.

Section 4. That Title 20 Chapter 20.04, entitled “Definitions,” is hereby amended to repeal and replace Section 20.04.426 to reads as follows:

20.04.426 Landscaping and Landscape Materials.

"Landscaping" and “Landscape Materials” means the planting and maintenance of some combination of trees, shrubs, vines, groundcovers, flowers, turf or lawns and, in addition, the combination or design may include natural materials or features such as bark, mulch, rock, stone, and structural features including fountains, reflecting pools, artwork, screens, walls, fences, and benches. The combination of plant and natural materials shall be consistent with the “Sufficient Plant Materials” Exhibit pursuant to Chapter 8.12, entitled “Nuisances”, Section 8.12.010(Q)5.

Section 5. That Title 20, Chapter 20.46, entitled “LO Landscape Overlay District,” is hereby repealed in its entirety.

Section 6. That Title 20, Chapter 20.10, entitled “Residential Districts,” is hereby amended to add Section 20.10.072 to read as follows:

20.10.072 Landscape materials and turf replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area

2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or greater.

Section 7. That Title 20, Chapter 20.20, entitled "Commercial Districts," is hereby amended to add Section 20.20.055 to read as follows:

20.20.055 Landscape materials and turf replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 8. That Section 20.40.072, SP-1, Town Center East Specific Plan, is hereby added as follows:

20.40.072 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 9. That Section 20.42.045, SP-2, Hilltop Specific Plan District, is hereby added as follows:

20.42.045 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 10. That Section 20.45.035, SP-3, Town Center West Specific Plan District, is hereby added as follows:

20.45.035 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 11. That Section 20.47.062, SP-4, Auto Center Specific Plan, is hereby added as follows:

20.47.062 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 12. That Section 20.48.035, SP-5, California Crown Specific Plan, is hereby added as follows:

20.48.035 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area

2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 13. That Section 20.49.065, SP-6, Commercial Corridor Specific Plan, is hereby added as follows:

20.49.065 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 14. That Section 20.41.085, Area One, SP-7, Special Purpose Housing Specific Plan, is hereby added as follows:

20.41.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 15. That Section 20.41.245, Area Two, SP-7, Special Purpose Housing Specific Plan, is hereby added as follows:

20.41.245 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 16. That Section 20.41.635, Area Four, SP-7, Special Purpose Housing Specific Plan, are hereby added as follows:

20.41.635 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited

to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 17. That Section 20.41.865, Area Five, SP-7, Special Purpose Housing Specific Plan, is hereby added as follows:

20.41.865 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 18. That Section 20.41.952, Area Six, SP-7, Special Purpose Housing Specific Plan, is hereby added as follows:

20.41.952 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 19. That Section 20.43.085, SP-8 Signal Hill Village Specific Plan, is hereby added as follows:

20.43.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 20. That Section 20.44.035, SP-9, Bixby Ridge Specific Plan District, is hereby added as follows:

20.44.035 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 21. That Section 20.30.042, SP-10, Pacific Coast Highway Specific Plan, is hereby added as follows:

20.30.042 Landscape Materials and Turf Replacement. A. Residential properties shall comply with the requirements of Section 20.10.072, "Residential Districts".

B. Commercial properties shall comply with the requirements of Section 20.20.055, "Commercial Districts.

Section 22. That Section 20.31.035, SP-11, Crescent Heights Historic District Specific Plan, is hereby added as follows:

20.31.035 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 23. That Section 20.32.047, SP-12, Freeway Self-Storage Specific Plan, is hereby added as follows:

20.32.047 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 24. That Sections 20.33.085 and 20.33.255, SP-13, Cherry Avenue Corridor Residential Specific Plan, are hereby added as follows:

20.33.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

20.33.255 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 25. That Section 20.34.085, SP-14, Hathaway Ridge Residential Specific Plan, is hereby added as follows:

20.34.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)

3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 26. That Section 20.35.085, SP-15, Cityview Residential Specific Plan, is hereby added as follows:

20.35.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 27. That Section 20.36.085, SP-16, Villagio Residential Specific Plan, is hereby added as follows:

20.36.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the

maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development Turf in new development is subject to Chapter 13.10..

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 28. That Section 20.37.085, SP-17, Crescent Square Residential Specific Plan, is hereby added as follows:

20.37.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10' (max. width)
2 car garage	20' (max. width)
3 or more car garage	30' (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 29. That Section 20.38.085, SP-18, Pacificwalk Residential Specific Plan, is hereby added as follows:

20.38.085 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

Section 30. That Section 20.39.075, SP-19, General Industrial Specific Plan is hereby added as follows:

20.39.075 Landscape Materials and Turf Replacement. A. Maximum Allowed Hardscape. Hardscape in front and street side setbacks is limited to driveways and walkways only (hardscape includes paved materials, both permeable and non-permeable). The remaining area shall be landscaped and maintained.

B. Turf in new development. Turf in new development is subject to Chapter 13.10.

C. Turf replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2,500 square feet or larger.

Section 31. That Section 20.29.962, SP-20, Freeman Heights Residential Specific Plan, is hereby added as follows:

20.29.962 Landscape Materials and Turf Replacement. A. Maximum % Hardscape Area. With the exception of the established Driveway Allowance, the maximum area of hardscape material (permeable or non-permeable) within the front setback shall be limited to 25% of the setback area (includes walkways, patios and courtyards, but excludes driveways).

1. Area of front setback – area of driveway = remaining front setback area
2. Remaining front setback area x 25% = total allowed hardscape area

B. Driveway Allowance. Driveways serving garages, or providing on-site parking (for properties without garages) are excluded from the maximum allowed 25% of hardscape material in front yard setbacks.

Driveway Allowance is based on garage capacity and size.

Garage Capacity	*Driveway Allowance*
0-1 car garage	10’ (max. width)
2 car garage	20’ (max. width)
3 or more car garage	30’ (max. width)

C. Turf in new development. Turf in new development is subject to Chapter 13.10.

D. Turf Replacement.

1. Turf is not a required or preferred landscape material. Drought tolerant landscape materials that retain water on site are strongly encouraged when replacing existing turf.

2. Pursuant to Chapter 13.10, turf may not be replaced in landscape areas of 2500 square feet or larger.

PASSED, APPROVED, AND ADOPTED, at a regular meeting of the Planning Commission of the City of Signal Hill on this 13th day of October, 2015.

_____
JANE FALLON
CHAIR

ATTEST:

_____
SCOTT CHARNEY
COMMISSION SECRETARY

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES)ss.
CITY OF SIGNAL HILL)

I, SCOTT CHARNEY, Secretary of the Planning Commission of the City of Signal Hill, California, hereby certify that Resolution No. _____was adopted at a regular meeting of the Planning Commission held on the 13th day of October, 2015 by the following vote.

AYES:

NOES:

ABSTAIN:

ABSENT:

_____
SCOTT CHARNEY
COMMISSION SECRETARY

October 3

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **DIRECTOR'S REPORT – CHANGES TO MEETING DATES**

Summary:

At the October 6, 2015 City Council meeting, the second reading of the ordinance to change City Council dates was approved by a vote of 4/1. Effective November, 2015, meetings will now be held on the 2nd and 4th Tuesdays of the month. Accordingly, meeting dates for the Planning Commission and Sustainable City Committee will change as follows:

	Recurring dates	2015	2016
City Council	2nd and 4th Tuesdays	11/03/15 11/24/15 12/08/15 12/22/15	See website for 2016 dates
Planning Commission	3rd Tuesdays	11/10/15 12/15/15	01/19/16 02/16/16 03/15/16 04/19/16 05/17/16 06/21/16 07/19/16 08/16/16 09/20/16 10/18/16 11/15/16 12/20/16
Sustainable City Committee	1st Tuesday	Effective after 9/22/15 meeting	01/05/16 03/01/16 05/03/16 07/05/16 09/06/16

Recommendation:

Receive and file.

October 4

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **MINUTES**

Summary:

Attached for your review and approval are the minutes of last month's regular meeting.

Recommendation:

Approve.

A REGULAR MEETING OF THE CITY OF SIGNAL HILL
PLANNING COMMISSION
September 8, 2015
7:00 P.M.

CALL TO ORDER

Chair Fallon called the meeting to order at 7:00 p.m.

ROLL CALL

The Commission Secretary conducted roll call.

Present: Chair Fallon
Vice-Chair Devon Austin
Commissioner Tom Benson
Commissioner Shannon Murphy
Commissioner Rose Richárd

Staff present:

1) Community Development Director Scott Charney
2) Senior Planner Colleen Doan
3) Assistant City Attorney David Kwon
4) Sr. Engineering Technician II Anthony Caraveo

In addition, there were 0 people in attendance.

PLEDGE OF ALLEGIANCE

Chair Fallon led the audience in reciting the Pledge of Allegiance.

PUBLIC BUSINESS FROM THE FLOOR

There was no public business from the floor.

DIRECTOR'S REPORT

(1) Roadmap for Adoption of the State Mandated Water Efficient Landscape Ordinance and Commercial Turf Replacement Regulations

Senior Planner Colleen Doan gave the staff report.

Vice-Chair Austin asked if developers of projects currently in process, such as Gundry Hill, would be asked to reconsider landscaping options which were previously approved prior to current drought conditions.

Staff advised that what had been approved were conceptual landscape plans. The developer is in plan check and will be required to comply with the new standards.

Commissioner Benson noted confusing definitions in the Model Water Efficient Landscape Ordinance for partial landscapes. Staff advised that a consultant is overseeing the verbiage of the Ordinance. Commissioner Benson also asked about providing better definitions of greywater and captured rain water. Staff advised these are incentives rather than requirements, but agreed better definitions would help clarify qualification provisions.

Staff advised the Maximum Applied Water Allowance (MAWA) calculations and the evaporation provisions have undergone significant changes in the new code. However, consultants and industry professionals have already been training on the new standards and their reports reflect installations have been consistent with updated plans.

Commissioner Benson asked about requirements for greywater and rainwater retention. Staff advised that LID requirements are separate regulations from the Ordinance.

Commissioner Benson asked about commercial turf replacement, limiting the hardscape, and encouraging swales to keep water on-site. Staff advised there will not be an incentive for swales in order to retain options, and that residential guidelines will emphasize water retention and minimizing water run-off.

Commissioner Benson asked if the artificial turf at the new BMW dealership will be in compliance with the goals being developed, and staff confirmed it is. Commissioner Benson stated that trees need a greater amount of water than turf, and staff confirmed there will not be amendments regarding watering of trees or hand watering. Staff also explained that larger projects have soils analyses which may affect a different level of water demand due to soil conditions.

Chair Fallon asked if there were any further questions from the Commission, and stated she thought staff had been very thorough.

Vice-Chair Austin asked if there would be considerations for future commercial projects that are close to residential areas. Staff advised once the Ordinance is adopted all projects will fall under the requirements. Current projects fall under the existing water efficient landscape ordinance.

Commissioner Benson asked if information was available about the reflection of heat from artificial turf. Staff advised that while researching qualities of artificial turf that issue was not addressed. Commissioner Benson noted that a grass-like image softens the appearance of an area and asked if such a common theme was desirable. Staff advised that new projects generally have a variety of treatments with only a limited amount of artificial turf and that most of the setback is comprised of other plant materials.

Chair Fallon asked for the reason for lack of turf at Fresh & Easy. Staff explained that the need was to be able to service the parking lot oil well which resulted in the use of rock in that area. Also, there is a slope which required a complex stormwater retention system. Some landscape plantings balance the site.

Staff indicated that significant direction had been received and will bring standards back for a Public Hearing.

CONSENT CALENDAR

(2) Minutes of the Following Meeting

Regular Meeting of August 11, 2015.

Recommendation: Approve.

(3) City Council Follow-up

Summary: Attached for review is a brief summary on the City Council's action from the August 18, 2015 and September 1, 2015 meetings.

Recommendation: Receive and file.

(4) Development Status Report

Summary: Attached for review is the monthly Development Status Report which highlights current projects.

Recommendation: Receive and file.

(5) In the News

Summary: Articles compiled by staff that may be of interest to the Commission.

Recommendation: Receive and file.

It was moved by Commissioner Benson and seconded by Commissioner Richárd to receive and file the Consent Calendar.

The motion carried 5/0.

COMMISSION NEW BUSINESS

Commissioner Richárd asked if the City had begun preparing for projected rain from the El Niño weather system in order to prevent flooding. Staff indicated the Public Works Department will have sand available for sandbags and that they will follow up with Public Works. The Building Department will also be sending a reminder to developers of their obligation to install stormwater best management practices for projects under construction.

Commissioner Benson suggested storm grates be cleaned, and staff advised they will pass the request to the appropriate department. The City is also talking with

Signal Hill Petroleum, the independent oil operators, and trucking and storage yards regarding stormwater issues.

Staff also advised that some stormwater requirements are now affecting the oil industry. They must demonstrate appropriate dikes and berms. The City is looking to adopt a Vacant Parcel Ordinance in the near future to decrease dirt flowing into storm drains. The City is working with a consultant to find effectual and cost effective methods to do so.

Commissioner Benson asked if red-lined comments of ordinance amendments might be printed in color for easier reading; staff advised the model Ordinance was provided only in black and white but would try to have that available in the future.

Commissioner Benson noted that mulch in parkways tends to wash away in heavy rains. Staff advised that the guidelines will include information regarding maintenance responsibility as well as pros and cons to aid residents in making choices.

Commissioner Benson mentioned that lava rock material and decomposed granite wear over time. Staff advised that those working with landscaping contractors may need to emphasize alternatives such as edging and creating a lip in order to retain water on-site. Commissioner Benson also mentioned a storage yard on a sloped site which appeared to have a fair amount of dirt piled along with a number of vehicles. Staff advised they will follow up about the storage yard.

Commissioner Benson noted there are landscaping and trees on 21st Street which may die soon due to lack of water. Staff will pass on as appropriate.

Commissioner Murphy stated the traffic flow at Costco gas station was problematic and that she has seen vehicles driving outside the prescribed lanes. When she spoke with the attendant, he stated he had not noticed. Staff advised that Costco is still within their one-year review period for the CUP and that providing remedies is still in process. The relocation of the Wells Fargo ATM is also under consideration.

Commissioner Murphy asked if information was available regarding the landscaping for the Willow Ridge HOA entry area. Staff advised the plans and scope of work could be forwarded to her, and that staff would note if the landscaping triggered the new requirements.

Commissioner Richárd stated a Fish-O-Licious restaurant will be coming to the former City Mex location and will be managed by the former Khoury's owner. This may also increase the traffic in the Town Center East area. Staff advised that a meeting is scheduled with RED, the shopping center manager, and with Costco to discuss traffic concerns.

Chair Fallon stated that she had previously nominated Arkraft for the beautification award, however, drought resistant plants had been removed. Staff advised other

requirements had not been completed correctly and that the nomination can be rescinded.

Commissioner Benson announced the Signal Hill Historical Society's Pancake Breakfast on September 19, 2015 at the Applebee's restaurant.

ADJOURNMENT

It was moved by Commissioner Richárd and seconded by Commissioner Benson to adjourn to the next regular meeting of the Planning Commission to be held on Tuesday, October 13, 2015, at 7:00 p.m., in the Council Chamber of City Hall, 2175 Cherry Avenue, Signal Hill, CA, 90755.

The motion carried 5/0.

Chair Fallon adjourned the meeting at 7:55 p.m.

_____
Jane Fallon
Chair

Attest:

_____
Scott Charney
Commission Secretary

October 5

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **SAVE THE DATES - 2015 FALL EVENTS**

Summary:

The City has several events planned for the next two months.

- The Mayor's Clean-Up – October 17, 2015
- Halloween Carnival – October 24, 2015
- Mulch Day – November 7, 2015

Flyers are attached for your information. Staff appreciates participation by volunteers who help make these events successful.

Recommendation:

Receive and file.

Volunteers Wanted - We need YOU
to join our crew for a
day of service to the community!

MAYOR'S CLEAN-UP
OCTOBER 17, 2015

Place: ***North End Neighborhood***

Staging Area: ***Reservoir Park, 3315 Gundry Avenue***

Date: ***Saturday, October 17, 2015***

Time: ***9:00 a.m. to 11:00 a.m.***

What to bring: ***Work or garden gloves and extended grippers***

The City will provide water and a light snack. We'll have trash bags, and we have a limited number of extended grippers to lend. We encourage you to bring your own gloves but some will also be available.

An RSVP is not required. If you have questions, please contact Community Development at (562) 989-7340.

The event will be cancelled with inclement weather.

Hosted by the Sustainable City Committee.

THANKS FOR PITCHING IN!

City of Signal Hill • 2175 Cherry Avenue • Signal Hill, CA 90755
www.cityofsignalhill.org

Reservoir Park is located on the south side of Wardlow Road between Gundry and Brayton Avenues. Street parking is available.

Orientation for the event will begin at 9:00 and the clean-up is open to participation anytime between 9:00 a.m. and 11:00 a.m.

City of Signal Hill

City of Signal Hill • 2175 Cherry Avenue • Signal Hill, CA 90755
www.cityofsignalhill.org

CITY OF SIGNAL HILL
COMMUNITY SERVICES DEPARTMENT PRESENTS

HALLOWEEN CARNIVAL

BROUGHT TO YOU BY SIGNAL HILL PETROLEUM

SATURDAY OCTOBER 24

3:00 PM to 6:00 PM

SIGNAL HILL PARK
2175 CHERRY AVENUE

CHILD FRIENDLY COSTUMES WELCOMED,
BRING YOUR OWN TREAT BAG.

ALL AGES WELCOME!

BUY A $3.00 WRISTBAND AT THE CARNIVAL
(WRISTBAND REQUIRED FOR ALL ACTIVITIES)

LIVE DJ
STAGE SHOW
JUMPERS

CRAFTS
GAMES

CANDY
PRIZES

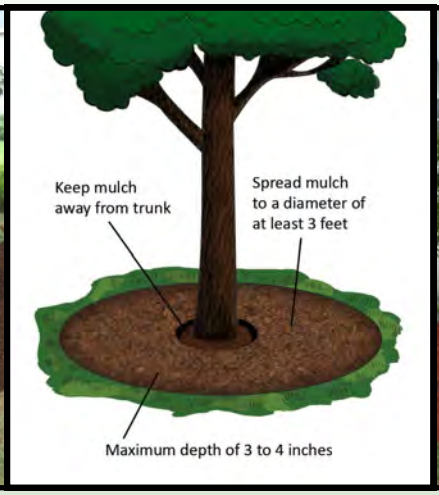
PIZZA
POPCORN
DRINKS

EVENT SPONSORED BY:
MESA ENVIRONMENTAL, SIGNAL HILL PETROLEUM, HOOMAN NISSAN OF LONG BEACH, SIGNAL HILL EMPLOYEES ASSOCIATION, ROSSMOOR PASTRIES, SIGNAL TRIBUNE NEWSPAPER, UNLIMITED ENVIRONMENTAL, INC.

City of Signal Hill

COMMUNITY SERVICES DEPARTMENT
2175 CHERRY AVENUE
SIGNAL HILL, CA 90755
PLEASE CALL (562) 989-7330

FREE MULCH PICK-UP DAY



Free Mulch is available to all Signal Hill residents. This is a self-service pick-up event so please:

- Bring your own shovel, container/bag and/or truck
- Load up your own containers and take as much as you need
- Limited supplies, first come first serve.

Saturday
November 7, 2015
8:00 am - 11:00 am

Inclement weather will cancel the event.
Parking lot at 2236 Legion Drive North of Hill Street/Cherry Ave.
(see reverse side for map)

For more information, please contact Sarah Tsao
(562) 989-7340

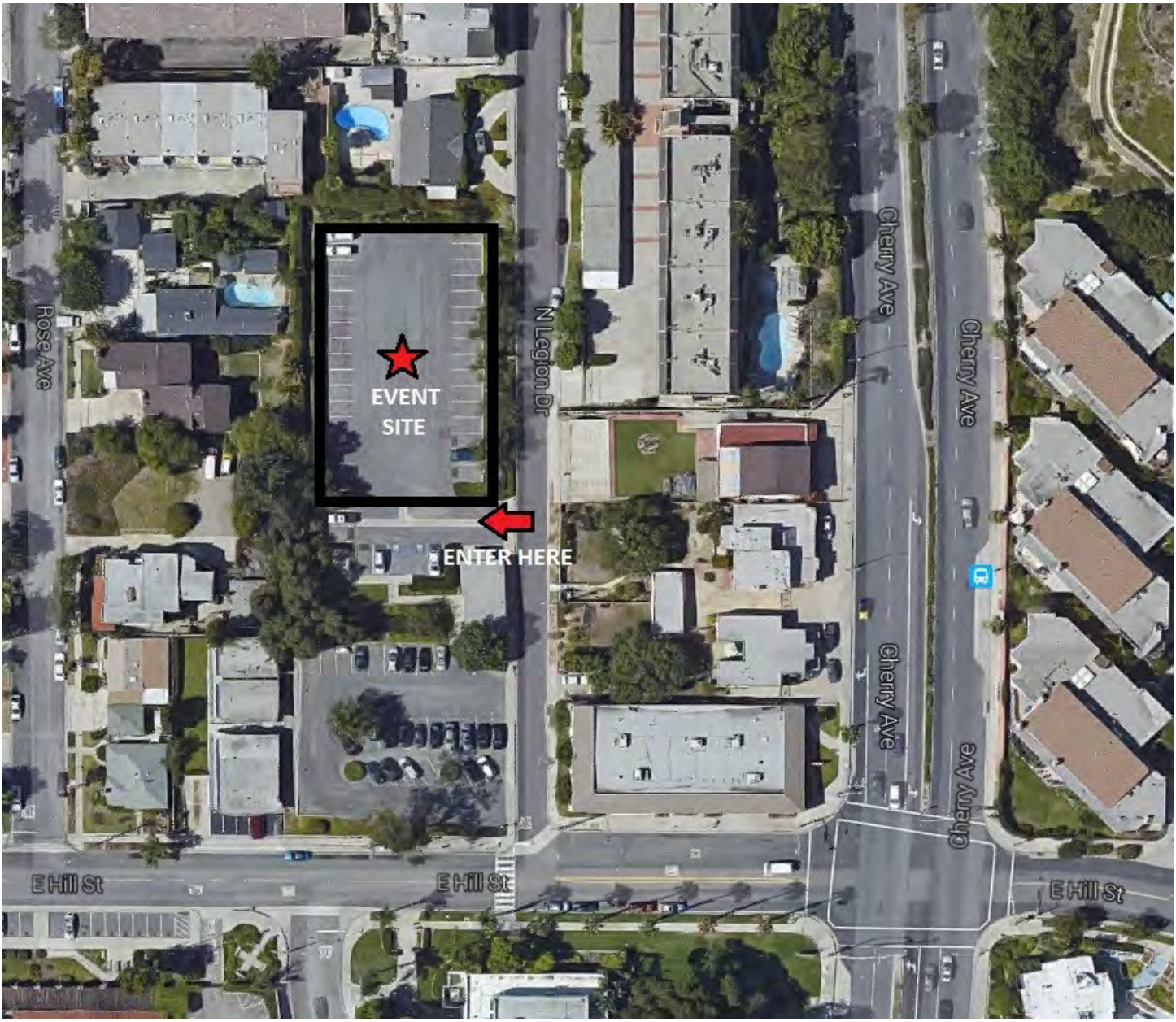
Did you know mulch can help conserve water? There are benefits to using mulch in landscapes. Mulch retains soil moisture, moderates temperature of soil, creates richer soil through nutrient breakdown and can help keep weeds away.

The Sustainable City Committee has partnered with the Public Works Department and West Coast Arborist for a Free Mulch Pick-up Day.

City of Signal Hill

FREE MULCH PICK-UP DAY

Parking lot at 2236 Legion Drive



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October 6

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SELENA ALANIS**
ASSOCIATE PLANNER

SUBJECT: **CITY COUNCIL FOLLOW-UP**

Summary:

Below for your review is a brief summary on the City Council's action from the previous month.

Recommendation:

Receive and file.

Background and Analysis:

1) At the September 15, 2015 City Council meeting there were no Community Development Department items.

2) At the October 6, 2015 City Council meeting:
   - The Community Development Department Administrative Assistant gave a presentation for Planning Month. The theme for 2015 is *Healthy Communities, Healthy People*, and the After-school Recreation Club children created a model city using birdhouses.
   - The second reading of the ordinance to change City Council dates was approved by a vote of 4/1.

Approved by:

_____

Scott Charney

October 7

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **DEVELOPMENT STATUS REPORT**

Summary:

Attached for your review is the monthly Development Status Report which highlights current projects.

Recommendation:

Receive and file.

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2357 Lewis Avenue	Repairs to a fire damaged single-family dwelling Applicant: California Construction	Administrative Review	✓	N/A	N/A	Building Permit Issued 2/13/15	N/A	N/A	2/8/16			Home rebuild begun, rough plumbing and electrical complete (5/15). Drywall and stucco begun (6/15). Stucco complete (7/15). Landscape installation and site clean-up pending (8/15). Project has been finaled (9/15). SA/JH
1790 E Burnett St.	Renovation of existing house and construction of new 4-car garage with roof deck, workshop and parking court Applicant: Gary Severns	Administrative Review	✓	N/A	N/A	Building Permit Issued 02/13/14	N/A	N/A	N/A			Approved change to composite roof. New color board and rock samples submitted. Rock band installed. Rev. front window design (9/14). Rear grade too steep, grade reworked, garage foundation and framing begun (1/15). Rough plumbing, electrical and HVAC complete (3/15). Garage roof and interior underway (5/15). Public Works required removal of wall & landscaping in ROW (6/15). Retaining wall complete. Street improvements completed. Interior work progressing (10/15). JH/CTD

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
3240 Cerritos Ave.	New permit issued for interior drywall, plumbing and electrical for remainder of interior of existing house Applicant: Jim Trevillyan	Administrative Review	✓	N/A	N/A	Building Permit Issued 03/3/15	N/A	N/A	02/26/16			Rough plumbing, electrical and mechanical completed (7/15). Drywall and nailing completed (9/15). Improvements on project ongoing (10/15). JH
2477 Gaviota Ave.	Rehabilitation of the existing single-family dwelling and new 2-car garage Applicant: Rama Singhal	Administrative Review (SPDR 15-03)	✓	N/A	N/A	Building Permit Issued 07/15/15	N/A	N/A	07/15/16			Demolition for the rehabilitation has started (8/15). Framing for new garage completed. Foundation repair ongoing (9/15). SA
2518 Willow St.	New front entry electronic gate w/stone veneer pil-asters, update guard shack Applicant: Willow Ridge Homeowners Association	Administrative Review	✓	N/A	N/A	Permit Ready for Issuance						Plans are ready for permit issuance (8/15). Reminder was sent to applicant (10/15). JH/SA

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2451 Avis Court	Addition of one bedroom and bath under 200 sf Applicant: M/M Lopez	Administrative Review	✓	N/A	N/A	Building Permit Issued 10/5/15			4/2/16			Building permit issued 10/5/15. SA
2311 Ocean View	Add/expand second story decks and "trainhouse" in side and rear yard of existing single-family home Applicant: M/M Hughes	SPDR 08-05	N/A	07/14/09	N/A	Building Permit Issued 08/16/13	N/A	N/A	08/11/14	9/30/14	03/03/15 	The first extension granted by Director until 9/30/14. A second extension granted until 3/03/15. The project is an active Code Enforcement case (7/15). Stucco in progress and staff is monitoring. Roofing is next, then the scaffolding can be removed (9/15). Stucco and roofing completed. Scaffolding removed. Front yard cleaned up (10/15). SA/JH

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
924 E Vernon St.	Demolition of existing dwelling and detached garage for construction of a new two story 3,230 sf duplex and 4-car garage Applicant: LLG Construction	SPDR 14-02	N/A	06/10/14	N/A	06/10/15	12/10/15					Plan are approved. Issuance pending approval of fire department sprinkler plans and Public Works conditions of approval. SPDR extended to 12/10/15. An expiration notification was sent on 10/6/15. The Planning Commission must review the next SPDR extension. SA
3360 Lemon Ave.	A 1,207 sf 2nd unit over a four-car garage at the rear of a property with a SFD Applicant: Jason Shorrow	SPDR 14-03	N/A	07/08/14	N/A	07/08/15	01/08/16					SPDR approved, signed conditions received. Plan check is complete. Applicant is preparing grading plans for submittal to Public Works and submittals for LA County Fire (6/15). SPDR extended to 1/08/16. CTD

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
3347 Brayton Ave.	Remodel of the front SFD to include a 271 sf addition and new 1-car garage on the first floor and a 731 sf second story addition Applicant: Reginald McNulty	SPDR 15-02	N/A	4/14/15	N/A	4/14/16						Site Plan & Design Review valid until 4/14/16. SA
1995 St. Louis Ave.	Demolition of the existing dwelling and detached garage and construction of a two story 3,187 sf SFD with attached 3-car garage Applicant: Seth Sor for Kimberly and Phat Ly	SPDR 15-04	N/A	8/11/15	N/A	8/12/16						Site Plan & Design Review valid until 8/12/16. SA
2260 Walnut Ave.	A proposal for a new two story 1,894 sf SFD with attached 2-car garage on a vacant lot Applicant: Santana Investors	SPDR	N/A	Required	N/A							Leak test passed, vent cone was not installed (2/15). Staff has reviewed preliminary plans. Well exhibit approved (9/15). Applicant is working on plans (10/15). SA

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2085 Freeman Ave.	A proposal for a new two story 3,746 sf SFD with attached 3-car garage on a vacant lot Applicant: RPP Architects	SPDR	N/A	Required	N/A							Leak test passed and vent cone installed (2/15). The applicant has submitted plans for Planning review and preliminary comments (3/15). Well Assessment Report has been submitted for review (10/15). SA/CTD

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**

Large Subdivisions (5 or more lots) and Multi-family Developments

Crescent Square Walnut/ Crescent Heights St.	25 three-story detached single-family dwellings at the N/E corner of Walnut and Crescent Heights Street Applicant: SummerHill Homes/Signal Hill Petroleum	SPDR 14-04 ZOA 14-03 VTTM 72594	N/A	8/12/14	9/2/14 (Map 9/2/16)	9/2/15	3/3/16					SPDR approved on 8/12/14. SPDR has been extended to 3/3/16. Grading plan has been submitted for plan check (3/15). Awaiting submittal of building plans for plan check (8/15). WAR for 8 wells approved by the Oil Services Coordinator 8/13/15. CC&Rs are pending submittal from applicant (9/15). SC/SA
Gundry Hill 1500 E Hill St.	Development of 72 multiple-family, affordable units, three and four stories in height and a community building, community garden, tot lot and courtyard with on-site management Applicant: Meta Housing	Administrative Review (SPDR 15-01)	Approved 2/18/15	N/A	N/A	N/A	N/A	N/A				Building and landscape plan check comments have been returned to the applicant 8/25/15. A demolition permit was issued on 8/27/15 for the existing buildings and demolition is close to completion (9/15). SC/SA

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2599 Pacific Coast Highway	Residential SP-10 1st concept plan had 14 attached units 2nd concept plan had 12 attached units 3rd concept plan had 10 detached units 4th concept plan has 9 units Applicant: Mike Afiuny	Preliminary review PC Workshop 8/14/12 PC Workshop 9/9/14 SPDR	N/A	Required	Required							Staff met w/owner who reported unsuccessful lot consolidation out-reach effort (9/12). Staff met w/applicant to review a new concept plan on 9/13. Revised design (10 detached units) more closely met the intent of SP-10. Access and guest parking revised (6/14). Commission requested design changes. Applicant's revised conceptual plans (9 units) were previewed and met most of the development standards. Due to proposed height / view policy, applicant to proceed with view analysis outreach (9/14). Revised plans submitted for conceptual review w/one less unit and required setbacks. Some buildings still exceed height limit and view policy outreach is pending. Rough grading to be submitted to review options to reduce heights (5/15). Application and plans for a ZOA and SPDR submitted. Condominium map submittal is pending (10/15). CTD

City of Signal Hill
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Residential

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
1939 Temple Avenue	Potential sale of the property for residential development for 10 dwelling units and Specific Plan Applicant: High Rhodes/Anglers	Site Plan and Design Review and Specific Plan	N/A	Required	Required							2 wells discovered, leak tests passed and vent cones installed (8/15). Preliminary site plan received and proposes 10 new units (5 buildings with 2 attached units) two and three stories in height (9/15). Applicant has begun outreach to nearby HOAs. Applicant is working on plans for a Planning Commission workshop (10/15). SA

City of Signal Hill
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Development Status Report
October 13, 2015

Commercial-Industrial

			REVIEW			SPDR/CUP			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
1798 E Willow St.	Tenant Improvements to replace existing restaurant with a new sushi restaurant	Administrative Review	✓	N/A	N/A	Building permit issued 06/17/15	N/A	N/A	N/A			Obtained permit, working on interior TI (8/15). Stop Work notice issued due to NSF check (10/15). JH
2653 Walnut Ave. 2H Construction	An approximate 8,000 sf warehouse/office building Applicant: 2H Construction	Administrative Review	✓	N/A	N/A	Building permit issued 04/13/11	N/A	N/A	Prior to CTL			Exterior complete. Working on Public Works conditions of approval (4/15). TI plans returned to applicant with corrections on 6/30/15. In plan check. Applicant met with Plans Examiner (10/15). JH
2701 Cherry Avenue	ADA parking lot improvements Applicant: Best Buy	Administrative Review	✓	N/A	N/A	Building permit issued 06/01/15	N/A	N/A	N/A			Sidewalk and curb completed (7/15). Awaiting request for final inspection (10/15). JH

City of Signal Hill
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October 13, 2015

Commercial-Industrial

			REVIEW			SPDR/CUP			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
3355 Olive Avenue	Proposal for new 5,000 sf warehouse and office building Applicant: Roger Vititow	Administrative Review	✓	N/A	N/A	In plan check						2nd building plan check comments returned to applicant. Corrections to methane plan needed (7/15). Grading permit issued and in process (10/15). JH/SA
2650-2690 and 2700-2730 Cherry Ave.	Leak testing for previously abandoned wells on the property Applicant: City of Signal Hill Successor Agency	Well Discovery Permit	✓	N/A	N/A	Permit Issued						2 wells discovered, tested, and vent cones installed. 3rd well discovered but could not be tested due to deterioration. Backfilled and compacted (7/15). JH
1400 E Spring St.	Leak testing for previously abandoned wells on the property Applicant: City of Signal Hill Successor Agency	Well Discovery Permit	✓	N/A	N/A	Permit Issued						2 wells discovered, leak tests completed and vent cones installed. Backfilled and compacted (7/15). JH

City of Signal Hill
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Development Status Report
October 13, 2015

Commercial-Industrial

			REVIEW			SPDR/CUP			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
3201-3225 Pacific Coast Highway Quality Inn	Tentative Parcel Map to subdivide an existing 1.8-acre lot into two lots Applicant: William Suh	71592, extension granted	N/A	11/08/11	N/A	11/8/13	11/8/14	11/8/15	N/A	N/A	N/A	3rd ext granted per State law. TPM valid until 11/8/15. Property has new owner. Staff inquired about future intent for subdivision from new property owner with no response (3/15). CTD
2200 E. Willow St.	Amendment to CUP 13-01 to extend the gas station hours of operation to 5 am to 10pm seven days a week Applicant: Costco Wholesale	Amendment to CUP	N/A	7/15/15	Required	N/A	N/A	N/A				Community meeting held (2/15). Planning Commission public hearing on 7/14/15. Applicant is working with staff to create a plan to address on-site circulation issues (10/15). SA
845 E. Willow St. 2H Construction	A 18,994 sf medical/office building Applicant: 2H Construction	SPDR 13-02	N/A	07/09/13	N/A	Building permit issued 02/25/14	N/A	N/A	2/15/16			Conformity Report went to the Planning Commission on 12/09/14. Ext of building complete. Awaiting paperwork per Conditions of Approval (8/15). Kaiser Permanente TI plans resubmitted (10/15). JH

City of Signal Hill
Community Development Department
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Commercial-Industrial

			REVIEW			SPDR/CUP			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
995 E. 27th St. LBIC Center	A 2,205 sf religious center at the NW corner of California and 27th Street Project Manager: Tarak Mohamed Applicant: Abdel Alomar	SPDR 13-04 CUP 13-02	N/A	10/08/13	10/15/13	Building permit issued 10/31/13	N/A	N/A	4/30/15	7/20/15  		Rough plumbing and electrical is complete (1/15). Methane venting, drainage filtration systems installed. 60 day CTL exp ltr sent (3/15). Drywall complete, elec. conduit to building and stucco complete (5/15). Windows, doors, AC installed (6/15). Ceiling T-bar and rough mechanical complete. CTL extension expires on July 20, 2015. Applicant submitted a 2nd ext. request letter. **Certificate of Occupancy was issued (10/15).** CTD/JH
1660 E. Spring St. BMW Dealership	A 77,810 sf showroom, sales, and service facility and display area for automobile sales Applicant: Sonic/BMW	SPDR 14-01	N/A	4/8/14	N/A	Building permit issued 9/16/14	N/A	N/A	09/5/16			Conformity Report for architectural changes and appraisal room went to Planning Commission on 7/14/15. Applicant estimating construction will be completed the end of October and dealership will open soon afterward (10/15). JH/SA

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Commercial-Industrial

			REVIEW			SPDR/CUP			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2953 Obispo Ave. Futsal Indoor Soccer	A request to allow indoor soccer as a conditionally permitted use in the City. Applicant: Mike Biddle	ZOA CUP	N/A	Required	Required							Deposit submitted to begin coordination of workshops w/HOAs (7/14). Applicant has requested to temporarily postpone request (12/14). Applicant intends to proceed w/ CUP request but no application has been submitted to date (10/15). CTD

Business Licenses and Permit Summary

- Planning Department staff reviewed and approved 17 business licenses.
- Building Department staff issued 18 permits including 3 residential solar permits. The valuation of the projects is approximately $206,000 with permit revenues at $4,450.

Training/Forums

- Senior Planner attended the California American Planning Association Annual Conference in Oakland.
- Staff attended Driver Awareness training.
- Building Inspector participated in webinar for Small Residential Rooftop Solar Systems.
- Senior Planner and Associate Planner attended the luncheon for *Women Leading Government.*

Current Projects

- Water Conservation in Landscaping and Turf replacement ordinance.
- Finance and Conveyance Map ordinance.

Ongoing / Upcoming Projects

- Vacant Parcel Ordinance.
- Oil Well Inspections.
- Meeting with Mercedes Benz regarding expansion opportunities.
- Dog Park Zoning Ordinance Amendment and General Plan Amendment.

City of Signal Hill
Community Development Department
Development Status Report
October 13, 2015

Wireless Telecommunications Facilities

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2411 Skyline Dr.	A request to add 1 new Tower Dish to the Cell Tower as allowed by CUP 99-05 Applicant: Crown Castle	Administrative to modify CUP 99-05	✓	N/A	N/A	Building permit issued 10/2/14	N/A	N/A				Crown Castle has new management and resolved interference issues. Plans approved and permit issued for 1 new dish for Clearwire 10/2/14. Current tenants have current business licenses (4/15). An updated audit of equipment and tenants was submitted and revisions are pending. Plans have been submitted requesting additional equipment as allowed under the CUP and revisions are pending (10/15). CTD
1855 Coronado rooftop facility	Replacing 56” panel with 72” panel antennas, screen box in sector A & B will be increased by 3’ Applicant: Core Dev.	Administrative to modify CUP 08-03	✓	N/A	N/A	Permit ready for issuance	N/A	N/A				Plans ready for permit issuance (4/15). Reminder sent to applicant (9/15). SA
2525 Cherry Avenue Sprint	Removing and replacing the 3 existing antennas	Administrative to modify CUP 02-01	✓	N/A	N/A	In progress						Planning Department approved plans to go into building plan check (6/15). SA

City of Signal Hill
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Wireless Telecommunications Facilities

			REVIEW			SPDR			CTL			
Address	**Project Description**	**Application**	**Director approval**	**PC approval**	**CC approval**	**Expires**	**1st Ext.**	**2nd Ext.**	**Expires**	**1st Ext.**	**2nd Ext.**	**Status**
2633 Cherry Avenue AT&T	Rooftop Wireless Telecommunication Facility for AT&T Applicant: Core Dev.	CUP	N/A	Required	Required							Staff met with the applicant to review preliminary plans for the rooftop facility and suggested revisions to elevations and plans for aesthetics (5/14 and 7/14). Applicant preparing plans and expects to resubmit (10/15). SA

October 8

CITY OF SIGNAL HILL

2175 Cherry Avenue ◆ Signal Hill, CA 90755-3799

October 13, 2015

AGENDA ITEM

TO: **HONORABLE CHAIR**
AND MEMBERS OF THE PLANNING COMMISSION

FROM: **SCOTT CHARNEY**
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: **IN THE NEWS**

Summary:

Articles compiled by staff that may be of interest to the Commission include:

- Technology to the Rescue - Innovative Ways to Get More Petroleum for Less Money
- Tap the Sun, Together – Community Solar may be Poised to Take Off
- New-Age Central Parks – Small and Innovative: That's What Works Today
- The Good News on Renewables – Electricity Grids
- Traffic Deaths Surge as Americans Return to the Roads

Recommendation:

Receive and file.

Technology to the Rescue

Low oil prices have spurred energy companies to find innovative ways to get more petroleum for less money

BY ALISON SIDER AND ERIN AILWORTH

THE DEPRESSED PRICE of oil has spurred a new wave of innovation in energy exploration.

When a barrel of oil fetched $100 or more, energy companies were focused on drilling wells and pumping crude just as fast as they could. But now that prices have settled around $50 a barrel, companies are focused on efficiency—getting the most petroleum for the least amount of money. And many are turning to advanced technology for help.

Big oil-field-services companies like **Halliburton** Co. and **Schlumberger** Ltd. say their customers are hungrier than ever for technology that saves them cash. Some are using lasers and other high-tech equipment and data analytics before they drill to make sure new wells deliver the most crude for the buck. Others are looking to new techniques that they hope will allow them to wring more crude from both new and old wells.

Shale wells drilled in the past five years may be candidates for refracking, Schlumberger says.

"You have to keep your focus on finding new and innovative solutions," says Bruce Tocher, manager for shale oil and gas research at the Norwegian energy company **Statoil** ASA. "You need those solutions more than ever."

Fracking all over again

Several companies are looking into refracking—using the latest fracking techniques to get more out of wells that were originally fracked using less advanced techniques. This is still an experimental approach, and companies aren't making their results public. But they are seeing enough to keep trying.

ConocoPhillips, for instance, says it has tried several refracks and continues to evaluate the technology. "We do see some potential, particularly in wells that were drilled a few years ago," says spokeswoman Andrea Urbanek.

Devon Energy Corp. is actively refracking, particularly in the Barnett natural-gas field in Texas, and is applying what it has learned to other fields, like the Permian and Eagle Ford fields in Texas.

On a recent conference call with analysts about the company's earnings, Chief Executive Dave Hager described Devon's efforts to refrack wells using new technology. "We've got, I think, a working laboratory in the Barnett," Mr. Hager said. The company is using finer grains of sand and experimenting with different ways of sealing off old pathways to allow new ones to be created for oil and natural gas to flow.

"When using the more recent technology of finer-grade sand and more diversion, more capable diversion techniques, that's really what we're exploring right now," Mr. Hager said.

"There's tremendous upside with the refracks," he said.

In another recent earnings call, Halliburton officials described improvements in fracking technology, including the use of fiber-optic tools to help monitor what's going on during fracking to make sure that it's working as well as possible.

Schlumberger estimates that roughly 10,000 horizontal shale oil and gas wells drilled in the past five years in North America are candidates for refracking, and says it is working with eight producers on the technique.

Software and microbes

For new wells, engineers are relying more than ever on software and sensors to determine exactly the right places to use different amounts of sand, water and chemicals to maximize the amount of oil a well produces.

In recent years, companies have begun to double or triple the amount of sand they use to hold open the fissures that allow oil to flow through dense rock, which has often resulted in much higher production—but also higher costs. The new technology can help companies figure out the right balance between cost and production, says Gene Beck, vice president of Bakken development and production at Statoil.

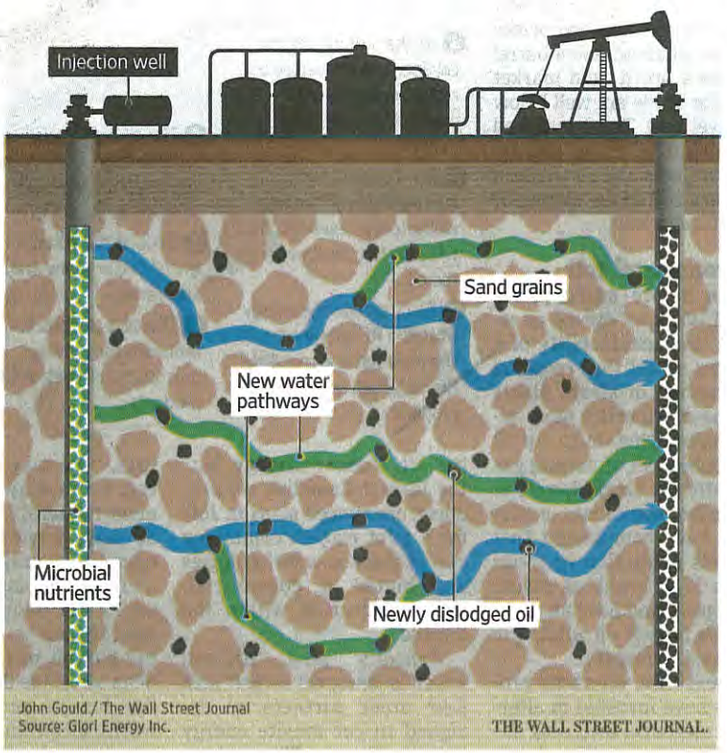
On another front, **Glori Energy** Inc. of Houston is working with companies including Statoil and Brazil's **Petróleo Brasileiro** to test a process that aims to boost output by using tiny organisms already present in conventional oil fields that have been flooded with water, a common technique used to help oil flow.

The process works, Glori says, by stimulating the microbes with a special nutrient mix. As they feed, the organisms attach themselves to bits of oil—essentially breaking it up and making it easier for the crude to flow through rock.

Early tests show the technology can extend the life a well by several years and boost the amount of recoverable oil by 33% from initial estimates, on average, Glori says.

Scouring the Well

In wells flooded with water to push oil out, one way to increase production takes advantage of natural microbes in the ground that grow in contact with oil. A special nutrient mix added to the injected water stimulates growth of the organisms. When the microbes attach themselves to bits of oil, they help break it up and dislodge it. They also create more, and ever-changing, pathways for water and oil to move through the rock than in conventional flooding. All of that makes it possible for more oil to travel to the wellhead.



John Gould / The Wall Street Journal
Source: Glori Energy Inc.
THE WALL STREET JOURNAL.

The next big thing

Meanwhile, the search for new technologies goes on. The oil and gas division of **General Electric** Co. plans to increase its spending on R&D this year, says Eric Gebhardt, the division's chief technology officer and vice president of engineering. And "co-funding from our customers is actually up this year," he says.

GE collaborates with some customers who are looking for solutions to particular problems. In some cases, customers will help fund development of specific technologies that they want GE to accelerate. These days they are more willing to do that if they think it will result in improved equipment or data analytics that can help them make an old oil field more productive, Mr. Gebhardt says.

"These are things that even if the oil price came back up again would still be great solutions," he says. "They're just better when there's a lower price for oil."

WellDog, a company started in 1999 to develop techniques to extract natural gas from coal seams, is ramping up its work in North American shale formations. It opened an office in Denver this year and plans to triple its staff at a technology center in Wyoming.

The company has worked with **Royal Dutch Shell** PLC to use lasers to locate oil and gas deposits in shale formations. Analyzing the changes in photons that bounce back from underground rock formations can help drillers figure out the best places to locate wells.

John Pope, WellDog's chief executive, says energy companies "are spending a lot of time and money to get wells into the lower cost bracket" by embracing data and monitoring tools.

"We've been shocked by how progressive and determined shale customers have been," he says.

Ms. Sider and Ms. Ailworth are Wall Street Journal reporters in Houston. They can be reached at alison.sider@wsj.com and erin.ailworth@wsj.com.

Tap the Sun, Together

Community solar may be poised to take off

BY CASSANDRA SWEET

MANY CONSUMERS would like to switch to solar power but can't. It could be their homes have too much shade or their roofs can't accommodate solar panels, or perhaps they live in a condominium or apartment building.

Enter so-called community or shared solar, which allows people to buy solar power from centrally owned arrays. The power is delivered by the local utility, and customers get credits on their monthly bills for any power the project sells back to the grid.

Although a relatively small business now, community solar is growing and could account for as much as half of the small-scale solar-panel market by 2020, according to an April forecast by the Energy Department's National Renewable Energy Laboratory in Golden, Colo. That would create a hefty new solar market in between individually owned rooftop arrays and large utility-scale projects.

"There's a lot of potential [for community solar], particularly with the cost of solar dropping every year and programs being put in place to make things easier and more affordable," says David Feldman, an analyst at the National Renewable Energy Lab and an author of the report.

Different approaches

The U.S. home solar-power market has grown rapidly in recent years, thanks to falling panel prices and government subsidies. Homeowners nationwide installed 918 megawatts of panels during the first half of this year, nearly quadruple the amount installed in all of 2010, according to **GTM Research** and the Solar Energy Industries Association. By the middle of 2015, there were about 4,400 megawatts of home rooftop solar panels installed in the U.S., according to GTM, compared with just 81 megawatts for community solar projects.

Community solar programs can vary widely by state and among utilities, partly because some states have rules for how regulated utilities must administer community solar programs and others don't.

In Colorado and Massachusetts, where such rules exist, participants make an upfront payment to buy a share of a solar-panel project, which is usually developed by an independent firm. The utility then buys power from the project and credits the participant for his or her share of the power.

Lower bills

Naomi Lederer, a librarian at Colorado State University, owns a 0.6% share of a 2,035-panel community solar project near her home in Fort Collins. She paid the developer $16,100 for her share and received a $4,500 rebate from her utility; she also expects a $4,800 federal tax refund after the array starts generating power this month. She expects her average monthly power bill to drop by 75%, and—assuming electricity rates don't change—she expects the investment to pay for itself in about 14 years.

"I love being green this way and not having to have the panels on my house," she says. If she has to move out of the area, she plans to sell her share to another resident.

Where there aren't statewide rules for community solar projects, utilities are experimenting with their own programs.

In Arizona, Tempe-based municipal utility Salt River Project built a 20-megawatt solar farm in Florence, Ariz., and offered the power to customers for 9.9 cents a kilowatt-hour; its typical residential rate is eight to 12.5 cents a kilowatt-hour. Nearly 2,800 residential customers and 96 schools signed up for the program, which locks in the rate for five to 10 years.

In California, the state's three big utilities—owned by PG&E Corp., Edison International and Sempra Energy—plan to sell solar power from community projects starting next year. The power will cost more, the utilities say, so they will emphasize the projects' green appeal instead.

Still, not everyone is a fan of community solar. In some states, utilities have to pay the same higher retail rate for community solar power that they pay homeowners with rooftop arrays. In contrast, they can buy power from large utility-scale solar-power plants at wholesale rates. The higher costs, utilities say, are a burden on nonsolar customers who pay for the programs through higher rates but don't see the benefits.

Xcel Energy Inc., which owns Minnesota's largest utility, is trying to limit the size of community solar projects in any one location to no more than five megawatts. It says power from community solar projects costs it roughly twice as much as the power from large solar farms. "We still have concerns about the cost," says Laura McCarten, a regional vice president at Xcel's Minnesota utility.

To address those concerns, some developers are seeking ways to build community solar projects that might benefit both utilities and customers. One idea is to build community solar arrays in areas where power is needed to even out the flow of electricity on the grid, which would allow utilities to avoid costly system upgrades.

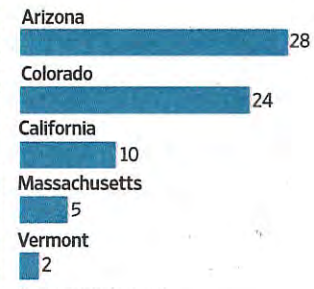
"We're trying to strike some kind of balance" between utilities and consumers, says Paul Spencer, chief executive of Clean Energy Collective, which has worked with utilities to build community solar projects in Colorado and elsewhere.

CLEAN ENERGY COLLECTIVE

A customer signs her name on a community solar installation at its opening in Golden, Colo.

Common Cause

States with the most generating capacity, in megawatts, from community solar-panel installations



Source: GTM Research

THE WALL STREET JOURNAL.

Ms. Sweet is a reporter for The Wall Street Journal in San Francisco. Email her at cassandra.sweet@wsj.com.

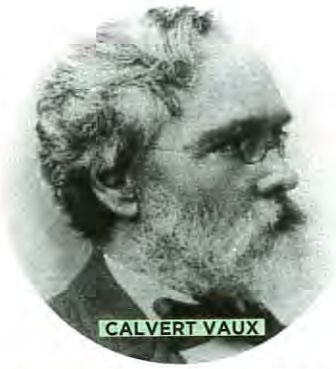
NEW-AGE Central Parks

SMALL AND INNOVATIVE: THAT'S WHAT WORKS TODAY.

By RUTHERFORD H. PLATT AND PETER HARNIK

REFLECTIONS ON CITY GEMS: A high-rise dweller snapped a photo of Millennium (at upper right in photo) and Maggie Daley parks from inside his rooftop gym. The undulating BP Bridge, designed by Frank Gehry, links the two compact spaces. The Renzo Piano-designed Modern Wing of the Art Institute of Chicago (center, top) connects to Millennium via Piano's Nichols Bridgeway.

PHOTO BY JOHN Y. LE BOURGEOIS



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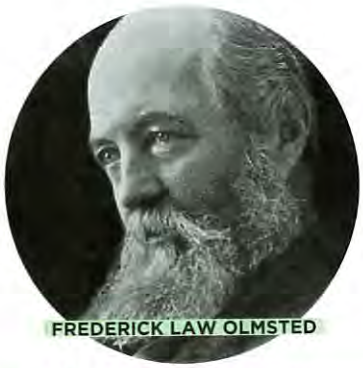


FREDERICK LAW OLMSTED

AUDACIOUS VISIONARIES

CITY PARKS DON'T JUST HAPPEN; each is a unique blend of nature, technology, design, culture, politics, and vision. Many European city parks are remnants of former royal estates. Examples include London's Hyde Park and Regent's Park, Jardin des Tuileries and Jardin du Luxembourg in Paris, Berlin's Tiergarten, and Vienna Woods. ¶ American cities, lacking such aristocratic legacies, have had to fabricate parks out of colonial commons in New England, former military sites like San Francisco's Presidio, filled land such as Chicago's lakeshore, distinctive natural or scenic sites, or simply nooks and crannies of underused land. ¶ An early notable example in the U.S. was the audacious 1858 Greensward Plan for Central Park by Frederick Law Olmsted and Calvert Vaux, which transformed 843 acres of rocky wasteland into the world's best-known urban park. That masterwork in turn spawned an urban parks movement that endowed American cities with hundreds of parks and landscapes designed by Olmsted and his successors until the 1970s. ¶ That era is over: Big new parks on the scale of Central Park aren't feasible today. One attempt to convert a former military base into a 1,300-acre Great Park in Orange County, California, has been tangled in design and financing issues. (See "Too Big to Fail?" in the April 2014 issue of *Planning* and a follow up in June: "Audit: 'Hubris' Killed Great Park Plan.") The winning design for Governors Island in New York Harbor may be as innovative as Greensward in its day, but the island can only be reached by ferry. One of us (Harnik) has documented how parks now are cobbled together in surprising places like rooftops, landfills, cemeteries, freeway decks, and stormwater channels.

While the size and complexity of the great Olmsted parks can't be replicated today, a new generation of much smaller but hugely successful facilities may claim to be "new-age Central Parks." This judgment is based not on whether they look Olmstedian; most do not. Rather, the resemblance lies in their audacity: How bold are they in concept and execution and how inventively do they use available scraps of urban space and serve diverse people?

The audacity of Central Park was reflected in such factors as:

VISION: advocacy by New York civic leaders to set aside a "central park" before Manhattan Island was fully built out

OPPORTUNISM: New York City's timely purchase of underused land in the path of development as a site for the future park

INGENUITY: creative adaptation of legal authorities, technology, financing, and landscape design

TENACITY: confronting bureaucracy and politics, requiring leaders and activists with unusual creativity, stamina, and political skills

HUMANISM: in Olmsted's words, welcoming "vast numbers of persons brought closely together, poor and rich, young and old, Jew and Gentile."

With these indicators in mind, we now visit some of our favorite "new-age Central Parks," beginning in New York City, close to the mother lode.

New York and vicinity

Since the 1980s, much of New York City's waterfront has been transformed from a no-man's-land of derelict piers and warehouses to a green fringe of exciting new parks and bikeways. Unlike the Chicago lakeshore parks, which are managed chiefly by one agency (the Chicago Park District), New York's waterfront is a hodgepodge of diverse facilities, each with its own history, physical obstacles, vested interests, design features, funding sources, and administrative structure.

Riverbank State Park is one of the city's busiest but least known newer parks. It occupies the 28-acre rooftop of the North River Sewage Treatment Plant, which extends 600 feet into the Hudson River at the edge of Harlem. The park originated as "compensation" to offset the environmental injustice of placing the city's biggest sewage plant on the doorstep of one of its poorest communities.

Designed and constructed over 15 years (1978–93) by Dattner Architects and ABB Landscape Architects, Riverbank features an Olympic-size swimming pool, basketball and tennis courts, garden plots, a year-round skating rink, cultural center, restaurant, and a 2,500-seat athletic complex. Modeled on Tokyo's Arakawa Nature Park, it demonstrates the feasibility of locating a park above municipal infrastructure and folding its capital cost into the overall project budget. Riverbank State Park attracts about four million visitors a year.

Continuing downstream, the west side of Manhattan is lined by eclectic old and new parks: Riverside Park, originated by Olmsted and completed by Robert Moses in the 1920s; Riverside Park South, donated by Donald Trump in the 1990s as a condition for approval of a high-end residential complex; Hudson River Park, built and managed by a state-created authority after defeat of a massive highway and park project (Westway) in the 1980s; Battery Park City, with 36 acres of public parks provided by the BPC development authority; and Battery Park, a historic common ground dating back to Dutch settlement in 1623.

Just inland from Hudson River Park, the renowned High Line snakes around former lofts and warehouses now going upscale at a dizzying pace. The High Line is a showcase of new-age park creation. An abandoned 1.45-mile rail viaduct on Manhattan's Lower West Side provided the opportunity. The vision to convert it into a linear public park, modeled on the Promenade Plantée in Paris, originated with neighborhood residents Robert Hammond and Joshua David, who founded the Friends of the High Line Greenway, Inc. in 1999.

Some $50 million from the city and even more in private donations funded an international design competition in 2003. The winning concept by James Corner Field Operations in partnership with Diller Scofidio+Renfro and Piet Oudolf has transformed the rusty viaduct into an elevated ribbon of walkways, gardens, casual seating, and public art—entirely removed from traffic and offering glorious views of the city and the Hudson River.

As a public-private partnership, the High Line is city-owned but managed

Built atop a sewage treatment plant—to help mitigate that facility's community impacts—Riverbank State Park rises 69 feet above the Hudson River, with spectacular views of the river, the cliffs of the Palisades, and the George Washington Bridge.

The granite steps—built from stones salvaged from the Roosevelt Island Bridge reconstruction—of Brooklyn Bridge Park offer gorgeous views of Manhattan and the New York Harbor. PHOTO BY JULIENNE SCHAER

by the well-financed Friends of the High Line. Now open for its entire length, the High Line is jammed with residents and tourists, in good weather and bad. Surrounding neighborhoods are exploding in value and new development is going up at a scale perhaps not seen since Central Park itself was built.

Just across the East River from lower Manhattan, the acclaimed Brooklyn Bridge Park, which won a 2014 National Planning Excellence Award for Urban Design from APA, is shoehorned onto a 1.3-mile strip of waterfront and abandoned piers bordered on the inland side by the Brooklyn Heights Promenade and the Robert Moses-era Brooklyn-Queens Expressway. BBP's modest 85 acres (one-tenth the size of Central Park) is offset by inventive design and stunning views of the Manhattan skyline, with the Brooklyn Bridge and Manhattan Bridge arching overhead.

The vision for the park came from a community group, Friends of Fulton Landing (later renamed the Brooklyn Bridge Park Coalition), when the Port Authority of New York and New Jersey decided in 1984 to divest some obsolete waterfront properties. In 2002, the coalition persuaded the city and state to establish the BBP Development Corporation to design, build, and operate the park. Public agencies contributed $360 million toward its construction, but operating costs were to be generated mostly from concession revenue and high-end real estate development.

Under the 2005 BBP master plan by Michael Van Valkenburgh Associates, the challenging site (including its piers) has been transformed into a collage of small hills, lawns, trees, playgrounds, sports fields, food vendors, wetlands, a pocket beach, boat ramps, and the 1920s-era Jane's Carousel, restored and donated by a local couple, Jane and David Walentas.

In October 2012, when Hurricane Sandy slammed the new park with a 13-foot storm surge, thousand-pound concrete planters became floating objects, low-lying electrical and mechanical equipment was disabled, and some playgrounds and landscaping were damaged. But the Van Valkenburgh plan anticipated sea-level rise in its selection of park elevations, soil types, vegetation, tree placement, and edge design, and timely sandbagging narrowly saved Jane's Carousel.

The unusual practice of funding a park's operation from real estate development inside its boundaries remains controversial. In April 2015, completion of a luxury residential building was stayed by court order pending the outcome of a lawsuit by a neighborhood group, Save the View Now, which fears the project will obstruct views of the Brooklyn Bridge and Midtown Manhattan.

Eighty miles north of Times Square, the Hudson River is spanned by another audacious new park: the Walkway Over the Hudson. In 1889, the Poughkeepsie-Highland Railroad Bridge opened as the longest bridge in North America and the only Hudson River span south of Albany at the time. Until closed by a fire in 1974, the 1.28-mile bridge was a vital route for trains bringing coal from Pennsylvania to New England.

Due to be scrapped, the decrepit bridge attracted the attention of Poughkeepsie resident Bill Sepe, who saw an opportunity to create a level-grade bike and walking route high above the most scenic reach of the mid-Hudson Valley. In 1992, Sepe and a lo-

cal attorney founded Walkway Over the Hudson to promote the project.

Seventeen years later, at a cost of $38 million (substantially provided by the Dyson Foundation in Millbrook, New York), the bridge reopened as the Walkway Over the Hudson State Historic Park. Now paved, lighted, and handicap accessible, the span is the world's longest elevated walkway—and one of the highest at about 200 feet above the river and the Poughkeepsie riverfront. A 21-story high-speed elevator, completed in 2014, connects the walkway deck with a riverfront park and train station beneath it. Some 700,000 people visit the walkway annually.

Ironically, both the walkway and the High Line benefited from a kind of making-the-best-of-it audacity. Each used obsolete structures that were too big to tear down. (Simply removing the elevated viaduct in Manhattan would have cost Consolidated Rail Corporation about $30 million.) The new park facilities were in effect "Plan B" concepts to save the government from expensively tearing down a huge, orphan structure.

Around the country

Chicago's much admired 30-mile chain of lakefront parks was long interrupted by a gaping void of parking lots and train tracks east of the city's Loop, its downtown business district, so named for the elevated train tracks that encircle it.

In 1997, Mayor Richard M. Daley, reportedly looking down at the unattractive scene from his dentist's office, resolved to seize a golden opportunity to convert this beleaguered site into a world-class park. His germ of an idea, implemented by a formidable public-private partnership, led to the construction of Millennium Park on a 25-acre platform above a new parking garage. At $475 million (split about fifty–fifty public and private), Millennium is the most expensive city park ever created, but the investment has already stimulated billions of dollars in nearby real estate construction and tourist spending.

When it opened in 2004, Millennium Park attracted more than 1.5 million visitors in its first six months, lured by its many delights: the wading pool between digital towers at Crown Fountain, a native-plant horticulture garden, a mirrored sculpture (*Cloud Gate*, usually called "the Bean"), a sinuous pedestrian bridge and outdoor performance extravaganza (both designed by Frank Gehry), and a bicycle station for commuters.

Located downtown, Millennium Park established a new public focal point and center-city destination, and thousands of high-end apartments and condos have since been constructed within sight of it. Its role as a free and democratic playground for millions of people is in the best Olmsted tradition.

Also downtown and connected to Millennium Park by the Gehry bridge, the 25-acre Maggie Daley Park is named for the late wife of the former mayor. (The relationship of the two parks can be seen in the photo on pages 14 and 15). Opened this spring,

Known as the High Line at the Rail Yards—where visitors can interact with the rails and other freight artifacts—the last section of the elevated trail opened last September, extending it north to West 34th Street.

it reenvisions a corner of the enormous lakefront Grant Park, where seldom used tennis courts and formal gardens have been replaced with climbing walls, undulating hills, an ice skating ribbon, and inventive, adventuresome play spaces.

There's a great new park in Dallas, too, although its genesis came at a painful moment for the city. When the Boeing Corporation announced the relocation of its headquarters from Seattle to Chicago in 2001, the news hit Dallas like a bombshell. Dallas had been a contender and was accustomed to winning these kinds of competitions, especially when up against older Rust Belt cities. But Boeing let it be known that it was the quality of urban living—including parks—that had tipped the balance to Chicago.

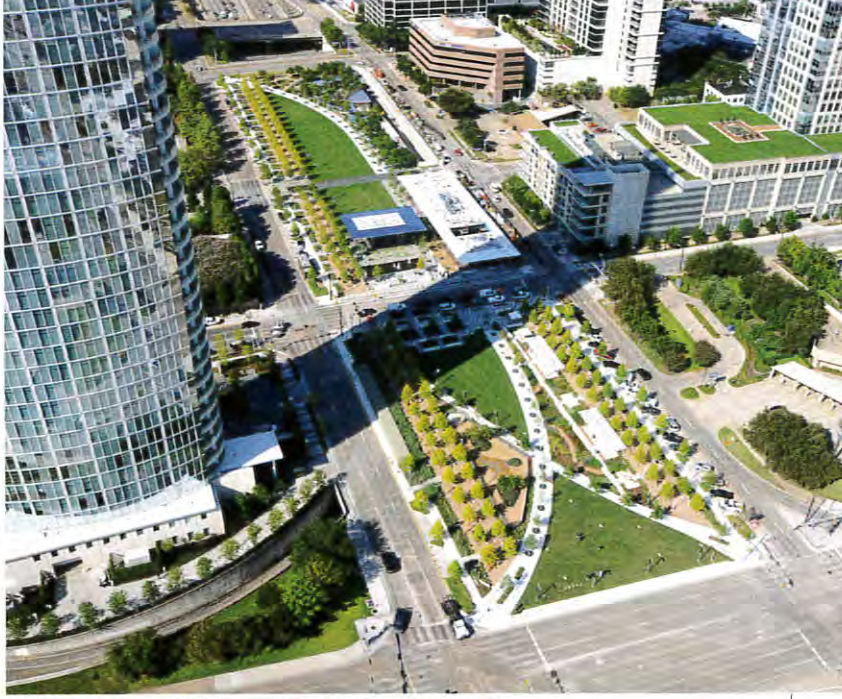
Dallas's powerful corporate community immediately began refocusing from simple growth to complex placemaking. And the city sprang into action on both the public and private fronts. Among many parks that have grown from these initiatives, the most transformative has been Klyde Warren Park, designed by the Office of James Burnett and built on a deck over the Woodall Rogers Freeway.

Barely five acres in size, the park packs in a load of spaces from dog park to event lawn to reading and games courtyard to jogging trail to performance pavilion to restaurant, along with more than 300 trees and 900 shrubs. Further, the park links downtown office towers and cultural icons with the arts district and residences situated in uptown.

Because the park has healed the 50-year-old gash of the below-grade freeway, it has stimulated downtown high-rise housing, something quite rare in Dallas. Named for the nine-year-old son of the park's biggest benefactor, Klyde Warren Park is certainly not Olmstedian in design or in conception, but it is having the kind of impact on real estate and city shaping that the best of the greensward parks did more than a century ago.

Klyde Warren Park is not the first park to be built on a deck over a highway—the earliest on record was built in New York City in 1939—but it is quickly becoming the most influential since Seattle's Freeway Park opened to great fanfare during the nation's bicentennial year in 1976. The concept of a green and social oasis in the middle of a human and architectural bazaar is so novel and intriguing in formerly white-bread Dallas that it has become the place to see and be seen, just as Olmsted's more bucolic parks first were 150 years ago.

Not to be outdone in the new city park competition is Houston, Dallas's friendly rival. Already home to 445-acre Hermann Park (with the city's zoo and an iconic lake) and 1,466-acre Memorial Park (whose three-mile running track gets 10,000 users a day), Houston now boasts a new 12-acre gem in the bull's-eye center of its downtown. Called Discovery Green, the $182 million park was carved out of former parking lots and several streets that the city decertified and donated to the assemblage.



Klyde Warren Park is the new central gathering space in Dallas—a far more inviting spot than the Woodall Rodgers Freeway that it caps. At 5.2 acres, the urban park features a performance pavilion, two restaurants, walking trails, a dog park, and the requisite children's play space.

Funded about one-third publicly and two-thirds privately, the park is chock full of things to see, use, and experience—a playground, interactive fountain, dog park, cafe, putting green, kayaking pond, model boat basin, ice skating rink—and, like Klyde Warren, has stimulated a localized development boom, including the first downtown apartment tower built in 50 years. Discovery Green is located near the city's gargantuan Convention Center— the kind of facility that is usually the kiss of death for its surrounding neighborhood—but, with 1.2 million park visitors a year, it thus far has held its own against the needs of out-of-town conventioneers with other things on their minds.

Thanks to aggressive programing by the indefatigable Discovery Green Conservancy, the park is being adopted by Houstonians as their own special place. Although the number of children living downtown is still small, the Houston Independent School District schedules numerous field trips to the park, and Discovery Green is frequently encircled by yellow buses while students play in the water, listen to music, learn ecology, picnic, or happily take part in other activities.

Other cities are making their marks with high-profile parks as well. Cincinnati has invested $120 million its downtown waterfront. Smale Riverfront Park is a dramatic 45-acre destination that includes a stage and event lawn, an adventure playground, a carousel, a stairway that incorporates a light show, two interactive fountains, a striking Civil War monument to the Black Brigade, tree groves, a meditative labyrinth, a bike center, and a brewpub. (Future phases will include a marina and a boat dock.)

Cincinnati has, in fact, boasted an exemplary park system for many decades, but since the hilly city is segmented into dozens of insulated neighborhoods, each with its own special green space, there has been no central park that all citizens could share as owners. Smale Park, located in Cincinnati's front yard, between the baseball and football stadiums and facing the iconic Roebling Bridge, solves that problem in a way that would make Olmsted proud. Fittingly, despite the high-tech nature of some of the amenities, the park's most memorable and coveted features are the gently swinging steel benches with their alluring vistas of the Ohio River and Kentucky in the distance.

Small but mighty

Not every city park can or should be as iconic as Millennium Park or the High Line. Older city neighborhoods are often served only by scruffy, down-at-the-heels parks in dire need of help. The "new-age Central Parks" summarized in this article represent the most audacious level of park creation in the finest Olmsted tradition. But even the humblest city park may be revitalized through neighborhood initiative, supported by public and private funding.

The New York Restoration Project founded by Bette Midler has revitalized many neglected parks in distressed neighborhoods of New York City. While not world-class showcases, such revived parks may also reflect the humanitarian instincts of Frederick Law Olmsted and his successors. Nearly two centuries after his birth, creating and revitalizing city parks is a crucial part of making urban America more green, healthy, equitable, and humane. ■

Rutherford Platt is professor of geography emeritus at the University of Massachusetts Amherst and the author of *Reclaiming American Cities; The Struggle for People, Place, and Nature Since 1900*. Peter Harnik directs the Center for City Park Excellence of the Trust for Public Land in Washington, D.C., and authored *Urban Green: Innovative Parks for Resurgent Cities*.

NEIGHBORS: LIVING NEXT TO CHICAGO'S 606 *By* Jim Schwab, AICP

A street fair along Chicago's Humboldt Avenue in June entertained visitors, including some who watched from above on the 606. The city's latest park is a 2.7-mile elevated trail (with 12 access points) built along an abandoned railroad spur. Planning began in 2004 with widespread support from the city, volunteers, and civic organizations on the North Side. I live nearby, and I've watched it come to fruition over the years. Read my observations on its beauty, utility, and gentrification concerns on my blog: **jimschwab.com.**

OPENING DAY

Photos and more at http://tinyurl.com/pf6zcyh.

A WORK IN PROGRESS

A 2013 APA interview with the Trust for Public Land's **Jamie Simone**, AICP, explores the history of the Bloomingdale Trail, aka the 606.

https://youtu.be/iPENITOIg_sY

BLOG VIDEO

FROM APA

"Too Big to Fail." *Planning*, April 2014.

"Audit: 'Hubris' Killed Great Park Plan," *Planning*, June 2015.

Video about Brooklyn Bridge Park: planning.org/awards/2014.

"The Role of Parks in Shaping Successful Cities," with the National Recreation and Park Association, May 2014: available as a pdf at planning.org/cityparks.

IN PRINT

Public Parks: The Key to Livable Communities, by Alexander Garvin.

Reclaiming American Cities: The Struggle for People, Place, and Nature Since 1900, by Rutherford H. Platt.

Urban Green: Innovative Parks for Resurgent Cities, by Peter Harnik.

The Good News on Renewables

Conventional wisdom says the grid can handle only a certain amount. California's experience suggests otherwise.

BY GABRIEL KAHN

IN FEBRUARY 2013, California energy officials sat down with power-industry executives to figure out how to avert an approaching calamity: The rapid rollout of wind and solar electricity was stressing the state's grid. The more renewable energy California added, the more its power supply could be whipsawed by a cloudy day or a windy storm. Some at the meeting warned that problems, such as rolling brownouts, could start to show up later that year.

Those same worries were being echoed from Hawaii to Florida, as authorities struggled to load aging electricity grids with ever-greater amounts of renewable power. At the time, renewable energy accounted for about 14% of California's electricity output.

Today, California often gets as much as 30% of its power from renewables; there are periods of the day when production can soar to 40%. California legislators just approved a plan that would require half of all power to come from renewables by 2030. Still, the tipping point the power industry feared hasn't materialized.

The experience of California and other states with high concentrations of solar and wind, such as Hawaii, is challenging long-held assumptions about the limits of renewable energy. As the boundary of what is considered possible expands, so does the momentum around investment in new technology and resources.

"You'll hear numbers [that] people bandy about and most of them are wrong: 'We know we can get to at least 35% or 40%,' " says Haresh Kamath, an expert in energy storage and distributed generation with the Electric Power Research Institute in Palo Alto, Calif. "Now that we're getting to those numbers, people are pushing them up again."

Plenty of risks still remain. But the fact that the grid has been able to handle more renewables than previously thought is driving massive changes through the industry. One of the places it is being felt most acutely is among utilities.

Rooftop sourcing

Ted Craver is the chief executive of **Edison International** Inc., parent of **Southern California Edison**, one of the nation's largest electricity retailers. A few years ago, most of his investment was devoted to procuring power from big plants and sending it across large transmission lines. Today, he's expecting much of his new power to come from his customers' rooftops. In the first quarter, residential solar installations across the U.S. grew by 76% over the same period a year earlier, adding 1.3 gigawatts of capacity.

Investment in new technology and resources is gaining momentum.

"We will be lucky to see any growth in the large central plant; it will probably decline," he says. That is altering how he spends his money. He now plans on investing about $4 billion a year for the next three years upgrading the distribution network—the wires that connect homes to the grid—to make the grid better equipped to carry power back and forth, instead of just downstream.

The bigger change is how that will impact the core business of utilities, once the slumbering giants of the power industry. More solar means their once-captive customers suddenly have choice. To retain them, the utilities need to forge a stickier relationship—something that will require substantial regulatory change as well as a shift in how they run their business.

Mr. Craver, for one, says he's looking for a way to help manage a marketplace in which some of his customers are selling the power they generate while others are buying it.

"Think Bitcoin, eHarmony, eBay—platforms that match buyer and seller on an individual basis," says Mr. Craver. "That is the vision some of us have for the longer term."

Morning jolts

There are still moments when the grid can teeter on the brink, usually due to a series of coincidences. Most wind power in California comes at night, for example. But occasionally it keeps blowing into the morning, as the sun begins firing up solar panels. As demand is typically light then, a surge could swarm the grid with excess power—which can fry equipment and interrupt service.

To forestall such a possibility, officials at Ca-ISO, the state grid operator, are expanding the regional footprint where its renewable power can be consumed. Its weapon to date has been something called the energy-imbalance market—a spot market where power is traded at 15-minute or even 5-minute intervals. The market now includes not just California players, but also **Pacific** Corp., with power assets in Oregon and other Western states. Soon, Phoenix-based Arizona Public Service will join, followed by **NV Energy** of Nevada.

The energy-imbalance market works like a relief valve to offset pressure in the system. But solar is still being added at a heady pace. That means the state is essentially in a perpetual foot race, trying to stay one step ahead of the on-again, off-again issues brought on by renewable power.

With so much solar on the grid, a sudden weather shift still can leave utilities scrambling for more power. Rushing to fill the breach is a bevy of tech companies that insist the energy industry doesn't need better power generation, just better software.

Software and storage

Boston-based **EnerNOC** Inc., for one, sells software that companies use to receive warnings from utilities about possible power insufficiencies. The companies can respond by, and be compensated for, cycling off an air-conditioning unit or idling an elevator. David Brewster, EnerNOC's president, predicts that as utilities try to manage frequent bumps in their renewable energy supply, they will adopt ever more intricate pricing plans.

"We're going to have an evolution of rate structures," Mr. Brewster says. That is being spurred by the continuing rollout of digital electric meters, which allow utilities to send numerous price signals to consumers throughout the day, a practice known as time-of-use metering. Utilities can raise prices if they expect a shortfall in power, or lower them if they expect a deluge.

As the adoption rate of solar continues on its tear, the size of the challenge mounts. Still, some are surprisingly sanguine about the future.

"Call me an optimist, but I believe we can transition to clean energy and lower bills," says Peter Rive, co-founder of San Mateo, Calif.-based **Solar City** Inc. The big changes he sees happening aren't at the grid level, but at the home. Key to making that transition, he says, will be installing solar panels with software and storage devices—namely batteries.

Having storage and panels, with software that regulates it all, will allow the grid to tell the home when it is facing a potential power overload and instruct it to charge up the battery. Later, when the grid needs power, it can call on the battery to deliver it.

Enphase Energy Inc., based in Petaluma, Calif., will soon begin selling a home-solar-power storage system. So far, it will only be available in Australia. One of the hurdles is the high cost of batteries, though they are falling rapidly.

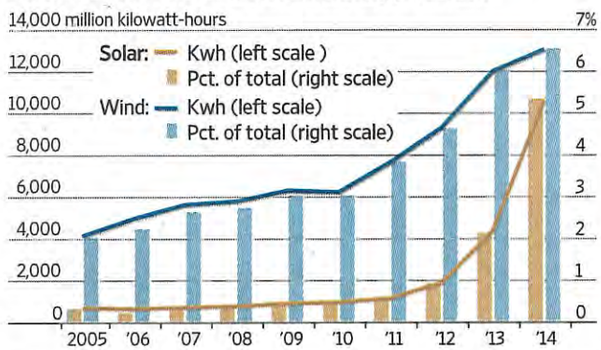
Paul Nahi, Enphase's chief executive, insists that installing a battery alongside solar panels won't just improve the reliability of the grid, but increase value for homeowners.

"When you wrap all these things together, solar, batteries and software," he says, "you start to solve a lot of these problems."

Mr. Kahn, a former Wall Street Journal bureau chief, is a professor at the University of Southern California's Annenberg School of Journalism. Email reports@wsj.com.

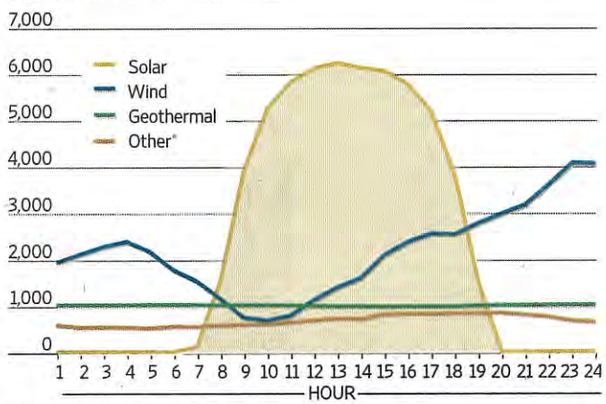
Sun and Wind Rising

Electricity generated in California by these two renewable sources and their share of the state's total electricity production



Daily Ups and Downs

An hourly breakdown of electricity production in California from renewable sources shows the big swings that can occur through the course of one day, posing a challenge to grid managers. Figures are for Aug. 17, in average megawatts by hour, but can vary widely from day to day and season to season.



* Includes biomass, biogas and small hydro.

Sources: California Energy Commission (top); California ISO THE WALL STREET JOURNAL.

News from 2015

News from 2014

News from 2013

News from 2012

News from 2011

News from 2010

Traffic deaths surge as Americans return to the roads

Posted on September 8th, 2015 in News

Tags: safety, VMT

By Chris McCahill

U.S. traffic deaths increased by 14 percent in the first half of 2015 compared to the first half of 2014, to nearly 19,000 deaths through June, according to the National Safety Council. If the trend holds, this year will be the deadliest for road users since 2007.

At the same time, traffic volume as measured by vehicle-miles traveled (VMT) also reached its highest six-month level since 2007—roughly 1.54 trillion miles in the first half of the year—according to the Federal Highway Administration.

The NSC connects the two trends, singling out the growth in VMT as a likely cause of the increase in deaths. However, NSC President Deborah A.P. Hersman also pointed out that the increase in driving is much smaller than the rise in traffic deaths and injuries. Hersman speculates that other factors, such as higher speed limits in some states and distracted driving due to mobile phone use, may be to blame as well.

Yet viewed over a period of 20 years, the association between deaths and VMT appears to be strong, albeit not at a 1-to-1 rate. Traffic safety appears to be highly sensitive to changes in the amount of vehicle travel taking place. As shown in Figure 1, traffic deaths dropped by more than 20 percent between 2007 and 2011, when VMT decreased by around 3 percent. The projected growth of each in 2015 shows a remarkably similar pattern, with both variables increasing but the death toll growing at a faster rate than VMT.

Figure 1. VMT and traffic deaths in the United States. Data sources: FHWA, NHTSA and NCS.

Why would a small change in VMT be related to a big change in deaths? One reason could be that discretionary travel likely plays a key role in VMT fluctuations. Discretionary trips often cover long distances on unfamiliar roads or they are made at night and on weekends, when serious crashes occur

most often.

That is only one theory. If you have a thought on this relationship, please share it. If we receive good ideas we will summarize them in a subsequent post.

Whatever the cause, these findings suggest that U.S. traffic fatality rates—the number of deaths per million miles driven—are not following a constant downward trajectory, but instead are related to the amount of travel taking place. As shown in Figure 2, fatality rates were decreasing relatively gradually through 2007, when they dropped sharply, at the same time that VMT fell. Now with VMT growing in 2015, those past safety gains are also receding.

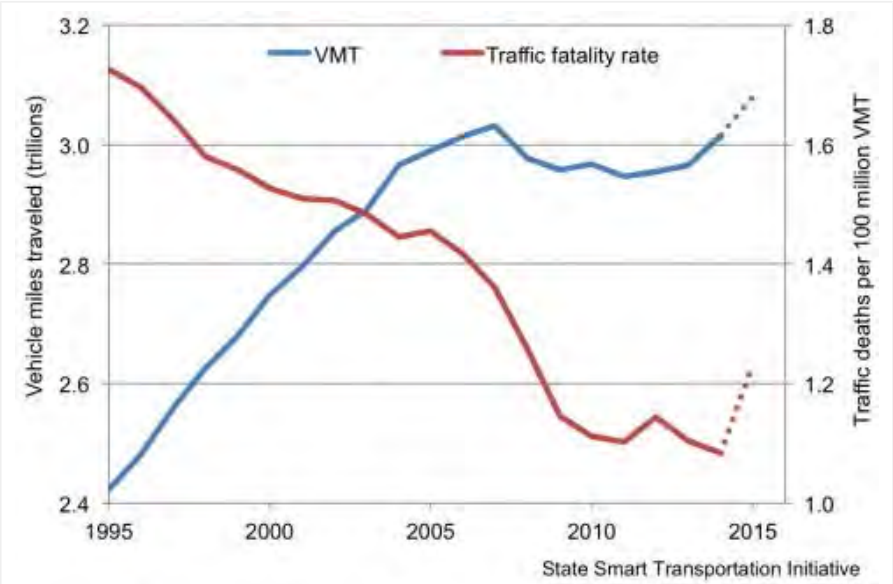


Figure 2. VMT and traffic fatality rates in the United States. Data sources: FHWA, NHTSA and NCS.

Several states, including California, Massachusetts, and Washington, have policies in place aimed at reducing VMT. Those policies are typically framed as solutions for congestion and/or greenhouse gas emissions. But stakeholders should be aware that VMT reduction also appears to be a powerful way to reduce injuries and save lives.

Chris McCahill is a Senior Associate at SSTI.