TECHNICAL MEMORANDUM

HydroScience
Strategic Water Solutions

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To: Mansour Nasser, P.E., City of Sunnyvale

From: Angela Singer, P.E., LEED AP

Reviewed By: Curtis Lam, P.E.
Mary Hoang, P.E

Subject: TM #3 – Dual-Plumbing Policies Recommendations
City of Sunnyvale – Feasibility Study for Recycled Water Expansion

Date: October 9, 2012

The City of Sunnyvale (City) has retained HydroScience Engineers, Inc. (HSe) to prepare a Feasibility Study for Recycled Water Expansion (Feasibility Study). This Technical Memorandum (TM) is the third in a series of TMs developing various aspects of the Feasibility Study, which will be compiled into a single Feasibility Study document.

Introduction and Purpose

Dual-plumbed use systems are defined as systems that have separate piping for recycled water and potable water under two scenarios; to serve plumbing fixtures (toilets and urinals) within a building or landscape irrigation for single-family residential. Landscape irrigation systems for non-single family residential parcels are specifically excluded from the definition of dual-plumbed use areas since they typically have separate irrigation systems to begin with and can be served by either potable or recycled water.

The purpose of this TM is to provide recommendations for the City's development and implementation of dual-plumbing policies. In September 2010, The City evaluated the potential for developing a dual-plumbing use ordinance. The report, which is included as **Attachment A**, describes the existing policies that address the use of recycled water and water conservation goals. The recommendation was to require recycled water use for irrigation, but not for dual-plumbing, for new residential and non-residential buildings that meet the identified criteria. The recommendation was also to further study ways to encourage recycled water use and expansion.

There are four attachments provided to supplement the TM. The attachments include:

- Attachment A – Report to Mayor and Council – Requiring Dual Plumbing for Future Developments for Reclaimed Water (Study Issue, September 28, 2010)
- Attachment B – City of Sunnyvale Municipal Codes related to Recycled Water and Conservation
- Attachment C – 2010 California Green Building Standards Code, Divisions 4.3 and 5.3, Mandatory Measures for Residential and Non-Residential Construction, respectively
- Attachment D – City of Sunnyvale Green Building Program Brochure and Checklists

Existing Policies and Regulations

The City operates the recycled water system under a Master Water Reclamation Permit (Permit) Order No. 94-069 issued by the San Francisco Bay Regional Water Quality Control Board (Regional Board). The Permit gives the City the authority to regulate recycled water users in accordance with Title 22 regulations. As such, the City is required to develop a program for recycled water users to assure that recycled water use is in accordance with applicable California Department of Public Health and Regional Board regulations. With respect to dual-plumbed use, typically a user would be required to provide a Title 22 Engineering Report; however, the users under the Permit are exempt from this requirement. Dual-plumbed users would be subject to requirements of the City's Water Reclamation Program per the Permit.

To date, the City has implemented various policies to address water conservation and the use of recycled water. In addition, there are other policies and regulations that are driving the City's policies as well as regional policies. Below is a summary of the various local, regional, and state codes and policies that are currently in place.

City of Sunnyvale Municipal Codes

The following list provides a description of the municipal codes, the intent, and targeted users. The full text of the codes is included as **Attachment B**.

- **Chapter 12.34. Water Conservation Restrictions:** The purpose of this chapter is to promote water conservation. This chapter identifies the types of activities defined as non-essential water uses and prohibits those activities. This chapter also details the penalty for violation, and the Director of Public Works authority to implement the provisions of the chapter.

- **Chapter 12.40. Wastewater Capacity Allocation:** Section 12.40.090 of this chapter addresses users that propose to discharge wastewater in quantities in excess of 50,000 gallons per day (gpd). This section identifies water conservation and recycling as two of the potential mitigation measures that must be implemented to reduce the proposed discharge to the maximum extent possible prior to exceeding the 50,000 gpd limit.

- **Chapter 19.37. Landscaping, Irrigation and useable open space:** This chapter provides design guidelines and minimum landscaped area requirements for each type of zoning district. This chapter also promotes water conservation and water use efficiency in design development. Section 19.37.060 also describes the requirement to use recycled water in recirculating water features, if available.

- **Chapter 19.39 Green Building Regulations:** This chapter is intended to promote sustainable development and describes the types of projects that are subject to the regulations, which are generally considered new construction or major alterations. As part of the Green Building rating system implemented by the City, developers are required to meet the minimum standards prescribed by the City. One of the standards is a water conservation requirement, which can be met either through conservation or the use of recycled water.

Other Policies/Regulations

The following policies are currently implemented by the City to promote water conservation and/or recycled water use.

- **2010 California Green Building Standards Code (CALGreen):** CALGreen was adopted by the State of California and sets minimum sustainability standards for new residential and non-residential construction. With respect to water conservation, the standard requires that new construction achieve a minimum of 20% reduction in indoor potable water use. This reduction can be met by either the use of water-efficient fixtures or the use of recycled water in lieu of potable water, i.e. a dual-plumbed system. The applicable sections of the CALGreen code are provided as **Attachment C**.

- **The Moffett Park Specific Plan:** The Plan incorporates a policy regarding the use of recycled water. It states the following (page 68 of the Specific Plan):

  "New development shall incorporate recycled water usage to the extent feasible into both landscaping and building operations. When municipal recycled water access is available or can be made available to the site, new development and additions greater than 10,000 square feet shall incorporate access to the recycled water system into the design for either immediate or future usage. Extension or expansion of water lines adjoining the site (Exhibit 4-10, 11) shall be the obligation of the subdivider or developer of the site at their own expense. Changes of use requiring a planning permit may be required by the approving authority to include recycled water options within the development."

- **City of Sunnyvale Green Building Program:** The City Council adopted a green building program, which has been in effect since January 1, 2010. The Council recently revised the green building standards on April 24, 2012, which will affect building permits submitted on or after October 1, 2012. The standards apply to new construction, additions, and remodels of buildings. The Program is intended to promote sustainability in design and construction and requires that any new permittee meet the minimum criteria based on a system of checklists. The City is also providing incentives for permittees that exceed the minimum criteria to further encourage green building design. The standards also reflect the recent requirements adopted by the State of California in CALGreen and also incorporate elements of the U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) Certification Program. The Program brochure and checklists are provided as **Attachment D**.

Regional Policies

Other municipalities have also evaluated and/or implemented dual-plumbing requirements for new or remodeled construction. Existing and proposed municipal codes were reviewed for the Cities of Palo Alto, Redwood City, Mountain View, San Jose, and Santa Clara. A description of each existing or proposed policy is described below.

- **City of Redwood City:** The City of Redwood City has implemented a detailed ordinance with respect to recycled water. The ordinance defines a Recycled Water Service Area within the City; projects are either located within or outside the Recycled Water Service Area. The ordinance further divides projects by land use type.

All existing commercial and industrial projects, as well as new residential apartments and condominiums, which are located within the Recycled Water Service Area are required to use recycled water for landscape irrigation (specifically in common-areas for residential projects).

All new commercial, industrial, institutional and governmental, and residential use within the Recycled Water Service Area are required to be dual-plumbed and industrial projects are encourage to consider the feasibility of using recycled water for cooling and/or other industrial processes.

In general, existing projects located within the Recycled Water Service Area and new projects located outside of the Recycled Water Service Area are encouraged to consider the feasibility of using recycled water for landscape irrigation, dual-plumbed use, cooling, and other industrial processes.

The code does not specify building or project site size criteria in determining which sites are subject to the policy.

- **City of Palo Alto:** The City of Palo Alto has also implemented a detailed ordinance with respect to recycled water. The policy requires that, within the Recycled Water Project Area, all notified customers use recycled water for landscape irrigation and all notified customers where dual-plumbing systems exist, use recycled water for toilet and urinal flushing and floor trap priming.

  The policy requires that all new construction, except for single-family homes, within the Recycled Water Project Area is required to use recycled water, when available and design and construct the infrastructure necessary to do so. The policy also applies to new construction outside of the Recycled Water Project Area if the total landscaped area exceeds 1,500 square feet.

  With regards to indoor uses, the policy requires that new construction located within the Recycled Water Project Area must allow the use of recycled water for toilet and urinal flushing and floor trap priming if the building is greater than 10,000 square feet or where the installation of 25 or more toilets and urinals are proposed. The policy applies to new construction located outside the Recycled Water Project Area if the building is greater than 100,000 square feet or where the installation of 100 or more toilets and urinals are proposed

- **City of Mountain View:** At this point in time, the City of Mountain View does not have a specific policy regarding indoor water use. The City of Mountain View does, however, require the use of recycled water for landscape irrigation for new construction located within the Shoreline Regional Park Community. In addition, the following statement is also included in the municipal code to give the City additional flexibility:

  "The city maintains the right to require recycled water use for additional purposes as appropriate."

- **City of San Jose:** The City of San Jose does not currently have a policy in place that specifically addresses indoor recycled water use. The policy for outdoor recycled water use prohibits the use of potable water where a site has been constructed or retrofitted for recycled water use for landscape irrigation and recycled water is available. Additionally, sites with landscaped area in excess of 10,000 square feet are required to design and install an irrigation system that allows the use of recycled water, whether recycled water is immediately available or available in the future.

In the summer of 2009, a report to council was submitted to propose an ordinance requiring dual-plumbing in new construction. The following recommendations were made:

(1) Prohibit the use of potable water for indoor uses for which recycled water is allowed in non-residential buildings where:

a) Plumbing for recycled water has been installed in compliance with the provisions of the Plumbing Code and

b) Recycled water is available to the property.

(2) Condition development approval on the installation of plumbing that allows for the use of recycled water, in compliance with the provisions of the Plumbing Code, where:

a) The project includes new non-residential buildings equal to or larger than 50,000 square feet; mixed-use buildings in which the non-residential area is equal to or larger than 50,000 square feet, or new non-residential or mixed-use buildings situated on a site equal to or greater than 100,000 square feet; or

b) The project is located within one-half mile of existing South Bay Water Recycling pipelines, pipelines that are included in the South Bay Water Recycling five year capital improvement budget, or pipelines that are otherwise likely to be installed within five years; and includes new non-residential buildings equal to or larger than 5,000 square feet or mixed-use buildings in which the non-residential area is equal to or larger than 5,000 square feet, or new non-residential or mixed-use buildings situated on a site equal to or greater than 10,000 square feet.

The City of San Jose has not yet made any modifications to the ordinances with regards to dual-plumbing.

- **City of Santa Clara:** The City of Santa Clara has implemented a similar outdoor recycled water use policy as that of the City of San Jose, where the use of potable water is prohibited where recycled water is available and meets all applicable standards. The City of Santa Clara policy also requires that all other non-potable uses, where recycled water is available, meet all applicable standards.

As demonstrated by these regional policies, there is a wide-range of policies regarding the implementation of recycled water. **Table 1** summarizes these policies and compares them to the City's policies.

Table 1: Summary of Regional Recycled Water Use Policies

Municipality	RW Service Area	Within Service Area		Outside Service Area	
		Landscape Irrigation Required	Dual Plumbing Required	Landscape Irrigation Required	Dual Plumbing Required
Sunnyvale	Moffett Park Specific Plan [1]	X	X		
Redwood City	Recycled Water Service Area	X	X		
Palo Alto	Recycled Water Project Area	X	X	X	X
Mountain View	Shoreline Regional Park Community	X			
San Jose	City Limits [2]	X		N/A	N/A
Santa Clara	City Limits [2]	X		N/A	N/A

Notes
1. The Moffett Park Specific Plan has a policy regarding the use of recycled water; however, the policy does not apply to the Recycled Water Service Area located outside of the Specific Plan Area nor the remainder of the City outside of the Recycled Water Service Area.
2. The Cities of San Jose and Santa Clara do not have a separately bounded recycled water service area within the City limits. The recycled water service area is bounded by the City limits. Anything outside of the recycled water service area would be outside of the City limits.

The Cities of Redwood City and Palo Alto both require the use of recycled water for irrigation and dual-plumbing for certain types and projects that exceed a certain criteria (i.e. square footage or number of water closets/urinal). The other cities (Mountain View, San Jose, and Santa Clara) require, at minimum, that users connect to the recycled water system for landscape irrigation, if it is available. As for the City of Sunnyvale, only the Moffett Park Specific Plan delineates a requirement for recycled water use; otherwise, recycled water use within the City is optional and is generally encouraged to meet water conservation requirements.

Considerations

The following sections describe the considerations for determining the feasibility and the necessity of a dual-plumbing policy for the City.

Water-Use Reduction

The City conducted research on the breakdown of indoor water use, which was presented in the Report to Council (**Attachment A**). The data indicated that indoor water consumption comprised 42% of overall residential water use and 24% of overall non-residential water use. The City further estimated the breakdown of water closets/urinals as 26% of the indoor water use for both residential and non-residential. As such, by providing dual-plumbing to water closets/urinals, there is the potential to save up to 26% of indoor potable water use, which can achieve the 20% reduction required by CALGreen. **Figure 1** and **Figure 2**, originally presented in the Report to Council, describe the breakdown of water consumption in residential and non-residential projects, respectively.

FIGURE 1: Residential Water Consumption

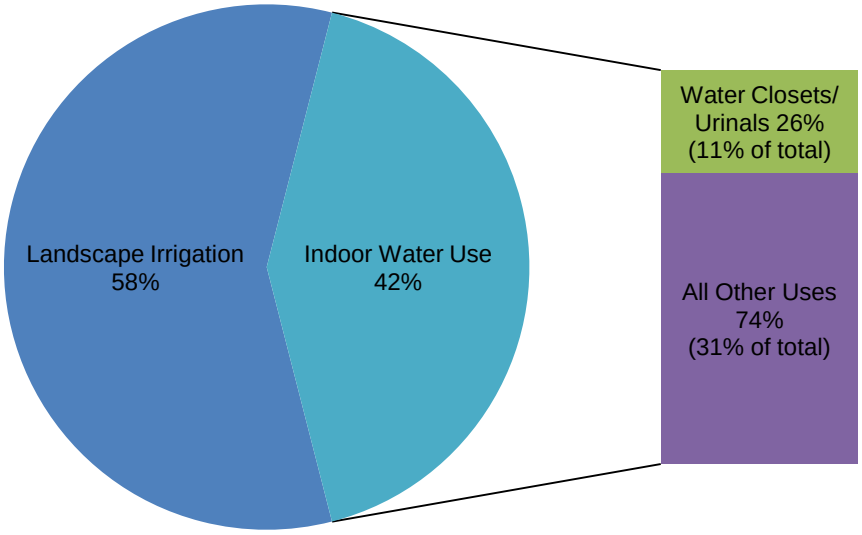
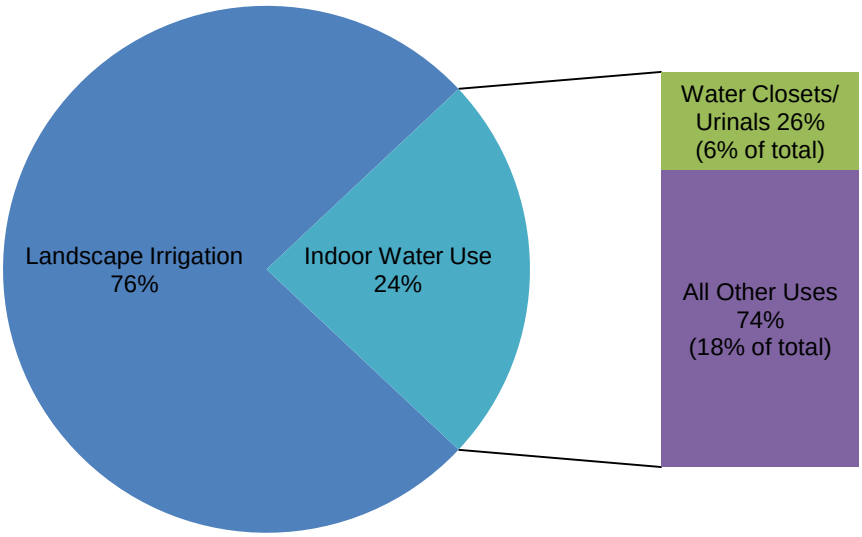


FIGURE 2: Non-Residential Water Consumption



Landscape Irrigation

Figures 1 and 2 show that the most effective way to reduce overall potable water consumption is to use recycled water for landscape irrigation; this would reduce overall potable water consumption by 58% to 76% for residential and non-residential projects, respectively. In addition, for new construction, the cost to install an irrigation system equipped for recycled water use is negligible relative to overall construction costs.

Dual-Plumbing

It is noted that, while CALGreen requires 20% reduction in indoor water use and implementing dual-plumbing would reduce indoor water use by up to 26%, the overall water use reduction that would be achieved by dual-plumbing for water closets/urinals would only be 11% and 6% for residential and non-residential projects, respectively.

Furthermore, the caveat to this is that the developer would need to provide water-efficient fixtures as well as dual-plumbing so that the building can meet the CALGreen 20% reduction requirement with potable water or recycled water. In the event that recycled water was not available, for any reason, then the developer would not be in compliance with the CALGreen requirement if they did not install water-efficient fixtures as well. As such, the developer would need to provide both water-efficient fixtures and dual-plumbing so that the building would achieve the CALGreen 20% reduction requirement either way.

With both water-efficient fixtures and dual-plumbing implemented, regardless of whether the project received potable or recycled water, there would be overall cost-savings for the reduction in the volume of water purchased while the actual cost-savings would be dictated by the price of recycled water versus potable water.

Cost of Dual-Plumbing

The City received information from developers that had worked in the City to estimate the cost implication for construction of a dual-plumbed building. **Table 2** provides a breakdown of the estimated cost increase by type of building (previously presented in the Report to Council):

Table 2: Estimated Cost Increase for Dual-Plumbing Installation [1]

Type of New Building	Increase in Plumbing Costs
Residential	40%
Non-Residential up to 3 Stories	20%
Non-Residential over 3 Stories	30%

Notes
1. Presented in *Report to Mayor and Council – Requiring Dual Plumbing for Future Developments for Reclaimed Water* (Study Issue, September 28, 2010)

The proposed cost increase in plumbing alone translates to approximately 1% increase in overall construction costs. Studies have indicated that there can be a cost premium for LEED certification, which also depends on the level of certification, but typically increases construction costs by 1% to 2%. LEED certification is a point-based system that incorporates all types of building materials and sustainability goals.

The City provides incentives to developers through the Green Building Program for attaining LEED certification. From the perspective of achieving LEED certification, the cost to implement dual-plumbing would increase overall costs significantly, while only enabling an applicant to obtain water-efficiency points, which is a small percentage of the overall LEED point requirement. The implication is that, based on the cost to implement dual-plumbing compared to the cost to attain LEED certification status, there is little incentive for a developer to implement dual-plumbing if they can reduce water use through implementing water-efficient fixtures, while obtaining City incentives through LEED certification.

Recommendations

HSe concurs with the findings of the Report to Council and does not recommend the City pursue the development of a dual-plumbing policy due to the limited incentive and opportunity, and the high cost of implementing a dual-plumbing system. Currently, the Green Building Program allows for developers to have the option to implement a dual-plumbing system to achieve the 20% reduction for indoor water use, which is an appropriate level of encouragement given the low incentives.

HSe also concurs with the findings of the Report to Council to codify a policy regarding the implementation of recycled water for landscape irrigation in new developments due to the high potential for water-savings as depicted in **Figure 1** and **Figure 2**. The Report to Council recommended the following criteria as a policy basis:

> *"…require that the following types of projects use the recycled water system for landscape irrigation when available at the project site or when within 300 feet of the project site.*
>
> - *New multi-family (3 or more dwelling units) with greater than 1,000 square feet of new or rehabilitated landscaped area; and*
> - *New non-residential buildings and additions greater than 5,000 square feet with greater than 1,000 square feet of new or rehabilitated landscaped area."*

HSe would recommend that the policy go the extra step to require a separate irrigation meter for all new multi-family and non-residential buildings that meet the criteria described above, regardless of proximity to an existing or planned recycled water pipeline. Those developments should also be required to design and construct the irrigation system to meet recycled water system design requirements per the City's and Title 22 regulations. This will assure that these systems will be ready for connection when and if, recycled water becomes available.

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ATTACHMENT A

City of Sunnyvale
Feasibility Study for Recycled Water Expansion
Dual-Plumbing Policies Recommendations TM
Report to Mayor and Council Regarding Dual-Plumbing Policies

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ATTACHMENT A

REPORT TO MAYOR AND COUNCIL **NO: 10-250_____**

Council Meeting: September 28, 2010

SUBJECT: Requiring Dual Plumbing for Future Developments for Reclaimed Water (Study Issue)

REPORT IN BRIEF

The Dual Plumbing for New Developments study issue was ranked by the Council as the Community Development Department's number two study issue for 2010. The purpose of dual plumbing is to reduce the amount of potable water used by supplying recycled water to certain plumbing fixtures within buildings. Dual plumbing systems provide municipally-supplied recycled water to certain plumbing fixtures within a building. The California Plumbing Code allows recycled water to be used for water closets, urinals, trap primers for floor drains, and floor sinks within a building. Of these fixtures, water closets and urinals are the most water consuming; the other fixtures use a very minimal amount of water.

The City currently has several policies to reduce the usage of potable water. In addition, the California Green Building Code (CALGreen), which will be effective on January 1, 2011, requires that all new construction reduce indoor water use by 20%. This code was adopted as part of the triennial California building code updates and local jurisdictions are required to enforce it on January 1, 2011.

The largest amount of water usage at a property is by far for landscape irrigation. The existing green building ordinance and water efficient landscape ordinance currently mandate water conservation performance goals or measures. Within a building, plumbing fixtures that are permitted to use recycled water account for approximately a quarter of water usage. This is a similar amount of savings that is required by the upcoming CALGreen Building Code.

Staff recommends the following:

1. Introduce an ordinance to require that the following types of projects use the recycled water system for landscape irrigation when available at the project site or when within 300 feet of the project site:
   - New multi-family (3 or more dwelling units) with greater than 1,000 square feet of new or rehabilitated landscaped area; and

- New non-residential buildings and additions greater than 5,000 square feet with greater than 1,000 square feet of new or rehabilitated landscaped area.

The developer/property owner would be responsible for incurring the costs of any extension of the recycled water distribution main lines.

2. Direct staff to further study the most effective way to encourage additional usage and expansion of the recycled water system as part of the upcoming Recycled Water Master Plan.

BACKGROUND

Dual Plumbing for New Developments was originally added as a potential Council study issue for 2008; however, it ranked below the line in 2008 and 2009. This item ranked number two for the Community Development Department for 2010. The Study Issue Paper is attached to this report (Attachment 1).

Since this study issue was first proposed, several policies and ordinances have been developed to reduce the use of potable water. These policies include the recently adopted water efficient landscape ordinance requiring reduction in potable water usage for landscape irrigation, staff participation in the County-wide Graywater Working Group, and the upcoming California Green Building Code (CALGreen). These items, as well as other adopted policies, are discussed in further detail in the Existing Policies section of this report.

Terms

Following are descriptions of terms that will be used throughout this report.

Dual plumbing systems consist of dedicated recycled water supply line for certain fixtures, such as water closets, urinals, trap primers for floor drains, and floor sinks. These lines are in addition to potable water supply lines to the remaining plumbing fixtures within a building

Recycled water for landscape irrigation is the use of municipal-supplied recycled water for outdoor irrigation use. These systems require connecting to the recycled water supply lines, rather than potable water, for the piping supplying landscape irrigation. Although these systems are not typically considered "dual plumbing," since there is only one set of water supply lines, they are considered as part of this study.

Graywater is untreated (or treated on-site) waste water from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs. Graywater can only be re-used on the site where the discharged waste water was generated. Graywater system installation requirements are regulated by

the California Plumbing Code and can only be used for landscape irrigation. These systems are not part of this study as they were reviewed by Council on September 29, 2009 at which time Council directed staff to continue to participate in the County Graywater Working Group. Staff from the Department of Public Works continues to work with this group and are reviewing the current State graywater requirements to determine if local modifications should be made.

Purpose

Purpose of dual plumbing is to reduce the amount of potable water used by supplying recycled water to certain plumbing fixtures within buildings. The California Plumbing Code allows recycled water to be used within a building for the water closets, urinals, trap primers for floor drains, and floor sinks. The trap primers and floor sinks are typically found in non-residential kitchens and use a minimal amount of water.

EXISTING POLICY

Community Vision – City-Wide Goal

III. Environmental Sustainability: To promote environmental sustainability and remediation in the planning and development of the city, in the design and operation of public and private buildings, in the transportation system, in the use of potable water, and in the recycling of waste.

Water Resources Sub-Element

Action Strategy A.2d: Pursue developer commitments to provide recycled water facilities in new and redevelopment projects for irrigation and dual plumbing, where feasible.

Action Strategy 3.3C.4c: Market recycled water to potential new customers and maximize the use of recycled water within existing distribution area.

Moffett Park Specific Plan

Requires that additions and new developments greater than 10,000 square feet shall incorporate recycled water usage, to the extent feasible, into both landscaping and building operations.

Municipal Code Section 19.39 – Green Building Standards

Requires all non-residential construction over 5,000 square feet, non-residential major alterations over 50,000 square feet, new multi-family projects (three or more units), and new single-family/duplex projects over 1,500 square feet to achieve minimum levels of green point ratings (either LEED or Build it Green). The green building point rating systems contain items for reduction in usage of potable water.

Municipal Code Section 19.37 – Landscaping, Irrigation, and Usable Open Space
Requires new or rehabilitated landscaping of 1,000 square feet or more (except single-family and duplex which is only when in conjunction with construction of a new dwelling unit) to meet water-efficient landscaping and irrigation standards which are designed to reduce potable water usage by 20% to 25%.

2010 California Green Building Code
Effective January 1, 2011, this new code will mandate that all new construction reduce indoor potable water use by a minimum of 20%.

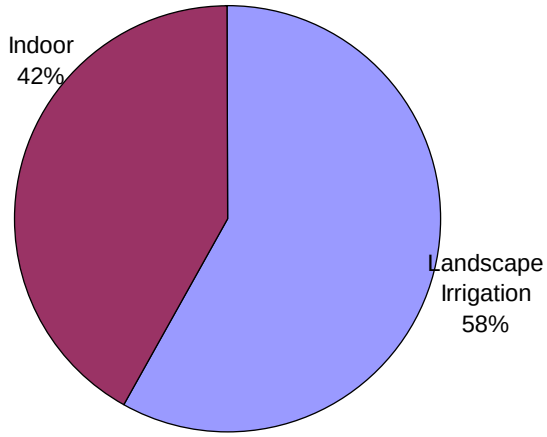
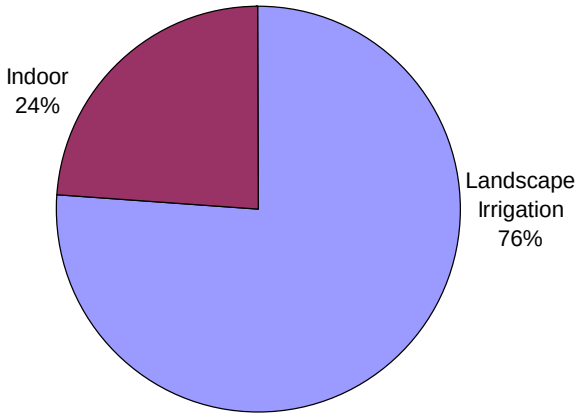
20 by 2020 Statewide Water Conservation
In 2008, the Governor signed into law SBX7 which calls for a 20 percent reduction in statewide gallons per capita per day by 2020. It requires the City, as a retail supplier, to meet this goal.

DISCUSSION

Current Availability of the Recycled Water Distribution System
The City's current recycled water distribution system primarily provides recycled water to the Moffett Park area with an extension line running south that is located to the east of Fair Oaks Avenue (Attachment 2). All of the current 128 utility accounts that use the recycled water system are for landscape irrigation purposes. The recycled water system is used by many large campus developments in Moffett Park, the Municipal Golf course, Baylands Park, and Lowe's on E. Arques Avenue (connecting to the extension east of Fair Oaks Avenue). Refer to Attachment 3 for recycled water use for sample projects.

Water Consumption
Following is a summary of average water consumption ratios for residential and non-residential sites. This information is based on research from the US Green Building Council's LEED program, Alliance for Water Efficiency, East Bay Municipal Utility District, and actual utility billing rates (summary in Attachment 3).

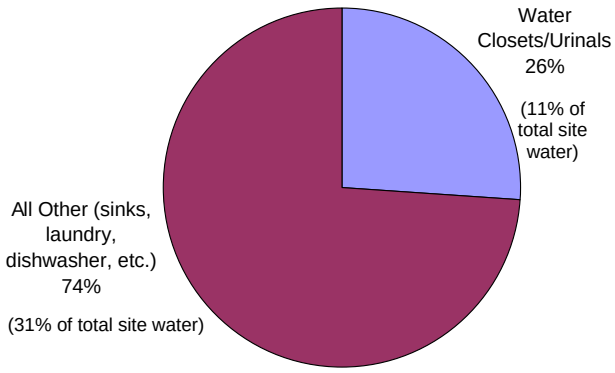
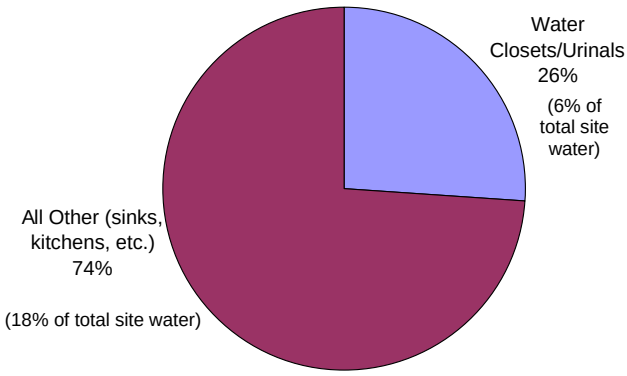
Average Total Site Water Consumption

Residential	Non-Residential
	

As demonstrated by the table above, the vast majority of water used is for landscape irrigation. Therefore, the most effective use of recycled water would be for landscape irrigation as it would result in the largest reduction in potable water consumption.

Based on the same research noted above, the following graphs show the average amount of indoor water use that is for water closets and urinals. These are the largest water consuming indoor fixtures permitted to be supplied with recycled water.

Average Total Indoor Water Consumption

Residential	Non-Residential
	

For both types of uses, about a quarter of indoor water usage is for water closets and urinals. This is the amount of potable water that would be saved if a building were supplied with a dual plumbing system.

Cost of Dual Plumbing
Based on information received from several developers who have done work in Sunnyvale in the past few years, following is a summary of the estimated increase in cost for the installation of dual plumbing in new construction:

Type of New Building	Increase in Plumbing Costs
Residential	40%
Non-Residential up to 3 Stories	20%
Non-Residential over 3 Stories	30%

These costs are based on the additional on-site costs and assume that municipally provided recycled water distribution pipes are available to the site.

The increased cost of the plumbing for new construction in each example above equals approximately 1% of the overall construction costs. While this may not seem like a significant overall increase, according to the US Green Building Council, to achieve LEED Certification for new buildings an increase of 1% - 2% in construction costs is required. In addition to potable water savings, the LEED Certification includes material conservation, energy savings, and indoor environmental quality.

Cost of Recycled Water for Landscape Irrigation
Using the municipally-supplied recycled water system for landscape irrigation has a very minimal cost increase over using potable water. The use of recycled water requires the installation of different materials (i.e. purple water pipe and cautionary signage), a connection to the recycled water system rather than the potable water system, and a separate water meter.

The use of recycled water within a building increases the installation costs due to the two plumbing lines that must be installed; one for potable water at certain fixtures and one for recycled water at other fixtures. With landscape irrigation, there is only one set of water lines for either system.

2010 California Green Building Code (CALGreen)
The 2010 CALGreen contains mandatory requirements for new residential and non-residential buildings throughout California beginning on January 1, 2011. The development of CALGreen is intended to (1) cause a reduction in greenhouse gas emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; and (3) reduce energy and water consumption.

CALGreen mandates that all new buildings reduce indoor potable water consumption by 20%. This reduction can be achieved through the use of water conserving plumbing fixtures, high efficiency appliances, dual flush toilets, waterless urinals, or dual plumbing. This mandated reduction amount of 20% is close to the 26% potable water savings that would be realized through a dual plumbing system noted previously in this report.

The adoption of the 2010 California building codes, which include CALGreen, is scheduled to be heard by the Council in November 2010.

Recycled Water Master Plan

The Department of Public Works is currently in the beginning stages of updating the 2000 Recycled Water Master Plan and the Plan is scheduled for Council adoption in 2011. The plan will update the issues surrounding the use of recycled water including the regulatory requirements, promoting the use of recycled water, analysis of existing facilities, and the demand for recycled water. It will also include strategies for potential expansion of the recycled water distribution system. Expansion of the system will come at significant cost; however with the price of potable water climbing steeply in the near future, it is likely that it will be cost effective to begin further expansion of the system within the next ten years.

Policies from Other Jurisdictions

Based on staff's research, no other city in the Bay Area requires dual plumbing. The City of San Jose was considering it; however, based on feedback from the community (mostly due to the increased expense), they have deferred the study to at least the end of the year.

Considerations for Requiring Use of the Recycled Water System

Requiring Dual Plumbing within a Building

Staff will continue to enforce the existing green building ordinance which includes reduction in potable water usage. Additionally, with the upcoming adoption of CALGreen, all new construction will be required to reduce potable water consumption within buildings by 20%. This is very close to the savings that may be achieved through the use of a dual plumbing system, which provides recycled water to water closets and urinals reducing potable water usage by approximately 26% of indoor water usage.

The City's current green building ordinance and upcoming CALGreen result in a similar amount of indoor potable water savings as a dual plumbing system while still providing the building owner with the flexibility of determining how best to meet the requirement (i.e. through the use of water conserving plumbing fixtures, high efficiency appliances, dual flush toilets, waterless urinals, or dual plumbing, etc.).

Based on these issues, staff does not recommend a requirement for the use of dual plumbing for indoor water usage.

Requiring Recycled Water for Landscape Irrigation
As shown in this report, the major source of water consumption is the exterior landscape irrigation. Therefore, staff recommends codifying the current Moffett Park Specific Plan policy and require that the following types of projects use the recycled water system for landscape irrigation when available at the project site or when within 300 feet of the project site.

- New multi-family (3 or more dwelling units) with greater than 1,000 square feet of new or rehabilitated landscaped area; and
- New non-residential buildings and additions greater than 5,000 square feet with greater than 1,000 square feet of new or rehabilitated landscaped area.

The 5,000 square foot threshold for non-residential and multi-family residential projects was selected as they are the current thresholds where the green building ordinance is applicable. Similarly, the 1,000 square feet of landscaping is recommended as it is in line with the thresholds in the water efficient landscape ordinance.

Recycled water used for landscape irrigation has a very minimal increased installation cost (additional cost of a separate water meter) as a "dual" system is not required; all irrigation lines are connected to the recycled water system and non-potable water is used. This recommendation was well received by the development community representatives that provided feedback on this study issue.

Potential Expansion of Recycled Water Use
Staff also considered the additional properties that might be required to incorporate recycled water use (beyond Moffett Park per present policy) when new buildings or developments occur near the current recycled water system. Staff reviewed a variety of distances requirements based on development potential, land uses and additional cost to the developers.

Based on these factors, a 300-foot distance is suggested (see map in Attachment 4). This would allow for potential expansion of recycled water use along the easterly line to several public facilities (i.e. San Miguel Elementary School area, King's Academy at the old Sunnyvale High School Site) and industrial uses (East Sunnyvale industrial area). Several residential uses are located along this distribution line that will be affected if redevelopment projects were to occur. Along the westerly line, potential expansion would be mainly in the Peery Park industrial area.

Most of the properties within 300-feet of the recycled water system would have fairly direct access to the recycled water main. If a water line extension were required, the cost for extension of the recycled water distribution mains would depend on the size of the water main, but would range from approximately $35,000 to $45,000 for a full 300-foot extension.

The 300-foot distance was also generally acceptable to the developers and property owners that provided input; farther distances raised concerns about the increased costs. Therefore, staff recommends that the ordinance require recycled water use for landscape irrigation if the recycled water distribution main is located within 300 feet of the project site.

FISCAL IMPACT

The change to the Municipal Code would have a minimal fiscal impact; however, depending on the alternatives selected, there may be some fiscal impact to the Building Division as additional plan review and inspection resources may be needed if extensive new requirements are implemented.

PUBLIC CONTACT

A notice of this study was mailed to over 160 property owners, developers, architects, and other interested parties (i.e. Chamber of Commerce, Moffett Park Business Group, etc.) who have worked on development projects in Sunnyvale over the past several years. A notice has also been available at the One-Stop permit Center for over three months.

A community meeting was held on Tuesday, August 17, 2010 to receive input from the community regarding a potential dual plumbing requirement. Staff also spoke with many members of the development community regarding this issue. The input received was consistent in expressing concern about the increased cost to provide dual plumbing and the limited availability of recycled water in the City.

Public contact was made by posting the Council agenda on the City's official-notice bulletin board outside City Hall, at the Sunnyvale Senior Center, Community Center and Department of Public Safety; and by making the agenda and report available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's Web site.

ALTERNATIVES

1. Introduce an ordinance to require that the following types of projects use the recycled water system for landscape irrigation when available at the project site or when within 300 feet of the project site:
   - New multi-family (3 or more dwelling units) with greater than 1,000 square feet of new or rehabilitated landscaped area; and

- New non-residential buildings and additions greater than 5,000 square feet with greater than 1,000 square feet of new or rehabilitated landscaped area.

The developer/property owner would be responsible for incurring the costs of any extension of the recycled water distribution main lines.

2. Introduce an ordinance to require the use the recycled water system for landscape irrigation per Alternative 1 with modifications.

3. Direct staff to further study the most effective way to encourage additional usage and expansion of the recycled water system as part of the upcoming Recycled Water Master Plan.

4. Direct staff to return with an amendment to the Municipal Code to initiate specific changes regarding dual plumbing for indoor water use.

5. Take no action.

RECOMMENDATION

Staff recommends alternatives 1 and 3.

As shown by the information provided in this report, the largest amount of water used on a site is for landscape irrigation. Additionally, with the upcoming CALGreen code, indoor water reductions will be required. Therefore, staff recommends an ordinance (Attachment 5) to require that specific projects use recycled water for landscape irrigation. Staff believes this is the most effective use of the recycled water system to reduce potable water usage.

Additionally, staff recommends continued consideration of this issue as part of the updated Recycled Water Master Plan. As this plan is updated and a strategy for possible expansion of the recycled water distribution system is developed, staff can continue to study potential future private development requirements for the usage of the system.

Reviewed by:

Hanson Hom, Director, Community Development Department
Reviewed by: Ali Fatapour, Chief Building Official
Prepared by: Diana Perkins, Acting Permit Center Coordinator

Reviewed by:

Marvin Rose, Director, Public Works Department

Approved by:

Gary M. Luebbers
City Manager

Attachments

1. Study Issue Paper
2. Map of Existing Recycled Water Distribution System
3. Summary of 2-Year Water Consumption for Sample Projects
4. Map of 300' Boundary Around Existing Recycled Water Distribution System
5. Draft Ordinance

Proposed 2010 Council Study Issue

CDD 09-02 Requiring Dual Plumbing for Future Developments for Reclaimed Water

Lead Department Community Development

Element or Sub-element Water Resources Sub-Element

New or Previous Previous

Status Pending **History** **1 year ago** Below the line **2 years ago** Below the line

1. **What are the key elements of the issue? What precipitated it?**

   Currently, the City generally provides recycled water to areas in Moffett Park, north of SR 237. Redeveloped properties in areas that are supplied with recycled water are required to connect the landscape irrigation to the recycled water system. There are currently no requirements for properties to use the recycled water system for other non-potable water uses.

   The City does not have any current plans or projects to extend the reclaimed water network to other areas of the city. Funding for such an expansion could be provided by raising water rates throughout the city.

   The adopted 2007 California Plumbing Code allows, but does not require, the use of reclaimed water in non-residential buildings for water closets, urinals, trap primers, floor drains, floor sinks, and outside irrigation.

   This study would examine the feasibility of requiring new buildings to contain dual plumbing systems, one for potable water and one that could potentially be connected to the City's recycled water system, should the system be expanded in the future.

2. **How does this relate to the General Plan or existing City Policy?**

   Water Resources Sub-Element

   Policy D.1 - Provide for an on-going potable water conservation program.

3. **Origin of issue**

   Council Member(s) Moylan, Whittum
   General Plan
   City Staff
   Public
   Board or Commission none

4. **Multiple Year Project?** No **Planned Completion Year** 2010

5. **Expected participation involved in the study issue process?**

   Does Council need to approve a work plan? No

Does this issue require review by a Board/Commission? No

If so, which?

Is a Council Study Session anticipated? No

What is the public participation process?
Notification to non-residential developers and the public of any community meeting or public hearing.

6. **Cost of Study**

Operating Budget Program covering costs
243 - Construction Permitting

Project Budget covering costs

Budget modification $ amount needed for study

Explain below what the additional funding will be used for

7. **Potential fiscal impact to implement recommendations in the Study approved by Council**

Capital expenditure range None
Operating expenditure range None
New revenues/savings range None
Explain impact briefly

8. **Staff Recommendation**

Staff Recommendation None

If 'For Study' or 'Against Study', explain

9. **Estimated consultant hours for completion of the study issue**

Managers

Role	Manager				Hours
Lead	Fatapour, Ali	Mgr CY1:	40	Mgr CY2:	0
		Staff CY1:	150	Staff CY2:	0
Support	Ryan, Trudi	Mgr CY1:	5	Mgr CY2:	0
		Staff CY1:	20	Staff CY2:	0
Interdep	Berry, Kathryn	Mgr CY1:	20	Mgr CY2:	0
		Staff CY1:	0	Staff CY2:	0
Interdep	Craig, Jim	Mgr CY1:	40	Mgr CY2:	0
		Staff CY1:	0	Staff CY2:	0
Interdep	Kirby, Tim	Mgr CY1:	40	Mgr CY2:	0
		Staff CY1:	0	Staff CY2:	0

Total Hours CY1: 315

Total Hours CY2: 0

Note: If staff's recommendation is 'For Study' or 'Against Study', the Director should note the relative importance of this Study to other major projects that the Department is currently working on or that are soon to begin, and the impact on existing services/priorities.

Reviewed by

Department Director **Date** 10/15/09

Approved by

City Manager **Date** 10/15/09

Addendum

A. Board / Commission Recommendation

☐ **Issue Created Too Late for B/C Ranking**

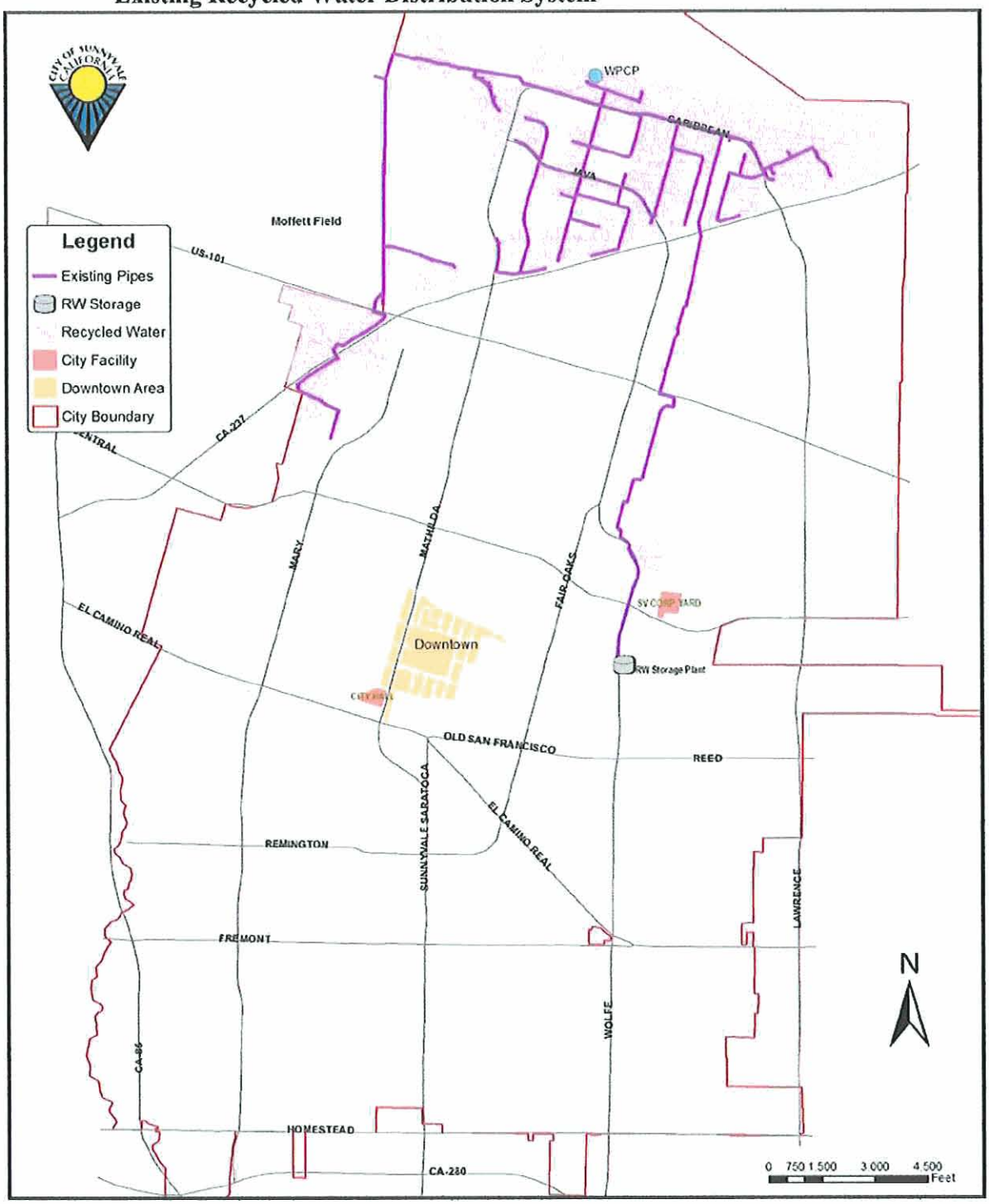
Board or Commission	Rank	Rank 1 year ago	Rank 2 years ago
Arts Commission			
Bicycle and Pedestrian Advisory Committee			
Board of Building Code Appeals			
Board of Library Trustees			
Child Care Advisory Board			
Heritage Preservation Commission			
Housing and Human Services Commission			
Parks and Recreation Commission			
Personnel Board			
Planning Commission			

Board or Commission ranking comments

B. Council

Council Rank	(no rank yet)
Start Date	(blank)
Work Plan Review Date	(blank)
Study Session Date	(blank)
RTC Date	(blank)
Actual Complete Date	(blank)
Staff Contact	

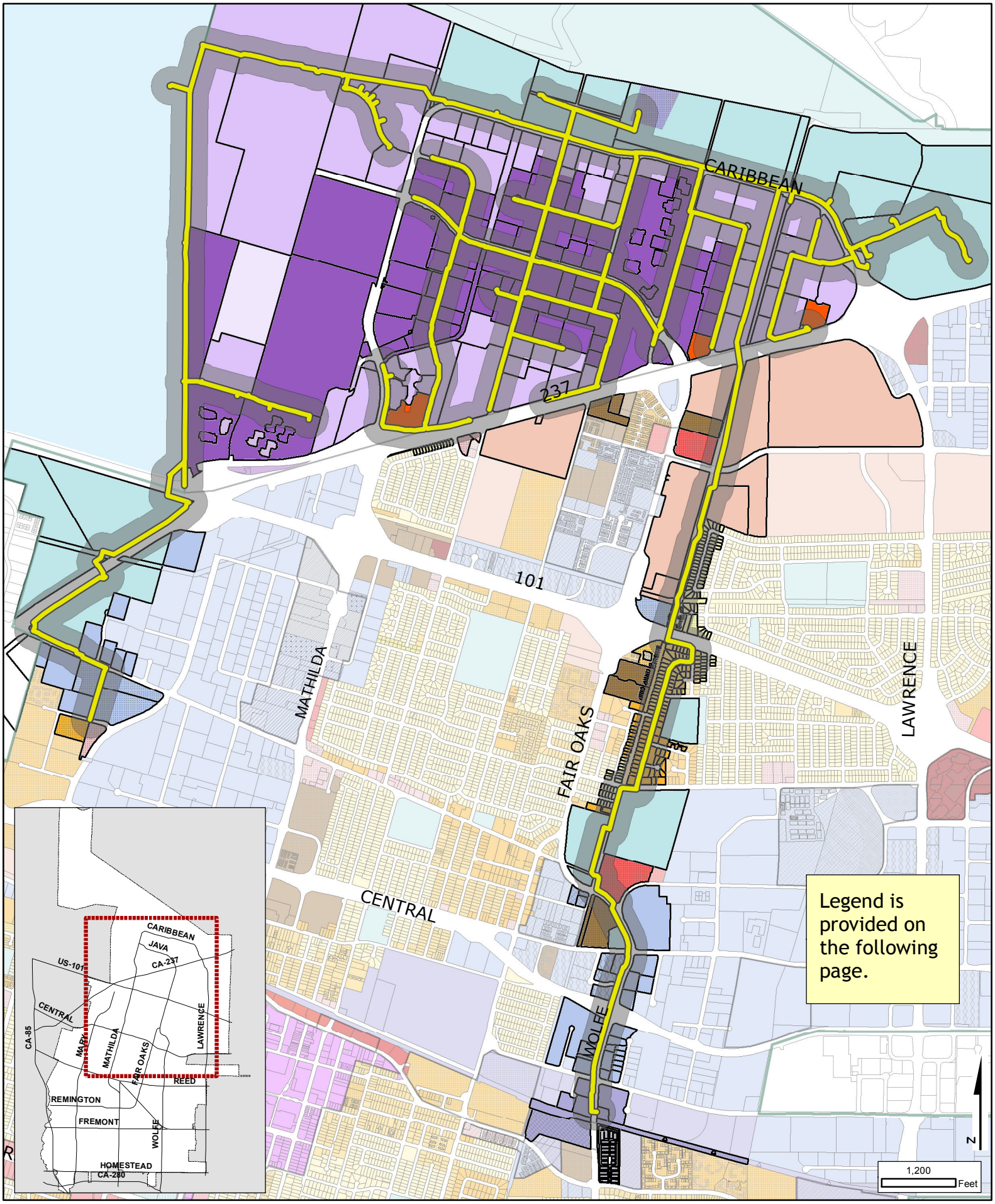
Existing Recycled Water Distribution System



Actual Water Usage for FY 08/09 and FY 09/10
Updated 8/11/2010

Type of Building	Recycled Water	Water Service	% of Total Water Used That is Recycled
100,000 Square Foot Office Building	1,860	234	88.8%
32,000 Square Foot Office Building	1,579	968	62.0%
97,000 Square Foot Office Building	2,118	1,454	59.3%
27,000 Square Foot Office Building	2,330	989	70.2%
52,000 Square Foot Office Building	2,271	553	80.4%
46,000 Square Foot Office Building	2,430	309	88.7%
165,000 Square Foot Retail Store	11,049	1,010	91.6%
52,000 Square Foot Office Building	1,195	1,962	37.9%
26,000 Square Foot Office Building	2,032	1,111	64.7%
	26,864	**8,590**	**75.8%**

Council Study Issue: Requiring Dual Plumbing for Future Developments for Reclaimed Water Properties Within 300 feet of the Existing Reclaimed Water System



Zoning - October 2009

Council Study Issue: Requiring Dual Plumbing for Future Developments for Reclaimed Water Properties Within 300 feet of the Existing Reclaimed Water System

LEGEND

- Existing Reclaimed Water (RW) System
- 300-ft Distance from RW System
- Parcels within 300 ft of RW System

Zoning Districts

- R1 - Low Density Residential
- R0 - Low Density Residential
- R1.5 - Low Medium Density Residential
- R1.7 - Low Medium Density Residential
- R2 - Low Medium Density Residential
- R3 - Medium Density Residential
- R4 - High Density Residential
- R5 - High Density Residential and Office District
- RMH - Residential Mobile Home
- MS - Industrial and Service
- M3 - General Industrial
- MPT - Moffett Park TOD
- MPI - Moffett Park Industrial
- MPC - Moffett Park Commercial
- O - Administrative and Professional Office
- C1 - Neighborhood Business
- C2 - Highway Business
- C3 - Regional Business
- C4 - Service Commercial
- PF - Public Facilities
- DSP - Downtown Specific Plan
- LSP - Lakeside Specific Plan

Combining Districts

- PD - Planned Development
- S - Single Story
- O - Office
- O-PD - Office/Planned Development
- HH - Heritage Housing
- ECR - El Camino Real
- POA - Places of Assembly
- POA/PD - Places of Assembly/Planned Development
- FAR50 - 50% FAR
- FAR55 - 55% FAR
- FAR70 - 70% FAR
- PD70 - 70% FAR/PD
- FAR100 - 100% FAR
- PD100 - 100% FAR/PD
- ITRR1.7 - Industrial to Residential (Low-Medium)
- ITRR3 - Industrial to Residential (Medium)
- ITRR4 - Industrial to Residential (High)
- Mixed Use
- Specific Plan Boundaries
- City Boundary
- Sphere of Influence

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SUNNYVALE ADDING SECTION 19.37.140 (RECYCLED WATER FOR LANDSCAPE IRRIGATION) TO CHAPTER 37 (TITLE 19 (ZONING) OF THE SUNNYVALE MUNICIPAL CODE

THE CITY COUNCIL OF THE CITY OF SUNNYVALE DOES ORDAIN AS FOLLOWS:

SECTION 1. Section 19.37.140 here is added to the Sunnyvale Municipal Code as follows:

19.37.140. Recycled water for landscape irrigation.

(a) Applicability. This section shall apply to the following types of projects:

(1) new multi-family projects with greater than one thousand square feet of landscaped area; and

(2) new non-residential buildings and additions greater than five thousand square feet with greater than 1,000 square feet of landscaped area.

(b) Use of recycled water. Recycled water shall be used for landscape irrigation if a recycled water supply is available within 300 feet of the project site boundaries. The property owner shall be responsible for extending the recycled water supply lines across the entire project site frontage.

(c) If a project applicant believes that circumstances exist presenting an unreasonable hardship to meet the requirements of this chapter, the applicant may apply for an exemption as set forth 19.39. In applying for an exemption, the burden is on the applicant to show significant hardship. Acceptance or denial of an exemption is at the discretion of the director of community development Hardship exemptions will only be granted in unusual circumstances based upon a showing of good cause and a determination that the public interest is not served by compliance or other compelling circumstances

An unreasonable hardship shall be defined as practical infeasibility, difficulties, or results inconsistent with the general purposes of this section or harms designated heritage resources.

SECTION 2. CONSTITUTIONALITY; SEVERABILITY. If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be invalid by a court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance, and each section, subsection, sentence, clause and phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid.

SECTION 3. CEQA EXEMPTION. The City Council finds, pursuant to Title 14 of the California Code of Regulations, Section 15061(b)(3), that this ordinance is exempt from the requirements of the California Environmental Quality Act (CEQA) in that it is not a Project which has the potential for causing a significant effect on the environment. The Council therefore directs that the Planning Division may file a Notice of Exemption with the Santa Clara County Clerk in accordance with the Sunnyvale Guidelines for the implementation of CEQA adopted by Resolution No. 118-04.

SECTION 4. EFFECTIVE DATE. This ordinance shall be in full force and effect thirty (30) days from and after the date of its adoption.

SECTION 5. POSTING AND PUBLICATION. The City Clerk is directed to cause copies of this ordinance to be posted in three (3) prominent places in the City of Sunnyvale and to cause publication once in *The Sun*, the official newspaper for publication of legal notices of the City of Sunnyvale, of a notice setting forth the date of adoption, the title of this ordinance, and a list of places where copies of this ordinance are posted, within fifteen (15) days after adoption of this ordinance.

Introduced at a regular meeting of the City Council held on _____ 2010, and adopted as an ordinance of the City of Sunnyvale at a regular meeting of the City Council held on _____ 2010, by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

ATTEST: APPROVED:

_____ _____

City Clerk Mayor
Date of Attestation: _____

(SEAL)

APPROVED AS TO FORM AND LEGALITY:

_____

David E. Kahn, City Attorney

ATTACHMENT B

City of Sunnyvale
Feasibility Study for Recycled Water Expansion
Dual-Plumbing Policies Recommendations TM
Sunnyvale Municipal Codes related to Recycled Water and Conservation

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Chapter 12.34. WATER CONSERVATION RESTRICTIONS

12.34.010. Purpose and application.

The purpose of this chapter is to identify and restrict nonessential water uses which, if allowed, would constitute wastage of the water supply of the city. The provisions of this chapter shall apply to all persons or entities using water obtained from the city of Sunnyvale both in and outside the city of Sunnyvale and within the city's water service area, and regardless of whether any person or entity using water has a contract for water service with the city. Use of water by the city itself shall be in conformance with a water conservation plan to be presented by the city manager to the city council for approval, and which shall essentially conform to the provisions of this chapter. This chapter is adopted pursuant to the provisions of Water Code Section 350, et seq., the city charter and the common law. (Ord. 2433-93 § 1 (part)).

12.34.020. Nonessential uses prohibited.

The following uses, methods, types or techniques of uses of water are hereby determined and declared nonessential, and except as expressly provided to the contrary, are hereby prohibited:

(a) Allowing or maintaining broken or defective plumbing, sprinklers, watering or irrigation systems which permit the escape or leakage of potable water.

(b) Using potable water in any manner which causes, allows or permits the flooding of any premises, or any portion thereof, or which causes, allows or permits water to escape from any premises or any portion thereof and flow into gutters, streets, or any surface water drainage system.

(c) Using any hose or similar device using potable water for washing automobiles, trucks, buses, boats, trailers, equipment, recreational vehicles, mobilehomes or other vehicles or machinery, unless the hose or device is equipped with a positive automatic shutoff valve.

(d) Using potable water to wash sidewalks, driveways, filling station aprons, patios, parking lots, porches or other paved or hard surfaced areas, unless there is a positive automatic shutoff valve on the outlet end of the hose.

(e) The service of water by any restaurant or other eating or refreshment establishment to any patron, except upon the specific request by a patron for such services.

(f) Installation of any single pass cooling process in new construction.

(g) Any use of nonpotable water not in compliance with all federal, state and local laws, rules and regulations. Use of reclaimed water from the city's water pollution control plant shall be subject to the discretion of the director of public works. (Ord. 2433-93 § 1 (part)).

12.34.030. Exceptions.

(a) The director of public works is hereby authorized to grant to any user an exception to the prohibitions set forth in Section 12.34.020, upon a finding by the director that such exception is necessary to prevent an emergency condition affecting the health, sanitation or fire protection of such user, and that the user to whom such adjustment or exception pertains has adopted or used all practicable water conservation measures.

(b) Exceptions permitted hereunder shall be made only upon written application submitted to the director setting forth a statement of justification for such exception. The director may attach conditions, specifications or other qualifying provisions to any exception granted. (Ord. 2433-93 § 1 (part)).

12.34.040. Penalty – Flow restricting devices.

(a) Upon a determination by the director of public works that a user has continuously or repeatedly violated or failed to comply with one or more provisions of Section 12.34.020, or of any conditions of any exception granted pursuant to the provisions of Section 12.34.030, the director may issue an order to cease and desist from continued or repeated violation, and further order such user to comply forthwith with such provisions or terms of exception, or otherwise to take appropriate remedial or preventive action. If after the issuance of such cease and desist order, such user continues to consume or use, or again consumes or uses water in violation of any such provision or condition of exception, the director may order the installation of a flow restricting device upon the water service line to the premises of such user. Such flow restricting device shall be installed and maintained for a period of not less than three days nor more than ten days for a first violation, and shall be installed and maintained for not less than ten days for each succeeding violation, and may be ordered to remain installed and maintained for a period of up to three months upon a finding by the director that any user is habitually in violation of any of the provisions of this chapter, or the provisions of any exception granted pursuant to Section 12.34.030.

(b) Prior to installation of any such flow restricting device, the director shall give written notice of intent to install such device, including the reasons for the proposed installation. The notice shall specify the date, time and place at which the user or other interested party may appear before the director to present any evidence or reasons why such installation should not occur. Instead of appearing, the user or other interested party may present written material to the director at or before the time specified. The installation of a flow restricting device shall not occur less than twenty-four hours after the time specified in the notice. The written notice shall be delivered personally, or by posting with the United States mail service, first class postage prepaid, certified mail, and addressed to the last known address of the user to whom given. Copies of the notice shall also be delivered personally or by mail as specified above, to the owner of the property on which the flow restrictor is proposed to be installed as shown on the last equalized assessment roll of the county assessor, county of Santa Clara, and to the person or entity shown on the latest city records as being responsible for payment of utility charges on such property, if either or both is different from the user to whom the notice is sent.

(c) There are hereby established, and there shall be imposed and levied charges in the amount of fifty dollars for each installation and fifty dollars for each removal of flow restricting devices under this section. (Ord. 2433-93 § 1 (part)).

12.34.050. Implementation.

The director of public works is authorized to delegate authority granted under this chapter to such deputies, officers, employees or agents of the city as the director shall designate, and to establish such rules, regulations and procedures, and to prepare or furnish such forms as the director deems necessary or appropriate to carry out the provisions of this chapter. (Ord. 2433-93 § 1 (part)).

12.34.060. Notices.

Except as otherwise provided, notices required to be given pursuant to the provisions of this chapter shall be in writing, may be combined with water service bills or other written communication, and shall be delivered personally, or by posting with the United States mail service, first class postage prepaid, and addressed to the last known address of the user to whom given, or to the owner of the premises to which the water service of such user pertains, shown on the last equalized assessment roll of the county assessor, county of Santa Clara. (Ord. 2433-93 § 1 (part)).

12.34.070. Violations.

It is unlawful for any person, firm, partnership, association, corporation or political entity to use water obtained from the water system of the city of Sunnyvale in violation of any provision of this chapter or in violation of the conditions of any exception granted pursuant to Section 12.34.040 of this chapter. Use of water by any user in accordance with the provisions of any exception granted by the director shall not be deemed in violation of this chapter. Violations of this chapter shall be punishable as infractions. (Ord. 2433-93 § 1 (part)).

12.34.080. Remedies cumulative.

The remedies and penalties provided for in this chapter shall be cumulative and not exclusive, and shall be in addition to any or all other remedies available to the city. (Ord. 2433-93 § 1 (part)).

Chapter 12.40. WASTEWATER CAPACITY ALLOCATION

12.40.090. Users discharging in excess of 50,000 gallons per day.

Effective immediately upon the effective date of the adoption of this chapter, any user proposing to discharge in excess of 50,000 gallons per day, or proposing to exceed their current Wastewater Discharge Permit (whichever is greater) shall be required to meet with city technical staff, prior to commencing such increased flow, to assure that:

(a) The proposed increase is within quantitative and qualitative limits of the city Water Pollution Control Plant; and

(b) Water conservation, filtering, recycling, pretreatment, evaporation or other wastewater reduction techniques are utilized to the maximum extent feasible; and

(c) Proposed increases in volume do not infringe upon reserves held for vacant land; and

(d) Both user and city personnel understand the needs, limitations, and alternatives of all parties involved in the situation. (Ord. 2078-83 § 2 (part)).

Chapter 19.37. LANDSCAPING, IRRIGATION AND USEABLE OPEN SPACE

19.37.010. Purpose.

The purpose of this chapter is to ensure that adequate landscaped areas and useable open space are provided where applicable for all zoning districts; to promote the conservation and efficient use of water and to prevent the waste of this valuable resource; and to promote water conservation as one component of sustainable building practices. This chapter shall be construed to assure consistency with the requirements of the Water Conservation in Landscaping Act of the California Government Code, or any successor statute, and any applicable implementing regulations, as they exist at the time of enactment or as later amended. In addition to compliance with the provisions in this chapter, projects shall comply with stormwater management requirements set forth in Chapter 12.60. (Ord. 2918-10 § 3).

19.37.020. Applicability.

All provisions of this chapter shall apply to the following landscaping projects:

(a) Individual Single-Family or Duplex Residential Projects. New landscaping installations equal to or greater than one thousand square feet in connection with construction of a new dwelling unit.

(b) All Other Projects. New landscaping installations or landscaping rehabilitation projects equal to or greater than one thousand square feet.

(c) Exemptions. Landscaping and irrigation requirements shall not apply to:

(1) Projects that fall below the square footage thresholds stated in subsections (a) and (b);

(2) Individual single-family or duplex residential projects that are not in connection with construction of a new dwelling unit;

(3) Registered local, state or federal historical sites where landscaping establishes a historical landscaping style, as determined by the Heritage Preservation Commission, planning commission, or by any applicable public board or commission responsible for architectural review or historic preservation;

(4) Ecological restoration or mined-land reclamation projects that do not require a permanent irrigation system; or

(5) Community gardens, plant collections (as part of botanical gardens and arboretums open to the public), non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation), agricultural uses, commercial nurseries and sod farms. (Ord. 2918-10 § 3).

19.37.030. Definitions.

The following terms and definitions pertain to the water efficiency sections of this chapter:

(a) “Applied water” means the portion of water supplied by the irrigation system to the landscaped area.

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

(c) "Certified professional" means a licensed landscape architect, a licensed landscape contractor, a licensed professional engineer, certified irrigation designer, or any other person authorized by the state to design a landscape or irrigation system, or a certified landscape irrigation auditor.

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

(e) "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.

(f) "Estimated total water use" (ETWU) means the total water used for the landscaped area as described in Section 19.37.050.

(g) "ET adjustment factor" (ETAF) means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscaped area. ETAF for a special landscaped area shall not exceed 1.0.

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

(i) "Hardscape" means any durable material (pervious and non-pervious) in a landscaped area, such as decks, patios or pedestrian walkways, and other non-irrigated elements which may include art work, benches, and bicycle parking.

(j) "Hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

(k) "Irrigation audit" means an in depth evaluation of the performance of an irrigation system. An irrigation audit includes, but is not limited to: inspection, system tune up, system test with distribution uniformity or emission uniformity, correction of any overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

(l) "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. Required irrigation efficiency is described in Section 19.37.110.

(m) "Low water use plant" means a plant species whose water needs are compatible with local climate and soil conditions. Species classified as "very low water use" and "low water use" by WUCOLS, having a regionally adjusted plant factor of 0.0 through 0.3, shall be considered low water use plants.

(n) "Maximum applied water allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 19.37.050.

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

(p) "Native plant" means a plant indigenous to a specific area of consideration. For the purposes of these guidelines, the term shall refer to plants indigenous to the coastal ranges of central and northern California, and more specifically to such plants that are suited to the ecology of the present or historic natural community(ies) of the project's vicinity.

(q) "No water using plant" means a plant species with water needs that are compatible with local climate and soil conditions such that regular supplemental irrigation is not required to sustain the plant after it has become established.

(r) "Plant factor" or "plant water use factor" is a factor, when multiplied by ETo (reference evapotranspiration), estimates the amount of water needed by plants. For purpose of calculation of the ETWU, use values from WUCOLS, or equivalent reference subject to approval by the director of community development.

(s) "Precipitation rate" means the rate of application of water measured in inches per hour.

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

(u) "Reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. For purposes of calculation of the MAWA and ETWU, as described in Section 19.37.050, use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), or other equivalent data, or soil moisture sensor data.

(v) "Runoff" means water which is not absorbed by the soil or landscaping to which it is applied and flows from the landscaped area.

(w) "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.

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

(y) "Turf" means a ground cover surface of mowed grass.

(z) 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).

(aa) WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000. (Ord. 2918-10 § 3).

19.37.040. Minimum landscaped area and useable open space.

(a) Minimum Landscaped Area. Table 19.37.040 describes the minimum landscaped area and useable open space required by zoning district. In addition to the minimum landscaped area, areas not used for buildings, parking lot areas, driveways or pedestrian walkways shall be landscaped unless the review authority determines that landscaping is not necessary to achieve the purposes of this chapter. For requirements specific to single family uses, see subsection (f).

(b) Landscaped Buffer Required. A landscaped buffer is required for any property with a nonresidential use in a residential zoning district that abuts a residential use. It is also required for properties of any use in a nonresidential zoning district which abuts a residential zoning district. See Section 19.37.080 for buffer landscaping design requirements.

(c) Landscaped Frontage Strip Required. A fifteen-foot wide landscaped frontage strip is required for all properties except those noted below in subsection (f). The frontage strip is measured from the inside edge of the public sidewalk, or if no sidewalk exists, from the curb. See Section 19.37.090 for frontage strip landscaping design requirements.

(d) Useable Open Space Required. Useable open space is required for all duplex and multifamily residential properties as described in Table 19.37.040. Useable open space areas that meet the definition of landscaping may contribute towards the minimum landscaped area of the site. See Section 19.37.100 for useable open space design requirements.

(e) Specific Plan, Precise Plan and Other Specialized Plan Areas. Minimum landscaped area and useable open space for properties within a specialized plan's prescribed area are described in their individual plans.

(f) Allowances and Limitations for Single-Family Uses and Single-Family Zoning Districts.

(1) Allowances for Single-Family Zoning Districts. Yards are not required to be landscaped in single-family zoning districts; however other provisions in Title 19 may apply.

(2) Limitation on Paved Areas in the R-0 and R-1 Zoning Districts. Not more than fifty percent of the required front yard of any lot within an R-0 or R-1 zoning district shall be paved with asphalt, concrete cement, or any other impervious surface, except as may be required to meet off-street parking and access requirements of Chapter 19.46.

(3) Landscaped Frontage Strip for Single-Family Uses. A landscaped frontage strip is not required in any zoning district for single-family residential uses which have a frontage on a public street.

Table 19.37.040. Minimum Landscaped Area and Useable Open Space by Zoning District

Zoning District	Useable Open Space	Other Landscaped Area	Parking Lot Landscaped Area	Total Landscaped Area
R-0	N/A	N/A	N/A	N/A
R-1	N/A	N/A	N/A	N/A
R-1.5	N/A	N/A	N/A	N/A
R-1.7/PD	N/A	N/A	N/A	N/A
R-2	500 sq. ft./unit[1]	850 sq. ft./ unit	20% of the parking lot area	Total minimum landscaped area is the combination of the minimum parking lot landscaped area and other landscaped area. In no case shall this total be less than 20% of the lot area.
R-3	400 sq. ft./unit	425 sq. ft./unit		
R-4	380 sq. ft./unit	375 sq. ft./unit		
R-5	380 sq. ft./unit	375 sq. ft./ unit		
C-1	N/A	12.5% of floor area		
C-2	N/A	12.5% of floor area		
C-3	N/A	12.5% of floor area		
C-4	N/A	12.5% of floor area		
O	N/A	10% of lot area		
P-F	N/A	10% of lot area		
M-S	N/A	10% of floor area		
M-3	N/A	10% of floor area		

[1] One thousand square feet of useable open space is required for a property with an accessory living unit.

(Ord. 2918-10 § 3).

19.37.050. Water efficiency design requirements.

Water Efficiency in Design. Landscaped areas shall be designed to achieve water efficiency. Landscaping design and plant selection may be based on one of two options. Regardless of which option is selected, all other criteria described in this chapter shall apply. The options include:

(a) Option 1—Turf Limitation and Minimum Area with Water Conserving Plants. Turf area shall not be more than twenty-five percent of the landscaped area, and native, low water use or no water use plants shall be installed in at least eighty percent of all non-turf landscaped areas.

(b) Option 2—Water Budget Calculations. If the turf limitation option is not selected, a water budget calculation shall be prepared and shall adhere to the following requirements:

(1) The plant factor shall be obtained from WUCOLS or an equivalent reference subject to approval by the director of community development. For areas that mix plants with different water uses, the plant factor calculation is based on the proportion of the respective plant factors, or based on the plant factor of the higher water using plant. The plant factor ranges from 0.0 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.

(3) All special landscaped areas (SLA) shall be identified and their water use included in the water budget calculations.

(4) The reference evapotranspiration adjustment factor (ETAF) for SLAs shall not exceed 1.0. The ETAF for all other landscaped areas shall not exceed 0.7.

(5) Maximum applied water allowance (MAWA) shall be calculated using the following equation:

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

Where:

MAWA = Maximum applied water allowance (gallons per year)

ETo = Reference evapotranspiration (inches per year)

0.62 = Conversion factor (to gallons)

0.7 = Reference evapotranspiration adjustment factor (ETAF)

LA = Planted landscaped area including SLA and not including hardscapes (square feet)

0.3 = Additional water allowance for SLA

SLA = Special landscaped area (square feet)

(6) Estimated total water use (ETWU) will be calculated using the equation below. The sum of the ETWU calculated for all hydrozones shall not exceed the 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

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

SLA = Special landscaped area (square feet)

0.62 = Conversion factor

IE = Irrigation efficiency (minimum 0.70)

(Ord. 2918-10 § 3).

19.37.060. General planting, soil management and water feature design requirements.

(a) Plant Material. In addition to the requirements below, plant selection and installation shall be done in accordance with accepted horticultural industry practices.

(1) Variety. Landscaping shall include trees, shrubs, vines, flowers, ground covers or a combination thereof.

(2) Size at Time of Planting. Plant materials shall be sized and spaced to achieve immediate effect, in accordance with horticultural industry practices and at the discretion of the director of community development. Trees shall be of minimum fifteen gallon size. Twenty-four or thirty-six inch box trees may be required at the discretion of the director of community development.

(3) Number of Trees. There shall be one tree per one thousand square feet of required landscaped area in addition to required street trees and parking lot trees.

(4) Turf. All turf areas shall be planted with tall fescue or similar turf requiring less water. Turf shall not be planted on slopes greater than ten percent where the toe of the slope is adjacent to an impermeable hardscape.

(b) Grouping of Plants. Plants with similar water needs shall be grouped (also described as a hydrozone). Areas that mix plants with different water uses may be allowed if a water budget is performed.

(c) Soil Management.

(1) Mulch. A minimum two-inch layer of mulch shall be applied on all non-turf soil areas.

(2) Soil Amendments. Soil amendments, such as compost, shall be incorporated according to the soil conditions at the project site and based on what is appropriate for selected plans.

(3) Grading. If the project includes grading, the grading shall be designed to minimize soil erosion, runoff and water waste. The grading shall avoid soil compaction in planted landscaped areas.

(d) Water Features. Recirculating water systems shall be used for water features. Where available, recycled water shall be used for water features. (Ord. 2918-10 § 3).

19.37.070. Parking lot landscape design requirements.

(a) Parking Lot Shading. Trees shall be planted and maintained throughout the lot to ensure that at least fifty percent of the parking area will be shaded within fifteen years after the establishment of the lot.

(1) Solar Energy Systems as Shading. Up to twenty-five percent of the fifty percent parking lot shading requirement (twelve and one-half percent of the total parking lot area) may be met with installation of solar energy systems rather than trees.

(2) Calculation of Shading. Shading shall be calculated by using the diameter of the tree crown at fifteen years or the dimensions of any roofed area supporting the solar energy system within the parking lot area.

(3) Surfaces Subject to Shading Calculation. All surfacing on which a vehicle can drive is subject to shade calculation, including all parking stalls, vehicular drives within the property regardless of length, drive-through lanes, and all maneuvering areas regardless of depth. The following surface areas are exempt from shading requirements: truck loading areas in front of overhead doors, truck maneuvering and parking areas unconnected to and exclusive of any vehicle parking, surfaced areas not to be used for vehicle parking, driving or maneuvering, provided they are made inaccessible to vehicles by a barrier such as bollards or fencing, display, sales, service, or vehicular storage areas for automobile dealerships (required parking for auto dealerships is still subject to shading requirements), or surfaced areas existing prior to January 1, 2002.

(b) Ground Cover and Shrubs on Parking Islands. Parking islands shall contain living ground cover or shrubs with the trees, unless it can be shown that ground cover is incompatible with the tree. Where living ground cover is unsuitable, the director of community development may allow porous, nonliving ground cover such as pebbles or tanbark.

(c) Drainage Design. Landscaping islands and parking islands shall be designed to integrate parking lot and site drainage in order to reduce storm water runoff velocities and minimize non-point source pollution. When six-inch concrete curbs are installed, they shall have drainage “weep holes.”

(d) Wheel Stops. Concrete wheel stops shall be installed when landscaped areas are not adequately protected. (Ord. 2918-10 § 3).

19.37.080. Buffer landscaping design requirements.

The following is a list of design requirements for buffer landscaping.

(a) Width. The buffer shall maintain a width of at least ten feet.

(b) Landscaping. The buffer shall include a planted screen of approved trees and shrubs which shall be placed along the length of the buffer at intervals not to exceed twenty feet, provided, however, that the director of community development may grant exceptions through a miscellaneous plan permit when warranted by conditions on the property.

(c) Wall Design. The buffer shall include a decorative masonry wall six feet in height measured from the highest adjoining grade. When the adjacent nonresidential building is two stories or more in height, the decorative masonry wall shall be eight feet measured from the highest adjoining grade. Where a residential use is permitted in a nonresidential zoning district, the wall shall be required on the residential property, unless a wall already exists.

(d) Specific Plan, Precise Plan and other specialized plan areas. Properties within a specialized plan's prescribed area may be subject to additional buffer landscaping design requirements, as described in their individual plans. (Ord. 2918-10 § 3).

19.37.090. Frontage strip landscaping design requirements.

(a) Width. The frontage strip shall be fifteen feet wide along the entire street frontage measured from the inside edge of the public sidewalk, or if no sidewalk exists, from the curb.

(b) Landscaping Allowances. Frontage strip landscaping may be crossed by walkways and access drives.

(c) Specific Plan, Precise Plan and Other Specialized Plan Areas. Properties within a specialized plan's prescribed area may vary from these frontage strip design requirements, as described in their individual plans. (Ord. 2918-10 § 3).

19.37.100. Useable open space design requirements.

(a) Function. Useable open space must be designed to be accessible to, and useable for outdoor living, recreation or utility use.

(b) Location. Useable open space may not be located in any required front yard area.

(c) Minimum Useable Open Space Dimensions and Area. Each useable open space area shall have at least a twelve foot dimension in any direction and a minimum area of two hundred square feet except for:

(1) Private balconies must have a minimum of seven feet in any direction and a minimum area of eighty square feet.

(2) Roofs, decks or porches must have a minimum of ten feet in any direction and a total of one hundred twenty square feet.

(d) Private Useable Open Space Required. In the R-4 and R-5 zoning districts, a minimum of eighty square feet per unit shall be designed as private useable open space.

(e) Specific Plan, Precise Plan and Other Specialized Plan Areas. Properties within a specialized plan's prescribed area may vary from these useable open space design requirements, as described in their individual plans. (Ord. 2918-10 § 3).

19.37.110. Irrigation system design requirements.

(a) Irrigation System Required. All landscaped areas shall have a permanent irrigation system, except for single-family detached and duplex dwellings.

(b) Irrigation Efficiency. Irrigation systems shall be designed and maintained to meet or exceed an average landscaping irrigation efficiency of seventy percent.

(c) Water Waste Prohibited. Water waste resulting from an inefficient irrigation system leading to runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas such as walkways, roadways or structures is prohibited.

(d) Hydrozone Irrigation. Systems shall be designed to meet the individual needs of each plant group. Valves and control circuits shall be separated based on the required rate and quantity of water used.

(1) Valves. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions and plant materials with similar water use. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.

(2) Sprinkler Heads. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone. Sprinkler heads must have matched precipitation rates within each circuit.

(e) Low Volume Irrigation. Bubbler or drip-type irrigation, or other low-flow, non-spray technology shall be provided for:

(1) Trees and shrubs.

(2) Mulched areas.

(3) Areas with slope greater than ten percent, unless it can be demonstrated that no runoff or erosion will occur if other types of irrigation is used.

(4) Areas that are less than eight feet wide in any direction.

(f) Overhead Sprinkler Irrigation. Overhead irrigation systems may be used for clustered shrub plantings. Areas within two feet of a non-permeable surface may not be irrigated using overhead sprinkler irrigation unless it can be demonstrated that no runoff would occur, or the adjacent non-permeable surface is designed and constructed to drain entirely to landscaping.

(g) Irrigation Controllers and Sensors. All irrigation controllers must utilize either evapotranspiration or soil moisture sensor data and be capable of dual or multiple programming. Irrigation systems shall also incorporate sensors (rain, freeze, wind, etc.) that suspend or alter irrigation operation during unfavorable weather conditions.

(h) Screening of Devices. Irrigation controllers and backflow devices shall be screened from public view.

(i) Scheduling. Irrigation must be scheduled between eight p.m. and ten a.m. (Ord. 2918-10 § 3).

19.37.120. Landscaping and irrigation approval.

(a) Permit Required. Except as otherwise provided in this chapter, no person shall install or modify any landscaped area described in Section 19.37.020 without first obtaining a miscellaneous plan permit for each such action, in accordance with the procedure described in Chapter 19.82.

(b) Landscaping and Irrigation Plans Required. Landscaping and irrigation plans shall be required for any modification or installation of new landscaping that falls within the thresholds stated in this chapter. The plans shall meet the information requirements determined by the director of community development to comply with the provisions of this chapter.

(1) Preparation by Certified Professional. Landscaping and irrigation plans shall be prepared by, and bear the signature of, a certified professional, except for new landscaping installations or landscaping rehabilitation projects with less than two thousand five hundred square feet of landscaped area. (Ord. 2918-10 § 3).

19.37.130. Landscaping irrigation audit and maintenance.

(a) Irrigation Audit Required. Prior to approval of occupancy by a building official, a landscaping irrigation audit shall be conducted and an irrigation audit report shall be submitted for projects with landscaping and irrigation plans approved after June 10, 2010.

(1) Audit by Certified Professional. The landscaping irrigation audit shall be conducted and the report shall be prepared by a certified professional, except for new landscaping installations or landscaping rehabilitation projects with less than two thousand five hundred square feet of landscaped area.

(2) Audit Report Content. The irrigation audit report shall include, but not be limited to: inspection, system tune-up, system test with distribution uniformity, correction of any overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

(b) Submittal of Landscaping Maintenance Schedule. Prior to the final inspection by the building official, a regular maintenance schedule shall be submitted to the director of community development for review and approval. The maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscaped areas; and removing obstructions to irrigation spray heads or other emission devices. Landscaping shall be maintained in accordance with the approved maintenance schedule.

(c) General Maintenance. Landscaping shall be maintained in compliance with the approved landscaping plan, and shall be maintained in a neat, clean and healthful condition. Removed landscaping shall be replaced with specimen plants to match the approved landscaping plan. (Ord. 2918-10 § 3).

Chapter 19.39 GREEN BUILDING REGULATIONS

19.39.010. Purpose.

The purpose of this chapter is to implement sustainable development with development and construction practices designed to use natural resources in a manner that does not eliminate, degrade or diminish their usefulness for future generations, to enhance the public health and welfare by promoting the environmental and economic health of the city through the design, construction, maintenance, operation and deconstruction of buildings and other site development, and to incorporate green building practices into all development projects. The green building provisions referred to in this chapter are designed to achieve the following goals:

(a) Increase energy efficiency in buildings;

(b) Encourage water and resource conservation;

(c) Minimize waste generated by construction projects;

(d) Provide durable buildings that are efficient and economical to own and operate;

(e) Promote the health and productivity of residents, workers, and visitors to the city; and

(f) Recognize and conserve the energy embodied in existing buildings. (Ord. 2894-09 § 6).

19.39.020. Covered projects.

This chapter applies to covered projects, defined as means any planning permit application(s) or building permit application(s) for new construction, addition, or remodel of an existing public facility or private building, except that it shall not apply to any project for which a complete building permit application has been submitted prior to January 1, 2010, as determined by chief building official. Projects within the scope of this chapter are:

(a) Newly constructed residential buildings;

(b) Residential alterations;

(c) Newly constructed non-residential buildings that are five thousand gross square feet or more;

(d) New large nonresidential interiors;

(e) Major alterations of existing nonresidential buildings. (Ord. 2894-09 § 6).

19.39.030. Standards for compliance.

(a) The standards for compliance shall be implemented in three phases as shown in the Green Building Tables, effective January 1, 2010, as adopted by resolution of the city council, and as amended from time to time.

(b) The following projects, regardless of scope of work, are exempt from this section:

  (1) Solar or energy generation/conservation facilities;

  (2) Heritage buildings;

  (3) Fire, flood, wind, earthquake, or other natural disaster damage repairs;

  (4) Disabled access upgrades;

(5) Seismic upgrades;

(6) Exterior modifications;

(7) Swimming pools;

(8) Temporary structures;

(9) Anything in the opinion of the director of community development that is a hardship or infeasible per Section 19.39.060.

(c) In order to qualify for the incentives, as set forth in the Green Building Tables, for industrial and office projects, applicant shall submit a transportation demand management program and analysis for the entire project site that demonstrates that vehicle-trip rates for the project are not greater than the number that would be generated by development of the site at the permitted FAR.

(d) It is intended that the green building FAR bonus permitted by this section shall supersede any other FAR allowances provided for in Section 19.32.070 of this code.

(e) Public Recognition for Exceptional Green Building Design. Those projects that implement exceptional green building design and construction practices that meet thresholds for incentives as specified in the above standards for compliance section shall be recognized by the city and eligible to receive a plaque that may be displayed on the structure.

(f) Wherever the LEED or GreenPoint Rate systems include a minimum energy or other performance requirement, the applicant may choose to meet the minimum performance requirements with an alternative equivalent method approved by the director of community development.

(g) Maintenance of Required Features. Any structure subject to this chapter shall maintain the green building features required herein, regardless of subsequent alterations, additions, or changes of use, unless subject to equal or more stringent requirements.

(h) The city council shall establish by resolution, and shall periodically review and update as necessary, green building standards for compliance. The standards for compliance shall include, but are not limited to, the following:

(1) The types of projects subject to regulation (covered projects);

(2) The green building rating system to be applied to the various types of projects;

(3) Minimum thresholds of compliance for various types of projects; and

(4) Timing and methods of verification of compliance with these regulations. (Ord. 2894-09 § 6).

19.39.040. Administrative procedures.

(a) The director of community development shall promulgate any rules and guidelines necessary or appropriate to achieve compliance with the requirements of this chapter and as more fully outlined in the administrative procedures promulgated by the director of community development.

(b) The procedures for compliance documentation shall include, but not be limited to, the following:

(1) Upon submittal of an application for any discretionary planning entitlement (if required) for any covered project, application materials shall include the appropriate completed checklists, as required by the standards for compliance specified in Section 19.39.040, accompanied by a text description of the proposed green building program and expected measures and milestones for compliance.

(2) Upon submittal of an application for a building permit, building plans for any covered project shall include a checklist and green building program description, reflecting any changes proposed since the planning entitlement phase (if a planning entitlement was required). The checklist shall be incorporated onto a separate plan sheet included with the building plans

(3) Prior to final building inspection and occupancy for any covered project, a qualified building professional, if required by the standards for compliance, shall provide evidence of adequate green building compliance or documentation to the director of community development to satisfy the requirements of the standards for compliance for review and approval. This information shall include, but is not limited to:

(A) Documentation that verifies incorporation of the design and construction related credits specified in the project approval for the covered project;

(B) A letter from the qualified green building professional that certifies that the covered project has been constructed in accordance with the approved green building project checklist;

(C) Any additional documentation that would be required by the LEED™ reference guide for LEED certification (if required), or by the GreenPoint Rated manuals for GreenPoint Rated certification (if required); and

(D) Any additional information that the applicant believes is relevant to determining that a good faith effort has been made to comply with this chapter. (Ord. 2894-09 § 6).

19.39.050. Noncompliance.

If, as a result of any inspection, the city determines that the covered project does not or is unlikely to comply with the approved plans or green building checklist, a stop work order shall be issued if the director of community development determines that continuation of construction activities will jeopardize the project's ability to meet the required compliance threshold. The stop work order shall remain in effect and final certificate of occupancy withheld (moved) until the director of community development determines that the project will be brought into compliance with the approved plans and/or checklist. (Ord. 2894-09 § 6).

19.39.060. Hardship or infeasibility exemption.

If a project applicant believes that circumstances exist presenting an unreasonable hardship to meet the requirements of this chapter, the applicant may apply for an exemption as set forth in this section. In applying for an exemption, the burden is on the applicant to show significant hardship. Acceptance or denial of an exemption is at the discretion of the director of community development Hardship exemptions will only be granted in unusual circumstances based upon a showing of good cause and a determination that the public interest is not served by compliance or other compelling circumstances

An unreasonable hardship shall be defined as practical infeasibility, difficulties, or results inconsistent with the general purposes of this chapter or harms designated heritage resources. (Ord. 2894-09 § 6).

19.39.070. Appeal.

(a) Any aggrieved applicant or person may appeal the determination of the director regarding: (1) the granting or denial of an exemption pursuant to the Building Code; or (2) compliance with any other provision of this chapter.

(b) Any appeal must be filed in writing with the community development department not later than fifteen days after the date of the determination by the director. The appeal shall state the alleged error or reason for the appeal.

(c) The appeal shall be processed and considered at a Building Code board of appeals hearing in accordance with the Building Code.

(d) An appeal from the decision of the Building Code board of appeals may be made to the city council, which decision shall be final. (Ord. 2894-09 § 6).

ATTACHMENT C

City of Sunnyvale
Feasibility Study for Recycled Water Expansion
Dual-Plumbing Policies Recommendations TM
2010 California Green Building Standards Code, Divisions 4.3 and 5.3

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CHAPTER 4

RESIDENTIAL MANDATORY MEASURES

Division 4.3 – WATER EFFICIENCY AND CONSERVATION

SECTION 4.301
GENERAL

4.301.1 Scope. The provisions of this chapter shall establish the means of conserving water used indoors, outdoors and in wastewater conveyance.

SECTION 4.302
DEFINITIONS

4.302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SECTION 4.303
INDOOR WATER USE

4.303.1 Twenty percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by at least 20 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the *California Building Standards Code*. The 20 percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Each plumbing fixture and fitting shall meet reduced flow rates specified in Table 4.303.2; or
2. A calculation demonstrating a 20 percent reduction in the building "water use" baseline as established in Table 4.303.1 shall be provided. For low-rise residential occupancies, the calculation shall be limited to the following plumbing fixture and fitting types: water closets, urinals, lavatory faucets and showerheads.

4.303.2 Multiple showerheads serving one shower. When single shower fixtures are served by more than one showerhead, the combined flow rate of all the showerheads shall not exceed the maximum flow rates specified in the 20 percent reduction column contained in Table 4.303.2 or the shower shall be designed to only allow one showerhead to be in operation at a time.

Exception: The maximum flow rate for showerheads when using the calculation method specified in Section 4.303.1, Item 2, is 2.5 gpm @ 80 psi.

4.303.3 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 4.303.3.

TABLE 4.303.1
WATER USE BASELINE[1]

FIXTURE TYPE	FLOW RATE[2]	DURATION	DAILY USES	OCCUPANTS[3]
Showerheads, residential	2.5 gpm @ 80 psi	8 min.	1	
Lavatory faucets, residential	2.2 gpm @ 60 psi	.25 min.	3	
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	
Replacement aerators	2.2 gpm @ 60 psi			
Gravity tank-type water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Urinals	1.0 gallon/flush	1 flush	2 male	

Fixture "Water Use" = Flow rate × Duration × Occupants × Daily uses

1. Use Worksheet WS-1 to calculate baseline water use.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20, *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
4. The daily use number shall be increased to three if urinals are not installed in the room.

TABLE 4.303.2
FIXTURE FLOW RATES

FIXTURE TYPE	FLOW RATE	MAXIMUM FLOW RATE AT ≥ 20 percent REDUCTION
Showerheads	2.5 gpm @ 80 psi	2 gpm @ 80 psi
Lavatory faucets, residential	2.2 gpm @ 60 psi	1.5 gpm @ 60 psi[2]
Kitchen faucets	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Gravity tank-type water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer tank water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer valve water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Electromechanical hydraulic water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Urinals	1.0 gallon/flush	.5 gallon/flush

1. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.
   Single flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.233.2.
   Dual flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A112.19.2 and ASME A112.19.14.
2. Lavatory faucets shall not have a flow rate less than 0.8 gpm at 20 psi.

TABLE 4.303.3
STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

REQUIRED STANDARDS	
Water closets (toilets)—flushometer valve-type single flush, maximum flush volume	ASME A 112.19.2/CSA B45.1 – 1.28 gal (4.8 L)
Water closets (toilets)—flushometer valve-type dual flush, maximum flush volume	ASME A 112.19.14 and U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification – 1.28 gal (4.8 L).
Water closets (toilets)—tank type	U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification
Urinals, maximum flush volume	ASME A 112.19.2/CSA B45.1 – 0.5 gal (1.9 L)
Urinals, nonwater urinals	ASME A 112.19.19 (vitreous china) ANSI Z124.9-2004 or IAPMO Z124.9 (plastic)
Public lavatory faucets: Maximum flow rate – 0.5 gpm (1.9 L/min)	ASME A 112.18.1/CSA B125.1
Public metering self-closing faucets: Maximum water use – 0.25 gal (1.0 L) per metering cycle	ASME A 112.18.1/CSA B125.1
Residential bathroom lavatory sink faucets: Maximum flow rate – 1.5 gpm (5.7 L/min)	ASME A 112.18.1/CSA B125.1

SECTION 4.304
OUTDOOR WATER USE

4.304.1 Irrigation controllers. Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

Note: More information regarding irrigation controller function and specifications is available from the Irrigation Association.

SECTION 4.305
WATER REUSE SYSTEMS
(Reserved)

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES
DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter	X																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							X												
Chapter/Section																			
5.301.1							X												
5.302.1 Definitions							X												
5.303.2							X												
Table 5.303.2.2							X												
Table 5.303.2.3							X												
5.303.4, Item 1 only							X												
5.303.6							X												
Table 5.303.6							X												

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

Division 5.3 – WATER EFFICIENCY AND CONSERVATION

SECTION 5.301
GENERAL

5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water used indoors, outdoors and in wastewater conveyance.

SECTION 5.302
DEFINITIONS

5.302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

GRAYWATER. Untreated household waste which has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins and water from clothes washing machines and laundry tubs. It shall not include waste water from kitchen sinks, dishwashers or laundry water from soiled diapers.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE. The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

POTABLE WATER. Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the *California Plumbing Code*, Part 5.

RECYCLED WATER. Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [*Water Code* Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter attaining a quality that is suitable to use the water again.

SUBMETER. A meter installed subordinate to a site meter. Usually used to measure water intended for one purpose, such as landscape irrigation. For the purposes of this section, a dedicated meter may be considered a submeter.

WATER BUDGET. Estimated total landscape irrigation water use shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MLO).

SECTION 5.303
INDOOR WATER USE

5.303.1 Meters. Separate meters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day.
2. For spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop projected to consume more than 100 gal/day.

5.303.1.2 Excess consumption. Any building within a project or space within a building that is projected to consume more than 1,000 gal/day.

5.303.2 Twenty percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the *California Building Standards Code*. The 20 percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Each plumbing fixture and fitting shall meet the 20 percent reduced flow rate specified in Table 5.303.2.3, or
2. A calculation demonstrating a 20 percent reduction in the building "water use baseline" as established in Table 5.303.2.2 shall be provided.

5.303.2.1 Multiple showerheads serving one shower. When single shower fixtures are served by more than one showerhead, the combined flow rate of all the showerheads shall not exceed the maximum flow rates specified in the 20 percent reduction column contained in Table 5.303.2.3 or the shower shall be designed to only allow one showerhead to be in operation at a time.

Exception: The maximum flow rate for shower heads when using the calculation method specified in Section 5.303.2, Item 2 is 2.5 gpm @ 80 psi.

5.303.4 Wastewater reduction. Each building shall reduce by 20 percent wastewater by one of the following methods:

1. [DSA-SS] The installation of water-conserving fixtures (water closets, urinals) meeting the criteria established in sections 5.303.2 or 5.303.3 or
2. Utilizing nonpotable water systems [captured rainwater, graywater, and municipally treated wastewater (recycled water) complying with the current edition of the California Plumbing Code or other methods described in Section A5.304].

5.303.6 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 5.503.6.

TABLE 5.303.2.2
INDOOR WATER USE BASELINE[4]

FIXTURE TYPE	FLOW RATE[2]	DURATION	DAILY USES	OCCUPANTS[3]
Showerheads	2.5 gpm @ 80 psi	8 min.	1	X
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	X
Replacement aerators	2.2 gpm @ 60 psi			X
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]			X
Metering faucets	0.25 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.25 min.		X
Gravity tank type water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	1.0 gallons/flush	1 flush	2 male	X

Fixture "Water Use" = Flow rate × Duration × Occupants × Daily uses

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20, *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. Refer to Table A, Chapter 4, *California Plumbing Code*, for occupant load factors.
4. Use Worksheet WS-1 to calculate base line water use.

TABLE 5.303.2.3
FIXTURE FLOW RATES

FIXTURE TYPE	FLOW RATE	MAXIMUM FLOW RATE AT 20 percent REDUCTION
Showerheads	2.5 gpm @ 80 psi	2 gpm @ 80 psi
Lavatory faucets—nonresidential	0.5 gpm @ 60 psi	0.4 gpm @ 60 psi
Kitchen faucets	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]	1.8 [rim space (in.)/20 gpm @ 60 psi]
Metering faucets	0.25 gallons/cycle	0.2 gallons/cycle
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.20 [rim space (in.)/20 gpm @ 60 psi]
Gravity tank type water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer tank water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer valve water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Electromechanical hydraulic water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Urinals	1.0 gallons/flush	.5 gallons/flush

1. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less:
   Single flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A 112.19.233.2.
   Dual flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A 112.19.2 and ASME A 112.19.14.

TABLE 5.303.6
STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

REQUIRED STANDARDS	
Water closets (toilets) – flushometer valve type single flush, maximum flush volume	ASME A 112.19.2/ CSA B45.1 – 1.28 gal (4.8 L)
Water closets (toilets) – flushometer valve type dual flush, maximum flush volume	ASME A 112.19.14 and USEPA WaterSense Tank-Type High-Efficiency Toilet Specification – 1.28 gal (4.8 L)
Water closets (toilets) – tank-type	U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification
Urinals, maximum flush volume	ASME A 112.19.2/ CSA B45.1 – 0.5 gal (1.9 L)
Urinals, nonwater urinals	ASME A 112.19.19 (vitreous china) ANSI Z124.9-2004 or IAPMO Z124.9 (plastic)
Public lavatory faucets: Maximum flow rate – 0.5 gpm (1.9 L/min)	ASME A 112.18.1/CSA B125.1
Public metering self-closing faucets: Maximum water use – 0.25 gal (1.0 L) per metering cycle	ASME A 112.18.1/CSA B125.1
Residential bathroom lavatory sink faucets: Maximum flow rate – 1.5 gpm (5.7 L/min)[1]	ASME A 112.18.1/CSA B125.1

SECTION 5.304
OUTDOOR WATER USE

5.304.1 Water budget. A water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

Note: Prescriptive measures to assist in compliance with the water budget are listed in Sections 492.5 through 492.8, 492.10 and 492.11 of the ordinance, which may be found at: http://www.owue.water.ca.gov/landscape/ord/ord.cfm.

5.304.2 Outdoor potable water use. For new water service for landscaped areas between 1,000 square feet and 5,000 square feet (the level at which *Water Code* §535 applies), separate meters or submeters shall be installed for indoor and outdoor potable water use.

5.304.3 Irrigation design. In new nonresidential construction with between 1,000 and 2,500 square feet of landscaped area (the level at which the MLO applies), install irrigation controllers and sensors which include the following criteria, and meet manufacturer's recommendations.

5.304.3.1 Irrigation controllers. Automatic irrigation system controllers installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in

response to changes in plants' needs as weather conditions change.

2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

Note: More information regarding irrigation controller function and specifications is available from the Irrigation Association.

SECTION 5.305
WATER REUSE SYSTEMS
(Reserved)

ATTACHMENT D

City of Sunnyvale
Feasibility Study for Recycled Water Expansion
Dual-Plumbing Policies Recommendations TM
City of Sunnyvale Green Building Program Brochure and Checklists

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GREEN BUILDING PROGRAM

THESE REQUIREMENTS APPLY TO BUILDING PERMITS SUBMITTED ON OR AFTER OCTOBER 1, 2012

On April 24, 2012, the City Council revised the green building standards for new construction, additions, and remodels of buildings. The new requirements will be effective for projects that submit building permits on or after **October 1, 2012**.

Green Building Program

The following steps are needed to comply with the green building program:

- Identify minimum standards: Minimum standards are based on the type of project and scope of work. Refer to the tables on the reverse side of this brochure to determine green building checklist requirements, level of achievement, and verification necessary for various types of projects.
- Submit Building Permit Plans: Building permit plans shall include the appropriate checklist on a plan sheet. All required/selected green building items shall be incorporated in the plans.
- Verification of Green Building Measures: The type of verification is described in the tables on the reverse side of this brochure.

  City Staff verification will be part of the regular plan review and inspection process.

  Green Point Rater/LEED AP verification requires the project LEED AP to provide a letter that states the project is designed to achieve the minimum points required. A similar letter, based on the actual construction, is required before occupancy/final inspection.

  USGBC Certification verification is achieved by providing a letter prior to permit issuance that states, as designed, the plans will achieve the minimum points required and that the project has been registered with the USGBC. A similar letter is required before occupancy/final inspection and based on the actual construction and stating when the project will be submitted to the USGBC.

Incentives

Incentives are offered for projects that exceed the minimum green building standards and are offered to encourage project applicants and developers to provide additional green building features.

Projects that add additional buildings of floor area to an existing site, qualify for the incentive if all buildings at the existing site meet the incentive level through an applicable LEED program (i.e. new construction, core and shell, commercial interiors, existing buildings). The LEED standard for the existing building(s) shall be met prior to occupancy of the new building(s).

Mixed-Use Projects

Mixed use projects are required to meet the appropriate BIG standard for the residential portion and LEED for the non-residential portion. Alternatively, LEED may be applied to the entire project.

In the United States alone, buildings account for:

- *72% of electricity use,*
- *39% of energy use,*
- *38% of all carbon dioxide (CO_2) emissions,*
- *40% of raw materials use,*
- *30% of waste output (136 million tons annually), and*
- *14% of potable water consumption.*

(Source: US Green Building Council)

***Build It Green** (BIG) is a non-profit organization whose mission is to promote healthy, energy- and resource-efficient building practices in California. www.builditgreen.org*

*The **U.S. Green Building Council** (USGBC), through the LEED program, encourages adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. www.usgbc.org*

***CALGreen** was adopted by the State of California and is the nation's first mandatory green building code which sets the minimum sustainability standards for new residential and non-residential construction.*

Residential Projects

Type of Project	Minimum Standard	Verification/ Review	Voluntary Incentives
New Construction			
All New Construction	GreenPoint Rated Checklist v4.2 or later (which includes CALGreen) with 80 points minimum	Green Point Rater	Achieve 110 points, with Green Point Rater verification, and the project can increase lot coverage by 5%. Multi-family projects have the option to increase lot coverage by 5% or receive a 5% density bonus.
Remodel, Alteration, and Additions			
Construction Valuation*: Single-Family - ≤ $100,000 Multi-Family - ≤ $250,000	--	--	--
Construction Valuation*: Single-Family - > $100,000 Multi-Family - > $250,000	CalGreen Mandatory Measures as applicable to the scope of work	City staff	--

** Valuation per square foot of construction is determined in the annually adopted fee resolution.*

Non-Residential Projects

Type of Project	Minimum Standard	Verification/ Review	Voluntary Incentives
New Construction and Initial Tenant Improvements*			
≤ 5,000 sq.ft.	CALGreen Mandatory Measures	City staff	--
> 5,000 sq.ft. (excluding Moffett Park Specific Plan Area)	CALGreen Mandatory Measures and LEED Silver Level	LEED AP	Achieve LEED Gold, with USGBC certification, and the project can increase FAR by 10% or height by 10'.
> 5,000 sq.ft. (Moffett Park Specific Plan Area)	CALGreen Mandatory Measures and LEED Silver Level	LEED AP	Achieve LEED Gold, with LEED AP verification, and the project can increase: 15% FAR (MP-I) or 20% FAR (MP-TOD)
			Achieve LEED Gold, with USGBC certification, and the project can increase FAR by 10%
Major Alterations (structural, mechanical, plumbing, and electrical alterations)			
5,000 – 25,000 sq.ft.	LEED Checklist (no minimum points required)	City staff	--
> 25,000 sq.ft.	LEED Certified Level	LEED AP	--

** CALGreen does not apply to initial tenant improvements where the shell was permitted prior to January 1, 2011.*

For additional information and updates, please contact the Community Development Department at (408) 730-7444 or refer to: GreenBuilding.insunnyvale.com

GREEN BUILDING – PRESCRIPTIVE CHECKLIST
SINGLE FAMILY, DUPLEX, AND TRIPLEX

Following is a standardized checklist of CALGreen Mandatory Measures and Build It Green (BIG) requirements that may be used for new homes to comply with the green building requirements. Items that have been pre-selected are mandated by CALGreen or BIG. Use of the specific points achieved in this checklist is not required; a homeowner/architect can develop a project specific checklist to submit with a development permit application.

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
A. Site	☑ Sheet: _____	Item 2a 0 Point Required **CALGreen Mandatory**	Divert/Recycle Job Site Construction Waste – Minimum 50% by Weight	The City of Sunnyvale has a franchise agreement with Specialty Solid Waste and Recycling. All solid waste materials are required to be disposed of by Specialty Solid Waste and Recycling, which takes all debris to the SMaRT Station. The SMaRT Station recycles a minimum of 50% of construction debris which qualifies for this credit.	Initials: _____ Date: _____
A. Site	☐ Sheet: _____	Item 3a 1 Point	Use Recycled Content Aggregate (Minimum 25%) – Walkway and Driveways	Mining of virgin aggregate may disturb riverbeds and quarries. Recycled aggregate consists mainly of crushed concrete and crushed asphalt pavement. Aggregate installed in walkways and driveways shall contain a minimum of 25% recycled material.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	Item 5a 1 Point **CALGreen Mandatory**	Covering of duct openings and protection of mechanical equipment during construction	In order to reduce indoor air pollutants, all duct and other air distribution component openings shall be covered with tape, plastic, sheet metal or other approved method to reduce the amount of dust or debris which may collect in the system. Opening shall be covered for all material is store on-site and at rough installation until the startup of the heating and cooling equipment.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen Mandatory 4.106.2 Storm water management during construction	Storm water run-off can carry pollutants to the bay. Projects which disturb less than one acre of soil shall manage storm water run-off during construction. Incorporate the "Blueprint for a Clean Bay" plan sheet into the plan set.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.106.3 Design for surface water drainage away from buildings	Water intrusion into buildings can damage the structure as well an increase indoor air pollutants. The site shall be planned and developed to keep surface water from entering buildings. Construction plans shall indicate how the site grading or drainage system will manage surface water flows. This is also a California Residential Code requirement (Section R401.3).	Initials: _____ Date: _____
B. Foundation	☐ Sheet: _____	Item 1 2 point	Replace Portland Cement in Concrete with Recycling Flyash or Slag – Minimum 20% Flyash or Slag	Flyash is a byproduct of coal-burning power plants and slag is a byproduct of the steel industry. Both are typically sent to a landfill for disposal; however, they can be used as a replacement for a portion of the Portland cement in concrete. Many local concrete suppliers use a mix that includes 20% of flyash or slag.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
B. Foundation	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.505.2 Vapor retarder and capillary break is installed at slab on grade foundations	In order to resist moisture from penetrating the slab foundation, a capillary break consisted of a 4-inch thick base of 1/2 inch or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete unless a geotechnical engineer recommends otherwise.	Initials: _____ Date: _____
C. Landscaping	☐ Sheet: _____	Item 6a 2 points	Install High-Efficiency Irrigation Systems – System Uses Only Low-Flow Drip, Bubblers, or Low-Flow Sprinklers	Efficient irrigation systems apply only the amount of water that the plants need, with little or no waste through run-off, over watering or misting. Irrigate shrub areas with drip, bubblers, or low-flow sprinklers (micro spray) with a maximum flow rate of 1 gallon per minute. Irrigation in lawn areas shall use efficiency spray heads with a maximum flow rate of 1 inch per hour.	Initials: _____ Date: _____
C. Landscaping	☑ Sheet: _____	Item 6b 3 points **CALGreen Mandatory**	Install High-Efficiency Irrigation Systems – System has Smart (Weather-Based) Controllers	Install a smart irrigation system which automatically adjusts the irrigation system frequency and/or duration based on changing weather. The smart irrigation system shall include the following features: • Automatic adjustments to the irrigation program based on external sensors • Multiple start times • Run-times able to support low-volume applications • Intervals for days of the week or same-day intervals • More than one operating program The system shall include a rain sensing device that prohibits irrigation during rainy weather. Product specifications and product listing information is available on-line at www.BeWaterWise.com.	Initials: _____ Date: _____
D. Structural Frame & Building Envelope	☐ Sheet: _____	Item 3e 1 point	Use Engineered Lumber - Oriented Strand Board (OSB) for Subfloor	Solid-sawn lumber is typically harvested from old-growth forests or large diameter trees. Alternatively, engineered lumber products come from small-diameter, fast-growing plantation trees. Use OSB as an alternative to plywood for subfloors.	Initials: _____ Date: _____
D. Structural Frame & Building Envelope	☐ Sheet: _____	Item 3f 1 point	Use Engineered Lumber - Oriented Strand Board (OSB) for Wall and Roof Sheathing	Use OSB or other sheathing as an alternative to plywood for wall and roof sheathing.	Initials: _____ Date: _____
D. Structural Frame & Building Envelope	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.505.3 19% moisture content of building framing materials	Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
E. Exterior Finish	☐ Sheet: _____	Item 4 1 point	Use Durable and Non-Combustible Siding Materials	In order to promote durability and reduce material consumption with long-lasting products, use metal, stone, brick, stucco, or fiber-cement for exterior building siding (excluding window/door trim).	Initials: _____ Date: _____
E. Exterior Finish	☐ Sheet: _____	Item 5 2 points	Use Durable and Fire Resistant Roofing Materials	In order to promote durability and reduce material consumption with long-lasting products, use 40-year or 50-year asphalt shingles, tile, slate, fiber-cement, or metal for roof material.	Initials: _____ Date: _____
G. Plumbing	☐ Sheet: _____	Item 1a 2 points	Distribute Domestic Hot Water Efficiently - Insulate All Hot Water Pipes	To reduce water wasted at plumbing fixtures while waiting for hot water to arrive and save energy for heating water, insulate all hot water pipes from the water heater to the fixture. Pipe insulation must be a minimum of 1" foam on the entire run of the hot water piping system for pipe less than or equal to 2" diameter and 1.5" for pipe greater than 2" diameter.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 2a 3 points **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Showerheads ≤ 2.0 gpm at 80psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency showerheads with a flow rate of ≤ 2.0 gpm at 80psi. When more than one showerhead is installed in a single shower, the combined flow rate shall not exceed 2.0 gpm or the shower shall be designed to only allow one showerhead to be in operation at a time.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 2b 1 point **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Bathroom Faucets ≤ 1.5 gpm at 60psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency bathroom faucets with a flow rate of ≤ 1.5 gpm at 60 psi.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 2c 1 point **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Kitchen and Utility Faucets ≤ 1.8 gpm at 60psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency kitchen faucets with flow rate of ≤ 1.8 gpm at 60 psi.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 3 2 points **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – Install Only High Efficiency Toilets (Dual-Flush or < 1.28 gpf) (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install High Efficiency Toilets (HETs), which use less than 1.28 gpf. HETs are available in single or dual-flush, pressure-assist and conventional gravity-flush models. All toilets must be HETs.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
G. Plumbing	☐ opt. 2 Sheet: _____	0 Point **CALGreen Mandatory** (effective 7/1/11)	CALGreen 4.303.1 As an alternative to prescriptive compliance, a 20% reduction in baseline water use shall be demonstrated through calculation	As an alternative to Water Efficient Fixture requirements above for showerheads, bathrooms faucets, kitchen faucets, and toilets, a 20% reduction in potable water use shall be demonstrated through calculations. These calculations are available in the CALGreen section 5.303.2.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 1a 4 points **CALGreen Mandatory**	Properly Design and Install HVAC System to ACCA Manual J, D, and S Recommendations	Design and install the HVAC system according to the results obtained from house-specific calculations using Manual J (the home's heat load calculation), Manual D (ductwork, design and sizing) and Manual S (equipment selection and sizing). This is also a requirement of the California Energy Efficiency Standards.	Initials: _____ Date: _____
H. HVAC	☐ Sheet: _____	Item 5b 1 Point	Design and Install Effective Ductwork - Use Duct Mastic on All Duct Joints and Seams	Leaks in the joints between ductwork have been shown to allow, on average, 20% to 30% of conditioned air to leak out. To maintain a tight seal for decades, use a water-based mastic at every duct joint and seam or have professionally installed aerosol sealant sprayed into the ducts.	Initials: _____ Date: _____
H. HVAC	☐ Sheet: _____	Item 6 1 Point	Install High Efficiency HVAC Filter (MERV 6+)	HVAC filters remove particulates from the air. Install HVAC filters that have a minimum rating of MERV 6. These are typically the filters with corrugated material. These filters are recommended for cleaner air without compromising the performance of standard mechanical systems.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 8 1 Point	Install ENERGY STAR Bathroom Fans Controlled by a Humidistat	Excessive moisture resulting from poor ventilation is one of the main causes of mold issues and building failures. Install ENERGY STAR fans controlled by a humidistat in all bathrooms and vent them to the outside.	Initials: _____ Date: _____
H. HVAC	☐ Sheet: _____	Item 11 1 point	Install Carbon Monoxide Alarms (or No Combustion Appliances in Living Space and No Attached Garage)	Carbon monoxide is a dangerous gas emitted from fuel-burning appliances such as stoves, cooktops, water heaters, furnaces, gas space heaters, and fireplaces, as well as from cars and gasoline powered landscape equipment. Alarms must be installed in areas with fuel burning appliances, such as in kitchens, in hallways near bedrooms, and near doors to attached garages.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 10a 0 Point Required	Advanced Mechanical Ventilation for Indoor Air Quality – Compliance with ASHRAE 62.2 Mechanical Ventilation Standards	Mechanical fresh air ventilation helps maintain indoor air quality by ensuring a steady supply of fresh outdoor air for diluting and removing indoor air contaminants. Install a mechanical ventilation system that meets ASHRAE 62.2. This is also a requirement of the 2008 California Energy Efficiency Standards section.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
H. HVAC ning	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.503.1 Gas fireplace shall be a direct-vent sealed-combustion type. Woodstove or pellet stove shall comply with US EPA Phase II emission limits	To reduce the pollutants resulting from burning wood, all fireplaces shall be gas-fueled and shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 702.1 HVAC system installers are trained and certified in the proper installation of HVAC systems	Installation of the HVAC systems is essential for the system to operate as efficiency as designed. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program (e.g. State contractor license).	Initials: _____ Date: _____
J. Building Performance	☐ Sheet: _____	Item 2 30 Points	Design and Build High Performance Homes - 15% above Title 24	Design and build the home to exceed the minimum Title-24 Energy Efficiency Regulations by at least 15%.	Initials: _____ Date: _____
J. Building Performance	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.406.1 Joints and openings. Annular spaces around pipes, electric cables, conduits, or other openings in plates at exterior walls shall be protected	Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar approved method. Openings in the building envelope separating conditioned space from unconditioned space needed to accommodate gas, plumbing, electrical lines and other necessary penetrations must be sealed in compliance with the California Energy Efficiency Standards.	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 2a 1 Point **CALGreen Mandatory**	Use Low-VOC or Zero-VOC Paint - Low-VOC Interior Wall/Ceiling Paints (<50gpl VOCs)	Most interior paints contain volatile organic compounds (VOCs), a major class of indoor and outdoor air pollutants. Solvents contained in the product are released into the air, impacting indoor air quality and be may harmful to children and chemically sensitive individuals. Use low VOC primer and paint on all interior walls and ceiling (the trim is exempt). These products shall also meet the VOC limits in Table 4.504.3 of the 2010 California Green Building Code.[1]	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 3 2 Points **CALGreen Mandatory**	Use Low-VOC Coatings that Meet SCAQMD Rule 1113	Conventional petroleum-based wood finishes can off-gas toxic compounds for months and can be harmful to children and chemically sensitive individuals. Use lower VOC wood finishes, stains or coatings that meet the South Coast Air Quality Management District (SCAQMD) Rule 1113[2] for Architectural Coatings standards. These products shall also meet the VOC limits in Table 4.504.3 of the 2010 California Green Building Code.[1]	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
K. Finishes	☑ Sheet: _____	Item 4 2 Points **CALGreen Mandatory**	Use Low-VOC Caulks, Construction Adhesives and Sealants that Meet SCAQMD Rule 1168	Conventional caulks and construction adhesives may off-gas toxic compounds for months. Use caulks and adhesives that meet the South Coast Air Quality Management District (SCAQMD) Rule 1168[3] for Adhesive and Sealant Applications standards. The limits in Table 4.504.1 and Table 4.504.2 of the 2010 California Green Building Code[1] may be used to meet this requirement.	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	0 Points **CALGreen Mandatory**	CALGreen 4.504.2.3 Aerosol paints and coatings shall be compliant with product weighted MIR limits for ROC and VOC limits	Conventional caulks and construction adhesives may off-gas toxic compounds. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC and regulations for toxic compounds and ozone depleting substances in Section 94522(a)3, 94522(c)(2) and 94522(d)(2) of California Code of Regulations, Title 17.[5] Paints and coatings shall also meet the VOC limits of the Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 49.[4]	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 7 0 Point **CALGreen Mandatory**	Reduce Formaldehyde in Interior Finish – Meet Current California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits	To reduce formaldehyde levels in indoor air, hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in CARB's Air Toxic Control Measure for Composite Wood. Formaldehyde limit: Hardwood plywood veneer core: < 0.05ppm Hardwood plywood composite core: < 0.08ppm Particleboard: < 0.09ppm Medium density fiberboard: < 0.11ppm Thin medium density fiberboard (8mm max): < 0.21ppm	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
L. Flooring	☑ Sheet: _____	Item 4 0 Point **CALGreen Mandatory**	All carpet and 50% of Resilient Flooring is low emitting	To promote use of products that require less intensive natural resource use to manufacture, all carpet installed shall meet the testing and product requirements of one of the following: • Carpet and Rug Institute's Green Label Plus Program. • California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350). • NSF/ANSI 140 at the Gold level. • Scientific Certifications Systems Indoor Advantage™ Gold. All carpet cushion installed shall meet the requirements of the Carpet and Rug Institute Green Label program. All carpet pad adhesives used shall have VOC content no more than 50 gpl. Where resilient flooring is installed, at least 50% of floor area receiving resilient flooring shall comply with the VOC emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.	Initials: _____ Date: _____
M. Appliances & Lighting	☐ Sheet: _____	Item 1 2 Points	Install ENERGY STAR Dishwasher	High efficiency dishwashers use less water and energy than conventional dishwashers. They reduce energy use by at least 31% and water use by at least 33% compared to conventional dishwashers. Install a dishwasher that is ENERGY STAR rated.	Initials: _____ Date: _____
M. Appliances & Lighting	☐ Sheet: _____	Item 3a 1 Point	Install ENERGY STAR Refrigerator – ENERGY STAR Qualified & < 25 Cubic Feet Capacity	Refrigerators and freezers are among the largest users of electricity in most homes. They can account for up to 25% of household energy use. Install a refrigerator that is ENERGY STAR rated and less than 25 cubic feet (including the freezer).	Initials: _____ Date: _____
N. Other	☑ Sheet: _____	Item 1 0 Point Required	Incorporate GreenPoint Rated Checklist (Green Building – Prescriptive Checklist) in Blueprints	Incorporating the GreenPoint checklist into the blueprints makes it easier for everyone involved—including the builder, homebuyer and municipality—to see which green features are included in the home. Include a copy of the GreenPoint checklist on a plan sheet as part of the plans submitted for the building permit review and issuance.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
N. Other	☑ Sheet: _____	Item 4a 2 Points **CALGreen Mandatory**	Develop an Operating and Maintenance Manual	An operating and maintenance manual that includes the following information shall be provided to the building occupant or owner. 1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure. 2. Operation and maintenance instructions for the following: a. Equipment and appliances, including water-saving devices and systems, HVAC systems, water-heating systems and other major appliances and equipment. b. Roof and yard drainage, including gutters and downspouts. c. Space conditioning systems, including condensers and air filters. d. Landscape irrigation systems. e. Water reuse systems. 3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations. 4. Public transportation and/or carpool options available in the area. 5. Educational material on the positive impacts of an interior relative humidity between 30% -60% and what methods an occupant may use to maintain the relative humidity level in that range. 6. Information about water-conserving landscape and irrigation design and controllers which conserve water. 7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation. 8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc. 9. Information about state solar energy and incentive programs available. 10. A copy of all special inspection verifications required by the enforcing agency or the building codes.	Initials: _____ Date: _____
O. Community Design and Planning	☐ Sheet: _____	Item 1a 2 Points	Develop Infill Sites - Project is an Urban Infill Development	Infill development reduces pressure to develop greenfields such as open space and farmland by redeveloping abandoned and underutilized sites and buildings. The majority of single family homes in Sunnyvale will meet this requirement.	Initials: _____ Date: _____

ALTERNATIVE POINTS

Following are alterative items that may be used in place of the standard items listed above. When substituting items, ensure that the total points substituted are equal to or greater than the standard point items removed.

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
C. Landscaping	☐ Sheet: _____	Item 2 2 Points	Mulch All Planting Beds a Minimum of 3 Inches	To reduce water consumption by slowing evapotranspiration, all soil surfaces in landscaped areas, excluding lawn area, shall contain a minimum of 3 inches of mulch. In order to maintain a minimum of 3 inches after settlement, initial mulch installation shall be 4 inches in depth. Do not place mulch directly against the plant stem or tree.	Initials: _____ Date: _____
C. Landscaping	☐ Sheet: _____	Item 4a 2 points	Minimize Turf Areas in Landscape Installed – Turf Shall Not Be Installed on Slopes Exceeding 10% or in Areas Less than 8 Feet Wide	In order to reduce the run-off and over-spraying that occurs in lawn irrigation, do not install lawn on slopes exceeding 10% or in isolated areas (driveway strips, medians) less than 8 feet wide on the shortest side. However, lawn may be installed in areas less than 8 feet wide when irrigated with subsurface irrigation or micro spray heads.	Initials: _____ Date: _____
H. HVAC	☐ Sheet: _____	Item 2a 2 points	Install Sealed Combustion Units - Furnaces	Sealed combustion furnaces vent outdoor air directly outdoors, eliminating the use of house air for combustion and reducing the potential for back-drafting. They tend to be high efficiency, condensing units with PVC piping or metal bi-directional (concentric) piping. Furnaces must comply with one of the following criteria: • True sealed combustion units with ducting from the outside for fresh combustion air and ducted vents, • Power vented units in attached garages, in attics, in exterior recessed boxes, or in exterior closets with manufacturer specified outside air vents, • Passive atmospherically vented units outside the building (i.e. carport).	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 9b 1 Point	Install Mechanical Ventilation System for Cooling – Install Whole House Fan	Whole house fans are used instead of an air conditioner to cool a house at night. They exhaust warm indoor air and bring in large volumes of cool outdoor air. Install a whole house fan that has an insulated, airtight sealed cover to prevent air and heat leakage through the fan assembly. The whole house fan shall be properly sized.	Initials: _____ Date: _____
J. Building Performance	☐ Sheet: _____	Item 5 1 Point	Title 24 Prepared and Signed by a CABEC Certified Energy Plans Examiner (CEPE)	Certified Energy Plans Examiners (CEPE) have undergone a certification process by the California Association of Building Energy Consultants (CABEC) to demonstrate their experience and ability in completing energy compliance calculations.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
M. Appliances & Lighting	☐ Sheet: _____	Item 4a 1 Point	Install Built-In Recycling Center	To increase the rate of recycling by making it easier, co-locate trash & recycling into a two bin minimum (1 trash, 1 recycling) assembly built into kitchen cabinets. Separately located bins or bins in the garage utility room do not qualify.	Initials: _____ Date: _____
O. Community Design & Planning	☐ Sheet: _____	Item 5a 1 Point	Design for Safety & Social Gathering - All Home Front Entrances Have Views from the Inside to Outside Callers	Design buildings and landscapes to deter crime and promote safety through casual observation and community interaction. At the front entrance install sidelights, doors with integral windows, double-height peepholes or equivalent features that allow occupants of all heights (minimum of 32" from finished floor) and capacities to recognize callers. Windows near the door in the same plane do not qualify. Windows on adjacent or opposite walls do qualify.	Initials: _____ Date: _____
O. Community Design &	☐ Sheet: _____	Item 5b 1 Point	Design for Safety & Social Gathering - All Home Front Entrances Can be Seen from the Street and/or from Other Front Doors	All home front entrances can be seen from the street or from other front doors.	Initials: _____ Date: _____

Footnotes/Resources:

[1] 2010 California Green Building Standards Code (CALGreen)
http://www.hcd.ca.gov/codes/shl/2010_CA_Green_Bldg.pdf

[2] South Coast Air Quality Management District (SCAQMD) Rule 1113 for Architectural Coatings standards
http://www.aqmd.gov/rules/reg/reg11/r1113.pdf

[3] South Coast Air Quality Management District (SCAQMD) Rule 1168 for Adhesive and Sealant Applications standards
http://www.aqmd.gov/rules/reg/reg11/r1168.pdf

[4] Bay Area Air Quality Management District Regulation 8, Rule 49 – Aerosol Paint Products
http://www.arb.ca.gov/drdb/ba/curhtml/r8-49.htm

[5] Searchable database for California Code of Regulations (See Title 17, Section 94522 for aerosol paints and coatings regulations)
http://ccr.oal.ca.gov/linkedslice/default.asp?SP=CCR-1000&Action=Welcome

GREEN BUILDING – PRESCRIPTIVE CHECKLIST
MULTI-FAMILY WITH FOUR OR MORE DWELLING UNITS

Following is a standardized checklist of CALGreen Mandatory Measures and Build It Green (BIG) requirements that may be used for multi-family buildings to comply with the green building requirements. Items that have been pre-selected are mandated by CALGreen or BIG. Use of the specific points achieved in this checklist is not required; a homeowner/architect can develop a project specific checklist to submit with a development permit application.

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
AA. Community Design and Planning	☐ Sheet: _____	Item 1a 1 Points	Develop Infill Sites - Project is an Urban Infill Development	Infill development reduces pressure to develop greenfields such as open space and farmland by redeveloping abandoned and underutilized sites and buildings. The majority of the residential projects in Sunnyvale will meet this requirement.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	Item 2a 0 Point Required **CALGreen Mandatory**	Divert/Recycle Job Site Construction Waste – Minimum 50% by Weight	The City of Sunnyvale has a franchise agreement with Specialty Solid Waste and Recycling. All solid waste materials are required to be disposed of by Specialty Solid Waste and Recycling, which takes all debris to the SMaRT Station. The SMaRT Station recycles a minimum of 50% of construction debris which qualifies for this credit.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	Item 3a 1 Point **CALGreen Mandatory**	Covering of duct openings and protection of mechanical equipment	In order to reduce indoor air pollutants, all duct and other air distribution component openings shall be covered with tape, plastic, sheet metal or other approved method to reduce the amount of dust or debris which may collect in the system. Opening shall be covered for all material is store on-site and at rough installation until the startup of the heating and cooling equipment.	Initials: _____ Date: _____
A. Site	☐ Sheet: _____	Item 4 1 Point	Use Recycled Content Aggregate (Minimum 25%)	Mining of virgin aggregate may disturb riverbeds and quarries. Recycled aggregate consists mainly of crushed concrete and crushed asphalt pavement. Use aggregate with a minimum of 25% recycled aggregate for the entire project, including: parking lots, walkways, landscape paving, and roadway base.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen Mandatory 4.106.2 Storm water management during construction	Storm water run-off can carry pollutants to the bay. Projects which disturb less than one acre of soil shall manage storm water run-off during construction. Incorporate the "Blueprint for a Clean Bay" plan sheet into the plan set.	Initials: _____ Date: _____
A. Site	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.106.3 Design for surface water drainage away from buildings	Water intrusion into buildings can damage the structure as well an increase indoor air pollutants. The site shall be planned and developed to keep surface water from entering buildings. Construction plans shall indicate how the site grading or drainage system will manage surface water flows. This is also a California Residential Code requirement (Section R401.3).	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
B. Landscaping	☐ Sheet: _____	Item 1di 2 points	Minimize Turf Areas in Landscape Installed – Turf Shall Not Be Installed on Slopes Exceeding 10% or in Areas Less than 8 Feet Wide	In order to reduce the run-off and over-spraying that occurs in lawn irrigation, do not install lawn on slopes exceeding 10% or in isolated areas (driveway strips, medians) less than 8 feet wide on the shortest side. However, lawn may be installed in areas less than 8 feet wide when irrigated with subsurface irrigation or micro spray heads.	Initials: _____ Date: _____
B. Landscaping	☐ Sheet: _____	Item 1ei 2 points	Install High-Efficiency Irrigation Systems – System Uses Only Low-Flow Drip, Bubblers, or Low-Flow Sprinklers	Efficient irrigation systems apply only the amount of water that the plants need, with little or no waste through run-off, over watering or misting. Irrigate shrub areas with drip, bubblers, or low-flow sprinklers (micro spray) with a maximum flow rate of 1 gallon per minute. Irrigation in lawn areas shall use efficiency spray heads with a maximum flow rate of 1 inch per hour.	Initials: _____ Date: _____
B. Landscaping	☑ Sheet: _____	Item 1eii 3 points **CALGreen Mandatory**	Install High-Efficiency Irrigation Systems – System has Smart (Weather-Based) Controllers	Install a smart irrigation system which automatically adjusts the irrigation system frequency and/or duration based on changing weather. The smart irrigation system shall include the following features: • Automatic adjustments to the irrigation program based on external sensors • Multiple start times • Run-times able to support low-volume applications • Intervals for days of the week or same-day intervals • More than one operating program The system shall include a rain sensing device that prohibits irrigation during rainy weather. Product specifications and product listing information is available on-line at www.BeWaterWise.com.	Initials: _____ Date: _____
D. Foundation, Structural Frame and Building Envelope	☐ Sheet: _____	Item 1 2 point	Replace Portland Cement in Concrete with Recycling Flyash or Slag – Minimum 20% Flyash or Slag	Flyash is a byproduct of coal-burning power plants and slag is a byproduct of the steel industry. Both are typically sent to a landfill for disposal; however, they can be used as a replacement for a portion of the Portland cement in concrete. Many local concrete suppliers use a mix that includes 20% of flyash or slag.	Initials: _____ Date: _____
D. Foundation, Structural Frame and Building Envelope	☐ Sheet: _____	Item 4e 1 point	Use Engineered Lumber - Oriented Strand Board (OSB) for Subfloor	Solid-sawn lumber is typically harvested from old-growth forests or large diameter trees. Alternatively, engineered lumber products come from small-diameter, fast-growing plantation trees. Use OSB as an alternative to plywood for subfloors.	Initials: _____ Date: _____
D. Foundation, Structural Frame and Building Envelope	☐ Sheet: _____	Item 4f 1 point	Use Engineered Lumber - Oriented Strand Board (OSB) for Wall and Roof Sheathing	Use OSB or other sheathing as an alternative to plywood for wall and roof sheathing.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
D. Foundation, Structural Frame and Building Envelope	☑ Sheet:	0 Point **CALGreen Mandatory**	CALGreen 4.505.2 Vapor retarder and capillary break is installed at slab on grade foundations	In order to resist moisture from penetrating the slab foundation, a capillary break consisted of a 4-inch thick base of 1/2 inch or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete unless a geotechnical engineer recommends otherwise.	Initials: Date:
D. Foundation, Structural Frame and Building Envelope	☑ Sheet:	0 Point **CALGreen Mandatory**	CALGreen 4.505.3 19% moisture content of building framing materials	Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content.	Initials: Date:
E. Exterior Finish	☐ Sheet:	Item 1b 1 point	Use Durable and Non-Combustible Siding Materials	In order to promote durability and reduce material consumption with long-lasting products, use metal, stone, brick, stucco, or fiber-cement for exterior building siding (excluding window/door trim).	Initials: Date:
E. Exterior Finish	☑ Sheet:	Item 2a 0 Point Required	Durable Roofing – All Roofing Has 3-Year Subcontractor Warranty and a 20-Year Manufacturer Warranty	In order to promote durability and reduce material consumption with long-lasting products, roofing shall carry a 3-year subcontractor installation guarantee and at least a 20-year manufacturer's Warranty.	Initials: Date:
E. Exterior Finish	☐ Sheet:	Item 2b 1 point	Use Durable and Fire Resistant Roofing Materials	In order to promote durability and reduce material consumption with long-lasting products, roofing materials for sloped roofs must have a minimum of a 40-year warranty and a 3-year workmanship guarantee and the roofing material or roof assembly must have a Class A fire rating (per ASTM E-180). Roofing materials for flat roofs must have a Class A fire rating (per ASTM E-180) and have a minimum of a 10-year material warranty and a 3-year workmanship guarantee.	Initials: Date:
G. Plumbing	☐ opt. 1 Sheet:	Item 1a 2 points **CALGreen Mandatory** (effective 7/1/11)	Install Only High Efficiency Toilets (Dual-Flush or < 1.28 gpf) (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install High Efficiency Toilets (HETs), which use less than 1.28 gpf. HETs are available in single or dual-flush, pressure-assist and conventional gravity-flush models. All toilets must be HETs.	Initials: Date:
G. Plumbing	☐ opt. 1 Sheet:	Item 1bi 1 points **CALGreen Mandatory** (effective 7/1/11)	High Efficiency Urinals with average flush rate ≤ 0.5 gpf	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install High Efficiency urinals with average flush rate that does not exceed 0.5 gpf.	Initials: Date:

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
G. Plumbing	☐ opt. 1 Sheet: _____	Item 1c 3 points **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Showerheads ≤ 2.0 gpm at 80psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency showerheads with a flow rate of ≤ 2.0 gpm at 80psi. When more than one showerhead is installed in a single shower, the combined flow rate shall not exceed 2.0 gpm or the shower shall be designed to only allow one showerhead to be in operation at a time.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 1d 1 point **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Bathroom Faucets ≤ 1.5 gpm at 60psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency bathroom faucets with a flow rate of ≤ 1.5 gpm at 60 psi.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 1 Sheet: _____	Item 1d 1 point **CALGreen Mandatory** (effective 7/1/11)	Water Efficient Fixtures – High Efficiency Kitchen and Utility Faucets ≤ 1.8 gpm at 60psi (Alternative: 20% water use reduction calculation method may be used – opt. 2)	To reduce potable water consumption and pressure on delivery and sewage infrastructure, install high efficiency kitchen faucets with flow rate of ≤ 1.8 gpm at 60 psi.	Initials: _____ Date: _____
G. Plumbing	☐ opt. 2 Sheet: _____	0 Point **CALGreen Mandatory** (effective 7/1/11)	CALGreen 4.303.1 As an alternative to prescriptive compliance, a 20% reduction in baseline water use shall be demonstrated through calculation	As an alternative to Water Efficient Fixture requirements above for showerheads, bathrooms faucets, kitchen faucets, and toilets, a 20% reduction in potable water use shall be demonstrated through calculations. These calculations are available in the CALGreen section 5.303.2.	Initials: _____ Date: _____
G. Plumbing	☐ Sheet: _____	Item 2a 2 points	Distribute Domestic Hot Water Efficiently - Insulate All Hot Water Pipes	To reduce water wasted at plumbing fixtures while waiting for hot water to arrive and save energy for heating water, insulate all hot water pipes from the water heater to the fixture. Pipe insulation must be a minimum of 1" foam on the entire run of the hot water piping system for pipe less than or equal to 2" diameter and 1.5" for pipe greater than 2" diameter.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
H. HVAC	☐ Sheet: _____	Item 6 1 point	Install Carbon Monoxide Alarms (or No Combustion Appliances in Living Space and No Attached Garage)	Carbon monoxide is a dangerous gas emitted from fuel-burning appliances such as stoves, cooktops, water heaters, furnaces, gas space heaters, and fireplaces, as well as from cars and gasoline powered landscape equipment. Alarms must be installed in areas with fuel burning appliances, such as in kitchens, in hallways near bedrooms, and near doors to attached garages.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 4a 0 Point Required	Advanced Mechanical Ventilation for IAQ – Compliance with ASHRAE 62.2 Mechanical Ventilation Standards	Mechanical fresh air ventilation helps maintain indoor air quality by ensuring a steady supply of fresh outdoor air for diluting and removing indoor air contaminants. Install a mechanical ventilation system that meets ASHRAE 62.2. This is also a requirement of the 2008 California Energy Efficiency Standards section.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 4d 1 Point	Install ENERGY STAR Bathroom Fans Controlled by a Humidistat	Excessive moisture resulting from poor ventilation is one of the main causes of mold issues and building failures. Install ENERGY STAR fans controlled by a humidistat in all bathrooms and vent them to the outside.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	P. Item H1 4 points **CALGreen Mandatory**	Properly Design and Install HVAC System to ACCA Manual J, D, and S Recommendations	Design and install the HVAC system according to the results obtained from house-specific calculations using Manual J (the home's heat load calculation), Manual D (ductwork, design and sizing) and Manual S (equipment selection and sizing). This is also a requirement of the California Energy Efficiency Standards.	Initials: _____ Date: _____
H. HVAC	☐ Sheet: _____	P. Item H3 1 Point	Install High Efficiency HVAC Filter (MERV 6+)	HVAC filters remove particulates from the air. Install HVAC filters that have a minimum rating of MERV 6. These are typically the filters with corrugated material. These filters are recommended for cleaner air without compromising the performance of standard mechanical systems.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.503.1 Gas fireplace shall be a direct-vent sealed-combustion type. Woodstove or pellet stove shall comply with US EPA Phase II emission limits	To reduce the pollutants resulting from burning wood, all fireplaces shall be gas-fueled and shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 702.1 HVAC system installers are trained and certified in the proper installation of HVAC systems	Installation of the HVAC systems is essential for the system to operate as efficiency as designed. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program (e.g. State contractor license).	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
J. Building Performance	☐ Sheet: _____	Item 1a 30 Points	Design and Build High Performance Homes - 15% above Title 24	Design and build the home to exceed the minimum Title-24 Energy Efficiency Regulations by at least 15%.	Initials: _____ Date: _____
J. Building Performance	☐ Sheet: _____	Item 5 1 Point	Title 24 Prepared and Signed by a CABEC Certified Energy Plans Examiner (CEPE)	Certified Energy Plans Examiners (CEPE) have undergone a certification process by the California Association of Building Energy Consultants (CABEC) to demonstrate their experience and ability in completing energy compliance calculations.	Initials: _____ Date: _____
J. Building Performance	☑ Sheet: _____	0 Point **CALGreen Mandatory**	CALGreen 4.406.1 Joints and openings. Annular spaces around pipes, electric cables, conduits, or other openings in plates at exterior walls shall be protected	Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar approved method. Openings in the building envelope separating conditioned space from unconditioned space needed to accommodate gas, plumbing, electrical lines and other necessary penetrations must be sealed in compliance with the California Energy Efficiency Standards.	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 3a 1 Point **CALGreen Mandatory**	Use Low-VOC or Zero-VOC Paint - Low-VOC Interior Wall/Ceiling Paints (<50gpl VOCs)	Most interior paints contain volatile organic compounds (VOCs), a major class of indoor and outdoor air pollutants. Solvents contained in the product are released into the air, impacting indoor air quality and be may harmful to children and chemically sensitive individuals. Use low VOC primer and paint on all interior walls and ceiling (the trim is exempt). These products shall also meet the VOC limits in Table 4.504.3 of the 2010 California Green Building Code.[1]	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 3c 2 Points **CALGreen Mandatory**	Use Low-VOC Coatings that Meet SCAQMD Rule 1113	Conventional petroleum-based wood finishes can off-gas toxic compounds for months and can be harmful to children and chemically sensitive individuals. Use lower VOC wood finishes, stains or coatings that meet the South Coast Air Quality Management District (SCAQMD) Rule 1113[2] for Architectural Coatings standards. These products shall also meet the VOC limits in Table 4.504.3 of the 2010 California Green Building Code.[1]	Initials: _____ Date: _____
K. Finishes	☑ Sheet: _____	Item 4 1 Points **CALGreen Mandatory**	Use Low-VOC Caulks, Construction Adhesives and Sealants that Meet SCAQMD Rule 1168	Conventional caulks and construction adhesives may off-gas toxic compounds for months. Use caulks and adhesives that meet the South Coast Air Quality Management District (SCAQMD) Rule 1168[3] for Adhesive and Sealant Applications standards. The limits in Table 4.504.1 and Table 4.504.2 of the 2010 California Green Building Code[1] may be used to meet this requirement.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
K. Finishes	☑ Sheet:	0 Points **CALGreen Mandatory**	CALGreen 4.504.2.3 Aerosol paints and coatings shall be compliant with product weighted MIR limits for ROC and VOC limits	Conventional caulks and construction adhesives may off-gas toxic compounds. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC and regulations for toxic compounds and ozone depleting substances in Section 94522(a)3, 94522(c)(2) and 94522(d)(2) of California Code of Regulations, Title 17.[5] Paints and coatings shall also meet the VOC limits of the Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 49.[4]	Initials: Date:
K. Finishes	☑ Sheet:	Item 7 0 Point **CALGreen Mandatory**	Reduce Formaldehyde in Interior Finish – Meet Current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits	To reduce formaldehyde levels in indoor air, hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in CARB's Air Toxic Control Measure for Composite Wood. Formaldehyde limit: Hardwood plywood veneer core: < 0.05ppm Hardwood plywood composite core: < 0.08ppm Particleboard: < 0.09ppm Medium density fiberboard: < 0.11ppm Thin medium density fiberboard (8mm max): < 0.21ppm	Initials: Date:
L. Flooring	☑ Sheet:	Item 4 0 Point **CALGreen Mandatory**	All carpet and 50% of Resilient Flooring is low emitting	To promote use of products that require less intensive natural resource use to manufacture, all carpet installed shall meet the testing and product requirements of one of the following: • Carpet and Rug Institute's Green Label Plus Program. • California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350). • NSF/ANSI 140 at the Gold level. • Scientific Certifications Systems Indoor Advantage™ Gold. All carpet cushion installed shall meet the requirements of the Carpet and Rug Institute Green Label program. All carpet pad adhesives used shall have VOC content no more than 50 gpl. Where resilient flooring is installed, at least 50% of floor area receiving resilient flooring shall comply with the VOC emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.	Initials: Date:
M. Appliances and Lighting	☐ Sheet:	Item 1a 2 Points	Install ENERGY STAR Dishwasher	High efficiency dishwashers use less water and energy than conventional dishwashers. They reduce energy use by at least 31% and water use by at least 33% compared to conventional dishwashers. Install a dishwasher that is ENERGY STAR rated.	Initials: Date:

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
M. Appliances and Lighting	☐ Sheet: _____	Item 1ci 1 Point	Install ENERGY STAR Refrigerator – ENERGY STAR Qualified & < 25 Cubic Feet Capacity	Refrigerators and freezers are among the largest users of electricity in most homes. They can account for up to 25% of household energy use. Install a refrigerator that is ENERGY STAR rated and less than 25 cubic feet (including the freezer).	Initials: _____ Date: _____
N. Other	☑ Sheet: _____	Item 1 0 Point Required	Incorporate GreenPoint Rated Checklist (Green Building – Prescriptive Checklist) in Blueprints	Incorporating the GreenPoint checklist into the blueprints makes it easier for everyone involved—including the builder, homebuyer and municipality—to see which green features are included in the home. Include a copy of the GreenPoint checklist on a plan sheet as part of the plans submitted for the building permit review and issuance.	Initials: _____ Date: _____

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
N. Other	☑ Sheet: _____	Item 4a 1 Points **CALGreen Mandatory**	Develop an Operating and Maintenance Manual	An operating and maintenance manual that includes the following information shall be provided to the building occupant or owner. 1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure. 2. Operation and maintenance instructions for the following: a. Equipment and appliances, including water-saving devices and systems, HVAC systems, water-heating systems and other major appliances and equipment. b. Roof and yard drainage, including gutters and downspouts. c. Space conditioning systems, including condensers and air filters. d. Landscape irrigation systems. e. Water reuse systems. 3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations. 4. Public transportation and/or carpool options available in the area. 5. Educational material on the positive impacts of an interior relative humidity between 30% - 60% and what methods an occupant may use to maintain the relative humidity level in that range. 6. Information about water-conserving landscape and irrigation design and controllers which conserve water. 7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation. 8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc. 9. Information about state solar energy and incentive programs available. 10. A copy of all special inspection verifications required by the enforcing agency or the building codes.	Initials: _____ Date: _____

ALTERNATIVE POINTS

Following are alterative items that may be used in place of the standard items listed above. When substituting items, ensure that the total points substituted are equal to or greater than the standard point items removed.

BIG Reference	Part of Plan Set	Reference	Description	Comments	City Use Only Field Insp. Verification
AA. Community Design and Planning	☐ Sheet: _____	Item 3bii 2 Points	Proximity to Public Transit - Located Within ½ Mile of Major Transit Stop (Commuter Train/Light Rail Transit System OR Two or More Planned/Current Bus Line Stops)	To encourage use of alternative transportation, locate developments in close proximity to public transit. Major transit stop is defined as a light rail, subway, passenger rail, ferry stop or at least two or more existing, or planned (and funded) bus lines, constituting 60 or more transit rides per weekday (combined bus, rail, and ferry) AND 40 weekend trips (weekend trips must be met on Saturday and Sunday).	Initials: _____ Date: _____
AA. Community Design and Planning	☐ Sheet: _____	Item 6a 1 Point	Design for Safety & Vandalism Deterrence – Residence Entries Have Views to Callers (Windows or Double Peep Holes) & Can Be Seen By Neighbors	Design buildings and landscapes to deter crime and promote safety through casual observation and community interaction. At the front entrance install sidelights, doors with integral windows, double-height peepholes or equivalent features that allow occupants of all heights (minimum of 32" from finished floor) and capacities to recognize callers. Windows near the door in the same plane do not qualify. Windows on adjacent or opposite walls do qualify.	Initials: _____ Date: _____
H. HVAC	☑ Sheet: _____	Item 3bii 1 Point	Install Mechanical Ventilation System for Cooling – Install Whole House Fan	Whole house fans are used instead of an air conditioner to cool a house at night. They exhaust warm indoor air and bring in large volumes of cool outdoor air. Install a whole house fan that has an insulated, airtight sealed cover to prevent air and heat leakage through the fan assembly. The whole house fan shall be properly sized.	Initials: _____ Date: _____
K. Finishes	☐ Sheet: _____	Item 2 1 Point	Use Recycled Content Paint	To encourage the use of recycled materials, use a recycled content paint with a minimum 20% recycled-content paint (post-consumer) on at least half of all exterior walls. Recycled-content can be post-industrial, post-consumer, or some combination thereof. Post-industrial (pre-consumer) recycled content is counted at half the rate of post-consumer recycled content.	Initials: _____ Date: _____
M. Appliances and Lighting	☐ Sheet: _____	Item 2 1 Point	Common Laundry Facilities Are Provided for All Occupants	In order to reduce water and energy used in clothes washing by discouraging small loads, provide common laundry facilities. Locate clothes washers and dryers in central areas that are accessible to all occupants. Do not install clothes washers and dryers in individual units.	Initials: _____ Date: _____
M. Appliances and Lighting	☐ Sheet: _____	Item 3 1 Point	Install Built-In Recycling Center	To increase the rate of recycling by making it easier, co-locate trash & recycling into a two bin minimum (1 trash, 1 recycling) assembly built into kitchen cabinets. Separately located bins or bins in the garage utility room do not qualify.	Initials: _____ Date: _____

Footnotes/Resources:

[1] 2010 California Green Building Standards Code (CALGreen)
http://www.hcd.ca.gov/codes/shl/2010_CA_Green_Bldg.pdf

[2] South Coast Air Quality Management District (SCAQMD) Rule 1113 for Architectural Coatings standards
http://www.aqmd.gov/rules/reg/reg11/r1113.pdf

[3] South Coast Air Quality Management District (SCAQMD) Rule 1168 for Adhesive and Sealant Applications standards
http://www.aqmd.gov/rules/reg/reg11/r1168.pdf

[4] Bay Area Air Quality Management District Regulation 8, Rule 49 – Aerosol Paint Products
http://www.arb.ca.gov/drdb/ba/curhtml/r8-49.htm

[5] Searchable database for California Code of Regulations (See Title 17, Section 94522 for aerosol paints and coatings regulations)
http://ccr.oal.ca.gov/linkedslice/default.asp?SP=CCR-1000&Action=Welcome

CALGREEN MANDATORY CHECKLIST

NON-RESIDENTIAL PROJECTS

THESE REQUIREMENTS APPLY TO BUILDING PERMITS SUBMITTED ON OR AFTER JULY 1, 2012

Following is a standardized checklist of the 2010 California Green Building Standards Code (CALGreen) requirements that may be used for new non-residential projects to comply with the CALGreen Mandatory Measures (chapter 5).

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.1 Planning and Design	**5.106.1 Storm water soil loss prevention plan.** Newly constructed projects which disturb less than one acre of land shall prevent the pollution of storm water runoff from the construction activities through local ordinance in Section 5.106.1.1 or Best management practices (BMP) in Section 5.106.1.2	**Sheet:**	Initials: _____ Date: _____
5.1 Planning and Design	**5.106.4 Bicycle parking.** Comply with Sections 5.106.4.1 and 5.106.4.2; or meet local ordinance, whichever is stricter. **5.106.4.1 Short-term bicycle parking.** If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack. **5.106.4.2 Long-term bicycle parking**. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.	**Sheet:**	Initials: _____ Date: _____
5.1 Planning and Design	**5.106.5.2 Designated parking.** Provide designated parking for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles as shown in Table 5.106.6.2.	**Sheet:**	Initials: _____ Date: _____
5.1 Planning and Design	**5.106.8 Light pollution reduction.** Outdoor lighting systems shall be designed and installed to comply with the following: 1. The minimum requirements in the California Energy Code for Lighting Zones 1–4 as defined in Chapter 10 of the California Administrative Code; and 2. Backlight, Uplight and Glare (BUG) ratings as defined in IESNA TM-15-11; and 3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent. **Exceptions:** 1. Luminaires that qualify as exceptions in Section 147 of the California Energy Code 2. Emergency lighting	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.1 Planning and Design	**5.106.10 Grading and Paving.** Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.	**Sheet:**	Initials: _____ Date: _____
5.2 Energy Efficiency	**5.201.1 Scope** The California Energy Commission will continue to adopt mandatory building standards.	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.303.1 Meters.** Separate meters shall be installed for the uses described in Sections 5.303.1.1 through 5.303.1.3. **5.303.1.1 Buildings in excess of 50,000 square feet.** Separate submeters shall be installed as follows: 1. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gal/day. 2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems: a. Makeup water for cooling towers where flow through is greater than 500 gpm. b. Makeup water for evaporative coolers greater than 6 gpm. c. Steam and hot-water boilers with energy input more than 500,000 Btu/h. **5.303.1.2 Excess consumption.** Any building or a space within a building that is projected to consume more than 1,000 gal/day.	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.303.2 20 percent Savings.** A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. (Calculate savings by Water Use Worksheets.) **5.303.2.1 Multiple showerheads serving one shower.** When a shower is served by more than one showerhead, the combined flow rate of all the showerheads controlled by a single valve shall not exceed the maximum flow rate at ≥ 20 percent reduction contained in Table 5.303.2.3 or the shower shall be designed to only allow one showerhead to be in operation at a time.	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.303.4 Wastewater reduction.** Each building shall reduce the generation of wastewater by one of the following methods: 1. The installation of water-conserving fixtures or 2. Utilizing non-potable water systems	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.3 Water Efficiency and Conservation	**5.303.6 Plumbing Fixtures and Fittings.** Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the requirements listed for each type in Items listed in Table 5.303.6. 1. Water closets (toilets) – flushometer type 2. Water closets (toilets) – tank type 3. Urinals 4. Public lavatory faucets 5. Public metering self-closing faucets 6. Residential bathroom lavatory sink faucets 7. Residential kitchen faucets 8. Residential shower heads 9. Single shower fixtures served by more than one showerhead	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.304.1 Water budget.** A water budget shall be developed for landscape irrigation use.	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.304.2 Outdoor potable water use.** For new water service, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas between 1,000 square feet and 5,000 square feet.	**Sheet:**	Initials: _____ Date: _____
5.3 Water Efficiency and Conservation	**5.304.3 Irrigation design.** In new nonresidential projects with at least 1,000 square feet but not more than 2,500 square feet of landscaped area (the level at which the MLO applies), install irrigation controllers and sensors which include the following criteria, and meet manufacturer's recommendations. **5.304.3.1 Irrigation controllers.** Automatic irrigation system controllers installed at the time of final inspection shall comply with the following: 1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change. 2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.	**Sheet:**	Initials: _____ Date: _____
5.4 Material Conservation and Resource Efficiency	**5.407.1 Weather protection.** Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1403.2 and California Energy Code Section 150, manufacturer's installation instructions, or local ordinance, whichever is more stringent.	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.4 Material Conservation and Resource Efficiency	**5.407.2 Moisture control.** Employ moisture control measures by the following methods; **5.407.2.1 Sprinklers.** Prevent irrigation spray on structures. **5.407.2.2 Entries and openings.** Design exterior entries and openings to prevent water intrusion into buildings.	**Sheet:**	Initials: _____ Date: _____
5.4 Material Conservation and Resource Efficiency	**5.408.1 Construction waste management.** Recycle and/or salvage for reuse a minimum of 50% of the nonhazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent. **5.408.1.1 Construction waste management plan.** Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that complies with Items 1 through 4 of this section. **5.408.1.2 Waste management company.** Utilize a waste management company that can provide verifiable documentation that the percentage of construction waste material diverted from the landfill complies with this section. **Exceptions to Sections 5.408.1.1 and 5.408.1.2:** 1. Excavated soil and land-clearing debris 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist. 3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets **5.408.1.4 Documentation.** Provide documentation of the waste management plan that meets the requirements listed in Sections 5.408.1.1 through 5.408.1.3, and the plan is accessible to the enforcement authority.	**Sheet:**	Initials: _____ Date: _____
5.4 Material Conservation and Resource Efficiency	**5.408.2 Isolated jobsites.** The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.	**Sheet:**	Initials: _____ Date: _____
5.4 Material Conservation and Resource Efficiency	**5.408.3 Excavated soil and land clearing debris.** 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. **Exception:** Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.	**Sheet:**	Initials: _____ Date: _____
5.4 Material Conservation and Resource Efficiency	**5.410.1 Recycling by occupants.** Provide readily accessible areas that serve the entire building and are identified for the depositing, storage, and collection of non-hazardous materials for recycling.	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.4 Material Conservation and Resource Efficiency	**5.410.2 Commissioning.** For new buildings 10,000 square feet and over, building commissioning for all building systems covered by T24, Part 6, process systems, and renewable energy systems shall be included in the design and construction processes of the building project. Commissioning requirements shall include items listed in 5.410.2. **Exceptions:** 1. Dry storage warehouses of any size 2. Areas under 10,000 square feet used for offices or other conditioned accessory spaces within dry storage warehouses 3. Tenant improvements under 10,000 square feet as described in Section 303.1.1. **5.410.2.1 Owner's Project Requirements (OPR).** Documented before the design phase of the project begins the OPR shall include items listed in 5.410.4. **5.410.2.2 Basis of Design (BOD).** A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project to cover the systems listed in 5.410.2.2. **5.410.2.3 Commissioning plan.** A commissioning plan describing how the project will be commissioned shall include items listed in 5.410.2.3. **5.410.2.4 Functional performance testing.** Functional performance testing shall demonstrate the correct installation and operation of each component, system, and system-to-system interface in accordance with the approved plans and specifications. **5.410.2.5 Documentation and training.** A Systems Manual and Systems Operations Training are required. **5.410.2.5.1 Systems manual.** The Systems Manual shall be delivered to the building owner or representative and facilities operator and shall include the items listed in 5.410.2.5.1. **5.410.2.5.2 Systems operations training.** A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and shall include items listed in 5.410.2.5.2. **5.410.2.6 Commissioning report.** A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.4 Material Conservation and Resource Efficiency	**5.410.4 Testing and adjusting.** Testing and adjusting of systems shall be required for buildings less than 10,000 square feet. **5.410.3.2 Systems.** Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include, as applicable to the project, the systems listed in 5.410.4.2. **5.410.3.3 Procedures.** Perform testing and adjusting procedures in accordance with applicable standards on each system as determined by enforcing agency. **5.410.3.3.1 HVAC balancing.** Before a new space conditioning system serving a building or space is operated for normal use, the system should be balanced in accordance with the procedures defined by national standards listed in 5.410.3.3.1. **5.410.3.4 Reporting.** After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services. **5.410.3.5 Operation and maintenance manual.** Provide the building owner with detailed operating and maintenance instructions and copies of guaranties/warranties for each system prior to final inspection. **5.410.3.5.1 Inspections and reports.** Include a copy of all inspection verifications and reports required by the enforcing agency.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.503.1** Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. **5.503.1.1 Woodstoves.** Woodstoves shall comply with US EPA Phase II emission limits.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.504.1.3 Temporary ventilation.** If the HVAC system is used during construction, use return air filters with a MERV of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.504.3 Covering of duct openings and protection of mechanical equipment during construction.** At the time of rough installation and during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet-metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.5 Environmental Quality	**5.504.4 Finish material pollutant control**. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.4. **5.504.4.1 Adhesives, sealants, caulks.** Adhesives and sealants used on the project shall meet the requirements of the following standards. 1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. 2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507. **5.504.4.3 Paints and coatings.** Architectural paints and coatings shall comply with Table 5.504.4.2 unless more stringent local limits apply. **5.504.4.3.1 Aerosol Paints and Coatings.** Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances (CCR, Title 17, Section 94520 et seq). **5.504.4.3.2 Verification.** Verification of compliance with this section shall be provided at the request of the enforcing agency. **5.504.4.4 Carpet systems.** All carpet installed in the building interior shall meet the testing and product requirements of one of the standards listed in 5.504.4.4. **5.504.4.4.1 Carpet cushion.** All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program. **5.504.4.4.2 Carpet adhesive.** All carpet adhesive shall meet the requirements of Table 804.4.1. **5.504.4.5 Composite wood products.** Hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in Table 5.504.4. **5.504.4.5.3 Documentation.** Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following. 1. Product certifications and specifications. 2. Chain of custody certifications. 3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.) 4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards. 5. Other methods acceptable to the enforcing agency.	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.5 Environmental Quality	**5.504.4.6 Resilient flooring systems.** Comply with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its High Performance Products Database; products compliant with CHPS criteria certified under the Greenguard Children & Schools program; certified under the FloorScore program of the Resilient Floor Covering Institute; or meet California Department of Public Health 2010 Specification 01350. **5.504.4.6.1 Verification of compliance.** Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.504.5.3 Filters.** In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a MERV of 8. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual. **Exception:** A MERV-1 filter shall be allowed for return air only or return with prefiltered outside air, if the filter is of a re-usable, nondisposable type, and the fan energy use of that air delivery system is 0.4W/cfm or less at design airflow.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.504.7 Environmental tobacco smoke (ETS) control.** Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows where outdoor areas are provided for smoking and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University or campus of the University of California, whichever are more stringent.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.505.1 Indoor moisture control.** Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1203 and Chapter 14.1	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.506.1 Outside air delivery.** For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 121 of the California Energy Code and Chapter 4 of CCR, Title 8 or the applicable local code, whichever is more stringent.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.506.2 Carbon dioxide (CO2) monitoring.** For buildings equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, CCR, Section 121(c).	**Sheet:**	Initials: _____ Date: _____

CALGreen Reference	Description	Designer's Comments with Plan Sheet Reference	City Use Only Field Insp. Verification
5.5 Environmental Quality	**5.507.4 Acoustical control.** Employ building assemblies and components with STC values determined in accordance with ASTM E 90 and ASTM E 413 or OITC determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2. **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and floor-ceiling assemblies exposed to the noise source making up the building envelope shall have exterior wall and roof ceiling assemblies meeting a composite STC rating of at least 50 or a composite OITC rating of no less than 40 with exterior windows of a minimum STC of 40 or OITC of 30 in the locations described in Items 1 and 2. **5.507.4.1.1 Noise exposure where noise contours are not readily available.** Buildings exposed to a noise level of 65 dB Leq-1Hr during any hour of operation shall have exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30). **5.507.4.2 Performance method.** For buildings located as defined in Sections A5.507.4.1 or A5.507.4.1.1, wall and roof-ceiling assemblies making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation. **5.507.4.2.1 Site features.** Exterior features such as sound walls or earth berms may be utilized as appropriate to the project to mitigate sound migration to the interior. **5.507.4.2.1 Documentation of compliance.** An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record. **5.507.4.3 Interior sound transmission.** Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.	**Sheet:**	Initials: _____ Date: _____
5.5 Environmental Quality	**5.508.1 Ozone depletion and global warming reductions.** Installations of HVAC, refrigeration, and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2. **5.508.1.1 CFCs.** Install HVAC and refrigeration equipment that does not contain CFCs. **5.508.1.2 Halons.** Install fire suppression equipment that does not contain Halons.	**Sheet:**	Initials: _____ Date: _____