

GREEN BUILDING AND ENERGY GUIDELINES

All Building Division Inspection and Submittal Guidelines can be downloaded from the Green Building Website.





The City of Palo Alto Development Services was awarded Insurance Services Office (ISO) Class 1 Rating Only three other cities in the State of California have a Class 1 Rating (which indicates the highest standards for Structural Safety)

Winner of the 2016 Industry Leader of the Year Award from the American Construction Inspectors Association

KEEP THIS BOOK WITH PERMIT CARD AND HAVE IT AVAILABLE DURING THE INSPECTION NO SMOKING DURING THE INSPECTION

CPA GREEN BUILDING INSPECTION AND SUBMITTAL INDEX		
	Page Number	
GENERAL		
Development Center Contact Directory	1	
Common Errors	2	
Green Building - Common Adoptive Ordinances	4	
Key Changes - 2016 California Green Building Code	6	
Key Changes - 2016 California Energy Code	8	
GREEN BUILDING		
Green Building - Non-Residential Submittals and Guidelines	13	
Green Building - Non-Residential Inspection Requirements	15	
Green Building - Residential Submittals and Guidelines	23	
Green Building - Residential Inspection Requirements	27	
SPECIAL INSPECTOR		
Residential Green Building Special Inspector Field Notes	49	
CALGreen Documentation Certificate of Compliance	51	
ENERGY		
Energy Code - Lighting & Electrical - Non-Residential	52	
Energy Code - Non-Residential	66	
Energy Code - Low-Rise Residential	77	
WATER		
Model Water Efficient Landscape Ordinance (MWELO)	82	
WINDOWS		
Window Replacement	89	
CPA ENERGY AND GREEN BUILDING ORDIN	IANCE	
2016 California Green Building Standards Code	95	
2016 California Energy Code	119	
GREEN BUILDING REQUIRED INSPECTIO	NS	
1. Inspection Code: 111 - Pre-Construction M	leeting *	
2. Inpsection Code: 112 - Green Building Incrementa	al Verification *	
3. Inspection Code: 974 - Green Building F	inal *	
* All inspections are scheduled through the office; the inspection reques	st Phone Number is: (650) 329-2496	
GREEN BUILDING COMPLIANCE		
For additional information, you can visit the City c	of Palo Alto's	
Green Building Compliance Website.		
You may also call the Green Building Compliance Team at (650) 329-2179 or via email at:	
Melanie Jacobson		
<u>Kelsey Anderson</u>		
Jennifer Davis		
For inspection-related inquiries, you can call the Green Building Specialis	t at: (650) 329-2179 or via email at:	
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Page 1 of 2



COMMON ERRORS

INSPECTION CODE: N/A

SCOPE: RESIDENTIAL AND COMMERCIAL CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

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NO GREEN BUILDING INFORMATION ON APPROVED PLANS

□ CalGreen-Title 24, Part 11, Sec. 102.2 states that project documents shall be of sufficient clarity to indicate the location, nature and scope of the proposed green building feature and show that it will conform to the provisions of the code. This information is indicated on the "GB-1" plan sheet, which is available at the Development Center Website, under Green Building.

□ Correction requirements:

- 1. Go to the City of Palo Alto <u>Green Building Compliance Website</u> and download the "GB-1" and other applicable forms.
- Once you have completed the requirements listed in the Green Building Compliance Website, coordinate a meeting with <u>John Carr</u> (650) 329-2503 or the Green Building Compliance Team (650) 329-2179 at the Development Center and complete the plan revision process.
- 3. Bring two copies of the completed forms; they must be stamped and signed by the design professional or record for the project.

2013 CALIFORNIA CODE ADOPTION CITY ORDINANCES

Contractors who work in the City of Palo Alto should review the Adopted City Ordinances prior to work.
 The adopted ordinances are available <u>on-line</u>.

"GB-1" IS NOT COMPLETED PROPERLY AND THE GREEN BUILDING PRECONSTRUCTION MEETING WAS NOT REQUESTED

□ Sometimes, the Green Building scope of work and City of Palo Alto Green Building Ordinance requirements are not indicated properly on the "GB-1" sheet. Furthermore, Green Building requirements vary from project to project. As a result, the Contractor must schedule a Green Building Preconstruction Meeting at the beginning of the project to verify that the "GB-1" sheet—the Green Building requirements for the project—are correct.

NOT REQUESTING A GREEN BUILDING ROUGH INSPECTION

□ Some projects will require rough inspections to verify required Green Building provisions. Items such as sub-meters, dual plumbing, and recycled water piping are examples of items that need to be inspected

before they are covered.

INCOMPLETE SUBMITTAL PACKAGE

□ Incomplete submittal packages will always trigger a re-inspection. Check your submittal package carefully to ensure that all items indicated on the "GB-1" sheet are included and the relevant information is highlighted for quick reference.



GREEN BUILDING – COMMON ADOPTIVE ORDINANCES

INSPECTION CODE: N/A SCOPE: RESIDENTIAL AND COMMERCIAL CODES ENFORCED: RELATED CPA MUNICIPAL CODES

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GREEN BUILDING

□ 16.14.135: Deconstruction Survey

Adopted as Mandatory (Not within a Tier). All single family residential dwelling units required to obtain a demolition permit shall complete a deconstruction survey. Development Services would provide a list of preapproved companies that could complete surveys and deconstructions. Applicant would need to provide a list of materials that are reusable in the project, along with a range of values. Completion of the deconstruction survey would be performed by a third party and be given external resource information for tax incentives.

□ 16.14.135: Graywater

 Amended to read: Alternative plumbing piping is installed to permit the discharge from the clothes washer and all other fixtures (except toilets and kitchen sinks) to be used for an irrigation system in compliance with the California Plumbing Code.

□ 16.14.230: Laundry to Landscape Infrastructure Diverter Valve.

- Newly constructed Residential Buildings with a landscape area of any size shall install an independent plumbing drainage system including a trap and vent that shall begin near the interior laundry fixtures and will terminate at the exterior of the home. This piping system will be capped at all outlets and will assist in the future installation of a "Laundry-to-Landscape" irrigation system. A complete irrigation system installation shall meet the requirements of the California Plumbing Code 1502.1.1, Clothes Washer System.
- Independent laundry to landscape capable system shall be labeled as "LAUNDRY-TO-LANDSCAPE CAPABLE" and be readily visible to the user.
- □ 16.14.260: Enhanced Construction Waste
 - Increase to 80% which represents a 5% increase.
 - Amended A4.408.1 Enhanced construction waste reduction. Non-hazardous construction and demolition debris generated at the site is diverted to recycle or salvage in compliance with the following:
 - Tier 1 and Tier 2. At least a 80-percent reduction. Any mixed recyclables that are sent to mixed-waste recycling facilities shall include a qualified third party verified facility average

Green Building – Common Adoptive Ordinances

Page 2 of 2

diversion rate. Verification of diversion rates shall meet minimum certification eligibility guidelines, acceptable to the local enforcing agency.

- □ 16.14.360: Non-Residential Enhanced Water Budget
 - Non-residential buildings anticipated to use more than 1,000 gallons of water a day shall complete an Enhanced Water Budget Calculator.
- 16.14.420: Electrical Vehicle (EV) Charging, Section A4.106.8.3: Multi-Family Residential Structures:
 - Amended Item (C) to read: Accessible spaces. Projects shall comply with the 2016 California Building Code requirements for accessible electric vehicle parking.
- □ 16.14.080 (301.1.1): Mandatory Provisions
 - The mandatory provisions of California Green Building Standards Code, Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increased the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.
 - All residential building additions or alterations exceeding 1000 square feet must meet California Green Building Standards Code Mandatory plus Tier 1 requirements.
- 16.14.080 (301.4): All newly construction residential buildings must meet California Green Building Standards Code Mandatory plus Tier 2 requirements.
- □ A4.106.8.2: All newly constructed detached and attached single family residences require provisions for EVSE that include one of the following: Conduit Only, EVSE-Ready Outlet, or EVSE Installed.



KEY CHANGES – 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CGBSC)

INSPECTION CODE: -

SCOPE: RESIDENTIAL AND COMMERCIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

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Several definitions have been added, most related to electric vehicles and waste management. Most mandatory measure changes were related to the definitions and to the clarification or addition of referenced manuals, handbooks and standards.

- □ CGBSC 202: Definitions
 - Several definitions were added or revised. Several affect Electric Vehicles Chargers and Charging. Others include: Hot Water Recirculation System, Hybrid Urinal, Organic Waste, OVE, Postconsumer Content, Preconsumer, Recycled Content, Recycled Content Value, and Universal Waste.
- □ CGBSC 301.3.2: Water Diversion
 - The requirement of Section 5.408 shall be required for nonresidential additions and alterations whenever a permit is required for work.
- □ CGBSC 301.1.1: Initial Tenant Improvements
 - Provides references to the scoping provisions for alterations and additions.
- □ CGBSC 4.106.4.2 4.106.4.2.5: New Multi-Family Dwellings (Residential Mandatory Measures)
 - Provides additional electric vehicle charging space requirements including: quantity, location, size, single EV space, multiple EV spaces and identification
- □ CGBSC 4.408.1: Construction Waste Management
 - Minimum recycle or salvage of nonhazardous residential waste increased to 65%.
- □ CGBSC 4.408.4.1: Waste Stream reduction alternative
 - Residential criteria has been revised for consistency with Section 4.408.1.
- □ CGBSC 4.503.1: Fireplace
 - Any installed wood stove or pellet stove shall have a permanent NSPS label certifying emission

7

limits.

- □ CGBSC 4.504.2.3: Aerosol Paints and Coatings
 - The referenced Product weighted MIR Limits for ROC sections have been updated.
- □ CGBSC Table 4.501.1 3: VOC Limit Tables
 - o The word Current has been omitted from the VOC Limit column headings.
- **CGBSC 4.504.5.1: Documentation (Resilient Flooring Systems)**
 - o Canadian Standards have been added for exterior grade products.
- □ CGBSC 4.507.2: Heating and Air-Conditioning System Design
 - The editions of the referenced manuals, handbooks and standards have been updated.
- □ CGBSC 5.106.4.1.2: Long-Term Bicycle Parking (Nonresidential Mandatory Measures)
 - Scoping now includes "10 or more" language.
- □ CGBSC Table 5.106.5.3.3: Number of Required EV Charging Spaces
 - This table has been revised in its entirety.
- □ CGBSC 5.108 Exceptions: Light Pollution Reduction
 - Exceptions have been added to include limited building facades and custom lighting features.
- □ CGBSC 5.303.4: Commercial Kitchen Equipment
 - o Provides water use conservation and automatic shut-off requirements.
- □ CGBSC 5.408.2: Universal Waste
 - Provides documentation and verification requirements for the identification and proper disposal of universal waste (fluorescent lamps and ballast and mercury containing thermostats, among others).
- □ CGBSC 5.410.1 Exception: Recycling by Occupants
 - o An Exception is provided for qualifying rural jurisdictions
- □ CGBSC 5.410.2: Commissioning
 - All occupancies other than I-occupancies and L-occupancies shall comply with the California Energy Code. I-occupancies not regulated by OSHPD or for I-occupancies and L-occupancies not regulated by the California Energy Code shall comply with this section.
- □ CGBSC 5.503.1.1: Woodstoves
 - Any installed wood stove or pellet stove shall have a permanent NSPS label certifying emission limits.



KEY CHANGES – 2016 CALIFORNIA ENERGY CODE

INSPECTION CODE: N/A

SCOPE: RESIDENTIAL AND COMMERCIAL CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

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New and altered homes are to become more efficient in several ways to create energy and environmental savings for Californians. Building systems that include updates are: High Performance Attics, High Performance Walls, Improved Water Heating System Efficiency and High Efficacy Lighting.

Changes to the nonresidential requirements largely follow ASHRAE 90.1 national standards and include energy conservation measures related to the following building systems: Door and Window Interlocks, Direct Digital Controls, Outdoor Lighting, Escalators and Elevators.

□ CEC 150.0: Mandatory Requirements (Residential Envelope)

- There are several new thresholds for mandatory envelope requirements, including a new exception that allows for 30 square feet for dual glazed greenhouse windows.
- □ CEC 150.1: Prescriptive High Performance Walls.
 - In Climate Zones 1-5 & 8-16, above grade framed wall assemblies must not exceed a maximum U-factor of 0.051. In Climate Zones 6 & 7, the maximum U-factor is 0.065.
- □ CEC 150.1: Prescriptive High Performance Attics
 - There are three options that may be used to comply: Two options allow ducts and air handler to be located in the attic; one option requires ducts and air handler to be located in conditioned space.
- □ CEC 150.2: Prescriptive Additions
 - Provides several options that allow for extensions of existing wood-framed walls to retain the same dimensions.
- □ CEC 150.0 (M): Mandatory Requirements (Residential Mechanical)
 - All ducts in conditioned spaces must include R-4.2 insulation. Duct leakage requirement has been reduced to 5% maximum for single family homes.
- CEC 150.1: Prescriptive Requirements

9

- Provides the duct insulation requirements for high performance attic. Air flow requirements for whole house fans (cfm/sf) attic vent areas (sf/cfm) requirements have been reduced.
- CEC 110.3 (C)7: Mandatory Isolation Valves (Domestic Hot Water)
 - Instantaneous water heaters with an input rating of 6.8kBTU/hr (2 kW) or greater need an isolation valve on the cold water supply and hot water leaving the water heater. Each valve will need a hose bib or other fitting allowing for flushing the water heater when the valves are closed.
- CEC 150.1 (C)8: Domestic-Water-Heating-System
 - Water heater prescriptive efficiencies have been increased. Options have been provided for 3 different (gas or propane) systems, which include efficiency and pipe insulation requirements.
- CEC 150.2 (B)1G: Mandatory Water Heater Pipe Insulation
 - For water heater replacements, install piping insulation per mandatory requirements. Insulation for existing accessible piping must meet the requirements of Sections 150.0(j)2Ai, iii and iv.
- CEC Guidebook (NSHP): Onsite Renewable Systems
 - Compliance credit for installing PV systems is only available if the project used a performance approach and meets several other conditions. Note: Taking the PV system credit does not require HERS verification unless getting a rebate from the New Solar Homes Partnership (NSHP).
- □ CEC 150.0(K): Mandatory High Efficacy Lighting (Residential Lighting)
 - All permanently installed light fixtures shall be high efficacy, including screw-based which must contain JA8 compliant lamps.
- CEC 150.0(K)G: Screw Based Luminaires
 - Must contain JA8 compliant light sources. Must not be contained in recessed downlight luminaires. Incandescent sources are prohibited from having a GU-24 base (per Title 20 Section 1605.3(k).
- □ CEC 150.0(K)B: Blank Electrical Boxes.
 - The number of blank electrical boxes more than 5 feet above the finished floor shall not be greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor, or fan speed control.
- CEC 150.0(K)2J: Bathrooms, Garages, Laundry Rooms, and Utility Rooms
 - At least one fixture must be controlled by a vacancy sensor.
- CEC 150.0(K)2L: Under Cabinet Lighting
 - Any under cabinet lighting (including kitchen) must be switched separately from other lighting systems.
- □ CEC 150.0(K)3: Outdoor Lighting
 - Must be high efficacy and include a manual on/off switch and one of the following: Photocontrol

and motion sensor; Photocontrol and automatic time switch control; Astronomical time switch control; Energy Management Control System.

- CEC 120.7: Mandatory Requirements (Envelope)
 - Wall insulation levels have been changed for metal framed and metal demising. All other mandatory insulation levels are unchanged. Additional exceptions apply for dedicated data centers.
- CEC 140.3 & Table 140.3: Prescriptive Requirements.
 - Prescriptive envelope requirements have been updated in Table 140.3-B & C. Prescriptive roof/ceiling insulation tradeoff for Aged Solar Reflectance Table 140.3 has been updated and applies to new installations as well as roof replacements.
- CEC 120.6 (G): Escalators and Moving Walkways
 - Will be required to run at lower speeds when unoccupied while not in use in use in high traffic areas like airports, hotels, and transportation function areas.
- CEC 120.6 (F): Elevators
 - Energy efficient lighting and fan changes. Automatic shut-off controls for lights and fans after 15 minutes of no service. Lighting and ventilation to be operable during emergency stop situations while occupied with passengers.
- CEC 110.2: Mandatory Equipment Efficiencies (Mechanical)
 - Air conditioning unit efficiencies have increased. Chiller and DX equipment efficiencies have become more stringent.
- CEC 120.2 (I): Economizers
 - New mandatory requirements for Fault Detection and Diagnostics (FDD) on all economizers installed on new air-cooled packaged DX units with cooling capacity of 54,000 Btu/hr or greater. Stand alone or integrated FDD accepted per Section 120.2(i).
- CEC 120.2 & 140.4: HVAC System Controls.
 - Mandatory Direct Digital Controls (DDC) must be capable of monitoring several points, have optimum start/stop controls, and perform automatic information transfers. Prescriptive HVAC Shut-off Sensors for Windows and Doors when left open for more than five minutes, sensors will adjust thermostats to disable the HVAC equipment by resetting the temperature setpoints. Exemptions for doors with automatic closers or any space without thermostatic controls.
- CEC 120.8: Nonresidential Building Commissioning
 - Commissioning is required for all new buildings with nonresidential conditioned space, including nonresidential spaces in hotel/motel and high-rise residential buildings. The Owner's Project Requirements (OPR) must include building envelope performance expectations. Section 10-103 in Part 1 specifies that the Design Reviewer may be a licensed architect or licensed contractor in addition to a professional engineer.

- CEC 140.6: Prescriptive Calculation Methodology (Lighting)
 - Allowed Lighting Power Densities are reduced for both Complete Building and Area Category Methods per Tables 140.6-B & C.
 - Lighting Power Density Values for the Tailored Method are updated per Table 140.6-G. Allowances in Table 140.6-D remain unchanged.
- □ CEC 130.1 & 140.6: Indoor Lighting Controls.
 - An additional exception is included for Mandatory Shut-Off Controls.
- CEC 130.1 & 140.6: Mandatory Multi-Level Controls
 - Mandatory Multi-Level Controls shall be provided for enclosed areas 100 ft2 or greater with a general lighting load greater than 0.5 w/ft2. Some exceptions apply.
- □ CEC 130.1 & 140.6: Mandatory Partial-ON Occupancy Sensor
 - Mandatory Partial-ON Occupancy Sensor for areas requiring occupant sensing controls (offices ≤ 250 ft2, multipurpose rooms < 1,000 ft2, classrooms, and conference rooms), and multilevel controls, the occupant sensing controls shall function as partial-ON or vacancy sensor. Where no multi-level controls are required, an automatic full-on occupancy sensor is acceptable.
- CEC 130.1 & 140.6: Control Credits
 - Control Credits: Power Adjustment Factors (PAF) listed in Table 140.6-A have been updated and include several options.
- CEC 141.2.I: Entire Luminaire Alterations
 - Renamed for clarity. Lighting shall meet the lighting power allowance in Section 140.6 and altered permanently installed luminaries shall meet the applicable requirements in Table 141.0-E if the following options occur:
 - Removing/reinstalling 10% or more of the existing luminaires (if there are more than 2) in a space, or
 - Replacing or adding entire luminaires, or
 - Adding, removing, or replacing walls or ceilings along with lighting redesign. When
 replacing existing luminaries and the alteration is not in conjunction with adding, removing
 or replacing walls or ceilings, the new luminaries must:
 - Reduce rated power by 50% for office, retail and hotel occupancies and 35% for all others, compared to the original luminaires, at full light output, and
 - Meet all the control requirements in the Sections listed.
- □ CEC 141.2.J: Luminaire Component Modifications
 - Formerly, luminaire modifications-in-place. Alterations that replace the ballasts or drivers and the associated lamps in the luminaire, or permanently change the light source or the optical system of the luminaire. Modifying the components of fewer than 70 existing luminaires on a single floor or within a tenant space within a year, does not trigger code. If there are 70 or more modifications per year on a single floor or tenant space, then the project needs to meet lighting power allowances and reduced power ratings. Modifications should not prevent or disable multi-level,

shout-off or daylight controls.

- CEC 141.0(b)2K: Lighting Wiring Alteration
 - Alterations that add a circuit feeding luminaires, that replace, modify or relocate wiring between a switch or panelboard and luminaires, or replace lighting control panels, panelboards, or branch circuit wiring. Wiring alterations (unless strictly to add lighting controls) in each enclosed space shall meet the control requirements of the sections listed. Exceptions for all lighting alterations are included at the end of this section.
- □ CEC Table 140.7-A: Hardscape Lighting Power (Outdoor Lighting)
 - o Zone 0 has been added for undeveloped areas of state or national parks.
- CEC Table 140.7-B: Specific Applications in Lighting Power
 - Lighting power allowances for building entrances/exits are reduced. Lighting power allowances for ATM machines is now specified.
- □ CEC 130.2(C)3: Motion Sensors.
 - Must be able to reduce lighting power of each luminaire by at 40% (90% max.). Sales lot and sales canopies are no longer exempt.
- □ CEC 141.(B)2L: Outdoor Lighting Alterations.
 - Alteration to outdoor lighting shall meet several mandatory control requirements. Added or altered luminaires that increase the connected light load must meet applicable control and specific lighting application requirements. Control requirements are also provided for alterations that do not increase the connecting lighting load but where the greater of 5 luminaires or 10% of existing luminaires are replaced and for alterations that do not increase the connecting lighting load but where the greater of 5 luminaires or 50% of existing luminaires are replaced. An exception to lighting control acceptance testing is provided for a total of 20 or fewer controlled luminaires





GREEN BUILDING – NON-RESIDENTIAL SUBMITTALS AND GUIDELINES

INSPECTION CODE: 111, 112, 974

SCOPE: COMMERCIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

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SEQUENCE OF INSPECTIONS

PRE-CONSTRUCTION GREEN BUILDING MEETING

- □ The Pre-Construction Green Building Meeting can only be scheduled through the office; when calling the Building Department, request Inspection Code 111.
- During the Pre-Construction meeting, the Inspector will:
 - o Request to see a copy of the GB-1 sheet in the approved permit plan set
 - Perform an overview of the construction phase requirements applicable to the project and confirm if the project requires a Mandatory, Tier 1, or Tier 2 Inspection
 - Review the Green Building Inspection Checklist (this document)
 - Discuss compliance expectations throughout construction and during the Green Building Incremental Verification (Inspection Code 112) and the Green Building Final Inspection (Inspection Code 974).
 - o Review resources available to the construction team
 - Provide answers to any questions

GREEN BUILDING INCREMENTAL VERIFICATION (GBIV)

- □ The GBIV can only be scheduled through the office; when calling the Building Department, request Inspection Code 112.
- During the GBIV inspection, the Inspector will:
 - \circ Request to see a copy of the GB-1 sheet in the approved permit plan set
 - Review the Green Building Inspection Checklist (this document) and inspect all items listed as "Green Building Incremental Verification"
 - o Request submittals or supplemental documentation as listed
 - Recycled content page

GREEN BUILDING FINAL INSPECTION

□ The Green Building Final Inspection can only be scheduled through the office; when calling the Building Department, request Inspection Code 974.

- This step must be completed prior to scheduling a Final inspection (Inspection Code 101)
- You <u>must</u> have the Construction and Debris (C&D) requirements met and approved before requesting the Green Building Final Inspection
- During the on-site Green Building Final Inspection, the inspector will verify compliance of the field-related Green Building requirements (see the Green Building Inspection Requirements).
 - Ahead of the Green Building Final Inspection, the General Contractor must prepare the Green Building Inspection Requirements in a 3-ring binder <u>and</u> a flash drive that shall include all relevant submittals as checked off and/or identified with a "Y" on the GB-1 sheet.
 - The General Contractor needs to <u>highlight</u> all applicable requirements on the submittals in the 3-ring binder.
 - The flash drive needs to be labeled with the permit number and given to the City of Palo Alto for its records.
- □ After the on-site Green Building Final Inspection, the inspector will take the GB-1 sheet with comments and scan it at the Development Center. The applicant may pick up the GB-1 sheet at the Development Center after it has been scanned.



GREEN BUILDING – NON-RESIDENTIAL INSPECTION REQUIREMENTS

INSPECTION CODE: 111, 112, 974

SCOPE: COMMERCIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

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During the Green Building Incremental Verification Inspection (Inspection Code 112) and the Green Building Final Inspection (Inspection Code 974), the General Contractor should be ready to review the compliance provisions that follow.

DVISION A5.1: PLANNING AND DESIGN – MANDATORY MEASURES

A5.106: STORMWATER

□ Enforcement is managed through the Public Works Department.

A5.106.4: BICYCLE PARKING INCREMENTAL VERIFICATION

- □ The inspector shall:
 - Review the approved set of plans and count the number of bike parking spaces.
 - Request to see the bike parking submittal if the bike parking configuration is unclear.
 - Note the number of bike parking spaces to review in the Final inspection.

FINAL INSPECTION

□ The inspector shall verify that that the amount of bike parking spaces shown on the plans has been provided and installed.

A5.106.5.2: DESIGNATED PARKING

INCREMENTAL VERIFICATION

- □ The inspector shall:
 - Review the approved set of plans and count the number of "clean air vehicles" spaces shown. Note the number of spaces to be verified in the field.
 - Verify with contractor that the striping has been completed. (<u>Do not schedule on-site</u> inspection until striping is completed.)

FINAL INSPECTION

□ The inspector shall:

• Verify that the correct number of clear air vehicle parking spaces have been provided and

marked.

• Verify that the markings read "CLEAN AIR/VANPOOL/EV" and that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle.

A5.106.8: LIGHT POLLUTION REDUCTION INCREMENTAL VERIFICATION

□ The inspector shall review:

- The approved set of plans to count the exterior light fixtures.
- Verify that all light fixtures meet the required Backlight, Uplight, and Glare (BUG) Ratings by reviewing the Lighting Submittals compared the figures listed in Table 5.106.8 (Note that Palo Alto is in lighting zone LZ3).
- The requirement for a specific fixture is based on the:
 - Mounting height (MH) of the fixture
 - The linear distance between the fixtures location as compared to the location of the property line.

FINAL INSPECTION

□ The inspector shall visually verify that the fixture installed matches the fixture on the cut-sheet.

Allowable Rating	Lighting Zone 3
Maximum Allowable Backlight Rating	
Luminaire greater than 2 mounting heights (MH) from property line	No Limit
Luminaire back hemisphere is 1-2 mounting heights (MH) from	B4
property line	
Luminaire back hemisphere is 0.5-1 mounting heights (MH) from	В3
property line	
Luminaire back hemisphere is less than 0.5 mounting heights (MH)	B2
from property line	
Maximum Allowable Uplight Rating	
For area lighting	UO
For all other outdoor lighting, including decorative luminaires	U3
Maximum Allowable Glare Rating	
Luminaire greater than 2 mounting heights (MH) from property line	G3
Luminaire back hemisphere is 1-2 mounting heights (MH) from	G2
property line	
Luminaire back hemisphere is 0.5-1 mounting heights (MH) from	G1
property line	
Luminaire back hemisphere is less than 0.5 mounting heights (MH)	G1
from property line	

Table 5.106.8 – Maximum Allowable Backlight, Uplight, and Glare (BUG) Ratings for Palo Alto

Revision Date: 12/21/2016

DIVISION A5.1: PLANNING AND DESIGN – TIER 1 & TIER 2 MEASURES

A5.106.5.3: ELECTRIC VEHICLE CHARGING

See the Electrical Vehicle Supply Equipment (EVSE) Submittal and Inspection checklists.

A5.106.11.2: COOL ROOF FOR REDUCTION OF HEAT ISLAND EFFECT FINAL INSPECTION

Inspector shall request a copy of the Roofing Submittal and shall verify that the Solar Reflective Index (SRI) values meet the minimum requirements listed in the table below. A higher SRI is most desirable.

Table CPA 002 – Minimum Requirements for Solar Reflective Index

Roof Slope	Minimum SRI
≤ 2:12 (Low-Slope)	75
> 2:12 (Steep Slope)	16

DIVISION A5.2: ENERGY EFFIFICIENCY – MANDATORY MEASURES

□ See Energy Ace Checklists

DIVISION A5.2: ENERGY EFFICIENCY – TIER 1 & TIER 2 MEASURES

□ See Energy Ace Checklists

DIVISION A5.3: WATER EFFICIENY AND CONSERVATION – MANDATORY MEASURES

□ See section below under Tier 1 & Tier 2 Measures.

DIVISION A5.3: WATER EFFICIENY AND CONSERVATION – TIER 1 & TIER 2 MEASURES

A5.303.1.1: METERS

This <u>only</u> applies to new building or additions that are 50,000 square feet or more.

INCREMENTAL VERIFICATION

□ The inspector shall review the approved set of plans to verify that the separate water sub-meter is installed and labeled for each tenant space projected to consume more than 100 gallons/day.

A5.303.1.2: EXCESS CONSUMPTION

For any tenant in a new building or addition which is projected to use more than 1,000 gallons/day. INCREMENTAL VERIFICATION

□ The inspector shall review the approved set of plans to verify that the separate water sub-meter is installed and labeled for each tenant space projected to consume more than 100 gallons/day.

A5.303: INDOOR WATER USE

<u>Note</u>: The required flow and flush rates for will vary from project to project. Therefore, the flow and flush rates shown on the plumbing fixture schedule (and water use calculations) shall govern the inspection.

A5.303.3: APPLIANCES AND FIXTURES FOR COMMERCIAL APPLICATION

FINAL INSPECTION

□ The inspector shall review the approved set of plans to verify that the specified water-using appliances are installed. The inspector may review the fixture specifications or approved substitutions to verify compliance with the following:

- Clothes Washers 10% reduction in Maximum Water Factor shown in Title 20
- Residential Grade Dishwashers Check for Energy Star Label
- Commercial Grade Dishwashers Check the cut sheet showing that the Maximum Gallons per Rack in Table A5.303.3 are not exceeded:

TYPE	HIGH TEMPERATURE – MAX GALLONS PER RACK	CHEMICAL – MAX GALLONS PER RACK	
Conveyer	0.70 (2.6L)	0.62 (4.4L)	
Door	0.95 (3.6L)	1.16 (2.6L)	
Under counter	0.90 (3.4L)	0.98 (3.7L)	

Table A5.303.3 - Commercial Dishwasher Water Use

The inspector shall field verify that the fixture cut sheet matches the fixture that was installed.
 Make sure to have the cut sheet on-site to verify installation.

A5.303.5: DUAL PLUMBING

INCREMENTAL VERIFICATION

□ The inspector shall review the approved set of plans to verify that the dual plumbing is installed and labeled as specified in accordance with the California Plumbing Code (CPC). If recycled water is immediately intended for use in the project, and not just pre-plumbed, the inspector should witness any testing of the system as required by the CPC and collect the results of any tests.

A5.304: OUTDOOR WATER USE

FINAL INSPECTION

□ For landscape projects over 1,000 square feet, the inspector shall verify that a separate irrigation meter has been installed and/or verified by City of Palo Alto Utilities (CPAU). The applicant should contact CPAU for any questions related to the installation.

A5.304: IRRIGATION CONTROLLERS

INCREMENTAL VERIFICATION

- □ The inspector shall:
 - Review the landscape submittals to verify that the controller contains a weather or a soil moisture-based system.
 - Review the irrigation schedule to verify that the irrigation has been scheduled for times between 8:00PM and 10:00AM only.
 - For above-ground irrigation only (i.e. non-drip system), note the duration "run-time" on the irrigation schedule for the field inspection.
 - "Run-times" vary throughout the year; locate the run-time specified for the month that the inspection occurs within.

FINAL INSPECTION

□ The inspector shall:

- Field-verify that a weather or soil moisture based controller has been installed (as shown in the landscape submittal).
- Request, for above-ground irrigation, that the irrigation be turned on for the length of the longest duration run-time.
- Verify that water does not run-off or does not spray on buildings or hardscapes. If run-off or spray on building/hardscape occurs, the General Contractor shall re-calibrate the controller to prevent this occurrence. (Note to General Contractor: Consider having the landscape contractor present on site.)

DIVISION 5.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY – MANDATORY MEASURES 5.410.2: COMMISSIONING

(NEW CONSTRUCTION 10,000 SQUARE FEET OR MORE ONLY)

INCREMENTAL VERIFICATION

□ The inspector shall request to see a commissioning schedule to verify that the Commissioning activities are planned.

FINAL INSPECTION

□ The inspector shall:

- Confirm that the Functional Performance Testing was completed by the Commissioning Agent.
- Confirm that the Systems Manual has been reviewed by the Commissioning Agent.
- Verify that the Systems Training has been verified as complete by the Commissioning Agent.
- Verify that the Commissioning Report is complete.

NOTE: If any of the above are in progress, the inspector shall verify that a contract is in place to complete the Commissioning Report by reviewing a signed copy of the commissioning agent's contract.

5.410.4: TESTING AND ADJUSTING

(NEW CONSTRUCTION LESS THAN 10,000 SQUARE FEET <u>OR</u> NEW SYSTEMS TO SERVE AN ADDITION OR ALTERATION)

INCREMENTAL VERIFICATION

□ The inspector shall request to see a testing and adjusting schedule to verify that these activities are planned.

FINAL INSPECTION

□ The inspector shall verify that the Testing and Adjusting report and verify that the Operations and Maintenance (O&M) Manual are completed.

DIVISION A5.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY – TIER 1 & TIER 2 MEASURES A5.405.1: REGIONAL MATERIALS

FINAL INSPECTION

□ Using receipts and records supplied by the building contractor, the inspector shall verify that 10 percent of the materials' value has been acquired from a source within 500 miles of project location.

A5.405.2.2: RAPIDLY RENEWABLE MATERIALS

FINAL INSPECTION

□ The inspector shall verify, using receipts and certifications provided by the contractor, that the project has used rapidly renewable materials for 2.5% of the materials value based on the project cost.

A5.405.3: REUSED MATERIALS

FINAL INSPECTION

□ The inspector shall verify, through receipts and other product-purchased documentation, that the percentage of building materials that have been reused (replacing the need for those additional "new materials") is 5% or greater of the overall material usage.

A5.405.4: RECYCLED CONTENT

FINAL INSPECTION

- □ The inspector shall verify through receipts and other product-purchased documentation that the percentage of building materials containing recycled content meet the minimum thresholds:
 - Tier 1 = 10% Recycled Content
 - Tier 2 = 20% Recycled Content

DIVISION 5.5: ENVIRONMENTAL QUALITY – MANDATORY MEASURES

5.404.1.3: TEMPORARY VENTILATION

INCREMENTAL VERIFICATION

□ The inspector shall field verify if the HVAC system is being used during construction. If yes, the inspector shall review the filter cut sheet to confirm that its meets a minimum of MERV 8.

5.504.3: COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION

INCREMENTAL VERIFICATION

□ The inspector shall verify that all duct and other related air distribution component openings are covered to reduce the amount of dust, water, and debris which may enter the building.

FINAL INSPECTION

□ The inspector shall verify, by reviewing (3) photos, that all duct and other related air distribution component openings were covered to reduce the amount of dust, water, and debris which may enter the building.

5.504.4: FINISH MATERIAL POLLUTAN CONTROL

FINAL INSPECTION

□ The inspector shall verify compliance with required VOC levels by reviewing the VOC Compliance Spreadsheet and associated product cut sheets.

5.506.2: CARBON DIOXIDE MONITORING

FINAL INSPECTION

 If shown on the project plans, the inspector shall review the Carbon Dioxide Monitor submittal to verify installation in the field. Typically, these are shown in areas with higher occupancy (i.e. Conference room, areas of assembly).

DIVISION 5.5: ENVIROMENTAL QUALITY – TIER 1 & TIER 2 MEASURES A5.504.2: IAQ POST CONSTRUCTION

FINAL INSPECTION

□ The inspector shall review the permit set of plans to verify which flush-out practices the contractor is to use on the project and ask for documentation showing compliance at the conclusion of the construction process. Compliance shall indicate a flush-out summary showing the calculation for the required flush-out period, beginning & end dates, temperature and humidity readings (shall remain at a minimum of 60 degrees F and relative humidity no higher than 60%).

A5.504.2.1: IAQ TESTING

FINAL INSPECTION

- □ If testing is completed on the project, review the IAQ Testing Report to verify that results <u>do not</u> <u>exceed the following:</u>
 - Carbon Monoxide (CO): Maximum 9 parts per million, not to exceed outdoor levels by 2 parts per million
 - Formaldehyde: 27 parts per billion
 - Particulates (PM10): 50 micrograms per cubic meter
 - 4-Phenylclohexene (4-PCH)—If fabrics and carpets with styrene butadiene rubber (SBR) latex backing are installed: 6.5 micrograms per cubic meter
 - Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.

A5.504.4.5.1: NO ADDED FORMALDEHYDE FOR COMPOSITE WOOD (MDF, PARTICLE BOARD) TIER 1 <u>FINAL INSPECTION</u>

The inspector shall review the Material Safety Data Sheets (MSDS) for all composite wood products. Composite wood is a material that is a mixture of wood fiber, plastic, and some type of binding agent (i.e. MDF, particle board). Verify that all data sheets are labeled as either "Approved by CARB" or "CARB Compliant" for either "No-added formaldehyde (NAF) or "Ultralow emitting formaldehyde."

A5.504.4.7: RESILIENT FLOORING SYSTEMS FINAL INSPECTION

□ The inspector shall review the Material Safety Data Sheets (MSDS) for at least 90% of the

resilient flooring material (i.e. Vinyl, linoleum). Each MSDS should show one of the following:

- RFCI "Floorscore Certified"
- "Compliant with California Department of Public Health VOC Requirements" or "1350 Standard Compliant"
- "2009 CHPS Product Database Listed"
- "Greenguard Children's & School Program Certified"

A5.504.5.1: ENTRYWAY SYSTEMS

FINAL INSPECTION

□ The inspector shall review the flooring submittal or product cut sheet to verify that "walk-off" mats, at least 6 feet in length, have been installed.

A5.504.5.2: ISOLATION OF POLLUTANT SOURCES

FINAL INSPECTION

□ The inspector shall confirm that all janitor closets or high-volume copy rooms are installed with self-closing hardware.

A5.504.5.3.1.1: FILTERS

FINAL INSPECTION

- □ The inspector shall review the product data sheets maintained by the contractor to verify that HVAC filtration specified on the approved plans and specifications installed, or is stored on site with the ability to be verified. The inspector may check a sample of installed filters to verify the MERV rating.
 - Tier 1 = MERV 11 Rating
 - Tier 2 = MERV 13 Rating

COMPLIANCE RESOURCES

The following resources are available to the construction team:

- 1. <u>City of Palo Alto Green Building Website</u>
 - Green Building requirements listed by project type and size
 - □ Green Building compliance process

2. Building Standards Commission Resources

- □ 2013 California Green Building Standards Code
- □ A guide to the California Green Building Standards Code
- □ A guide to the Non-Residential Commissioning of the Calgreen Code
- □ Sample Commissioning Project
- □ Sample Functional Performance Test, FPT Template

23



GREEN BUILDING – RESIDENTIAL SUBMITTALS AND GUIDELINES

INSPECTION CODE: 111, 112, 974

SCOPE: RESIDENTIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

GREEN BUILDING INSPECTION PROCEDURES

In accordance with Palo Alto Municipal Code (PAMC) 16.14, Residential projects triggering Tier 1 or Tier 2 shall be third-party verified by a Green Building Special Inspector. For CALGreen Tier 1 and Tier 2 information, consult the <u>City of Palo Alto – Green Building Website</u> webpage.

Special Inspectors must be selected from the pre-approved list of Green Building Special Inspectors. The Special Inspector shall perform inspections in accordance with the project's "GB-1" sheet, the Development Services webpage instructions, and this checklist. The Special Inspector shall consult the "Compliance Resources" listed at the end of this guideline. Where requirements are unclear, Special Inspectors may consult City Staff for clarification and case-by-case interpretations.

RESIDENTIAL GREEN BUILDING TRIGGERS

- <u>CALGreen Mandatory</u> requirements are triggered on all residential remodels or additions that are <u>less than</u>
 1,000 square feet and that increase the project's conditioned area, volume, or size.
- CALGreen Mandatory + Tier 1 requirements are triggered on all residential remodels that <u>exceed</u> 1,000 square feet.
- □ <u>CALGreen Mandatory + Tier 2</u> requirements are triggered on all <u>new</u> residential construction of <u>any</u> <u>size</u>.

PROJECTS SUBJECT ONLY TO CALGREEN MANDATORY

 Residential projects triggering <u>only</u> CALGreen Mandatory shall also use this checklist and the City of Palo Alto (CPA) Building Inspector shall perform the responsibilities of the Special Inspector as identified in this guideline.
 All reference to "Green Building Special Inspector" shall be replaced with "CPA Building Inspector."

ADMINISTRATIVE NOTE TO GENERAL CONTRACTORS SUBJECT TO SPECIAL INSPECTION

- Monthly inspection reports must be submitted by the General Contractor in writing to the Green Building Special Inspector for applicable provisions.
- Pre-approval of products to be installed is required for provisions.

Page 2 of 4

SEQUENCE OF INSPECTIONS

PRE-CONSTRUCTION GREEN BUILDING MEETING

□ The Pre-Construction Green Building Meeting can only be scheduled through the office; when calling the Building Department, request Inspection Code 111.

 When required for Tier 1 or Tier 2, the contractor shall coordinate this meeting with the Green Building Special Inspector. The Green Building Special Inspector shall be physically present and shall lead the meeting.

During the inspection, the CPA and Special Inspector will:

- Review the "GB-1" sheet in the approved set of plans
- Provide an overview of the construction phase requirements applicable to the project and confirm if the project requires Mandatory, Tier 1, or Tier 2 Inspection
- Review the Green Building Inspection Checklist (this document)
- Discuss compliance expectations throughout construction and during the Green Building Incremental Verification (Inspection Code 112) and the Green Building Final Inspection (Inspection Code 974)
 - The General Contractor shall submit monthly Green Building Progress report to the Special Inspector and shall provide an on-going update on the progress of the green building provisions
 - All products listed under 4.504: Pollutant Control must be pre-verified in writing by the Green Building Special Inspector prior to installation
 - IMPORTANT: If one or more non-compliant materials listed under 4.504: Pollutant Control are installed within this provision, the project is subject to an <u>automatic 14-day continuous flush-out</u> at the end of construction and occupancy may not occur until this flush-out is completed
 - The building flush-out must supply a total air volume of 14,000 cubic feet of outdoor air per square foot of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.
 - A HEPA vacuum may be used to bring in outside air if the mechanical system will be not accommodate the flush out
- Review importance of maintaining submittal paperwork requirements to prevent delays in the successful completion of the Green Building Final
- o Review resources available to the construction team
- o Go over Questions and Answers
- Upon completion of the Green Building Pre-Construction Meeting, the CPA Inspector shall sign and date the permit card next to Inspection Code 111
- Contractor shall schedule the approximate date of the first Green Building Incremental Verification with the Green Building Special Inspector. Should the project schedule change, the contractor shall reschedule the incremental inspection for a different day.
- The Green Building Special Inspector shall keep field notes of the meeting and items discussed.

GREEN BUILDING INCREMENTAL VERIFICATION

- □ The General Contractor must be in on-going communication with the Special Inspector to verify all Green Building Incremental Verification requirements.
- □ The inspection shall take place at the time of All-Trades.

□ The Contractor must submit monthly Green Building Inspection Reports to the Special Inspector. It is advised that the Special Inspector conduct up to three site visits to verify that all "Green Building Incremental Verification" requirements have been met.

 Once all Green Building Incremental Verification requirements have been confirmed as complete by Green Building Special Inspector, the contractor shall contact the Inspection Request line to schedule the Green Building Incremental Verification, <u>Inspection Code 112</u>. The Green Building Incremental Verification must take place at the time of All-Trades.

- During the inspection:
 - The CPA Inspector will review the "GB-1" sheet in the approved set of plans
 - Contractor shall prepare and deliver the submittals as listed under "Green Building Incremental Verification – Contractor Submittals"
 - The CPA and Special Inspector will review the Green Building Inspection Checklist (this document) and inspect all items listed as "Green Building Incremental Verification Inspection" by providing submittals, photos, and other documents assembled in preparation for this inspection
 - Upon completion of the Green Building Incremental Verification, the CPA Building Inspector shall sign and date the permit card next to Inspection Code 112
 - See the Green Building Residential Inspection Requirements document for all the provisions that will be verified during the Green Building Incremental Verification

GREEN BUILDING FINAL INSPECTION

- □ The Contractor shall contact the Green Building Special Inspector for inspection of the items listed under Green Building Final Inspection.
- When the requirements have been confirmed as complete by the Green Building Special Inspector, the Contractor shall contact the Inspection Request line to schedule the Green Building Final Inspection, <u>Inspection Code 974</u>. This step must be completed <u>prior</u> to scheduling the Building Final Inspection.

During the inspection:

- The CPA Inspector will review the "GB-1" sheet in the approved set of plans.
- The CPA will verify compliance of the project submittals and supplemental documentation against the provisions identified as "Y" in the "GB-1" sheet.
 - All submittals, photos, and other documents should be assembled in preparation for this inspection in a 3-ring binder <u>and</u> a flash drive (the flash drive needs to be labeled with the permit number and given to the City of Palo Alto for its records)

City of Palo Alto Development Services Building Division – 285 Hamilton Av. (First Floor), Palo Alto, CA 94301 – (650) 329-2496 CPA Utilities: Electric Engineering – 1007 Elwell Ct., Palo Alto 94303 – (650) 566-4500 CPA Utilities: Customer Service Center – 285 Hamilton Av. (Second Floor), Palo Alto, CA 94301 – (650) 329-2161

- The General Contractor needs to <u>highlight</u> all applicable requirements on the submittals, photos, and other documents in the 3-ring binder
- Upon completion of the Green Building Final, the Green Building Special Inspector shall sign and date the permit card next to Inspection Code 974.

ADMINISTRATIVE NOTES FOR THE FINAL GREEN BUILDING SPECIAL INSPECTION INSTRUCTIONS TO THE GENERAL CONTRACTOR

□ It is the responsibility of the General Contractor to prepare all submittals and schedule all inspections in accordance with this document. The Green Building Special Inspector is not responsible to perform any work on behalf of the contractor. The Green Building Special Inspections shall be performed similar to other Special Inspections.

INSTRUCTIONS TO SPECIAL INSPECTOR

□ It is the responsibility of the Special Inspector to review all required documentation and deliver to CPA along with the project Field Notes and Certificates of Compliance for submission to the CPA Building Inspector using the approved format. The Special Inspector may consult the "Compliance Resources" listed at the end of this guideline. Where requirements are unclear, the Special Inspector may consult City Staff for clarification and case-by-case interpretations.



GREEN BUILDING – RESIDENTIAL INSPECTION REQUIREMENTS

INSPECTION CODE: 111, 112, 974

SCOPE: COMMERCIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

During the Green Building Incremental Verification Inspection (Inspection Code 112) and the Green Building Final Inspection (Inspection Code 974), the General Contractor should be ready to review the compliance provisions that follow.

ADMINISTRATIVE NOTE TO GENERAL CONTRACTORS SUBJECT TO SPECIAL INSPECTION

- ☐ <u>Monthly inspection reports</u> must be submitted by the General Contractor in writing to the Green Building Special Inspector for applicable provisions. Items that require reports will be shown with this symbol: △
- □ <u>Pre-approval</u> of products to be installed is required for provisions. Items that require pre-approval will be shown with this symbol: ∩

DVISION A4.1: PLANNING AND DESIGN – MANDATORY MEASURES

A4.106.2: STORMWATER

□ Enforcement in the public right of way is managed through the Public Works Department.

A4.106.3: SURFACE DRAINAGE

FINAL INSPECTION

Verify that that installed paving and associated grade supports groundwater flows away from the building at all areas included in the scope. The Special Inspector shall take photos of hardscape installed indicating the drainage direction.

4.106.4: ELECTRIC VEHICLE CHANRGING (LOCALLY AMENDED)

All electrical inspections are outside the scope of the Green Building Special Inspector. General Contractor shall refer to the EVSE Installation Checklist for additional details.

FINAL INSPECTION

□ The Special Inspector shall verify that the electric vehicle pre-wiring infrastructure for single-family, and EVSE ready and EVSE installed for multi-family, has been installed. The function of this inspection is to verify that the required infrastructure has been installed. All electrical inspections are outside the scope of the Green Building Special Inspector.

DIVISION 4.2 AND A4.2: ENERGY EFFICIENCY

Tier 1 and Tier 2 Measures within A4.2 Energy Efficiency have not been adopted by the City of Palo Alto. Applicants must consult PAMC 16.17 for the local Energy Reach Code requirements.

DIVISION 4.3: WATER EFFICIENCY AND CONSERVATION – MANDATORY MEASURES 4.303: INDOOR WATER USE

- □ The Special Inspector shall:
 - Verify that the flow and flush rates specified have been installed
 - Review the Plumbing Fixture Schedule and associated water use rates. The fixtures are measured in:
 - Gallons per minute (GPM) for lavatories and kitchen sinks
 - Gallons per flush (GPF) for toilets and urinals.
 - Review each fixture specification cut sheet and verify that rates shown on the Plumbing Fixture Schedule matches the fixture cut sheet
 - Plumbing Fixtures and Fittings shall not exceed the following minimums:
 - Water Closets: 1.28 GPF
 - Urinals: 0.5 GPF
 - Single Showerhead: 2.0 GPF at 80 psi
 - Multiple Showerheads Serving One Shower: 2.0 GPF at 80 psi (maximum flow rate of all showerheads combined if they are controlled by a single value)
 - Residential lavatory faucets: 1.5 GPM at 60 psi
 - Metering faucets: 0.25 gallons per cycle
 - Metering faucets for wash fountains: 0.20 [rim space (in.)/20 GPM at 60psi]
 - Kitchen faucets: 1.8 GPM at 60 psi

4.304.1: OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS

(Emergency Regulations effective for permit applications submitted after June 1, 2015 – Formerly a voluntary measure found in A4.304.1)

FINAL INSPECTION

4.304.2: IRRIGATION CONTROLLERS

FINAL INSPECTION

- □ The Irrigation Contractor shall prepare and deliver the irrigation controller product cut sheets meeting the requirements.
- □ The Special Inspector shall:
 - Review the landscape submittals to verify that the controller is a weather or a soil moisture-based system.
 - Review the irrigation schedule to verify that the irrigation has been scheduled for times between 8:00PM and 10:00AM only.

[□] The Special inspector shall collect the Model Water Efficient Landscape Ordinance (MWELO) Certificate of Compliance from the licensed landscape contractor demonstrating compliance with the permit plans. See "Compliance Resources" section for a link to the certificate.

29

- Confirm that the number of scheduled days of watering does not exceed the current irrigation frequency allowed for irritation.
 - See link at the end of this document for current Water Use Restriction requirements through the City of Palo Alto Utilities
- Field-verify that the weather or soil moisture-based controller has been installed (as shown in the landscape submittal) and take photos as verification of the installation

DIVISION 4.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY – MANDATORY MEASURES 4.406.1: RODENT PROOFING

INCREMENTAL VERIFICATION

□ The Special Inspector shall field verify, at rough inspection, that annular spaces have been protected by closing the openings with approved material. The Special Inspector shall take photographs of all compliant annular spaces. (This requirement applies to the openings under a bathtub per the California Building Code.)

4.408: ENHANCED CONSTRUCTION WASTE REDUCTION

□ Locally amended; A4.408.1 moved from Appendix A4 to Chapter 4 Mandatory Measures.

□ This requirement is enforced within the Green Halo system and is managed by the C&D Planner. No Green Building Special Inspection is required.

4.410.1: BUILDING MAINTENANCE AND OPERATION FINAL INSPECTION

- □ The General Contractor shall prepare and deliver the Operations and Maintenance (O&M) Manual to the owner and Special Inspector.
- The Special Inspector shall verify that the Operations and Maintenance (O&M) Manual is completed in accordance with the HCD residential guide for the manual format. See "Compliance Resources" for a link to the approved format.

DIVISION 4.5: ENVIRONMENTAL QUALITY – MANDATORY MEASURES

4.503: FIREPLACES

FINAL INSPECTION

- □ The General Contractor shall prepare and deliver product cut sheets showing the requirements listed to the Green Building Special Inspector.
- The Special Inspector shall review and field-verify the cut sheet for any gas fireplace installed to confirm it meets the direct-vent sealed combustion type requirements. The Special Inspector shall review cut sheet for woodstove or pellet stove installed to confirm it complies U.S. EPA Phase II emission limits.

4.504.1: COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMET DURING CONSTRUCTION (\triangle)

30

INCREMENTAL VERIFICATION

- □ The General Contractor shall prepare and deliver a monthly update with updated photographs of the protected ducts to the Green Building Special Inspector regarding the progress of this item.
- □ The Special Inspector shall field verify that all duct and other related air distribution component openings are covered to reduce the amount of dust, water, and debris which may enter the building. The Special Inspector shall take photographs demonstrating compliance at one point during construction.

4.504.2: FINISH MATERIAL POLLUTANT CONTROL (∩) INCREMENTAL VERIFICATION

- □ The General Contractor shall prepare and deliver product cut sheets and/or pictures of containers showing compliance for all product types listed for 4.504.2.1 through 4.504.5 to the Green Building Special Inspector prior to installation.
- □ The Contractor must obtain pre-verification of product compliance from the Green Building Special Inspector. It is recommended to batch multiple products for review to reduce the administrative review time.
 - IMPORTANT: It is the responsibility of the Contractor to initiate the pre-verification and deliver the product cut sheets of predicted products to be installed.
 - The Contractor shall deliver the products cut sheets, no fewer than 10 business days, for pre-verification review prior to performing the installation.
- □ The Special Inspector shall verify compliance with required VOC levels, and associated product labels, by reviewing all product cut sheets provided by the Contractor and pre-verify products within 10 business days of receipt.

FINAL INSPECTION

□ The Special Inspector shall verify compliance with required VOC levels, and associated product labels, by reviewing all the VOC Compliance Spreadsheet and associated product cut sheets. See "Compliance Resources" section for a link to the spreadsheet.

4.504.2.1: ADHESIVES, PRIMERS, SEALANTS, AND CAULKS

Product VOC levels shall not exceed Table 4.504.1 and Table 4.504.2 as applicable.

ARCHITECTECTURAL APPLICATIONS	VOC LIMIT
Indoor carpet adhesive	50
Carpet pad adhesives	50
Outdoor carpet adhesive	150
Wood flooring adhesive	100
Rubber floor adhesive	60
Subfloor adhesive	50
Ceramic tile adhesive	65

Table 4.504.1 – Adhesive VOC Limits

Green Building – Residential Inspection Requirements

Page 5 of 22

ARCHITECTECTURAL APPLICATIONS	VOC LIMIT
VCT and asphalt tile adhesive	50
Drywall and panel adhesive	50
Cove base adhesive	50
Multipurpose construction adhesive	70
Structural glazing adhesive	100
Single-ply roof membrane adhesive	250
Other adhesives not specifically listed	50

SPECIALTY APPLICATIONS	VOC LIMIT
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
SUBSTRATE SPECIFIC APPLICATIONS	-
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

Table 4.504.2 – Sealant VOC Limit

SEALANTS	VOC LIMIT
Architectural	250
Marine Deck	760
Non-membrane Roof	300
Roadway	250
Single-ply roof membrane	450
Other	420

SEALANT PRIMERS	VOC LIMIT
Architectural – Nonporous	250
Architectural – Porous	775
Modified bituminous	500
Marine Deck	760
Other	750

4.504.2.2: PAINTS AND COATINGS

□ Product VOC levels shall not exceed Table 4.504.3

Grams of VOC per litter of coating, including water and including exempt compounds

COATING CATEGORY	VOC LIMIT
Flat coatings	50
Non-flat coatings	100
Non-flat high gloss coatings	150
SPECIALTY COATINGS	-
Aluminum coatings	400
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	150
Faux finishing coatings	350
Floor coatings	100
Form-release compounds	250
Graphic arts coatings (sign paints)	500
High temperature coatings	420
Industrial maintenance coatings	250
Low solids coatings	120
Mastic texture coatings	100
Metallic pigmented coatings	500
Multi-color coatings	250
Pre-treatment wash primers	420
Primers, sealers, and undercoats	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs – Clear	730
Shellacs – Opaque	550
Specialty primers, sealers, and undercoats	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340

Table 4.504.3 – A	Architectural	Coatings	VOC Limit
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COATING CATEGORY	VOC LIMIT
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340
Wood preservatives Zinc-rich primers	350 340

Page 7 of 22

4.504.2.3: AEROSOL PAINTS AND COATINGS (∩)

- □ Products shall meet the Product-Weighted Maximum Incremental Reactivity (PWMIR) Limits set by the Regulation for Consumer Products (RCP) in Section 94522(a)(3) and other restrictions within Sections 94522(c)(2) and (d)(2) of Title 17.
- □ In addition, in accordance with the Bay Area Air Quality Management District (BAAQMD), products must comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.

4.504.3: CARPET SYSTEMS (∩)

- □ Carpet product cut sheets shall meet one of the following:
 - o 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
 - o Scientific Certifications Systems Indoor AdvantageTM Gold

4.504.3.1: CARPET CUSHION (∩)

□ Carpet cushion shall meet the requirements of the Carpet and Rug Institute Green Label Program.

□ Carpet adhesives shall meet the requirements of Table 4.504.1

4.504.4: RESILIENT FLOORING (∩)

- □ Where resilient flooring is installed, at least 80 percent of the floor area receiving resilient flooring shall meet one the requirements listed. Product cut sheets shall indicate compliance with one or more of the following:
 - Products compliant with the California Department of Public Health's Specification 01350, certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Product Database.
 - Products certified under UL GREENGUARD Gold (formerly the Greenguard Children & Schools program)
 - o Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program

4.504.5: COMPOSITE WOOD (∩)

□ All hardwood plywood, particleboard, and medium density fiberboard composite wood products shall meet the requirements for Formaldehyde Limits in Table 4.504.5.

COATING CATEGORY	VOC LIMIT
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard (max thickness 5/16 inches)	0.13

Table 4.504.5 - Max Formaldehyde Limits (Parts per Million)

4.505.2.1: CONCRETE SLAB FOUNDATIONS – CAPILLARY BREAK

INCREMENTAL VERIFICATION

- Concrete slab foundations required to have a vapor retarder by the California Building Code, CCR Title 24, Part 2, Chapter 19 shall also comply with this section.
- □ A 4-inch thick base of ½-inch or larger clean aggregate, with a vapor barrier in direct contact with concrete, and a concrete mix design which will address bleeding, shrinkage, and curling. The Special Inspector shall collect the Individual Provision Certificate of Compliance from the general contractor for this measure.

4.505.3: MOISTURE CONTENT OF BUILDING MATERIALS INCREMENTAL VERIFICATION

- □ The Special Inspector shall collect the Individual Provision Certificate of Compliance from the general contractor for this measure.
- □ The Special Inspector shall perform at least three random moisture readings on wall and floor framings in compliance with section 4.505.3, using either a probe-type or contact-type moisture meter to verify compliance. The Special Inspector shall note the results of the moisture readings on the Field Notes.

4.506.1: BATHROOM EXHAUST FANS

FINAL INSPECTION

- □ The Special Inspector shall review the bathroom exhaust fan cut sheet to verify that it shows the ENERGY STAR label.
- □ The exhaust fan must be controlled by a humidity control unless the fan is operating as part of a whole house ventilation system.
- □ The Special Inspector shall review the humidity controls product cut sheet, or feature of the exhaust fan if integrated, for compliance.
 - The humidity control shall be capable of adjustment between a relative humidity range of ≤ 50 percent to a maximum of 80 percent. A humidity control may utilize manual or automatic means of adjustment.

4.507.2: HEATING AND AIR CONDITIONING SYSTEM DESIGN
FINAL INSPECTION

□ The Special Inspector shall collect the Individual Provision Certificate of Compliance from the general contractor for this measure, declaring that the systems have been installed in accordance with the Manual J, Manual D, and Manual S permit plan assumptions.

DIVISION A4.1: PLANNING AND DESIGN – ELECTIVE MEASURES

A4.104.1: SUPERVISION AND EDUCATION

PRE-CONSTRUCTION MEETING

- □ The Special Inspector shall:
 - Prepare and deliver a written project-specific green building manual for the project and shall administer an in-person training outside of the CPA specific inspections to all parties associated with the development of the project.
 - Take attendance during the training and shall submit a copy of the written project manual and attendance log to the CPA Inspector.
 - NOTE: The Special Inspector performing the training may or may not be the same Special Inspector performing the Green Building Special Inspection in accordance with the remainder of this guideline.

FINAL INSPECTION

□ The Special Inspector shall deliver a copy of the written project manual used during the project.

A4.105.1/PAMC 16.14: DECONSTRUCTION AND RE-USE OF EXISTING MATERIALS FINAL INSPECTION

- □ The Contractor shall prepare a spreadsheet of the Deconstructed and Re-used Materials in accordance with the code requirements and deliver it to the Green Building Special Inspector. All re-used materials must be code compliant.
- □ The Contractor shall take photographs of all deconstructed and re-used components. For partial remodels, the re-use must occur within the area of work for the project. The re-use of materials must include all associated building material within a project category to comply with the requirement (i.e. all doors and trim must be reused).

A4.106.2.2: SOIL ANALYSIS

FINAL INSPECTION

- □ The Contractor shall collect a soil analysis report performed by a licensed design professional on the physical and chemical properties of the soil type and the report shall identify any associated strengths and weaknesses. The report must have an addendum or supplemental summary describing how the soil analysis was utilized in the structural design.
- □ The Special Inspector shall collect the Certificate of Compliance declaring compliance with the requirement from the Structural Engineer.

A4.106.2.2: SOIL PROTECTION (△)

The Elective Measure available to projects is not subject to C3 requirements.

INCREMENTAL VERIFICATION

- □ The Contractor shall provide a monthly report and supporting photographs to the Special Inspector on the progress of this requirement.
- □ The Special Inspector shall field verify that soil protection measures have been installed and take photos as verification of the installation.

FINAL INSPECTION

□ The Contractor shall prepare and deliver one or more of the following:

- Photographs and supporting documentation demonstrating erosion control measures implemented as indicated on the permit plans
- A summary and supporting photographs demonstrating that site access has been accomplished by deliberately reducing the amount of cut and fill need to install access roads and driveways
- A summary and supporting photographs demonstrating that all construction activities are coordinated to use the same trench (throughout the duration of construction) to minimize the amount of time disturbed soil is exposed and replaced

A4.106.2.3: TOPSOIL PROTECTION – TIER 1 AND TIER 2 (△)

INCREMENTAL VERIFICATION

□ The Contractor shall prepare and deliver photographs of the protected topsoil demonstrating compliance with the requirements. These photos shall be submitted during the monthly inspection report.

□ The Special Inspector shall:

- Review the photographs submitted in the monthly report to verify compliance is maintained
- Field-verify that non-hazardous topsoil has been stockpiled for reuse in a designated area and covered or protected from erosion
 - Protection from erosion includes: covering with tarps, straw, mulch, chipped wood or vegetative cover to protect the topsoil for later use.
- Take photos as verification of compliance

A4.106.2.3: TOPSOIL PROTECTION - TIER 2 ONLY (△)

INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver photographs of the delineated fencing and flagging of the protected topsoil, thereby limiting construction activity to the construction area. These photos shall be submitted during the monthly inspection report. These photos are in addition to the photos taken for A4.106.2.1.
- □ The Special Inspector shall:
 - Review the photographs submitted in the monthly report to verify compliance is maintained.

• Field-verify that topsoil protection fencing and flagging has been utilized and take photos as verification of compliance.

A4.106.3: LANDSCAPE DESIGN (LOCALLY AMENDED)

NOTE: Some provisions are related to the MWELO provisions found in 4.304.1.

FINAL INSPECTION

□ The Landscape Contractor shall sign the Certificate of Compliance declaring that a minimum one of the four requirements have been met.

Page 11 of 22

- o Areas disturbed during construction are restored to be consistent with native vegetation
- Turf areas are limited to 25% for Tier 1 and 10% for Tier 2 for the total landscaped area
- o 75% of native or drought tolerant plants are utilized
- Hydrozoning is utilized throughout the landscape.
- □ The Special Inspector shall collect the Certificate of Compliance from the Landscape Contractor verifying that the requirements have been achieved.

A4.106.4: WATER PERMEABLE SURFACES - TIER 1 AND TIER 2

Permeable surface area shall meet 20% for Tier 1 and 30% Tier 2.

FINAL INSPECTION

- □ The Contractor shall prepare and deliver product cut sheets for each water permeable paved material meeting the requirements as shown on the Water Permeable Surface Area calculations on the permit plans.
- □ The Special Inspector shall field verify that permeable surface materials have been installed and take photos as verification of the installation.

A4.106.5: COOL ROOF FOR REDUCTION OF HEAT ISLAND EFFECT – TIER 2 FINAL INSPECTION

□ The Special Inspector shall request a copy of the Roofing Submittal and shall verify that the SRI values meet the minimum requirements listed below. A higher SRI is most desirable.

ROOF SLOPE	MINIMUM SRI			
≤ 2:12 (Low Slope)	78			
> 2:12 (Steep Slope)	20			

Table A4.106.5 – Minimum SRI

A4.106.6: VEGETATED ROOF

FINAL INSPECTION

- □ The Special Inspector shall review the vegetated roof submittals to verify compliance and shall collect a Certificate of Compliance from the roofing installer declaring that the installation complies with this section and the California Building Code for roofing.
- □ The Special Inspector shall field verify that the vegetated roof has been installed and take photos as verification of the installation.

A4.106.10: LIGHT POLLUTION REDUCTION

FINAL INSPECTION

- □ The Contractor shall prepare and exterior light fixture product cut sheets meeting the requirements.
- □ The Special Inspector shall review the permit set of plans to count the exterior light fixtures and shall verify that all light fixtures meet the required Backlight, Uplight, and Glare (BUG) Ratings by reviewing the light fixture cut sheets compared the figures listed in Table 4.106.8.

□ The requirement for a specific fixture is based on:

- Mounting height (MH) of the fixture
- The linear distance between the fixtures location compared to the location of the property line. Palo Alto is in lighting zone LZ3
- □ The Special Inspector shall visually verify that the fixture installed matches the fixture on the cutsheet.

	-, 0
ALLOWABLE RATING	LIGHTING ZONE 3
Maximum Allowable Backlight Rating	-
Luminaire greater than 2 mounting heights (MH) from property line	No Limit
Luminaire back hemisphere is 1-2 MHs from property line	B4
Luminaire back hemisphere is 0.5-1 MHs from property line	B3
Luminaire back hemisphere is less than 0.5 MHs from property line	B2
Maximum Allowable Uplight Rating	-
For area lighting	UO
For all other outdoor lighting, including decorative luminaires	U3
Maximum Allowable Glare Rating	-
Luminaire greater than 2 mounting heights (MH) from property line	G3
Luminaire back hemisphere is 1-2 MHs from property line	G2
Luminaire back hemisphere is 0.5-1 MHs from property line	G1
Luminaire back hemisphere is less than 0.5 MHs from property line	G1

Table 4.106.8 – Maximum Allowable Backlight, Uplight, and Glare (BUG) Ratings for Palo Alto

A4.106.7: REDUCTION OF THE HEAT ISLAND EFFECT FOR NON-ROOF AREAS <u>FINAL INSPECTION</u>

- □ The Contractor shall prepare and deliver product cut sheets meeting product requirements for high-albedo materials as shown on the permit plans (requirement is an initial solar reflectance value of at least 0.30) based on ASTM Standard E 1918 or ASTM C1549. If applicable, the contractor shall prepare submittals demonstrating an open grid paving system or water permeable paving material.
- □ The Special Inspector shall:

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- Review the paving material submittals to verify that the requirements have been met for 50% of the requirements.
- Field-verify that paving material has been installed and shall take photos as verification of the installation.

A4.108.1: INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS FINAL INSPECTION

□ The Special Inspector shall review submittals supporting the installation of the approved innovative concept as reviewed during plan check.

DIVISION A4.3: WATER EFFICIENCY AND CONSERVATION – TIER 1 & TIER 2 MEASURES A4.303.3.1: KITCHEN FAUCETS

FINAL INSPECTION

- □ The Special Inspector shall verify that the flow rate specified for the kitchen faucet has been provided.
 - Review the Plumbing Fixture Schedule and associated water use rates for the kitchen faucet
 - Review each fixture specification cut sheet and verify that rates shown on the Plumbing Fixture Schedule matches the fixture cut sheet. The kitchen faucet flow rate shall not exceed 1.5 gallons per minute (GPM) at 60 psi

□ The Special Inspector shall field verify that the fixture cut sheet matches the fixture that was installed. Make sure to have the cut sheets on-site to verify installation.

A4.303.2: ALTERNATE WATER SOURCES FOR NON-POTABLE APPLICATIONS (INDOOR USE OF RECYCLED WATER)

FINAL INSPECTION

- The Contractor shall prepare and deliver a Certificate of Compliance demonstrating that alternate non-potable water sources have been installed in accordance with the California Plumbing Code. The system must also be field verified by the Plumbing Engineer. The Plumbing Engineer shall provide a second Certificate of Compliance to the Special Inspector.
- □ The Special Inspector shall:
 - Collect the Certificates of Compliance and review to confirm the requirement has been met.
 - Field-verify that the non-potable indoor application has been installed and take photos as verification of the installation.

A4.303.3: APPLIANCES

FINAL INSPECTION

□ The Special Inspector shall:

- Review the approved set of plans to verify that the specified water-using appliances are installed and meeting the requirements
- Check that the appliance has an ENERGY STAR label or that the product cut sheet lists the

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product as ENERGY STAR qualified. The product must also meet the applicable requirements in Table A4.303.3.

Table A4.303.3 -	Water-Using	Appliances
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ТҮРЕ	MAXIMUM WATER USE
Standard Dishwater	4.25 gallons per cycle
Compact Dishwasher	3.5 gallons per cycle
Clothes Washer	Water Factor of 6 gallons per cubic feet of drum capacity

A4.303.4: NON-WATER SUPPLIED URINALS AND WATERLESS TOILETS

NOTE: These systems must be in compliance with the Health Department requirements.

FINAL INSPECTION

- □ The Special Inspector shall review the product submittals to verify that the waterless component of the installation has been met.
- □ The Special Inspector shall field verify that waterless fixture has been installed and shall take photos as verification of the installation.

A4.304.1: RAINWATER CATCHMENT SYSTEMS

FINAL INSPECTION

- □ The Special Inspector shall:
 - Review the submittals to verify that the requirements are met in accordance with the <u>City</u> of Palo Alto Rainwater Catchment System Submittals and Guidelines.
 - Collect the Certificate of Compliance from the system installer declaring that the requirements are met in accordance with the California Building Code.
 - The Special Inspector shall field verify that rainwater catchment system has been installed and shall take photos as verification of the installation.

A4.304.2: IRRIGATION METERING DEVICE (PAMC 16.14) – TIER 1 & TIER 2 MANDATORY FINAL INSPECTION

□ For landscape projects over 1,000 square fewer, the Special Inspector shall verify that a separate irrigation meter has been installed and/or verified by the Utilities department. The applicant should contact Utilities for any questions related to installation.

A4.304.3: POTABLE WATER ELIMINATION (FOR LANDSCAPES) <u>FINAL INSPECTION</u>

- The Landscape Contractor shall prepare and deliver a Certificate of Compliance declaring that 100% of the landscape shall be irrigated using non-potable water via one or more of the following:
 - o Use of captured rainwater
 - Use of recycled water using purple pipe (only in CPAU recycled water areas)
 - Use of graywater

□ The Special Inspector shall:

- Review the Certificate of Compliance to verify the requirement has been achieved.
- Field-verify that the system utilized to achieve the non-potable application has been installed and shall take photos as verification of the installation.

A4.305.1: GRAYWATER

INCREMENTAL VERIFICATION

- □ The Special Inspector shall:
 - Collect the Certificate of Compliance from the Contractor declaring that the requirements have been met in accordance with this section and the <u>City of Palo Alto</u> <u>Graywater Submittals and Guidelines</u>
 - Field-verify that the graywater system has been installed and shall take photos as verification of the installation

A4.305.2: RECYCLED WATER PIPING

INCREMENTAL VERIFICATION

- □ The Special Inspector shall:
 - Collect the Certificate of Compliance from the installer declaring that the requirements have been met in accordance with this section
 - Review the approved set of plans to verify that the dual piping is installed and labeled as specified in accordance with the California Plumbing Code (CPC). If recycled water is immediately intended for use in the project, and not just pre-plumbed, the City building inspector should witness any testing of the system as required by the CPC and collect the results of any tests
 - Take photos verifying the installation of the system

A4.305.4: RECYCLED WATER INFRASTRUCTURE ON MULTI-FAMILY ADDITIONS AND ALTERATIONS INCREMENTAL VERIFICATION

- □ The Landscape Contractor shall prepare and deliver the Certificate of Compliance declaring that the recycled water infrastructure (purple pipe) requirements have been achieved.
- □ Prior to the covering of purple pipe with soil and other organic material, the Special Inspector shall:
 - Review the approved set of plans to showing the recycled water infrastructure (purple piping) and field verify that the infrastructure shown on the plans has been installed
 - o Take photos verifying the installation of the piping

A4.305.5: LAUNDRY TO LANDSCAPE READY INFRASTRUCTURE

INCREMENTAL VERIFICATION

□ The Special Inspector shall field verify that laundry to landscape diverter valve has been installed at washer drain line and shall take photos as verification of the installation. The diverter value shall be capped until a future tie-in is made.

DIVISION A4.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY – TIER 1 & TIER 2 MEASURES

42

A4.403.1: REDUCTION IN CEMENT USE

FINAL INSPECTION

- The Contractor shall prepare and deliver concrete mix submittal showing the percent of fly ash, slay, silica fume, or rice hull ash. The Contractor shall submit the Certificate of Compliance declaring that the requirements of this provision have been met.
 - Tier 1 projects require a minimum of 20%
 - Tier 2 projects require a 25% content of the listed materials.
- □ The Special Inspector shall:
 - o Review the submittals to verify that the cement mix requirement has been specified
 - Collect the Certificate of Compliance declaring that the requirements of this provision have been met

A4.404.1: LUMBER SIZE

INCREMENTAL VERIFICATION

- □ The Contractor shall:
 - Prepare and deliver beam, header, and trimmer product cut-sheets meeting the requirements
 - Sign the Certificate of Compliance declaring that the requirement has been met in accordance with CRC Tables R502.5 (1) and R502.5(2)
- □ The Special Inspector shall review the beam, header, and trimmer submittals to verify that the requirements are met.

A4.404.2: BUILDING DIMENSIONS AND LAYOUTS

INCREMENTAL VERIFICATION

- □ Prior to the installation of drywall, the Special Inspector shall:
 - Field verify that building design dimensions of 2-foot increments have been installed and/or windows and doors are located at regular 16" or 24" stud positions as shown on the permit plans
 - Take photos as verification of the installation

A4.404.3: BUILDING SYSTEMS

INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver product cut sheets meeting the pre-manufactured building system requirements have been met as shown on the permit plans. The options include:
 - Composite floor joist or pre-manufactured floor framing system
 - o Composite roof rafters or pre-manufactured roof framing system
 - Panelized (SIPS, ICF, or similar) framing system

FINAL INSPECTION

- □ The Special Inspector shall:
 - Review the pre-manufactured submittals to verify that the requirements have been met in accordance with the approved plans

Page 17 of 22

• Field-verify that the specified pre-manufactured products have installed and shall take photos as verification of the installation.

A4.404.4: PRE-CUT MATERIALS AND DETAILS

FINAL INSPECTION

- □ The Contractor shall prepare and deliver a Certificate of Compliance declaring that the Materials Lists prepared on the permit plans have been fully utilized in the field for construction.
- □ The Special Inspector shall review the Certificate of Compliance verify the requirement has been achieved.

A4.404.4: PRE-FINISHED BUILDING MATERIALS

FINAL INSPECTION

- □ The Contractor shall prepare and deliver the pre-finished product cut sheets meeting the requirements as shown on the permit plans. The options include:
 - Exterior trim not requiring paint or stain
 - Windows not requiring paint or stain
 - Siding or exterior wall coverings which do not require paint or stain (The entirety of the installation shall be comprised of the pre-finished material)
- □ The Special Inspector shall review the product cut sheet to verify that the requirement has been met.

A4.405.1: CONCRETE FLOORS

FINAL INSPECTION

□ The Special Inspector shall field-verify that only concrete floors have been installed and no additional flooring material has been installed throughout the project and take photos as verification of the installation.

A4.405.3: RECYCLED CONTENT

FINAL INSPECTION

- □ The Contractor shall prepare and deliver product cut sheets showing the recycled content of each claimed material and shall complete the HCD Recycled Content worksheet. The link to this worksheet can be found at the end of this document.
- □ The Special Inspector shall verify through receipts and other product purchase documentation that the percentage of building materials containing recycled content meet the minimum thresholds:
 - Tier 1 = 10% Recycled Content
 - Tier 2 = 15% Recycled Content

A4.405.4: RAPIDLY RENEWABLE MATERIALS

FINAL INSPECTION

□ The Contractor shall prepare and deliver product cut sheets showing the rapidly renewable

44

content of each claimed material.

□ The Special Inspector shall verify through receipts and other product purchase documentation that the rapidly renewable sources have been installed.

A4.405.1: DRAINAGE AROUND FOUNDATIONS

INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver the Certificate of Compliance declaring that the requirements have been achieved in accordance with this section and the California Building Code.
- □ The Special Inspector shall:
 - Collect the Certificate of Compliance from the Contractor declaring that the requirements have been met in accordance with this section
 - Review the approved set of plans to verify that the foundation and landscape drains are installed
 - Take photographs verifying the installation of the system

A4.407.2: ROOF DRAINAGE

FINAL INSPECTION

- □ The Contractor shall prepare and deliver the Certificate of Compliance declaring that the gutter and downspout system have been installed to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, or rainwater capture system.
- □ The Special Inspector shall
 - Collect the Certificate of Compliance from the Contractor declaring that the requirements have been met in accordance with this section
 - Review the approved set of plans to verify that the gutter and downspout systems are installed and take photographs verifying the installation of the system

A4.407.3: FLASHING DETAILS

INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver the Certificate of Compliance declaring that the flashing details as shown on the permit plans have been installed in accordance with this section and the California Building Code.
- □ The Special Inspector shall
 - Collect the Certificate of Compliance from the Contractor declaring that the requirements have been met in accordance with this section
 - Review the permit set of plans to verify that the flashing details on the building plans systems are installed
 - o Verify flashing while it is exposed in cases when the design indicated concealed flashing
 - Take photographs verifying the installation of the system

A4.407.4: MATERIAL PROTECTION (△)

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INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver monthly photographs demonstrating that all building materials delivered to the construction site are protected from rain and other sources of moisture. This requirement must be fulfilled at all times throughout construction.
- □ The Special Inspector shall:
 - Review the monthly report to verify that the requirement is met throughout construction
 - Field-verify that material protection is maintained
 - Take photographs verifying the installation of the system

A4.407.6: DOOR PROTECTION

FINAL INSPECTION

- □ Exterior doors to the dwelling are covered to prevent water intrusion by one or more of the following:
 - Install an awning at least 54 feet in depth
 - The door is protected by a roof overhang at least 4 feet in depth
 - The door is recessed at least 4 feet
 - o Other methods which provide equivalent protection
- □ The Special Inspector shall field verify door protection measures have been installed at every exterior door and shall take photos as verification of the installation.

A4.407.7: ROOF OVERHANGS

FINAL INSPECTION

□ The Special Inspector shall field verify that roof overhang measures have been installed at every exterior door and shall take photos as verification of the installation (a permanent overhang or awning at least 2 feet in depth is provided at all exterior walls).

DIVISION 5.5: ENVIRONMENTAL QUALITY – TIER 1 & TIER 2 MEASURES

A4.504.1: NO ADDED FORMALDEHYDE FOR COMPOSITE WOOF (MDF, PARTICLE BOARD) (\cap) FINAL INSPECTION

- □ The Contractor shall:
 - Prepare and deliver review the Material Safety Data Sheets (MSDS) for all composite wood products and obtain pre-approval from the Special Inspector prior to installation
 - Allow 10 business days to review and approve the products.
 - Composite wood is a material that is a mixture of wood fiber, plastic, and some type of binding agent (i.e. MDF, particle board).
 - Verify that all data sheets are labeled as either "Approved by CARB" or "CARB Compliant" for either "No-added formaldehyde (NAF) or "Ultra-low emitting formaldehyde".
- □ The Special Inspector shall
 - Verify compliance with required formaldehyde levels, and associated product labels, by reviewing all product cut sheets provided by the Contractor and pre-verify products within 10 business days of receipt

A4.504.2: RESILIENT FLOORING (∩)

This is an elective and it is in addition to the requirements within A5.04.4.

INCREMENTAL VERIFICATION

- □ The Special Inspector shall
 - Collect and review a summary spreadsheet and Material Safety Data Sheets (MSDS) for resilient flooring material (i.e. Vinyl, VCT, linoleum)
 - At least 90% for Tier 1
 - 100% for Tier 2
 - Each MSDS should show one of the requirements below. The summary spreadsheet shall list all materials and compliance methodology.
 - RFCI "Floorscore Certified"
 - "Compliant with California Department of Public Health VOC Requirements" or "1350 Standard Compliant"
 - Certified as a CHPS Low Emitting Material listed on the CHPS Low-Emitting Material Products Database
 - Certified under the "UL GREENGUARD Gold (formerly Greenguard Children & Schools"

□ The Special Inspector shall:

- Review the product submittals to verify that the product requirement has been met and deliver the pre-approval in writing to the General Contractor within 10 business days
- Field-verify that the materials specified have been installed and shall take photos as verification of the installation.

A4.504.3: THERMAL INSULATION (∩) INCREMENTAL VERIFICATION

- □ The Contractor shall prepare and deliver thermal insulation product cut sheets verifying that all thermal insulation has met one or more than the following for Tier 1. Projects that are Tier 2 require all thermal insulation to meet one of the following and that it does not contain any added formaldehyde.
 - "Compliant with California Department of Public Health VOC Requirements" or "1350 Standard Compliant"
 - Certified as a CHPS Low Emitting Material listed on the CHPS Low-Emitting Material Products Database
 - o Certified under the "UL GREENGUARD Gold (formerly Greenguard Children & Schools"
- □ The Special Inspector shall:
 - Review the product submittals to verify that the product requirement has been met and deliver the pre-approval in writing to the Contractor within 10 business days
 - Field-verify that the materials specified have been installed and take photos as verification of the installation

A4.506.1: FILTERS

FINAL INSPECTION

- □ The Contractor shall prepare and deliver the MERV 6 product cut sheets meeting the requirements.
- □ The Special Inspector shall:
 - Review the product data sheets maintained by the contractor to verify that a MERV 6 rating has been installed on the HVAC system.
 - Field-verify that MERV 6 filters have been installed and take photos as verification of the installation

A4.506.2: CONSTRUCTION FILTERS

Only available to high-rise projects; therefore, it is not applicable in Palo Alto.

A4.506.3: DIRECT-VENT APPLIANCES

Direct-vent heating and cooling shall be utilized if the equipment will be located in the conditioned space, or the Contractor can install the space-heating and water-heating equipment in an isolated mechanical room.

FINAL INSPECTION

- □ The Contractor shall prepare and deliver product cut sheets to the Special Inspector meeting the direct vent heating and cooling system requirements.
- □ The Special Inspector shall:
 - Review the product cut sheets to verify that the equipment meets the direct vent requirements
 - Field-verify that the direct vent heating and cooling equipment has been installed and take photos as verification of the installation

COMPLIANCE RESOURCES

The following resources are available to the construction team:

- City of Palo Alto Green Building Website
 - o Green Building Requirements listed by project type and size
 - Green Building Compliance Process
- Building Standards Commission Resources
 - o 2013 California Green Building Standards Code
 - A Guide to the California Green Building Standards Code
- **Model Water Efficient Landscape Ordinance(MWELO) Certificate of Installation**
- □ <u>City of Palo Alto Water Use Restrictions</u>
- Housing and Community Development Operations and Maintenance Manual Guideline
 <u>PDF</u>

o Word Document

- Housing and Community Development Pollutant Control Worksheets
- ACCA Manual J, Residential Load Calculations
- ACCA Manual D, Residential Duct Systems
- ACCA Manual S, Residential Equipment Sizing
- City of Palo Alto Rainwater Catchment System Submittals and Guidelines
- **City of Palo Alto Graywater System Submittals and Guidelines**
- Housing and Community Development Recycled Content Worksheets

49



RESIDENTIAL GREEN BUILDING SPECIAL INSPECTOR FIELD NOTES

INSPECTION CODE: 111, 112, 974

SCOPE: RESIDENTIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

Field notes must be taken for the required Green Building inspections (Inspection Codes 111,112, and 974) by the Green Building Special Inspector. Within the notes, indicate clearly the following:

- A summary that include dates and times of provisions approved for each inspection performed
- □ A list of correction notices provided to the Contractor.

Green Building Special Inspectors shall not approve an inspection until the inspection requirements outlined in the Green Building Inspection Checklist have been completed in accordance with the project's GB-1 sheet.

All field notes shall be submitted to the City of Palo Alto Building Inspector during the Green Building Final Inspection. Field notes may be audited for quality control at the discretion of the CPA Building Inspector. Shorthand notes are acceptable.

GREEN BUILDING SPECIAL INSPECTOR REQUIREMENT

SELECT THE APPLICABLE INSPECTION PHASE:

- Green Building Pre-Construction (Inspection Code 111)
- Green Building Incremental Verification (Inspection Code 112)
- Green Building Final (Inspection Code 974)

FIELD NOTES

City of Palo Alto Development Services Building Division – 285 Hamilton Av. (First Floor), Palo Alto, CA 94301 – (650) 329-2496 CPA Utilities: Electric Engineering – 1007 Elwell Ct., Palo Alto 94303 – (650) 566-4500 CPA Utilities: Customer Service Center – 285 Hamilton Av. (Second Floor), Palo Alto, CA 94301 – (650) 329-2161

City of Palo Alto Development Services Building Division – 285 Hamilton Av. (First Floor), Palo Alto, CA 94301 – (650) 329-2496 CPA Utilities: Electric Engineering – 1007 Elwell Ct., Palo Alto 94303 – (650) 566-4500 CPA Utilities: Customer Service Center - 285 Hamilton Av. (Second Floor), Palo Alto, CA 94301 - (650) 329-2161

Revision Date: 10/10/2016

Residential CALGreen Documentation Certificate of Compliance Page 1 of 1



RESIDENTIAL CALGREEN DOCUMENTATION CERTIFICATE OF COMPLIANCE

INSPECTION CODE: -

SCOPE: RESIDENTIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

The following section shall be completed by a person with overall responsibility for the planning and design portion of the project.

REQUIRED DOCUMENTATION PROVIDED TO THE BUILDING INSPECTOR

CALGreen Provision:

DETAILS OF DECLARATION

□ I certify that the provision requirements listed above are complete in accordance with the CALGreen provision listed.

DECLARATION STATEMENT

I certify under penalty of perjury, under the laws of the State of California, that the information provided is true and correct. I certify that the installed measures, materials, components, or manufactured devices identified on this certificate conform to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcing agency.

Responsible Person's Name:	Position/Title:
Responsible Person's Signature	Date Signed:

NOTES



ENERGY CODE – LIGHTING & ELECTRICAL – NON-RESIDENTIAL

INSPECTION CODE: N/A

SCOPE: NON-RESIDENTIAL, HIGH-RISE RESIDENTIAL, HOTEL/MOTEL OCCUPANCIES CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

The design and installation of all lighting systems and equipment in non-residential, high-rise residential, hotel/motel buildings, outdoor lighting, and electrical power distribution systems—subject to the California Energy Code, Title 24, Part 6—shall comply with the applicable provisions of Sections 130.0 through 130.5.

SECTION 130.0: LIGHTING CONTROLS AND EQUIPMENT

FUNCTIONAL AREAS WHERE COMPLIANCE WITH THE RESIDENTIAL LIGHTING STANDARDS IS REQUIRED

- □ High-rise residential dwelling units
- Outdoor lighting that is attached to a high-rise residential or hotel/motel building and is separately controlled from the inside of a dwelling unit or guest room.
- □ Fire station dwelling accommodations.
- □ Hotel and motel guest rooms.
- Dormitory and senior housing dwelling accommodations.

LUMINAIRE CLASSIFICATION AND POWER

Luminaires shall be classified and wattage determined as follows:

- □ The maximum re-lamping rated wattage of a luminaire shall be listed on a permanent, pre-printed, factory-installed label.
- □ The factory-installed maximum re-lamping rated wattage label shall not consist of peel-off or peeldown layers or other methods that allow the rated wattage to be changed after the luminaire has been shipped from the manufacturer.
- □ For luminaires with line voltage lamp holders not containing permanently installed ballasts or transformers, the wattage of such luminaires shall be determined as follows:
 - The maximum re-lamping rated wattage of the luminaire

- For recessed luminaires with line-voltage medium screw base sockets, wattage shall not be less than 50 watts per socket
- Luminaires and luminaire housings designed to accommodate a variety of trims or modular components that allow the conversion between incandescent and any other lighting technology without changing the luminaire housing or wiring shall be classified as incandescent
- Screw-based adaptors shall not be used to convert an incandescent luminaire to any type of non-incandescent technology. Screw-based adaptors, including screw-base adaptors classified as permanent by the manufacturer, shall not be recognized for compliance with Part 6
- Luminaires and luminaire housings manufactured with incandescent screw base sockets shall be classified only as incandescent. Field modifications, including hard wiring of an LED module, shall not be recognized as converting an incandescent luminaire or luminaire housing to a nonincandescent technology for compliance with Part 6.
- LED modules having screw-bases including screw based pig-tails, screw-based sockets, or screw-based adaptors shall not be recognized as a LED lighting system for compliance with Part 6
- Luminaires and luminaire housings equipped with screw-base sockets shall not be classified as a LED lighting system for compliance with Part 6
- Luminaires manufactured or rated for use with low-voltage incandescent lamps, into which have been installed LED modules or LED lamps, shall not be recognized as a LED lighting system for compliance with Part 6

LIGHTING CONTROLS

All lighting controls and equipment shall comply with the applicable requirements in Section 110.9 and shall be installed in accordance with the manufacturer's instructions.

SECTION 130.1: INDOOR LIGHTING CONTROLS THAT SHALL BE INSTALLED

AREA CONTROLS

□ All luminaires shall be functionally controlled with manually switched ON and OFF lighting controls. Each area enclosed by ceiling-height partitions shall be independently controlled.

□ The requirements are as follow:

- o Be readily accessible
- Be operated with a manual switch that is located in the same room or area with the lighting that is controlled by that lighting control
- If controlling dimmable luminaires, the dimmer switch must allow manual ON and OFF functionality, and it shall be capable of manually controlling lighting through all lighting control step

OTHER LIGHTING CONTROLS

□ Other lighting controls may be installed in addition to the manual lighting controls, provided they do not override the functionality of the controls.

SEPARATELY CONTROLLED LIGHTING SYSTEMS

□ In addition to the above, the following should be considered:

- o General lighting shall be separately controlled from all other lighting systems in an area
- Floor and wall display, window display, case display, ornamental, and special effects lighting shall each be separately controlled on circuits that are 20 amps or less
- When track lighting is used, general, display, ornamental, and special effects lighting shall each be separately controlled

MULTI-LEVEL LIGHTING CONTROLS

- □ The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5 watts per square foot, shall meet the following requirements:
 - Control steps in accordance with TABLE 130.1-A
 - Multi-level lighting controls shall not override the functionally of other lighting controls
 - Each luminaire shall be controlled by at least of one of the following methods:
 - Manual dimming
 - Lumen maintenance
 - Tuning

SHUT-OFF CONTROLS

INDOOR LIGHTING

□ All indoor lighting shall be equipped with controls that meet the following requirements:

- Shall be controlled with an occupant sensing control, automatic time-switch control, signal from another building system, or other control capable of automatically shutting OFF all of the lighting when the space is typically unoccupied
- Separate controls for the lighting on each floor
- Separate controls for a space enclosed by ceiling height partitions not exceeding 5,000 square feet
- o Separate controls for general, display, ornamental, and display case lighting
 - Exceptions:
 - Where the lighting is serving an area that is in continuous use, 24 hours per day and 365 days per year
 - In office buildings, up to 0.05 watts per square foot of lighting in any area within a building may be continuously illuminated, provided that the area is designated an emergency egress area on the plans and specification

COUNTDOWN TIMER SWITCHES

□ Countdown timer switches shall not be used to comply with the automatic shut-OFF control requirements.

AUTOMATIC TIME-SWITCH CONTROL

□ If an automatic time-switch control, other than an occupant sensing control, is installed to

comply with shut-off controls:

- It shall incorporate an override lighting control that complies with Area Control requirements
- o Allows the lighting to remain ON for no more than 2 hours when an override is initiated
- □ If an automatic time-switch control, other than an occupant sensing control, is installed it shall incorporate an automatic holiday "shut-OFF" feature that turns OFF all loads for at least 24 hours and then resumes the normally scheduled operation.

OCCUPANT SENSING CONTROLS

- Areas where occupant sensing controls are required to shut off all lighting when the room is unoccupied:
 - In offices 250 square feet or smaller
 - Multipurpose rooms of less than 1,000 square feet
 - Classrooms of any size
 - Conference rooms of any size
- □ In addition, controls shall be provided that allow the lights to be manually shut-OFF in accordance with Area Controls regardless of the sensor status.

PARTIAL ON/OFF OCCUPANT SENSING CONTROLS

Areas where partial ON/OFF occupant sensing controls are required:

- In aisle ways and open areas in warehouses, lighting shall be controlled with occupant sensing controls that automatically reduce lighting power by at least 50 percent when the areas are unoccupied. The occupant sensing controls shall independently control lighting in each aisle way, and shall not control lighting beyond the aisle way being controlled by the sensor
- In library book stack aisles 10 feet or longer that are accessible from only one end, and library book stack aisles 20 feet or longer that are accessible from both ends, lighting shall be controlled with occupant sensing controls that automatically reduce lighting power by at least 50 percent when the areas are unoccupied. The occupant sensing controls shall independently control lighting in each aisle way, and shall not control lighting beyond the aisle way being controlled by the sensor
- Lighting installed in corridors and stairwells shall be controlled by occupant sensing controls that separately reduce the lighting power in each space by at least 50 percent when the space is unoccupied. The occupant sensing controls shall be capable of automatically turning the lighting fully ON only in the separately controlled space, and shall be automatically activated from all designed paths of egress
- Areas where partial ON/OFF occupant sensing controls are required instead of complying with shut-off controls:

- Lighting in stairwells and common area corridors that provide access to guestrooms and dwelling units of high-rise residential buildings and hotel/motels shall be controlled with occupant sensing controls that automatically reduce lighting power by at least 50 percent when the areas are unoccupied. The occupant sensing controls shall be capable of automatically turning the lighting fully ON only in the separately controlled space, and shall be automatically activated from all designed paths of egress.
- In parking garages, parking areas and loading and unloading areas, general lighting shall be controlled by occupant sensing controls having at least one control step between 20 percent and 50 percent of design lighting power. No more than 500 watts of rated lighting power shall be controlled together as a single zone. A reasonably uniform level of illuminance shall be achieved in accordance with the applicable requirements in TABLE 130.1-A. The occupant sensing controls shall be capable of automatically turning the lighting fully ON only in the separately controlled space, and shall be automatically activated from all designed paths of egress. Interior areas of parking garages are classified as indoor lighting. Parking areas on the roof of a parking structure are classified as outdoor hardscape.

REQUIREMENTS AT HOTELS/MOTELS

□ Hotel/motel guest rooms shall have captive card key controls, occupancy sensing controls, or automatic controls such that. For whatever option, no longer than 30 minutes after the guest room has been vacated, lighting power should be switched off.

AUTOMATIC DAYLIT CONTROLS

Daylight Zones are defined as follows:

<u>SKYLIT</u>

□ The rough area in plan view under each skylight, plus 0.7 times the average ceiling height in each direction from the edge of the rough opening of the skylight, minus any area on a plan beyond a permanent obstruction.

PRIMARY SIDELIT

□ The area on a plan directly adjacent to each vertical glazing, one window head height deep into the area, and window width plus 0.5 times window head height wide on each side of the rough opening of the window, minus any area on a plan beyond a permanent obstruction that is 6 feet or taller as measured from the floor.

SECONDARY SIDELIT

- □ The area on a plan directly adjacent to each vertical glazing, two window head heights deep into the area, and window width plus 0.5 times window head height wide on each side of the rough opening of the window, minus any area on a plan beyond a permanent obstruction that is 6 feet or taller as measured from the floor.
 - Note: Modular furniture walls shall not be considered a permanent obstruction.

57

- Luminaires providing general lighting that are in or are partially in the Skylit Daylit Zones or the Primary Sidelit Daylit Zones shall be controlled independently by fully functional automatic daylighting controls, and the applicable requirements below:
 - All Skylit Daylit Zones and Primary Sidelit Daylit Zones shall be shown on the plans
 - Luminaires in the Skylit Daylit Zone shall be controlled separately from those in the Primary Sidelit Daylit Zones
 - Luminaires that fall in both a Skylit and Primary Sidelit Daylit Zone shall be controlled as part of the Skylit Daylit Zone

AUTOMATIC DAYLIGHTING CONTROL INSTALLATION AND OPERATION

- □ For luminaires in daylight zones, automatic daylighting controls shall be installed and configured to operate according to all of the following requirements:
 - Photosensors shall be located so that they are not readily accessible to unauthorized personnel, and the location where calibration adjustments are made to automatic daylighting controls shall not be readily accessible to unauthorized personnel
 - Automatic daylighting controls shall provide functional multilevel lighting having at least the number of control steps specified in Table 130.1-A

PARKING GARAGE DAYLIGHT REQUIREMENTS

- □ In a parking garage area with a combined total of 36 square feet or more of glazing or opening, luminaires providing general lighting that are in the combined primary and secondary sidelit daylit zones shall be controlled independently by automatic daylighting controls, and shall meet the following requirements as applicable:
 - o All primary and secondary sidelit daylit zones shall be shown on the plans
 - Automatic Daylighting Control Installation and Operation. Automatic daylighting control shall be installed and configured to operate according to all of the following requirements:
 - Automatic daylighting controls shall have photosensors that are located so that they are not readily accessible to unauthorized personnel, and the location where calibration adjustments are made to the automatic daylighting controls shall not be readily accessible to unauthorized personnel
 - Automatic daylighting controls shall be multi-level, continuous dimming or ON/OFF
 - The combined illuminance from the controlled lighting and daylight shall not be less than the illuminance from controlled lighting when no daylight is available.
 - When primary sidelit zones receive illuminance levels greater than 150 percent of the illuminance provided by the controlled lighting when no daylight is available, the controlled lighting power consumption shall be zero

DEMAND RESPONSIVE CONTROLS

□ Lighting power in buildings larger than 10,000 square feet shall be capable of being automatically

58

Page 7 of 14

Revision Date: 12/21/2016

reduced in response to a Demand Response Signal, so that the building's total lighting power can be lowered by a minimum of 15 percent below the total installed lighting power. Lighting shall be reduced in a manner consistent with uniform level of illumination requirements in Table 130.1-A.

□ Spaces that are non-habitable shall not be used to comply with this requirement, and spaces with a lighting power density of less than 0.5 watts per square foot shall not be counted toward the building's total lighting power.

	MINIMUM	REQUIRED CO	ONTROL STEP	S (% OF FULL	UNIFORM LEVEL OF ILLUMINANCE SHALL BE	
	RATED POWER) ¹				ACHIEVED BY:	
Line-voltage sockets except GU-24						
Low-Voltage incandescent systems	Continous dimming 10% - 100%				ing 10% - 100%	
LED luminaires and LED source systems					ing 10/0 - 100/0	
GU-24 rated for LED						
GU-24 sockets rated for fluorescent > 20 watts					ing 20% 100%	
Pin-based compact fluorescent > 20 watts ²			Col	numous unnim	ling 20% - 100%	
GU-24 sockets rated for fluorescent \leq 20 watts						
Pin-based compact fluorescent \leq 20 watts ²	Minimum one step between 30% - 70%		- 70%	Step dimming; continuous dimming; switching alternate lamps in a luminaire		
Linear fluorescent and U-bent fluorescent \leq 13 watts						
	Minimum one step in each range				Step dimming; continuous dimming; switching	
Linear fluorescent and U-bent fluorescent > 13 watts	20% - 40%	50% - 70%	% 80% - 85% 100%		alternate lamps in each luminaire having a minimum of 4 lamps per luminaire, illuminating the same area and in the same manner	
Track Lighting	Minimum one step between 30% - 70%		- 70%	Step dimming; continuous dimming; separately switching circuits in multi-circuit track with a minimum of two circuits		
HID > 20 watts					Step dimming; continuous dimming; switching	
Induction > 25 watts	Minim	Minimum one step between 50% - 70%		6 - 70%	alternate lamps in each luminaire, having a	
Other light sources				the same areas in the same manner		
(1) Full rated input power of ballast and lamp, corresp	onding to the	e maximum b	allast factor			

Table 130.1-A – Multi-Level Lighting Controls and Uniformity Requirements

(2) includes only pin-based lamps: twin tube, multiple twin tube, and spiral lamps

SECTION 130.2: OUTDOOR LIGHTING AND EQUIPMENT

OUTDOOR INCANDESCENT LIGHTING

□ All outdoor incandescent luminaires rated over 100 watts shall be controlled by a motion sensor.

LUMINAIRE CUT-OFF REQUIREMENTS

- □ All outdoor luminaires rated for use with lamps greater than 150 watts shall comply with Backlight, Uplight, and Glare (collectively referred to as "BUG") requirements as follows:
 - There are no Backlight requirements in Section 130.2 of Part 6
 - Maximum zonal lumens for Uplight shall be in accordance with Table 130.2-A
 - Maximum zonal lumens for Glare shall be in accordance with Table 130.2-B
 - EXCEPTIONS:
 - Signs, building facades, public monuments, statues, vertical surfaces of bridges, and

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temporary outdoor lighting

CONTROLS FOR OUTDOOR LIGHTING

□ Outdoor lighting controls shall be installed that meet the following requirements:

- All installed outdoor lighting shall be controlled by a photocontrol or outdoor astronomical time-switch control that automatically turns OFF the outdoor lighting when daylight is available
- All installed outdoor lighting shall be circuited and independently controlled from other electrical loads by an automatic scheduling control
- All installed outdoor lighting, where the bottom of the luminaire is mounted 24 feet or less above the ground, shall be controlled with automatic lighting controls that meet all of the following requirements:
 - Shall be motion sensors or other lighting control systems that automatically controls lighting in accordance with Cutoff Requirements in response to the area being vacated of occupants
 - Shall be capable of automatically reducing the lighting power of each luminaire by at least 40 percent but not exceeding 80 percent, or provide continuous dimming through a range that includes 40 percent through 80 percent
 - Shall employ auto-ON functionality when the area becomes occupied
 - No more than 1,500 watts of lighting power shall be controlled together.
- □ For Outdoor Sales Frontage, Outdoor Sales Lots, and Outdoor Sales Canopies lighting, an automatic lighting control shall be installed that meets the following requirements:
 - A part-night outdoor lighting control as defined in Section 100.1
 - Motion sensors capable of automatically reducing lighting power by at least 40 percent but not exceeding 80 percent, and which have auto-ON functionality
- □ For Building Facade, Ornamental Hardscape and Outdoor Dining lighting, an automatic lighting control shall be installed that meets one or more of the following requirements:
 - A part-night outdoor lighting control
 - Motion sensors capable of automatically reducing lighting power by at least 40 percent but not exceeding 80 percent, and which have auto-ON functionality
 - A centralized time-based zone lighting control capable of automatically reducing lighting power by at least 50 percent
 - Outdoor wall mounted luminaires having a bilaterally symmetric distribution as described in the IES Handbook (typically referred to as "wall packs") where the bottom of the luminaire is mounted 24 feet or less above the ground
- □ The Energy Commission defines the boundaries of Lighting Zones based on U.S. Census Bureau boundaries for urban and rural areas as well as the legal boundaries of wilderness and park areas. By default, government designated parks, recreation areas and wildlife preserves are Lighting Zone 1;

Page 9 of 14

rural areas are Lighting Zone 2; and urban areas are Lighting Zone 3. Lighting Zone 4 is a special use district that may be created by a local government.

Table 130.2-A – Oplight Ratings (Maximum Zonai Lumens)						
	MAXIMUM ZONAL LUMENS PER OUTDOOR LIGHTING ZONE					
SECONDART SOLID ANGLE	OLZ 1	OLZ 2	OLZ 3	OLZ 4		
Uplight High (UH) - 100 to 180 degrees	10	50	500	1,000		
Uplight Low (UL) - 90 to < 100 degrees	10	50	500	1,000		

Table 130.2-A – Uplight Ratings (Maximum Zonal Li

Table 130.2-B – Glare Ratings (Maximum Zonal Lumens)

GLARE RATING FOR ASYMMETICAL LUMINAIRE TYPES (TYPE I, TYPE II, TYPE III, TYPE IV)						
SECONDARY SOLID ANGLE MAXIMUM ZONAL LUMENS PER OUTDOOR LIGHTING ZONE OLZ 1 OLZ 2 OLZ 3 OLZ 4						
						Forward Very High (FVH) - 80 to 90 degrees
Backlight Very Hight (BVH) - 80 to 90 degrees	100	225	500	750		
Forward High (FH) - 60 to < 80 degrees	1,800	5,000	7,500	12,000		
Backlight High (BH) - 60 to < 80 degrees	500	1,000	2,500	5,000		
GLARE RATING FOR ASYMMETICAL LUMINAIRE TYPES (TYPE V, TYPE V SQUARE)						
MAXIMUM ZONAL LUMENS PER OUTDOOR LIGHTING ZONE						
OLZ 1 OLZ 2 OLZ 3 OLZ 4						
Forward Very High (FVH) - 80 to 90 degrees	100	225	500	750		
Backlight Very Hight (BVH) - 80 to 90 degrees	100	225	500	750		
Forward High (FH) - 60 to < 80 degrees	1,800	5,000	7,500	12,000		
Backlight High (BH) - 60 to < 80 degrees	1,800	5,000	7,500	12,000		

SECTION 130.3: SIGN LOCATION CONTROLS

CONTROLS FOR SIGN LIGHTING

□ All sign lighting shall meet the requirements below, as applicable:

INDOOR SIGNS

□ All indoor sign lighting shall be controlled with an automatic time-switch control or astronomical time-switch control

OUTDOOR SIGNS

- Outdoor sign lighting shall meet the following requirements, as applicable:
 - All outdoor sign lighting shall be controlled with a photo control in addition to an automatic time-switch control, or an astronomical time-switch control
 - All outdoor sign lighting that is ON both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign lighting power by a minimum of 65 percent during nighttime hours. Signs that are illuminated at night and for more than 1 hour during daylight hours shall be considered ON both day and night

DEMAND RESPONSIVE ELECTRONIC MESSAGE CENTER CONTROL (MEC)

An Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal.

SECTION 130.4: LIGHTING CONTROL ACCEPTANCE AND INSTALLATION CERTIFICATE REQUIREMENTS LIGHTING CONTROL ACCEPTANCE REQUIREMENTS

- Before an occupancy permit is granted for a newly constructed building or area, or a new lighting system serving a building, area, or site is operated for normal use, indoor and outdoor lighting controls serving the building, area, or site shall be certified as meeting the Acceptance Requirements for Code Compliance in accordance with Section 130.4.
- □ A Certificate of Acceptance shall be submitted that:
 - Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6
 - Completes the applicable procedures in the Reference Nonresidential Appendix, and submits all applicable compliance forms
 - o Certifies automatic daylight controls
 - o Certifies lighting shut-OFF controls
 - Certifies demand responsive controls
 - Certifies outdoor lighting controls

LIGHTING CONTROL INSTALLATION CERTIFICATE REQUIREMENTS

- □ To be recognized for compliance with Part 6 an Installation Certificate shall be submitted in accordance with Section 10-103(a) for any lighting control system, Energy Management Control System, track lighting integral current limiter, track lighting supplementary overcurrent protection panel, interlocked lighting system, lighting Power Adjustment Factor, or additional wattage available for a videoconference studio, in accordance with the following requirements, as applicable:
 - o Certification of the lighting control system
 - o Certification of the Energy Management Control System
 - o Certification of the line-voltage track lighting integral current limiters
 - Certification of the line-voltage track lighting supplementary overcurrent protection panels
 - o Certification of the interlocked lighting systems
 - Certification of the lighting controls installed to earn a lighting Power Adjustment Factor (PAF)
 - o Certification of the additional lighting wattage installed for videoconference studio

WHEN CERTIFICATION IS REQUIRED BY TITLE 24, SECTION 10-103-A

- □ The acceptance testing specified by Section 130.4 shall be performed by a Certified Lighting Controls Acceptance Test Technician (CLCATT). If the CLCATT is operating as an employee, the CLCATT shall be employed by a Certified Lighting Controls Acceptance Test Employer. The CLCATT shall disclose on the Certificate of Acceptance a valid CLCATT certification identification number issued by an approved Acceptance Test Technician Certification Provider.
- □ The CLCATT shall complete all Certificate of Acceptance documentation in accordance with the applicable requirements in Section 10-103(a)4.

SECTION 130.5: ELECTRICAL POWER DISTRIBUTION SYSTEMS

SERVICE METERING

□ Each electrical service shall have permanently installed user-accessible metering of total electrical energy use per Table 130.5-A.

DISAGGREGATION OF ELECTRICAL CIRCUITS

- □ Electrical power distribution systems shall be designed to permit the disaggregated measurement of electrical load energy uses downstream from the service meter according to Table 130.5-B. Additive and subtractive methods may be used to determine aggregate and disaggregated energy use. This may be accomplished by any of the following methods:
 - Separate switchboards, motor control centers, or panelboards to which are connected only the required load or group of loads
 - Subpanels of the above to which are connected only the required load or group of loads and for which the subpanel load can be independently measured in aggregate
 - Branch circuits, taps or disconnects requiring overcurrent protection devices rated 60 amperes or greater

EXCEPTIONS

SECTION 130.5(A)

□ Buildings for which the utility company provides a meter for occupant or user use that indicates instantaneous kW demand and kWh for a user-resettable period.

EXCEPTION 1

□ Buildings for which a complete metering and measurement system is provided that at a minimum measures and reports the loads called for in Table 130.5-B.

EXCEPTION 2

- □ Alterations where all of the following conditions exist are not required to comply with this section:
 - The following existing equipment remains in place:
 - Service distribution switchboards or panelboards
 - Feeders
 - Motor control centers or panelboards.
 - Existing equipment included above remains unaltered except for:
 - Changes to load circuit connections
 - Changes to the quantity of outgoing overcurrent protection devices
 - Changes to the ampacity of outgoing overcurrent protection devices

VOLTAGE DROP

FEEDERS

Feeder conductors shall be sized for a maximum voltage drop of 2 percent at design load.

BRANCH CIRCUITS

- Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.
- EXCEPTION: Feeder conductors and branch circuits that are dedicated to emergency services.

CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES

- □ In all buildings, both controlled and uncontrolled, 120-volt receptacles shall be provided in each private office, open office area, reception lobby, conference room, kitchenette in office spaces, and copy room. Controlled receptacles shall meet the following requirements:
 - Electric circuits serving controlled receptacles shall be equipped with automatic shut-OFF controls
 - At least one controlled receptacle shall be installed within 6 feet from each uncontrolled receptacle or a split-wired duplex receptacle with one controlled and one uncontrolled receptacle shall be installed
 - Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles
 - For open office areas, controlled circuits shall be provided and marked to support installation and configuration of office furniture with receptacles
 - For hotel and motel guest rooms at least one-half of the 120-volt receptacles in each guest room shall be controlled receptacles
 - Electric circuits serving controlled receptacles shall have captive card key controls, occupancy sensing controls, or automatic controls such that, no longer than 30 minutes after the guest room has been vacated, power is switched off.
 - Plug-in strips and other plug-in devices that incorporate an occupant sensor shall not be used to comply with this requirement.
 - EXCEPTION 1:
 - In open office areas, controlled circuit receptacles are not required if, at time
 of final permit, workstations are installed, and each workstation is equipped
 with an occupant sensing control that is permanently mounted in each
 workstation, and which controls a hardwired, nonresidential-rated power strip.
 Plug-in strips and other plug-in devices that incorporate an occupant sensor
 shall not be used for this exception.
 - EXCEPTION 2:
 - Receptacles that are only for the following purposes:
 - Receptacles specifically for refrigerators and water dispensers in kitchenettes
 - Receptacles located a minimum of six feet above the floor that are specifically for clocks
 - Receptacles for network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms
 - Receptacles on circuits rated more than 20 amperes

DEMAND RESPONSIVE CONTROLS AND EQUIPMENT

Demand responsive controls and equipment shall be capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal.

ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS)

- □ An EMCS may be installed to comply with the requirements of one or more lighting controls if it meets the following minimum requirements:
 - Provides all applicable functionality for each specific lighting control or system for which it is installed in accordance with Section 110.9
 - Complies with all applicable Lighting Control Installation Requirements in accordance with Section 130.4 for each specific lighting control or system for which it is installed
 - Complies with all applicable application requirements for each specific lighting control or system for which it is installed, in accordance with Part 6
 - An EMCS may be installed to comply with the requirements of a thermostat if it complies with all applicable application requirements for each thermostat in accordance with Part 6

METER TYPE	SERVICES RATED 50kVA OR LESS	SERVICES RATED MORE THAN 50kVA AND LESS THAN OR EQUAL TO 250kVA	SERVICES RATED MORE THAN 250kVA AND LESS THAN OR EQUAL TO 1000kVA	SERVICES RATED MORE THAN 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not Required	Not Required	Required	Required
Resetable kWh	Required	Required	Required	Required
kWh per rate period	Not Required	Not Required	Not Required	Required

Table 130.5-A – Minimum Requirements for Metering of Electrical Load

Table 130.5-B – Minimum Requirements for Separation of Electrical Load

LOAD TYPE	SERVICES RATED 50kVA OR LESS	SERVICES RATED MORESERVICES RATED MORE THANHAN 50kVA AND LESS THAN250kVA AND LESS THAN OROR EQUAL TO 250kVAEQUAL TO 1000kVA		SERVICES RATED MORE THAN 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type, or area	All lighting disaggregated by floor, type, or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate

hergy Code – Lighting & Electi	Revision Date: 12/21/2016				
LOAD TYPE	SERVICES RATED 50kVA OR LESS	SERVICES RATED MORE THAN 50kVA AND LESS THAN OR EQUAL TO 250kVA	SERVICES RATED MORE THAN 250kVA AND LESS THAN OR EQUAL TO 1000kVA	SERVICES RATED MORE THAN 1000kVA	
Plug load including appliances rated less than 25kVA	Required	All plug load in aggregate. Groups of plug loadsAll plug load separated by flo type, or area. Groups of plug loads exceeding 25kVA connected load in an areas less than 5,000 SFAll plug load separated by flo type, or area. Groups of plug loads exceeding 25kVA connected load in an area le than 5,000 SF		All plug load separated by floor, type, or area. Groups of plug loads exceeding 25kVA connected load in an area less than 5,000 SF	
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate	
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each	
Industrial and commercial load centers 25kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each	
Renewable power source (net or total)	Each group	Each group	Each group	Each group	
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate	
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate	

Revision Date: 12/21/2016



ENERGY CODE – NON-RESIDENTIAL

INSPECTION CODE: N/A

SCOPE: NON-RESIDENTIAL, HIGH-RISE RESIDENTIAL, HOTEL/MOTEL OCCUPANCIES **CODES ENFORCED:** CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

The following are highlights of Mandatory Requirements for Non-Residential Buildings, High-Rise Residential, Hotel/Motel Occupancies and Covered Processes. For complete code sections and exceptions, see California Energy Code, Title 24, Part 6 Section 120.0.

REGISTRATION

Beginning on January1, 2015, contingent upon the approval of data registry(s) by the Commission, all non-residential buildings, high-rise residential buildings, and hotels and motels, the person responsible for the Certificates of Installation shall submit the Certificates for registration and retention to a data registry approved by the commission. The submittals to the data registry shall be made electronically in accordance with the specifications in Reference Joint Appendix JA7.

LIGHTING CONTROL INSTALLATION CERTIFICATE REQUIREMENTS

- To be recognized with Part 6, an Installation Certificate shall be submitted in accordance with Section 10-103(a) for the following:
 - Lighting control systems
 - o Energy Management Control Systems
 - o Track Lighting Integral Current Limiter
 - Track Lighting Supplementary Overcurrent Protection Panel
 - o Interlocked Lighting System
 - o Lighting Power Adjustment Factor
 - o Additional Wattage Available for a Videoconference Studio

WHEN CERTIFICATE IS REQUIRED

□ The acceptance testing shall be performed by a Certified Lighting Controls Acceptance Test Technician (CLCATT). The CLCATT shall disclose on the Certificate of Acceptance a valid CLCATT certification Identification number issued by an approved Acceptance Test Technician Certification Provider. The CLCATT shall complete all Certificate of Acceptance documentation in accordance with the applicable requirements in Section 10-103(a)4. 1.4.

SECTION 120.1: REQUIREMENTS FOR VENTILATION

Revision Date: 12/21/2016

□ All enclosed spaces in a building shall be ventilated in accordance with this section and the CBC.

- □ The outdoor air ventilation rate shall be clearly identified on the plans.
- Every space in a building shall be designed to have outdoor air ventilation by either Natural or Mechanical Means.

NATURAL VENTILATION

□ Spaces shall be permanently open to and within 20 feet of operable wall or roof openings to the outside, the openable area of which is not less than 5% of the conditioned floor area of the naturally ventilated space.

□ The means to open required operable openings shall be readily accessible.

MECHANICAL VENTILATION

- Every space that is not naturally ventilated shall be mechanically ventilated by no less than the larger of:
 - The conditioned floor area of the space times the applicable ventilation rate from Table 120.1-A
 - \circ 15 CFM per person, times the expected number of occupants

TRANSFER AIR

- □ The rate of outdoor air ventilation may be provided from air transferred from other ventilated spaces provided:
 - o None of the spaces from which air is transferred have unusual sources of contaminants
 - The outdoor air that is supplied to all spaces combined meets the Mechanical Ventilation rate individually

TYPE OF USE	CFM PER SQUARE FOOT OF CONDITIONED FLOOR AREA				
Auto repair workshops	1.50				
Barber shops	0.40				
Bars, cocktail lounges, and casinos	0.20				
Beauty shops	0.40				
Coin-operated dry cleaning	0.30				
Commercial dry cleaning	0.45				
High-rise residential	Ventilation rates specified by the CBC				
Hotel guestrooms (less than 500 SF)	30 CFM/guest room				
Hotel guestrooms (500 SF or greater)	0.15				
Retail stores	0.20				
All others	0.15				

Table 120.1-A – Minimum Ventilation Rates

REQUIRED DEMAND CONTROL VENTILATION

- □ HVAC systems with the following characteristics shall have Demand Ventilation Control:
 - They have an Economizer
 - They serve a space with an occupant load of 25 people per 1,000 sf
 - They are either:
 - Single zone systems with any controls; or
 - Multiple zone systems with Direct Digital Controls (DDC) to the zone level

DEMAND CONTROL VENTILATION DEVICES

□ CO2 Sensors shall be installed in each room, with no less than one sensor per 1,000 sf.

- □ Sensors shall be installed between 3 feet and 6 feet above the floor.
- □ Controls shall maintain CO2 concentrations at 600 ppm plus the outdoor air CO2 concentration in all rooms with sensors.
- □ Controls shall be certified by the manufacturer to be accurate.
- □ CO2 sensor reading for each zone shall be displayed continuously.

OCCUPANT SENSOR VENTILATION CONTROL DEVICES

- □ When required by Section 120.2(e)3–Shut-off and Reset Controls for Space-Conditioning Systems occupant sensors shall be used to reduce the rate of outside air flow when occupants are not present in accordance with the following:
 - Occupant sensors used for lighting may be used for ventilation as long as ventilation signal is independent of lighting control signals
 - One hour prior to normal scheduled occupancy, the sensor shall allow Pre-occupancy Purge
 - Within 30 minutes after being vacant for rooms served by zone damper or multiple zone system, no outside air ventilation is required

DUCTING FOR ZONAL HEATING AND COOLING UNITS

- □ Where a return plenum is used to distribute outdoor air to a zonal heating or cooling unit, the outdoor air shall be ducted to discharge either:
 - Within 5 feet of the unit
 - Within 15 feet of the unit, substantially toward the unit, and at a velocity of not less than 500 feet per minute

DESIGN CONTROL REQUIREMENTS FOR QUANTITIES OF OUTDOOR AIR

- □ Outdoor air rates shall operate at the lager of:
 - The minimum levels of natural or mechanical ventilation previously outlined
 - o The rate required for the make-up of required exhaust systems
- □ All variable air volume mechanical ventilation and space conditioning systems shall include dynamic controls that maintain ventilation rates within 10 percent of required rate at both full and reduced supply airflow conditions. Fixed minimum damper position is not considered to be dynamic, and is

not an allowed control strategy.

SECTION 120.2: REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS THERMOSTATIC CONTROLS FOR EACH ZONE

CRITERIA FOR THERMOSTATIC CONTROLS

- □ For comfort heating, capable of being set, locally or remotely, down to 55 deg. F or lower.
- □ For comfort cooling, capable of being set, locally or remotely, up to 85 deg. F or higher.
- □ Where used for heating and cooling, shall be capable of providing a temperature range or dead band of at least 5 degrees within which the supply of heating and cooling to the zone is shut off or reduced to a minimum.

HOTEL/MOTEL GUESTROOM AND HIGH-RISE RESIDENTIAL DWELLING UNIT THERMOSTATS

- □ Shall have numeric set points in deg. F and deg. C.
- □ Shall have set-point stops, which are accessible only to authorized personnel, such that occupants cannot adjust the set-point more than 5 deg. F or 3 deg. C.
- □ All conditioned space within a story shall comply with Part 6 whether or not the story is a habitable space.

SHUT-OFF AND RESET CONTROLS FOR SPACE-CONDITIONING SYSTEMS

- □ Each space-conditioning system shall be installed with controls that comply with the following:
 - Controls shall be capable of shutting off the system during periods of non-use, and shall have:
 - Automatic time switch control device
 - Occupancy sensor
 - A four-hour timer with manual operation
 - The control shall automatically restart and operate the system to maintain setback heating setpoint and setup cooling setpoint if heating/cooling provided
 - Hotel/Motel guest rooms shall have captive card key controls, occupancy sensing controls, or automatic controls such that no longer than 30 minutes after guest room has been vacated, setpoints are setup at least 5 deg. in cooling mode and set-down at least 5 deg. in heating mode

DAMPERS FOR AIR SUPPLY AND EXHAUST EQUIPMENT

Outdoor air supply and exhaust equipment shall be installed with dampers that automatically close upon fan shutdown.

ISOLATION AREA DEVICES

Each zone, or combination of zones, not exceeding 25,000 SF shall be a separate isolation area.

Each isolation area shall be provided with isolation devices- valves or dampers- that allow the supply

of heating and cooling to be reduced or shut-off independently from other isolation areas.

□ Each isolation area shall be controlled by a device with a timer switch, or occupancy sensor, or 4 hour timer with manual control.

AUTOMATIC DEMAND SHED CONTROLS

- □ HVAC systems with Direct Digital Controls shall be programmed to allow centralized demand shed for non-critical zones as follows:
 - Remotely setup and set-down cooling/heating set-points by 4 deg. F
 - o Capability to reset to original operating levels
 - o Conduct a centralized demand shed upon receiving a demand response signal

ECONOMIZER FAULT DETECTION AND DIAGNOSIS (FDD)

□ All newly installed air-cooled unitary direct-expansion units, equipped with an economizer and with mechanical cooling capacity at AHRI conditions of greater than or equal to 54,000 Btuh, shall include a Fault Detection and Diagnostics (FDD) system. Air-cooled unitary direct expansion units include packaged, split- systems, heat pumps, and variable refrigerant flow (VRF), where the VRF capacity is defined by that of the condensing unit.

SECTION 120.3: REQUIREMENTS FOR PIPE INSULATION

□ The piping for all space-conditioning and service water-heating systems shall have the amount of insulation specified in Table 120.3.

	CONDUCTIVITY RANGE	INSULATION MEAN	NOMINAL PIPE DIAMETER (IN)				
	(IN BTU-INCH PER	RATING	1 AND LESS	1 TO 1.5	1.5 TO 4	4 TO <8	8 AND LARGER
KANGE (F)	HOUR PER SF PER °F)	TEMPERATURE (°F)	INSULATION THICKNESS REQUIRED (IN)				D (IN)
SPACE HEATING, HOT WATER SYSTEMS (STEAM, STEAM CONDESATE AND HOT WATER) AND SERVICE WATER HEATING SYSTEMS							
Above 350	0.32 - 0.34	250	4.5	5	5	5	5
251-350	0.29-0.31	200	3	4	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	2.5	2.5	3	3
141-200	0.25-0.29	125	1.5	1.5	2	2	2
105-140	0.22-0.28	100	1	1.5	1.5	1.5	1.5
SPACE COOLING SYSTEMS (CHILLED WATER, REFRIGERANT AND BRINE)							
40-60	0.21-0.27	75	0.5	0.5	1	1	1
Below 40	0.20-0.26	50	1	1.5	1.5	1.5	1.5

Table 120.3 – Pipe Insulation Thickness

□ Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind, including but not limited to, the following:

- Insulation exposed to weather shall be suitable for outdoor service by either being rated by the manufacturer for outdoor use or by being covered e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material
- Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include a vapor retardant located outside the insulation (unless the
71

insulation is inherently vapor retardant), all penetrations and joints of which shall be sealed

SECTION 120.4: REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUM

- All air distribution system ducts and plenums, including, but not limited to, building cavities, mechanical closets, air-handler boxes and support platforms used as ducts or plenums, shall be installed, sealed and insulated to meet the requirements of the 2010 CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0, and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition, incorporated herein by reference.
 - Connections of metal ducts and the inner core of flexible ducts shall be mechanically fastened.
 - Openings shall be sealed with mastic, tape, aerosol sealant, or other duct-closure system.
- Portions of supply-air and return-air ducts conveying heated or cooled air located in one or more of the following spaces shall be insulated to a minimum installed level of R-8:
 - Outdoors
 - In a space between the roof and an insulated ceiling
 - In a space directly under a roof with fixed vents or openings to the outside or unconditioned spaces
 - In an unconditioned crawlspace
 - In other unconditioned spaces
- Portions of supply-air ducts that are not in one of these spaces, including ducts buried in concrete slab, shall be insulated to a minimum installed level of R-4.2 (or any higher level required by CMC Section 605.0) or be enclosed in directly conditioned space.
- □ Insulated flexible duct products installed to meet this requirement must include labels, in maximum intervals of 3 feet, showing the thermal performance R-value for the duct insulation.
- Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following:
 - o Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material

SECTION 120.5: REQUIRED NON-RESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE

- Before an occupancy permit is granted the following equipment and systems shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Reference Nonresidential Appendix NA7.
- □ A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements:
 - Outdoor air ventilation
 - Constant volume, single zone unitary air conditioning and heat pump unit controls
 - Duct systems

- o Demand control ventilation systems
- o Supply fan variable flow controls
- Hydronic system variable flow controls
- o Boiler or chillers that require isolation controls
- Hydronic systems with supply water temperature reset controls
- Automatic demand shed controls
- o Fault Detection and Diagnostics (FDD) for Packaged Direct-Expansion Units
- o Automatic fault detection and diagnostics (FDD) for air handling units and zone terminal units
- o Distributed Energy Storage DX AC Systems
- Thermal Energy Storage (TES) Systems
- Supply air temperature reset controls
- o Water-cooled chillers served by cooling towers with condenser water reset controls
- When an Energy Management Control System is installed, it shall functionally meet all of the applicable requirements of Part 6
- When certification is required by Title 24, Part 1, Section 10-103-B, the acceptance testing specified by Section 120.5(a) shall be performed by a Certified Mechanical Acceptance Test Technician (CMATT). If the CMATT is operating as an employee, the CMATT shall be employed by a Certified.
- Mechanical Acceptance Test Employer. The CMATT shall disclose on the Certificate of Acceptance a valid CMATT certification identification number issued by an approved Acceptance Test Technician Certification Provider. The CMATT shall complete all Certificate of Acceptance documentation in accordance with the applicable requirements in Section 10-103(a)4.

SECTION 120.6: MANDATORY REQUIREMENTS FOR COVERED PROCESSES MANDATORY REQUIREMENTS FOR COMMERCIAL REFRIGERATION

□ Retail food stores with 8,000 square feet or more of conditioned area, and that utilize either: refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units, shall meet the requirements of Subsections 1 through 4.

REFRIGERATED DISPLAY CASES

- □ Lighting in refrigerated display cases, and lights on glass doors installed on walk-in coolers and freezers, shall be controlled by one of the following:
 - Automatic time switch controls to turn off lights during non-business hours
 - Timed overrides for any line-up or walk-in case may only be used to turn the lights on for up to one hour
 - Manual overrides shall time-out automatically to turn the lights off after one hour
 - Motion sensor controls on each case that reduce display case lighting power by at least 50 percent within 30 minutes after the area near the case is vacated

REFRIGERATION HEAT RECOVERY

□ HVAC systems shall utilize heat recovery from refrigeration system(s) for space heating, using no less than 25 percent of the sum of the design Total Heat of Rejection of all refrigeration systems that have individual Total Heat of Rejection values of 150,000 Btuh or greater at design conditions.

MANDATORY REQUIREMENTS FOR ENCLOSED PARKING GARAGES

- □ Mechanical ventilation systems for enclosed parking garages where the total design exhaust rate for the garage is greater than or equal to 10,000 cfm shall conform to all of the following:
 - Automatically detect contaminant levels and stage fans or modulate fan airflow rates to 50 percent or less of design capacity provided acceptable contaminant levels are maintained
 - Have controls and/or devices that will result in fan motor demand of no more than 30 percent of design wattage at 50 percent of design airflow
 - CO shall be monitored with at least one sensor per 5,000 SF, with the sensor located in the highest expected concentration locations, with at least two sensors per proximity zone. A proximity zone is defined as an area that is isolated from other areas either by floor or other impenetrable obstruction
 - o CO concentration at all sensors is maintained at 25 ppm or less at all times
 - The ventilation rate shall be at least 0.15 cfm/ft2 when the garage is scheduled to be occupied
 - The system shall maintain the garage at negative or neutral pressure relative to other occupiable spaces when the garage is scheduled to be occupied
 - CO sensors shall be:
 - Certified by the manufacturer to be accurate within plus or minus 5 percent of measurement
 - Factory calibrated
 - Certified by the manufacturer to drift no more than 5 percent per year
 - Certified by the manufacturer to require calibration no more frequently than once a year
 - Monitored by a control system. The system shall have logic that automatically checks for sensor failure

PARKING GARAGE VENTILATION SYSTEM ACCEPTANCE

□ Before an occupancy permit is granted for a parking garage system, equipment and systems shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Reference Nonresidential Appendix NA7. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.12.

SECTION 120.8: BUILDING COMMISSIONING

For all new nonresidential buildings, the Subsections of 120.8 (a) through (i) for building commissioning shall be included in the design and construction processes of the building project to verify that the building energy systems and components meet the owner's or owner representative's project requirements. All building systems and components covered by Sections 110.0, 120.0, 130.0, and 140.0 shall be included in the scope of the commissioning requirements in this Section, excluding covered processes. For buildings less than 10,000 SF, only the design review requirements in Sections 120.8(d) and 120.8(e) shall be completed.

(a) – SUMMARY OF COMMISSIONING REQUIREMENTS

□ The following items shall be completed:

o Owner's or owner representative's project requirements

- Basis of design
- Design phase design review
- o Commissioning measures shown in the construction documents
- o Commissioning plan
- o Functional performance testing
- Documentation and training
- o Commissioning report

(b) – OWNER'S OR OWNER REPRESENTATIVE'S PROJECT REQUIREMENTS (OPR)

- □ The energy-related expectations and requirements of the building shall be documented before the design phase of the project begins. This documentation shall include the following:
 - Energy efficiency goals
 - Ventilation requirements
 - Project program, including facility functions and hours of operation, and need for afterhours operation
 - o Equipment and systems expectations
- □ EXCEPTION: Buildings less than 10,000 SF

(c) – 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, and updated as necessary during the design and construction phases. The Basis of Design document shall cover the following systems:
 - o Heating, ventilation, air conditioning (HVAC) systems and controls
 - o Indoor lighting system and control
 - Water heating systems and controls
 - Covered processes
- □ EXCEPTION: Buildings less than 10,000 SF

(d) – DESIGN PHASE DESIGN REVIEW

- Design Reviewer Requirements
 - For buildings less than 10,000 SF, design phase design review may be completed by the design engineer. Buildings between 10,000 SF and 50,000 SF require completion of the Design Review Checklist by either an engineer in-house to the design firm but not associated with the building project, or a third party design engineer. For buildings larger than 50,000 SF or for buildings with complex mechanical systems, an independent review of these documents by a third party design engineer is required.
- □ Design Review
 - During the schematic design phase of the building project, the owner or owner's representative, design team, and the design reviewer must meet to discuss the project scope, schedule, and how the design reviewer will coordinate with the project team. The building owner or owner's representative shall include the Design Review Checklist compliance form in

the Certificate of Compliance documentation (see Section 10-103).

- □ Construction Documents Design Review
 - The Construction Documents Design Review compliance form lists the items that shall be checked by the design reviewer during the construction document review. The completed form shall be returned to the owner and design team for review and sign-off. The building owner or owner's representative shall include this Construction Documents Design Review compliance form in the Certificate of Compliance documentation (see Section 10-103).

(e) – COMMISSIONING MEASURES SHOWN IN THE CONSTRUCTION DOCUMENTS

- Include commissioning measures or requirements in the construction documents (plans and specifications). Commissioning measures or requirements should be clear, detailed and complete to clarify the commissioning process.
- □ These requirements should include the list of systems and assemblies commissioned, testing scope, roles and responsibilities of contractors, requirements for meetings, management of issues, the commissioning schedule, operations and maintenance manual development and of training, and checklist and test form development, execution and documentation. Include, for information only, roles of non-contractor parties.

(f) – COMMISSIONING PLAN

- Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. The Commissioning Plan shall include the following:
 - General project information
 - Commissioning goals
 - Systems to be commissioned
 - Plans to test systems and components, which shall include:
 - An explanation of the original design intent
 - Equipment and systems to be tested, including the extent of test
 - Functions to be tested
 - Conditions under which the test shall be performed
 - Measurable criteria for acceptable performance
 - Commissioning team information
 - Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning requirements listed in Sections 120.8(g) through 120.8(i) shall be included
- □ EXCEPTION: Buildings less than 10,000 SF

(h) – DOCUMENTATION AND TRAINING

□ A Systems Manual and Systems Operations Training shall be completed.

76

- Documentation of the operational aspects of the building shall be completed within the Systems Manual and delivered to the building owner or representative and facilities operator. The Systems Manual shall include the following:
 - o Site information, including facility description, history and current requirements
 - Site contact information
 - Instructions for basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, and a site events log
 - Description of major systems
 - o Site equipment inventory and maintenance notes
 - o A copy of all special inspection verifications required by the enforcing agency or the Standards
- □ Systems operations training. The training of the appropriate maintenance staff for each equipment type or system shall be documented in the commissioning report. Training materials shall include the following:
 - System and equipment overview (i.e., what the equipment is, what it does and with what other systems or equipment it interfaces)
 - Review and demonstration of operation, servicing and preventive maintenance procedures
 - o Review of the information in the Systems Manual
 - o Review of the record drawings on the systems and equipment
- □ EXCEPTION: Buildings less than 10,000 SF

(i) – COMMISSIONING REPORT

- □ A complete report of commissioning process activities undertaken through the design, construction and reporting recommendations for post-construction phases of the building project shall be completed and provided to the owner or representative.
- EXCEPTION: Buildings less than 10,000 SF.

Revision Date: 12/21/2016



ENERGY CODE – LOW RISE RESIDENTIAL

INSPECTION CODE: N/A

SCOPE: LOW-RISE RESIDENTIAL

CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

The following are Highlights of Mandatory Requirements for New Construction, Low-Rise Residential Buildings. For complete code sections and exceptions, see California Energy Code, Title 24, Part 6 Section 150.0.

INSULATION

- □ Minimum insulation:
 - Ceiling and rafter roof insulation: R-30
 - o 2x4 walls: R-13
 - o 2x6 walls: R-19
 - Raised floor: R-19
 - o Supply/Return ducts and plenums in unconditioned space: R-6

INSTALLED AIR CONDITIONER AND HEAT PUMP UNITS

□ Shall have a clearance of at least 5 feet from the outlet of any dryer vent.

WATER SYSTEM PIPING AND INSULATION FOR PIPING

- □ Insulation is required at:
 - The first 5 feet of hot and cold water pipes from the storage tank
 - All piping with a nominal diameter of 0.75" and larger
 - All piping associated with hot water recirculation system regardless of the pipe diameter
 - Piping from the heating source to the storage tank or between tanks
 - Piping buried below grade
 - o All hot water pipes from the heating source to the kitchen fixtures
 - All domestic hot water pipes buried below grade must be installed in a water-tight, non-crushable casing or sleeve that allows for installation, removal and replacement of the enclosed pipe and insulation
- EXCEPTION: Piping installed in attics with a minimum of 4" of attic insulation on top of the piping.

Insulation outside conditioned space shall be protected from damage, including damage due to sunlight, moisture, equipment maintenance and wind.

Page 2 of 5

□ Insulation exposed to weather shall either be rated for outdoor use or installed with a cover suitable for outdoor service (i.e. protected by aluminum, sheet metal, painted canvas, or plastic cover).

RESIDENTIAL LIGHTING

- □ High efficacy luminaires shall be switched separately from low efficacy luminaires.
- □ Lighting in Kitchens:
 - A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy.

LIGHTING IN BATHROOMS

- □ A Minimum of one high efficacy luminaire shall be installed in each bathroom.
- □ All other lighting installed in each bathroom shall be high efficacy or controlled by vacancy sensors.

LIGHTING IN GARAGES, LAUNDRY ROOMS, AND UTILITY ROOMS

□ Lighting installed in attached and detached garages, laundry rooms, and utility rooms shall be high efficacy luminaires and controlled by vacancy sensors.

LIGHTING IN OTHER THAN GARAGES, LAUNDRY ROOMS, AND UTILITY ROOMS

□ Shall be high efficacy, or shall be controlled by either dimmers or vacancy sensors.

RECESSED LUMINAIRES IN CEILINGS

- □ Recessed luminaires in ceilings must meet the following:
 - Be listed for zero clearance insulation contact (IC) by Underwriters Laboratories
 - Be labeled for airtight
 - Gasketed to ceiling finish

OUTDOOR LIGHTING

- □ Outdoor lighting mounted to buildings must be high efficacy or all of the following:
 - o Manual on/off
 - Controlled by motion sensor
 - Photocontrol, astronomical time clock, EMS control
- See table 150.0-A for Classification of High and Low Efficacy Light Sources and Minimum Requirements for Other Light Sources to qualify as high efficacy.

Table 150.0-A - Classification of High and Low Efficacy Light Sources and Minimum Requirements

HIGH EFFICACY LIGHT SOURCES	LOW EFFICACY LIGHT SOURCES		
Luminaires manufactured, designed and rated for use	Luminaires manufactured, designed or rated for use		

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CPA Utilities: Customer Service Center – 285 Hamilton Av. (Second Floor), Palo Alto, CA 94301 – (650) 329-2161

Page 3 of 5 Revision Date: 12/21/2016 Energy Code – Low-Rise Residential **HIGH EFFICACY LIGHT SOURCES** LOW EFFICACY LIGHT SOURCES with any of the lighting technologies in this column with only lighting technologies in this column shall be shall be classified as low efficacy. classified as high efficacy: Pin-based linear or compact fluorescent lamps with Line-voltage lamp holders (sockets) capable of electronic ballasts. Compact fluorescent lamps ≥ 13 operating incandescent lamps of any type. watts shall have 4 pins for compliance with the electronic ballast requirements in Section 150.0(k)1D. Pulse-start metal halide lamps. Low-voltage lamp holders capable of operating incandescent lamps of any type. High pressure sodium lamps. High efficacy lamps installed in low-efficacy luminaires, including screw base compact fluorescent and screw base LED lamps. GU-24 sockets rated for LED lamps. Mercury vapor lamps. GU-24 sockets rated for compact fluorescent lamps. Track lighting or other flexible lighting system which allows the addition or relocation of luminaires without altering the wiring of the system. Luminaires using LED light sources which have been Luminaires using LED light sources which have not certified to the Commission as high efficacy in been certified to the Commission as high efficacy. accordance with Reference Joint Appendix JA8. Luminaire housings rated by the manufacturer for Lighting systems that have modular components that use with only LED light engines. allow conversion between high-efficacy and lowefficacy lighting without changing the luminaires' housing or wiring.

Table 150.0-B – Minimum Requirements for Other Light Sources to Qualify as High Efficacy Use Table 150.0-B to determine luminaire efficacy only for lighting systems not listed in Table 150.0-A.

LUMINAIRE POWER RATING	MINIMUM LUMINAIRE EFFICACY TO QUALITY AS HIGH EFFICACY (LUMENS PER WATT)	
5 watts or less	30	
Over 5 watts to 15 watts	45	
Over 15 watts to 40 watts	60	
Over 40 watts	90	

NOTE: Determine the minimum luminaire efficacy using the system initial rated lumens divided by the luminaire total rated system input power.

SLAB EDGE REQUIREMENT

□ Required with heated slabs.

□ Must be protected from physical damage and sunlight.

AIR DISTRIBUTION AND VENTILATION SYSTEM DUCTS, PLENUMS, AND FANS

□ Shall be installed per CMC requirements as well as ANSI/SMACNA, including UL 181 for factory-fabricated duct systems and sealing requirements.

DUCT LABELING

Insulated flexible duct products shall be labeled to show insulation R- values in maximum intervals of 3 feet.

BACKDRAFT DAMPERS

All fans systems that exchange air between the building's conditioned space and the outside of the building shall be provided with backdraft or automatic dampers to prevent unintended air leakage to exterior when the fan is not running.

DUCT SEALING AND LEAKAGE TESTING

- When space conditioning systems utilize forced air duct systems to supply conditioned air to an occupiable space, the ducts shall be sealed, as confirmed through field testing and diagnostic testing, which likely will be required to be done by a HERS Rater. See CF-1R on approved plans to confirm HERS test requirement (see Tables 150.0-C and 150.0-D below).
- □ For systems with forced air ducts to supply cooling to an occupiable space shall:
 - Have a hole for placement of a static pressure probe (HSPP)
 - Have a permanently installed static pressure probe (PSPP)
 - o Demonstrate minimum system airflow and return duct dimension/length/degree turns

Table 150.0-C – Return Duct Sizing for Single Return Duct Systems

Return duct length shall not exceed 30 feet and shall contain no more than 180 degrees of bend. If the total bending exceeds 90 degrees, one bend shall be a metal elbow.

Return grille devices shall be labeled in accordance with the requirements in Section 150.0(m)12A to disclose the grille's design airflow rate and a maximum allowable clean-filter pressure drop of 12.5 Pa (0.05 inches water) for the air filter media as rated in accordance with AHRI Standard 680 for the design airflow rate for the return grille.

SYSTEM NOMINAL COOLING CAPACITY (TON)*	MINIMUM RETURN DUCT DIAMETER (INCH)	MINIMUM TOTAL RETURN FILTER GRILLE GROSS AREA (SQUARE INCH)		
1.5	16	500		
2.0	18	600		
2.5	20	800		

* Not applicable to systems with nominal cooling capacity greater than 2.5 tons or less than 1.5 tons.

Table 150.0-D – Return Air Duct Sizing for Multiple Return Duct Systems

Each return duct length shall not exceed 30 feet and shall contain no more than 180 degrees of bend. If the total bending exceeds 90 degrees, one bend shall be a metal elbow.

Return grille devices shall be labeled in accordance with the requirements in Section 150.0(m)12A to disclose the grille's design airflow rate and a maximum allowable clean-filter pressure drop of 12.5 Pa (0.05 inches

Energy Code – Low-Rise Residential

Page 5 of 5

water) for the air filter media as rated in accordance with AHRI Standard 680 for the design airflow rate for the return grille.

SYSTEM NOMINAL	M NOMINAL RETURN DUCT 1		MINIMUM TOTAL RETURN		
COOLING CAPACITY	MINIMUM DIAMETER	MINIMUM DIAMETER	FILTER GRILLE GROSS AREA		
(TON)*	(INCH)	(INCH)	(SQUARE INCH)		
1.5	12	10	500		
2.0	14	12	600		
2.5	14	14	800		
3.0	14	14	900		
3.5	16	16	1000		
4.0	18	18	1200		
5.0	20	20	1500		

* Not applicable to systems with nominal cooling capacity greater than 2.5 tons or less than 1.5 tons.

WATER HEATERING SYSTEM

- □ Systems using gas or propane heaters to serve individual dwelling units shall include the following components:
 - \circ A 120V electrical receptacle that is within 3 feet from the water heater
 - A Category III or IV vent, or a Type B vent with straight pipe between outside termination and the space where the water heater is installed
 - A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows draining without pump assistance
 - A gas supply line with a capacity of at least 200,000 Btu/hr

VENTILLATION FOR INDOOR AIR QUALITY

- □ All dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Indoor Air Quality in Low-Rise Residential Buildings.
- □ Window operation is not a permissible method of providing Whole-Building Ventilation.
- □ Continuous operation of central forced air system air handlers used in central fan integrated ventilation systems is not a permissible method of providing Whole-Building Ventilation.
- Additionally: Field Verification and Diagnostic Testing is required for Whole Building Ventilation airflow.

Revision Date: 12/18/2016



MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO) COMPLIANCE SUBMITTALS AND GUIDELINES

INSPECTION CODE: 249 SCOPE: RESIDENTIAL AND COMMERCIAL CODES ENFORCED: MODEL WATER EFFICIENT LANDSCAPE ORDINANCE 2015

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

COMPLIANCE INSTRUCTIONS

LANDSCAPE ORDINANCE TRIGGERS

- □ The applicability includes residential, commercial, industrial, and institutional projects that require a permit, plan check or design review, including the following square footage thresholds:
 - New development projects that include landscape areas of 500 square feet or more
 - o Rehabilitated projects that include landscape areas of 250 square feet or more
- □ The Model Water Efficient Landscape Ordinance can be found in the <u>California Department of Water</u> <u>Resources</u>.

LANDSCAPE DOCUMENTATION PACKAGE

- □ Complete all instruction requirements found in this document.
- □ Submit all requirements found in the Landscape Documentation Package Checklist with a permit application. There are two pathways for compliance:
 - Water Budget Compliance Pathway
 - Prescriptive Compliance Pathway Appendix D (Note: This is a streamlined compliance pathway available only to projects with a landscaped area less than 2,500 square feet)
- □ Pay the fee associated with Water Efficient Landscape Review and Inspection.
- □ Receive approval to begin work.

INSPECTION

Note: The inspection requirements are the same for the Water Budget Compliance Pathway and the Prescriptive Compliance Pathway Appendix D.

□ Call (650) 329-2496 to schedule a Landscape Inspection.

- □ Follow the Water Efficient Landscape Inspection Checklist.
- □ Projects must submit a copy of the "Certificate of Installation" and submit all required submittals on the certificate to the Project Owner.

LANDSCAPE DOCUMENTATION PACKAGE SUBMITTAL CHECKLIST: WATER BUDGET COMPLIANCE PATHWAY

When a landscape project triggers the Model Water Efficient Landscape Ordinance (Title 23, Chapter 2.7), the following items must be included as part of the Landscape Documentation Package (Section 492.3) in order to be considered complete and ready for Water Efficient Landscape Review.

CODE SECTION	DESCRIPTION
Section 492.3: Project Information Worksheet/Certificate of Completion of the Landscape Package	Applicants shall complete the Project Information Worksheet and shall paste this or either the GB-2 sheet or on the Landscape Plans.
Section 492.4: Water Efficiency Landscape Worksheet	Applicants shall complete the Water Efficient Landscape Worksheet using the link below and shall paste this on either the GB-2 sheet or on the Landscape Plans. Submit the Landscape Documentation Package with the building permit application. Note: An example of the worksheet is included in this document. The applicant must use the water budget calculator found at the Department of Water Resources <u>webpage</u> .
Section 492.5: Soil Management Report	Applicants shall prepare a soil management report and shall submit as part of the Plan Review requirements.
Section 492.6: Landscape Design Plan	 A Landscape Design Plan shall be submitted and must meet all requirements outlined in Section 492.6. The Landscape Design Plan must: 1. Contain the following statement: "I have complied with the criteria of the Model Water Efficient Landscape Ordinance and have applied them for the efficient use of water in the Landscape Design Plan." 2. Include the signature of a licensed landscape architect or licensed landscape contractor.
Section 492.7: Irrigation Design Plan	 An Irrigation Design Plan shall be submitted and must meet all requirements outlines in Section 492.7. The Irrigation Design Plan must: 1. Contain the following statement: "I have complied with the criteria

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MWELO Submittals and Guidelines	Page 3 of 7	Revision Date: 12/18/2016
CODE SECTION	DESCRIPTION	
	of the Model Water Efficient Land applied them for the efficient use Plan." 2. Include the signature of a licensed landscape contractor.	dscape Ordinance and have of water in the Irrigation Design d landscape architect or licensed
Section 492.8: Grading Design Plan	 A Grading Design Plan shall be submit requirements outlined in Section 492 1. Contain the following statement: of the Model Water Efficient Land applied them for the efficient use Plan." 2. Include the signature of a licensed Note: A comprehensive grading plan other local agency permits satisfies the 492.8. However, the statement above 	tted and must meet all the .8. The Grading Design Plan must: "I have complied with the criteria dscape Ordinance and have of water in the Grading Design d Civil Engineer. prepared by a Civil Engineer for ne requirement outlines in Section e must be shown.

LANDSCAPE DOCUMENTATION PACKAGE SUBMITTAL CHECKLIST: PRESCRIPTIVE COMPLIANCE PATHWAY APPENDIX D

Note: This is a streamlined compliance pathway available only to projects with a landscaped area less than 2,500 square feet.

When a landscape project triggers the Model Water Efficient Landscape Ordinance (Title 23, Chapter 2.7), the following items must be included as part of the Landscape Documentation Package (Section 492 – Appendix D) in order to be considered complete and ready for Water Efficient Landscape Review.

CODE SECTION	DESCRIPTION		
Section 492.3: Project Information	Applicants shall complete the Project Information Worksheet and shall		
Worksheet/Certificate of	paste this or either the GB-2 sheet or on the Landscape Plans.		
Completion of the Landscape			
Package			
Section 492.6: Landscape Design	A Landscape Design Plan shall be submitted and must meet all		
Plan	requirements outlined in Section 492.6. The Landscape Design Plan		
	must:		
	1. Contain the following statement: "I have complied with the criteria		
	of the Model Water Efficient Landscape Ordinance and have		
	applied them for the efficient use of water in the Landscape Design		
	Plan."		
	2. Include the signature of a licensed landscape architect or licensed		
	landscape contractor.		

CERTIFICATE OF COMPLETION OF THE LANDSCAPE DOCUMENTATION PACKAGE

This certificate is filled out by the project applicant upon completion of the Landscape Documentation Package.

PROJECT APPLICANT

Name & Title	
Company	
Address	
Telephone Number & Email	

PROJECT INFORMATION

Project Name	
Street Address	
Parcel, Tract, Lot (if available)	
Latitude/Longitude (optional)	

PROJECT LANDSCAPE INFORMATION

Total Landscape Area (ft ²)	
Water Supply Type:	Project Type (select all that apply):
Potable	□ New
Recycled	Rehabilitated
🗆 Well	Public
	Private
	Cemetery
	Home Owner-installed

PROPERTY OWNER OR DESIGNEE

Name & Title	
Company	
Address	
Telephone Number & Email	

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

Property Owner Signature

Date

FOR OFFICIAL USE ONLY

- 1. Date the Landscape Documentation Package was submitted to the local agency: _____
- Date the Landscape Documentation Package was approved by the local agency: ______
- 3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the local water purveyor: ______

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

This is an example worksheet to be filled out by the project applicant and it is a required element of the Landscape Documentation Package. The applicant must use the water budget calculator found at the Department of Water Resources <u>webpage</u>.

WATER EFFICIENT LANDSCAPE WORKSHEET

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

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

^cIrrigation Efficiency

0.81 for drip

0.75 for spray head

^a Hydrozone #/Planting Description	^b Irrigation Method
E.g	overhead spray
1.) front lawn	or drip
0.) Investment of a standing of	

iow water use plantings
 medium water use planting

3.) medium water use planung

^eMAWA (Annual Gallons Allowed) = (Eto) (0.62) [(ETAF x LA)

+ ((1-ETAF) x SLA)]

where 0.62 is a conversion factor that converts acreinches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for nonresidential areas.

ETAF Calculations

Regular Landscape Areas

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

All Landscape Areas

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

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

^dETWU (Annual Gallons Required) =

where 0.62 is a conversion factor that converts acre-

inches per acre per year to gallons per square foot per

Eto x 0.62 x ETAF x Area

year.

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WATER EFFICIENT LANDSCAPE INSPECTION CHECKLIST

SUBMITTALS

□ The inspector shall request to see a copy of the following submittals:

CERTITIFCATE OF INSTALLATION PER THE LANDSCAPE DOCUMENTATION PACKAGE

IRRIGATION CONTROLLER

- □ The inspector shall review the landscape submittals to verify that the controller contains either a weather or soil moisture based system.
- □ Note: The applicant must certify that the following have been submitted to the project owner. These are not required submittals for the inspection.

IRRIGATION SCHEDULING

□ Parameters for setting the irrigation schedule on controller per Ordinance Section 492.10.

SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

□ Schedule of Landscape and Irrigation Maintenance per Ordinance Section 491.11.

LANDSCAPE IRRIGATION AUDIT REPORT

□ Landscape Irrigation Audit Report per Ordinance Section 491.12. To be completed by a third party.

FIELD VERIFICATION

IRRIGATION METER

□ The inspector shall verify that a separate irrigation meter has been installed as shown on the landscape plans. Applicant should contact CPAU for any questions related to installation.

IRRIGATION CONTROLLER

- □ The inspector shall review the landscape submittals to verify that the controller contains either a weather or soil moisture based system.
- □ The inspector shall review digital irrigation schedule to verify that the irrigation has been scheduled for times between 8:00PM and 10:00AM only.
- □ The inspector shall field verify that a weather or soil moisture based controlled has been installed (as shown in the landscape submittal).

CERTIFICATION OF INSTALLATION PER THE LANDSCAPE DOCUMENTATION PACKAGE

I/we certify that based upon periodic site observations, the work has been completed in accordance with the ordinance and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package. I/we certify that the standards within the Palo Alto Tree Technical Manual have been satisfied.

Page 7 of 7

Further, I/we certify that the following has been submitted to the project owner:

IRRIGATION SCHEDULING

□ Parameters for setting the irrigation schedule on controller per Ordinance Section 492.10.

SCHEDULE OF LANSCAPE AND IRRIGATION MAINTENANCE

□ Schedule of Landscape and Irrigation Maintenance per Ordinance Section 491.11.

LANDSCAPE IRRIGATION AUDIT REPORT

□ Landscape Irrigation Audit Report per Ordinance 491.12. To be completed by a third party.

Signature *	Date
Name & Title	
License or Certification Number	
Company	
Address	
Telephone Number & Email	

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



WINDOW REPLACEMENT

INSPECTION CODE: 228, 218, 101 SCOPE: RESIDENTIAL AND COMMERCIAL CODES ENFORCED: CURRENT CA. CODES OF REGULATIONS, TITLE 24, AND RELATED CPA MUNICIPAL CODES

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

BUILDING PERMIT IS REQUIRED WHEN

- □ The size or shape of the window frame is altered.
 - Note: the window frame consists of the header, king stud, cripple stud, sill and associated supports
- The existing flashing is altered (as when removing the nailing fin of an existing window) or the exterior finish is altered (as when stucco is removed in order to remove an existing window), or the window replacement is part of a project at the house that requires a Building Permit.
- □ If a retrofit window is installed (i.e. existing frame is left in place).
- □ If a bedroom window is to be replaced; it may be replaced with a window of the same size and type (i.e. casement, double hung, etc.) that was required by the Building Code when the existing window was installed.
- □ If an existing window is to be changed in size, type and/or location, then the replacement window shall comply with the Emergency Escape Window dimensions (as referenced in the Residential Book guidelines).
- Exception: Glass only (like for like) does not require a permit.

PLAN NOTES AND PERMIT INFORMATION

- The person who prepared the plans must sign all plans. If any of the plan sheets are prepared by a licensed architect or registered engineer, that individual must stamp and "wet" sign at least two copies of each of the sheets he or she has prepared in accordance with the California Business and Professions Code prior to permit issuance.
- A Building Permit may be issued only to a State of California Licensed Contractor.
- □ If the Homeowner is planning to hire workers, State Law requires the Homeowner to obtain Worker's

Compensation Insurance.

- o Proof of this insurance is required prior to issuance of a Building Permit.
- Building Permits may be issued to a Homeowner for construction if that Homeowner indicates the intent to do his or her own work personally.
- If the inspection indicates the Homeowner is unable to perform the work satisfactorily, then a licensed contractor must perform the work.

GUIDELINES FOR PREPARATION AND SUBMITTAL OF PLANS

PLANS REQUIRED

□ Window replacement projects require submittal of plans.

PLAN SIZE

□ The minimum sheet size for bathroom remodel replacement plans is 11 inches x 17 inches.

SETS OF PLANS

□ At least 2 sets of plans are required for the initial submittal to the Building Division.

CLARITY

□ All plans shall be prepared to be sufficiently readable and clear for a microfilm record. Pencil drawings are not acceptable but copies of pencil drawings can be submitted provided copies are readable and have good contrast.

DIMENSIONS

□ Floor Plans and other plan drawings shall be fully dimensioned.

SCALED

- □ All drawings shall be drawn to an adequate scale with the scale indicated. Recommended scales for drawings are:
 - Exterior Elevations: 1/8"=1'-0" or ¼"=1'-0"
 - Construction Details: ³/₄"=1'-0"
 - Floor Plans: ¼"=1'0"

EXISTING AND NEW CONSTRUCTION

□ When an existing building is being altered or remodeled, be sure to label all new and existing construction, components, and fixtures to distinguish between new work to be done and the existing work.

COMPLETENESS

□ Please remember, the more complete and accurate the drawings and submittal documents, the sooner a building permit can be issued.

PROJECT INFORMATION

□ On the first sheet of the plans, provide the following information:

NAME OF DESIGNER

□ The printed name, address, telephone number and signature of the person who prepared the plans.

ADDRESS AND OWNER

□ The name of the legal owner of the property and the street address of the property.

BUILDING CODES

□ State the current building codes in effect as the 2013 CBC, 2013 CPC, 2013 CMC, 2013 CEC, and 2013 California Residential Energy Standards.

ARCHITECTURAL PLANS REQUIRED

□ The following are minimum plan requirements for most windows.

FLOOR PLAN

□ The Floor Plan must show partial adjoining rooms and rooms to be modified. Label the use of each room and provide dimensions and door and window sizes for existing and/or modified rooms.

ELEVATIONS

□ Show exterior elevations or views of all sides of the building that will have replaced windows, siding or other new construction. A minimum of one exterior elevation should be provided along with exterior materials and notations.

DETAILS AND NOTES

□ Include all construction details.

GENERAL REQUIREMENTS

□ Whether a permit is required or not, new glazing in existing openings must be safety glass if

- Opening is located within 24" from a door
- Less than 60" above walking surface in habitable rooms
- Less than 60" above drain inlet in a bathtub/ shower enclosure.
- Other glazing panels located less than 18" above walking surface and more than 9 square feet shall be safety glass as defined in CBC Section 2406.4.
- Requirements for energy, light, ventilation and egress must be accommodated within the scope of work.
- □ If the existing framing is not altered, the new window must comply with current requirements for new construction as much as possible (including the size necessary or any required egress) within the existing opening. It is possible, therefore, that the style of window needs to be changed; for example, a non-complying single hung style would need to be changed to a complying casement style.
- □ If framing is altered, all aspects of the window must comply with the current Building Code

requirements.

- □ Replacement windows shall have (CEC 152 (6)1B):
 - $\circ~$ A maximum U factor of 0.40 and a
 - o Solar heat gain coefficient (SHGC) of 0.40

ROOM REQUIREMENTS

- □ All habitable rooms must have exterior windows, glass doors and/or skylights which area totals a minimum of 10% of the floor area (10 square feet minimum) for light per CBC Section 1203.2.
- □ All habitable rooms must have exterior operable windows, glass doors and/or operable skylights which area totals a minimum of 5% of the floor area (5 square feet minimum) for ventilation of the room served per CBC Section 1203.3.
- □ Bathroom water closet compartments and laundry rooms must have operable windows and/or operable skylights with the area totals a minimum of 5% of the floor area (1½ square feet minimum) of the room served or mechanical ventilation with a minimum of 5 air changes per hour shall be provided per CBC Section 1203.3 When the valuation of windows replacement project exceeds \$1,000.00 and a permit is required, smoke alarms shall be installed throughout the house per CBC Section 310.9.1.2.

EMERGENCY EGRESS AND RESCUE REQUIREMENTS

- Each sleeping room below the fourth story must have at least one operable window or exterior door for emergency escape or rescue that opens directly into a public street, alley, yard or exit court (CBC 310.4).
- □ Escape or rescue windows shall have an operable area of at least 5.7 square feet, with a minimum net clear dimension of 24" in height and 20" in width.
 - Note: In order to meet required 5.7 square feet total operable window area, either the width or height, or both, must exceed the minimum dimension. See figure below.



□ Finish window sill heights shall not exceed 44" above the floor.

- □ Make sure each bedroom has an emergency egress and rescue window or door with an operable panel at least 20 inches wide,
- □ 24 inches high, at least 5.7 square feet (5.0 square feet at grade level) in area and a sill height of no more than 44".
- □ Escape or rescue windows with the finished sill height below the adjacent ground elevation shall have a window well. The window well shall have a minimum clear opening of 9 square feet with a minimum dimension of 36". If window well have a vertical depth more than 44", it shall be equipped with a permanent affixed ladder or stairway in compliance with CBC Section 310.4.
- □ Bars, grills, grates or similar devices installed on escape or rescue windows, doors or window wells, shall be equipped with approved released mechanisms per CBC Section 310.4.
- □ When a replacement window is installed in an existing frame, the new window must meet all of the window dimensions noted above that as much as possible within the scope of work.

SEQUENCE OF INSPECTION

- □ If applicable, schedule a Rough Framing inspection to verify new framing.
- After rough framing, schedule an Exterior Lath inspection to verify the paper and flashing.
- □ Lastly, schedule a Final Inspection. The inspector will verify smoke alarms, egress, tempered windows, the R and U values (so Contractor needs to make sure to keep stickers attached to windows until Final Inspection), and all work must be completed.

CPA WINDOW INSPECTION

SMOKE ALARMS

□ Verify that all bedrooms, hall ways adjacent to bedrooms and each story, including basement smoke alarms are installed. Smoke alarms shall be approved and listed. (CBC 907.2.10.1.2)

ROUGH FRAMING

PAPER AND FLASHING

BEDROOM WINDOW EGRESS

□ Minimum clear height: 24"

- □ Minimum clear width: 20"
- □ Minimum openable areas: 5.7 square feet
 - EXCEPTION: Grade Floor: 5.0 square feet
- □ Max clear space to floor height (or requires a ladder): 44" (CBC 1026.2, CBC 1026.3, EXCEPTION)

VERIFY WINDOWS AND SKYLIGHTS AND R AND U-FACTOR

Verify that windows are per plan requirements (labels shall be attached to windows and remain until Final inspection is approved).

SAFETY GLAZING

□ At all windows, less than 60" above bottom of tub and shower floor (check for bug). (CBC 1026)

SECURITY BARS

□ Bars shall be openable from interior. (CBC 1026)

OPENABLE WINDOWS 72" INCHES OR MORE ABOVE EXTERIOR GRADE

□ Must be at least 24" above the finished interior floor or no opening to window that would allow 4" sphere or install window guards complying with ASTM F 2006 OR F 2090. (CBC 1405.12.2)

Ordinance No. 5393 Ordinance of the Council of the City of Palo Alto Amending and Restating Chapter 16.14 of the Palo Alto Municipal Code, California Green Building Standards Code 2016 Edition, and Local Amendments and Related Findings

The Council of the City of Palo Alto does ORDAIN as follows:

SECTION 1. Chapter 16.14 of the Palo Alto Municipal Code is hereby amended by repealing in its entirety Chapter 16.14 and adopting a new Chapter 16.14 to read as follows:

16.14.010 2016 California Green Building Standards Code adopted.

The California Green Building Standards Code, 2016 Edition, Title 24, Part 11 of the California Code of Regulations, together with those omissions, amendments, exceptions and additions thereto, is adopted and hereby incorporated in this Chapter by reference and made a part hereof the same as if fully set forth herein.

Unless superseded and expressly repealed, references in City of Palo Alto forms, documents and regulations to the chapters and sections of the former California Code of Regulations, Title 24, shall be construed to apply to the corresponding provisions contained within the California Code of Regulations, Title 24, 2016. Ordinance No. 5324 of the City of Palo Alto and all other ordinances or parts of ordinances in conflict herewith are hereby suspended and expressly repealed.

Wherever the phrases "California Green Building Standards Code" or "Cal Green" are used in this code or any ordinance of the City, such phrases shall be deemed and construed to refer and apply to the California Green Building Standards Code, 2016 Edition, as adopted and amended by this chapter.

One copy of the California Green Building Standards Code, 2016 Edition, has been filed for use and examination of the public in the Office of the Building Official of the City of Palo Alto.

16.14.020 2016 California Green Building Standards Code Appendix Chapters adopted.

The following Appendix Chapters of the California Green Building Standards Code, 2016 Edition, are adopted and hereby incorporated in this Chapter by reference and made a part hereof the same as if fully set forth herein:

- A. Appendix A4 Residential Voluntary Measures (Tier 1 and Tier 2)
- B. Appendix A5 Nonresidential Voluntary Measures (Tier 1 and Tier 2)

16.14.030 Cross - References to California Green Building Standards Code.

The provisions of this Chapter contain cross-references to the provisions of the California Green Building Standards Code, 2016 Edition, in order to facilitate reference and comparison to those provisions.

16.14.040 Violations – Penalties.

Any person, firm or corporation violating any provision of this chapter is guilty of a misdemeanor and upon conviction thereof shall be punished as provided in subsection (a) of Section 1.08.010 of this code. Each separate day or any portion thereof during which any violation of this chapter occurs or continues shall be deemed to constitute a separate offense, and upon conviction thereof shall be punishable as provided in this section.

16.14.050 Enforcement -- Citation authority.

The employee positions designated in this section may enforce the provisions of this chapter by the issuance of citations; persons employed in such positions are authorized to exercise the authority provided in Penal Code section 836.5 and are authorized to issue citations for violations of this chapter. The designated employee positions are: (1) chief building official; (2) building inspection supervisor; (3) Director of Development Services, and (4) Code enforcement officer.

16.14.060 Local Amendments.

The provisions of this Chapter shall constitute local amendments to the cross-referenced provisions of the California Green Building Standards Code, 2016 Edition, and shall be deemed to replace the cross-referenced sections of said Code with the respective provisions set forth in this Chapter.

16.14.070 Section 202 amended – Definitions added.

Section 202 of the California Green Building Standards Code is amended to include the following definitions:

CPAU: The City of Palo Alto Utilities Department.

CALGREEN MANDATORY: Calgreen mandatory requirements are triggered for projects outlined in Section 301.1 Scope of the code, as amended. Projects that trigger only Calgreen mandatory measures are not required to fulfill Calgreen Tier 1 or Tier 2 as listed in Appendix A4 and A5.

CALGREEN "TIER 1": To achieve Tier 1 status, a project must comply with the requirements identified in Appendix A4, Division A4.601.4 for residential projects and

96

Appendix A5.601.2 for non-residential projects. The local adaptations to these appendices are identified in this ordinance. Projects subject to Tier 1 must fulfill on Calgreen mandatory measures and Calgreen Tier 1 prerequisite measures. Tier 1 projects must also select the minimum amount Calgreen elective measures required for Tier 1. 97

CALGREEN "TIER 2": To achieve Tier 2 status, a project must comply with the requirements identified in Appendix A4, Division A4.601.5 for residential projects and Appendix A5.601.3 for non-residential projects. The local adaptations to these appendices are identified in this ordinance. Projects subject to Tier 2 must fulfill on Calgreen mandatory measures and Calgreen Tier 2 prerequisite measures. Tier 2 projects must also select the minimum amount of Calgreen elective measures required for Tier 2.

CALGREEN "TIER 1" AND "TIER 2" PREREQUISITE MEASURES: Projects subject to Calgreen Tier 1 or Tier 2 must fulfill the minimum prerequisites as described within Appendix A4, Division A4.6 for Residential projects and Appendix A5.6 for Non-Residential Projects, and local amendments within this ordinance. Tier 1 and Tier 2 prerequisite and elective measures are generally preceded by an "A".

CALGREEN "TIER 1" AND "TIER 2" ELECTIVE MEASURES: Projects subject to Calgreen Tier 1 or Tier 2 must fulfill the minimum number of electives as described within Appendix A4, Division A4.6 for Residential projects and Appendix A5.6 for Non-Residential Projects, and local amendments within this ordinance. Tier 1 and Tier 2 prerequisite and elective measures are generally preceded by an "A".

DEDICATED IRRIGATION METER. A dedicated irrigation meter is a water meter that exclusively meters water used for outdoor watering and irrigation, and is completely independent from the meter used for indoor water use.

CALGREEN PLANS EXAMINER: A Calgreen Plans Examiner is an individual certified through the International Code Council (ICC) for demonstrating knowledge and application of Green Building concepts during plan review. For projects that require a Calgreen Plans Examiner verification, the Examiner must be contracted directly with the owner and may not be a contractor or employee of the design or construction firm.

CALGREEN INSPECTOR: A Calgreen Inspector is an individual certified through the International Code Council (ICC) for demonstrating knowledge and application of Green Building concepts during inspection. For projects that require a Calgreen Inspector verification, the Inspector must be contracted directly with the owner and may not be a contractor or employee of the design or construction firm. **GREEN POINT RATER:** A GreenPoint Rater is an individual rated by Build It Green—a professional non-profit membership organization whose mission is to promote healthy, energy- and resource-efficient buildings in California. For projects that require Green Point Rater verification, the Green Point Rater must be contracted directly with the owner and may not be a contractor or employee of the design or construction firm. The city shall maintain a list of pre-approved Special Inspectors in accordance with Chapter 7, section 702.2 Special Inspection.

INVASIVE PLANTS. Invasive plants are both indigenous and non-indigenous species with growth habits that are characteristically aggressive. Invasive plants that are of concern and may be prohibited by this code are defined as such in the "Water Use Classification of Landscape Species (WUCOLS), A Guide to the Water Needs of Landscape Plants," from the University of California Cooperative Extension.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE. The California Department of Water Resources Model Water Efficient Landscape Ordinance (or "Model Water Ordinance) ordinance regulating new construction and rehabilitated landscape project design, installation and maintenance. The Model Water Ordinance assigns a Maximum Applied Water Allowance (MAWA) based on landscaped area and climatological parameters. The City of Palo Alto has adopted more stringent compliance regulations in this code than the Model Water Ordinance; however, the Model Water Ordinance is referenced as the guiding document for water use calculations, irrigation system design, and water waste prevention.

PROCESS WATER. Process water means untreated wastewater, uncontaminated by toilet discharge or an unhealthy bodily waste, which is not a threat from unhealthful processing, manufacturing or operating wastes.

SALVAGE. Salvage means the controlled removal of construction or demolition debris/ material from a building, construction, or demolition site for the purpose of on- or offsite reuse, or storage for later reuse. Examples include air conditioning and heating systems, columns, balustrades, fountains, gazebos, molding, mantels, pavers, planters, quoins, stair treads, trim, wall caps, bath tubs, bricks, cabinetry, carpet, doors, ceiling fans, lighting fixtures, electrical panel boxes, fencing, fireplaces, flooring materials of wood, marble, stone or tile, furnaces, plate glass, wall mirrors, door knobs, door brackets, door hinges, marble, iron work, metal balconies, structural steel, plumbing fixtures, refrigerators, rock, roofing materials, siding materials, sinks, stairs, stone, stoves, toilets, windows, wood fencing, lumber and plywood. **SQUARE FOOTAGE.** For application of green building requirements, square footage means all new and replacement square footage, including basement areas (7 feet or greater in height) and garages, except that unconditioned garage space shall only count as 50%. Areas demolished shall not be deducted from the total new construction square footage. Square footage may also apply to landscapes, in which case it is the total surface area of the site not covered by impervious surfaces.

16.14.080 Section 301 amended – voluntary tiers added.

Section 301 of the California Green Building Standards Code is amended to read:

SECTION 301 GENERAL

301.1 Scope. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code and any applicable local amendments. In addition, the City requires the use of Voluntary Tiers, as provided in Sections A4.601 and A5.601, for certain residential and nonresidential new construction, additions, and alterations.

301.1.1 Residential additions and alterations. [HCD] The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

Tier 1 adopted. All residential building additions or alterations exceeding 1000 square feet must meet California Green Building Standards Code Mandatory plus Tier 1 requirements, as amended by this Chapter and as applicable to the scope of work.

Note: On and after January 1, 2014, residential buildings undergoing permitted alterations, additions or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

301.2 Low-rise and high-rise residential buildings. [HCD] The provisions of individual sections of CALGreen may apply to either low-rise residential buildings, high-rise residential buildings, or both. Individual sections will be designated by banners to indicate where the section applies specifically to low-rise only (LR) or high-rise only (HR). When the section applies to both low-rise and high-rise buildings, no banner will be used.

301.3 Nonresidential additions and alterations. [BSC] The provisions of individual sections of Chapter 5 apply to building nonresidential additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of \$200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and alterations [AA]. When the code section applies to both, no banner will be used.

Tier 1 adopted. Nonresidential alterations (including tenant improvements or renovations) of 5,000 square feet that include replacement or alteration of at least two of the following: HVAC system, building envelope, hot water system, or lighting system, must comply with Mandatory California Green Building Standards Code plus Tier 1 requirements, as amended by this Chapter and as applicable to the scope of work.

Tier 2 adopted. Nonresidential additions of 1000 square feet or greater must comply with California Green Building Standards Code Mandatory plus Tier 2 requirements, as amended by this Chapter and as applicable to the scope of work.

301.4 Residential new construction – Tier 2 adopted. All newly constructed Residential Buildings must meet California Green Building Standards Code Mandatory plus Tier 2 requirements, as amended by this Chapter and as applicable to the scope of work.

301.5 Non-residential new construction – Tier 2 adopted. All new nonresidential construction must meet California Green Building Standards Code Mandatory plus Tier 2 requirements, as amended by this Chapter and as applicable to the scope of work.

301.6 Special Inspector Requirements. Residential project owners subject to Calgreen Mandatory plus Tier 1 or Tier 2 requirements shall contract a special inspector in accordance with section 702.2 of this code, as amended.

16.14.090 Section 702.2 Special Inspection.

Section 702.2 of the California Green Building Standards Code is amended to read:

702.2 Special Inspection. When required by the enforcing agency, the owner or responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector. The city shall maintain a list of pre-approved Special Inspectors in accordance with this section. The owner shall contract a Special Inspector meeting one of the following;

1) Certification by a national or regional green building program:

ICC Certified Plans Examiner and ICC Certified Calgreen Inspector: Contract a Calgreen Plans Examiner and Calgreen Inspector to provide third-party verification of compliance prior to Permit Issuance and prior to Final Inspection. This Special Inspector may fulfill both requirements if the individual, or company, maintains both the Calgreen Plans Examiner and Calgreen Inspector designation.

2) Other programs acceptable to the enforcing agency.

When required by the enforcing agency, the owner or responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The city shall maintain a list of pre-approved Special Inspectors in accordance with this section.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

16.14.100 Section 303.1.2 Cumulative construction.

Section 303.1.2 is added to the California Green Building Standards Code to read:

303.1.2 Cumulative construction. Cumulative construction over any two-year period, or a project completed in phases, shall be considered as a single project, subject to the highest level of green building requirements for that project, unless exempted by the Director of Development Services as impractical for compliance. If a project is developed in phases, such as a core and shell development following by a tenant improvement, regardless of ownership each phase will be subject to the green building requirements which apply to the scope of work constructed as part of that phase.

16.14.110 Residential Projects. Chapter 4 Preface: Green building requirements for project type and scope.

A preface is added to Chapter 4 of the California Green Building Standards Code to read:

Preface - Green Building Requirements for Project Type and Scope For design and construction of residential projects, the City requires compliance with the mandatory measures of Chapter 4, in addition to use of Tier 1 and Tier 2 as specified in Palo Alto Municipal Code Chapter 16.14. See Section 202 for definitions on Calgreen mandatory, Tier 1 prerequisites and electives, and Tier 2 prerequisites and electives. All elective measures are adopted as written under Appendix A4 unless otherwise indicated in this Section.

16.14.120 Section A4.104 Site Preservation.

Section A4.104.1 is adopted as a Tier 1 and Tier 2 elective and is amended to read:

A4.104.1 Supervision and Education by a Special Inspector. Individuals with oversight authority on the project, as defined in 16.14.090 of this code, who have been trained in areas related to environmentally friendly development, can teach green concepts to other members of the builder's staff and ensure training and written instruction has been provided to all parties associated with the development of the project. Prior to the beginning the construction activities, all the builder shall receive a written guideline and instruction specifying the green goals of the project.

103

Note: Lack of adequate supervision and dissemination of the project goals can result in negative effects on green building projects. If the theme of green building is not carried through the project, the overall benefit can be substantially reduced by the lack of knowledge and information provided to the various entities involved with the construction of the project.

16.14.130 Section A4.105.1 and A4.105.2 Deconstruction and Reuse of Existing Materials.

Sections A4.105.1 and A4.105.2 are adopted as Tier 1 and Tier 2 elective measures and are amended to read:

A4.105.1 General. Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials or products must comply with the current building standards requirements or be an accepted alternate method or material. Salvaged materials may be reused onsite or for a different project. The Chief Building Official may require documentation confirming that salvageable materials have been reused.

A4.105.2 Reuse of materials. Non-hazardous materials which can be easily reused include but are not limited to the following:

- 1. Light fixtures
- 2. Plumbing fixtures
- 3. Doors and trim
- 4. Masonry
- 5. Electrical devices
- 6. Appliances
- 7. Foundations or portions of foundations

Note: Reused material must be in compliance with the appropriate Title 24 requirements.

16.14.135 Section A4.105.3 Deconstruction Survey.

Section A4.105.3 is added as mandatory to read:

A4.105.3 Deconstruction Survey. All single family residential dwelling units required to obtain a demolition permit shall complete a deconstruction survey provided by third party approved by the Chief Building Official. The survey shall include a list of materials that are reusable in the project, as well as the values of such materials.

16.14.140 Reserved.

16.14.150 Section A4.106.8 Electric Vehicle (EV) Charging for New Construction.

Section A4.106.8 is not adopted as a Tier 1 and Tier 2 elective measure. Projects must comply with the mandatory electric vehicle supply equipment (EVSE) requirements stated in Section 4.106.4, as amended.

16.14.160 Section A4.106.9 Bicycle Parking.

Section A4.106.9 is not adopted as a Tier 1 and Tier 2 elective measure. Projects must comply with the bicycle parking requirements in the Palo Alto Municipal Code.

16.14.170 Section A4.106.10 Light Pollution Reduction.

Section A4.106.10 is adopted as a Tier 1 and Tier 2 elective measure for all covered projects and is amended to read:

A4.106.10 Light pollution reduction. Outdoor lighting systems shall be designed and installed to comply with the following:

- 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 IES TM-15-11; and
- 3. Allowable BUG ratings not exceeding those shown in Table A4.106.10; or
- 4. Comply with a local ordinance lawfully enacted pursuant to Section 101.7 of this code, whichever is more stringent.

Projects may use an approved equal reference standard for light fixtures where BUG ratings are unavailable.

Exceptions:

- 1. Luminaires that qualify as exceptions to the *California Energy Code*.
- 2. Emergency lighting.
- 3. One- and two-family dwellings.

16.14.180 Section A4.203.1 Performance Approach for Newly Constructed Buildings.

Sections A4.203.1 is not adopted as a Tier 1 and Tier 2 elective measure. Projects shall comply with Chapter 16.17 of the Palo Alto Municipal Code (Energy Reach Code).

- 16.14.190 Reserved.
- 16.14.200 Reserved.
- 16.14.210 Reserved.

16.14.220 Section A4.304.2.1 Irrigation Metering Device.

Section A4.304.2.1 is adopted as a Tier 1 and Tier 2 prerequisite and is amended to read:

A4.304.2.1 Irrigation Metering Device. Dedicated irrigation meters are to be installed in all new construction and rehabilitated landscapes when the landscape is greater than 1,000 square feet.

16.14.230 Section A4.305 Water Reuse Systems.

Sections A4.305.1 through A4.305.3 are adopted as Tier 1 and Tier 2 electives and are amended to read:

A4.305.1 Graywater. Alternative plumbing piping is installed to permit the discharge from the clothes washer and other fixtures (except toilets and kitchen sinks) to be used for an irrigation system in compliance with the California Plumbing Code.

A4.305.2 Recycled Water Piping. Based on projected availability, dual water piping is installed for future use of recycled water at the following locations:

- 1. Interior piping for the use of recycled water is installed to serve all water closets, urinals, and floor drains.
- 2. Exterior piping is installed to transport recycled water from the point of connection to the structure. Recycled water systems shall be designed and installed in accordance with the California Plumbing Code.

A4.305.3 Recycled water for landscape irrigation. Recycled water is used for landscape irrigation.

Section A4.305.4 is added and adopted as Tier 1 and Tier 2 prerequisite and shall read as follows:

A4.305.4 Additions and alterations. All multifamily residential additions and alterations must install recycled water infrastructure for irrigation when the landscape area exceeds 1,000 square feet.

Section A4.305.5 is added and adopted a Tier 2 prerequisite and shall read as follows:

A4.305.5 Laundry to Landscape Infrastructure. Newly constructed Residential Buildings with a landscape area of any size shall install an independent plumbing drainage system including a trap and vent that shall begin near the interior laundry fixtures and will terminate at the exterior of the home. This piping system will be capped at all outlets and will assist in the future installation of a "Laundry-to-Landscape" irrigation system. A complete irrigation system installation shall meet the requirements of the California Plumbing Code 1502.1.1, Clothes Washer System.

Exception: Laundry fixtures located below grade.

A4.305.5.1 Identification. Independent laundry to landscape capable system shall be labeled as "LAUNDRY-TO-LANDSCAPE CAPABLE" and be readily visible to the user.

16.14.240 Section A4.403.1 Frost Protection Foundation Systems.

Sections A4.203.1 is not adopted as a Tier 1 and Tier 2 elective measure.

16.14.250 Section A4.403.2 Reduction in cement use.

Section A4.403 is not adopted as a Tier 1 and Tier 2 prerequisite. Section A4.403 is adopted as a Tier 1 and Tier 2 elective measure and shall read as:

A4.403.2 Reduction in cement use. As allowed by the enforcing agency, cement used in foundation mix design shall be reduced as follows:

Tier 1. Not less than a 20 percent reduction in cement.

Tier 2: Not less than a 25 percent reduction in cement.

Note: Products commonly used to replace cement in concrete mix designs include, but are not limited to:

- 1. Fly ash
- 2. Slag
- 3. Silica fume
- 4. Rice hull ash
16.14.260 Section A4.408.1 Enhanced Construction Waste Reduction.

Section A4.408.1 is adopted as mandatory and is amended to read:

A4.408.1 Enhanced Construction Waste Reduction. Nonhazardous construction and demolition debris generated at the site is diverted to recycle or salvage incompliance with the following:

Tier 1 and Tier 2. At least a 80-percent reduction. Any mixed recyclables that are sent to mixed-waste recycling facilities shall include a qualified third party verified facility average diversion rate. Verification of diversion rates shall meet minimum certification eligibility guidelines, acceptable to the local enforcing agency.

A4.408.1.1 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with all construction and demolition waste reduction requirements.

16.14.270 Section A4.504.3 Thermal insulation.

Section A4.504.3 is not adopted as a Tier 1 and Tier 2 prerequisite. Section A4.504.3 is adopted as a Tier 1 and Tier 2 elective measure.

16.14.280 <u>Non-Residential Projects:</u> Chapter 5 Preface Green Building Requirements for Project Type and Scope.

A Preface is added to Chapter 5 of the California Green Building Standards Code to read:

Preface – Green Building Requirements for Project Type and Scope. For design and construction of non-residential projects, the City requires compliance with the mandatory measures of Chapter 5, in addition to use of Tier 1 and Tier 2 as specified in Palo Alto Municipal Code Chapter 16.14. See Section 202 for definitions on Calgreen mandatory, Tier 1 prerequisites and electives, and Tier 2 prerequisites and electives. All elective measures are adopted as written under Appendix A5 unless otherwise indicated in this Section.

16.14.290 Section 5.106.1.1 Local storm water pollution prevention.

Section 5.106.1.1 Local ordinance is amended to read:

5.106.1.1 Local ordinance. Newly constructed projects and additions shall comply with additional storm water pollution prevention measures as applicable. (See Chapter 16.11, Storm Water Pollution Prevention, of the Palo Alto Municipal Code.)

16.14.295 Section 5.106.8 Light pollution reduction

Section 5.106.8 Light pollution reduction is amended to read:

5.106.8 Light pollution reduction. Outdoor lighting systems shall be designed and installed to comply with the following:

- 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 IES TM-15-11; and
- 3. Allowable BUG ratings not exceeding those shown in Table A4.106.10; or
- 4. Comply with a local ordinance lawfully enacted pursuant to Section 101.7 of this code, whichever is more stringent.

Projects may use an approved equal reference standard for light fixtures where BUG ratings are unavailable.

Exceptions:

- 1. Luminaires that qualify as exceptins in Section 140.7 of the California Energy Code.
- 2. Emergency lighting.
- 3. Building façade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
- 4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs, and methods of construction.

16.14.300 Section 5.303.5 Dual Plumbing.

Section 5.303.5 Dual plumbing is added as mandatory and is amended to read:

5.303.5 Dual plumbing. New buildings and facilities shall be dual plumbed for potable and recycled water systems for toilet flushing when recycled water is available. All building projects for which CPAU recycled water service is available must install dual Plumbing and use recycled water for toilet and urinal flushing when the building area is greater than 10,000 square feet or where installation of 25 or more toilets and urinals is proposed. All projects for which CPAU recycled water for toilet and urinal flushing when the building must install dual plumbing for use of recycled water for toilet and urinal flushing when the building area and urinals is proposed. State of the plumbing for use of recycled water for toilet and urinal flushing when the building area exceeds 100,000 square feet or where installation of 100 or more toilets and urinals is proposed.

- 16.14.310 Reserved.
- 16.14.320 Reserved.
- 16.14.330 Reserved.
- 16.14.340 Reserved.

16.14.350 Section 5.304.5 Potable water elimination.

Section 5.304.5 Potable water elimination is adopted as mandatory and amended to read:

5.304.5 Potable water elimination. Recycled water infrastructure for irrigation systems is required for all projects for which CPAU recycled water service is available. All projects for which CPAU recycled water service is not yet available must install recycled water infrastructure for irrigation when the landscape area exceeds 1,000 square feet. Dedicated irrigation meters are to be installed in all new construction and rehabilitated landscapes when the landscape is greater than 1,000 square feet.

16.14.360 Section 5.304.6 Invasive species prohibited.

Section 5.304.6 is added as mandatory to read:

5.304.6 Invasive species prohibited. All nonresidential new construction, additions, and alterations shall not install invasive species in a landscape area of any size.

16.14.365 Section 5.305.1 Non-residential enhanced water budget.

Section 5.305.1 Non-residential enhanced water budget is added as mandatory to read:

5.305.1 Non-residential enhanced water budget. Non-residential buildings anticipated to use more than 1,000 gallons of water a day shall complete an Enhanced Water Budget Calculator as established by the Chief Building Official.

16.14.370 Section A5.408 Construction Waste, Reduction, Disposal and Recycling.

Section A5.408.3.1.1 Enhanced Construction Waste Reduction is adopted at Tier 2 (80% construction waste reduction) as a mandatory requirement for all nonresidential construction, including new construction, additions, and alterations, as long as the construction has a valuation exceeding \$25,000. Nonresidential projects with a lower valuation shall remain subject to California Green Building Code Chapter 5 mandatory requirements.

16.14.380 Section 5.410.4.6 Energy STAR portfolio manager.

Section 5.410.4.6 Energy STAR portfolio manager is added as mandatory to read:

5.410.4.6 Energy STAR portfolio manager. All nonresidential projects exceeding \$100,000 valuation must provide evidence of an Energy STAR Portfolio Manager project profile prior to Permit Issuance, acquire an Energy STAR Portfolio Manager Rating, and submit the rating to the City of Palo Alto once the project has been occupied after 12 months.

16.14.390 Section 5.410.4.7 Performance reviews – energy.

Section 5.410.4.7 Performance reviews - energy is added to read:

5.410.4.7 Performance reviews – energy. All projects over 10,000 square feet. The City reserves the right to conduct a performance review, no more frequently than once every five years unless a project fails review, to evaluate the building's energy use to ensure that resources used at the building and/or site do not exceed the maximum allowance set forth in the rehabilitation or new construction design. Energy use reviews may be initiated by the Building Division or as a coordinated effort between the City's Utilities Department and/or its designated contractors. Following the findings and recommendations of the review, the City may require adjustments to the energy usage or energy-using equipment or systems if the building is no longer compliant with the original design. Renovation or rehabilitation resulting from such audit activity shall be considered a project, and shall be subject to applicable documentation submittal

110

requirements of the City. This section is effective only for those projects for which a building permit was issued after January 1, 2009.

16.14.400 Section 5.410.4.8 Performance reviews – water.

Section 5.410.4.8 Performance reviews - water is added to read:

5.410.4.8 Performance reviews – water. All sites greater than one acre: The City reserves the right to conduct performance reviews, no more frequently than once every five years unless a project fails review, to evaluate water use to ensure that resources used at the building and/or site do not exceed a maximum allowance set forth in the rehabilitation or new construction design. Water use reviews may be initiated by the Building Division, or as a coordinated effort between the City's Utilities Department and the Santa Clara Valley Water District (SCVWD), or as part of SCVWD's established water conservation programs. Following the findings and recommendations of the review, the City may require adjustments to irrigation usage, irrigation hardware, and/or landscape materials to reduce consumption and improve efficiency. Renovation or rehabilitation resulting from such audit activity shall be considered a project, and shall be subject to applicable documentation submittal requirements of the City.

16.14.420 Section A4.106.8 Electric Vehicle (EV) Charging.

Section A4.106.8 of the California Green Building Standards Code is added as mandatory and amended to read:

A4.106.8 Electric Vehicle (EV) Charging for Residential Structures. Newly constructed single family and multifamily residential structures, including residential structures constructed as part of a mixed use development, shall comply with the following requirements for electric vehicle supply equipment (EVSE). All parking space calculations under this section shall be rounded up to the next full space. The requirements stated in this section are in addition to those contained in Section 4.106.4 of the California Green Building Standards Code. In the event of a conflict between this section and Section 4.106.4 of the California Green Building requirements shall prevail.

A4.106.8.1 Definitions. For the purposes of this section, the following definitions shall apply:

- (a) Level 2 EVSE. "Level 2 EVSE" shall mean an EVSE capable of charging at 30 amperes or higher at 208 or 240 VAC. An EVSE capable of simultaneously charging at 30 amperes for each of two vehicles shall be counted as two Level 2 EVSE.
- (b) Conduit Only. "Conduit Only" shall mean, at minimum: (1) a panel capable to accommodate a dedicated branch circuit and service capacity to install a 208/240V, 50 amperes grounded AC outlet; and (2) raceway or wiring with capacity to accommodate a 100 ampere circuit; terminating in (3) a listed cabinet, box, enclosure, or NEMA receptacle. The raceway shall be installed so that minimal removal of materials is necessary to complete the final installation.
- (c) EVSE-Ready Outlet. "EVSE-Ready Outlet" shall mean, at minimum: (1) a panel capable to accommodate a dedicated branch circuit and service capacity to install a 208/240V, 50 amperes grounded AC outlet; (2) a two-pole circuit breaker; (3) raceway with capacity to accommodate 100-ampere circuit; (4) 50 ampere wiring; terminating in (5) a 50 ampere NEMA receptacle in a covered outlet box.
- (d) EVSE Installed. "EVSE Installed" shall mean an installed Level 2 EVSE.

A4.106.8.2 Single Family Residences. The following standards apply to newly constructed detached and attached single family residences.

- (a) In general. The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for each residence.
- (b) Location. The proposed location of a charging station may be internal or external to the dwelling, and shall be in close proximity to an on-site parking space consistent with City guidelines, rules, and regulations.

A4.106.8.3 Multi-Family Residential Structures. The following standards apply to newly constructed residences in a multi-family residential structure, except as provided in section A4.106.8.4.

(a) Resident parking. The property owner shall provide at least one EVSE-Ready Outlet or EVSE Installed for each residential unit in the structure.

- (b) Guest parking. The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed, for at least 25% of guest parking spaces, among which at least 5% (and no fewer than one) shall be EVSE Installed.
- (c) Accessible spaces. Projects shall comply with the 2016 California Building Code requirements for accessible electric vehicle parking.
- (d) Minimum total circuit capacity. The property owner shall ensure sufficient circuit capacity, as determined by the Chief Building Official, to support a Level 2 EVSE in every location where Circuit Only, EVSE-Ready Outlet or EVSE Installed is required.
- (e) Location. The EVSE, receptacles, and/or raceway required by this section shall be placed in locations allowing convenient installation of and access to EVSE. In addition, if parking is deed-restricted to individual residential units, the EVSE or receptacles required by subsection (a) shall be located such that each unit has access to its own EVSE or receptacle. Location of EVSE or receptacles shall be consistent with all City guidelines, rules, and regulations.

A4.106.8.4 Exception – Multi-Family Residential Structures with Individual, Attached Parking. The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for each newly constructed residence in a multi-family residential structure featuring: (1) a parking space attached to the residence; and (2) a shared electrical panel between the residence and parking space (e.g., a multi-family structure with tuck-under garages).

16.14.430 Section A5.106.5.3 Electric Vehicle (EV) Charging for Non-Residential Structures.

Section A5.106.5.3 of the California Green Building Standards Code is added as mandatory and amended to read:

A5.106.5.3 Electric Vehicle (EV) Charging for Non-Residential Structures. New non-residential structures shall comply with the following requirements for electric vehicle supply equipment (EVSE). All parking space calculations under this section shall be rounded up to the next full space. The requirements stated in this section are in addition to those contained in Section 5.106.5.3 of the California Green Building Standards Code. In the event of a conflict between this section and Section 5.106.5.3, the more robust EV Charging requirements shall prevail.

A5.106.5.3.1 Definitions. For the purposes of this section, the following definitions shall apply:

113

- (a) Level 2 EVSE. "Level 2 EVSE" shall mean an EVSE capable of charging at 30 amperes or higher at 208 or 240 VAC. An EVSE capable of simultaneously charging at 30 amperes for each of two vehicles shall be counted as two Level 2 EVSE.
- (b) Conduit Only. "Conduit Only" shall mean, at minimum: (1) a panel capable to accommodate a dedicated branch circuit and service capacity to install at least a 208/240V, 50 amperes grounded AC outlet; and (2) raceway or wiring with capacity to accommodate a 100 ampere circuit; terminating in (3) a listed cabinet, box, enclosure, or NEMA receptacle. The raceway shall be installed so that minimal removal of materials is necessary to complete the final installation.
- (c) EVSE-Ready Outlet. "EVSE-Ready Outlet" shall mean, at minimum: (1) a panel capable to accommodate a dedicated branch circuit and service capacity to install at least a 208/240V, 50 amperes grounded AC outlet; (2) a two-pole circuit breaker; (3) raceway with capacity to accommodate a 100-ampere circuit; (4) 50 ampere wiring; terminating in (5) a 50 ampere NEMA receptacle in a covered outlet box.
- (d) EVSE Installed. "EVSE Installed" shall mean an installed Level 2 EVSE.

A5.106.5.3.2 Non-Residential Structures Other than Hotels. The following standards apply to newly constructed non-residential structures other than hotels.

- (a) In general. The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for at least 25% of parking spaces, among which at least 5% (and no fewer than one) shall be EVSE Installed.
- (b) Accessible spaces. Projects shall comply with the 2016 California Building Code requirements for accessible electric vehicle parking.
- (c) Minimum total circuit capacity. The property owner shall ensure sufficient circuit capacity, as determined by the Chief Building Official, to support a Level 2 EVSE in every location where Circuit Only, EVSE-Ready Outlet or EVSE Installed is required.
- (d) Location. The EVSE, receptacles, and/or raceway required by this section shall be placed in locations allowing convenient installation of and access to EVSE. Location of EVSE or receptacles shall be consistent with all City guidelines, rules, and regulations.

A5.106.5.3.3 Hotels. The following standards apply newly constructed hotels.

- (a) In general. The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for at least 30% of parking spaces, among which at least 10% (and no fewer than one) shall be EVSE Installed.
- (b) Accessible spaces. Projects shall comply with the 2016 California Building Code requirements for accessible electric vehicle parking.
- (c) Minimum total circuit capacity. The property owner shall ensure sufficient circuit capacity, as determined by the Chief Building Official, to support a Level 2 EVSE in every location where Circuit Only, EVSE-Ready Outlet or EVSE Installed is required.
- (d) Location. The EVSE, receptacles, and/or raceway required by this section shall be placed in locations allowing convenient installation of and access to EVSE. Location of EVSE or receptacles shall be consistent with all City guidelines, rules, and regulations.

SECTION 2. The Council adopts the findings for local amendments to the California Green Building Standards Code, 2016 Edition, attached hereto as Exhibit "A" and incorporated herein by reference.

SECTION 3. If any section, subsection, clause or phrase of this Ordinance is for any reason held to be invalid, such decision shall not affect the validity of the remaining portion or sections of the Ordinance. The Council hereby declares that it should have adopted the Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid.

SECTION 4. The Council finds that this project is exempt from the provisions of the California Environmental Quality Act ("CEQA"), pursuant to Section 15061 of the CEQA Guidelines, because it can be seen with certainty that there is no possibility that the amendments herein adopted will have a significant effect on the environment.

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PASSED: October 24, 2016

AYES: BERMAN, BURT, FILSETH, HOLMAN, KNISS, SCHARFF, SCHMID

NOES:

ABSENT: DUBOIS, WOLBACH

ABSTENTIONS:

ATTEST:

DocuSigned by: Bill Minor 45F95502DB71492...

City Clerk

APPROVED AS TO FORM:

DocuSigned by: albert yang 5B6C45220134DC

Senior Deputy City Attorney

DocuSigned by: atruch Bu

Mayor

APPROVED:

DocuSigned by:

City Manager

DocuSigned by: Peter Pinnyad

Director of Development Services

DocuSigned by:

David Ramberg for Lalo Perez 75F74730743R

Director of Administrative Services

Exhibit A

FINDINGS FOR LOCAL AMENDMENTS TO CALIFORNIA GREEN BUILDING STANDARD CODE, 2016 EDITION

Section 17958 of the California Health and Safety Code provides that the City may make changes to the provisions in the uniform codes that are published in the California Building Standards Code. Sections 17958.5 and 17958.7 of the Health and Safety Code require that for each proposed local change to those provisions in the uniform codes and published in the California Building Standards Code which regulate buildings used for human habitation, the City Council must make findings supporting its determination that each such local change is reasonably necessary because of local climatic, geological, or topographical conditions.

Local building regulations having the effect of amending the uniform codes, which were adopted by the City prior to November 23, 1970, were unaffected by the regulations of Sections 17958, 17958.5 and 17958.7 of the Health and Safety Code. Therefore, amendments to the uniform codes which were adopted by the City Council prior to November 23, 1970, and have been carried through from year to year without significant change, need no required findings. Also, amendments to provisions not regulating buildings used for human habitation, including amendments made only for administrative consistency, do not require findings.

	Code: Ca	Code: Cal Green e Add Deleted Amended Justification (See below for keys) untary tiers added ✓ ✓ C & F					
Section	Title	Add	Deleted	Amended	Justification (See below for keys)		
301	Voluntary tiers added	 ✓ 		\checkmark	C & E		
303.1.2	Cumulative Construction	\checkmark			C & E		
4.105	Deconstruction Survey	\checkmark			C & E		
4.304	Outdoor Water Use	\checkmark		\checkmark	С		
5.105.1	Salvage	\checkmark			E		
5.106.1.1	Local ordinance	\checkmark			С		
5.106.8	Light pollution reduction			\checkmark	E		
5.303.5	Dual Plumbing	\checkmark			С		
5.304.5	Potable Water Elimination	\checkmark			С		
5.304.6	Invasive Species	\checkmark			E		
5.305.1	Non-residential enhanced water budget	✓			с		
5.410.4.6	Energy STAR portfolio manager	\checkmark			C & E		
5.410.4.7	Performance reviews – energy	\checkmark			C & E		
5.410.4.8	Performance reviews – water	\checkmark			C & E		
702.2	Special Inspection			\checkmark	E		
Appendix A4	Residential Voluntary Measures	\checkmark		\checkmark	C & E		
Appendix A5	Non-Residential Voluntary Measures	\checkmark		\checkmark	C & E		

Key to Justification for Amendments to Title 24 of the California Code of Regulations

- С This amendment is justified on the basis of a local **climatic** condition. The seasonal climatic conditions during the late summer and fall create severe fire hazards to the public health and welfare in the City. The hot, dry weather frequently results in wild land fires on the brush covered slopes west of Interstate 280. The aforementioned conditions combined with the geological characteristics of the hills within the City create hazardous conditions for which departure from California Building Standards Code is required. Failure to address and significantly reduce greenhouse gas (GHG) emissions could result in rises in sea level, including in San Francisco Bay, that could put at risk Palo Alto homes and businesses, public facilities, and Highway 101 (Bayshore Freeway), particularly the mapped Flood Hazard areas of the City. Energy efficiency is a key component in reducing GHG emissions, and construction of more energy efficient buildings can help Palo Alto reduce its share of the GHG emissions that contribute to climate change. The burning of fossil fuels used in the generation of electric power and heating of buildings contributes to climate change, which could result in rises in sea level, including in San Francisco Bay, that could put at risk Palo Alto homes and businesses 1 public facilities, and Highway 101. Due to decrease in annual rain fall, Palo Alto experiences the effect of drought and water saving more than some other communities in California.
- **E** Green building enhances the public health and welfare by promoting the <u>environmental</u> and economic health of the City through the design, construction, maintenance, operation and deconstruction of buildings and sites by incorporating green practices into all development. The green provisions in this Chapter are designed to achieve the following goals:
 - (a) Increase energy efficiency in buildings;
 - (b) Increase water and resource conservation;
 - (c) Reduce waste generated by construction and demolition 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;
 - (f) Recognize and conserve the energy embodied in existing buildings;
 - (g) Encourage alternative transportation; and
 - (h) Reduce disturbance of natural ecosystems.
- **G** This amendment is justified on the basis of a local **geological** condition. The City of Palo Alto is subject to earthquake hazard caused by its proximity to San Andreas fault. This fault runs from Hollister, through the Santa Cruz Mountains, epicenter of the 1989 Loma Prieta earthquake, then on up the San Francisco Peninsula, then offshore at Daly City near Mussel Rock. This is the approximate location of the epicenter of the 1906 San Francisco earthquake. The other fault is Hayward Fault. This fault is about 74 mi long, situated mainly along the western base of the hills on the east side of San Francisco Bay. Both of these faults are considered major Northern California earthquake faults which may experience rupture at any time. Thus, because the City is within a seismic area which includes these earthquake faults, the modifications and changes cited herein are designed to better limit property damage as a result of seismic activity and to establish criteria for repair of damaged properties following a local emergency.
- T The City of Palo Alto topography includes hillsides with narrow and winding access, which makes timely response by fire suppression vehicles difficult. Palo Alto is contiguous with the San Francisco Bay, resulting in a natural receptor for storm and waste water run-off. Also the City of Palo Alto is located in an area that is potentially susceptible to liquefaction during a major earthquake. The surface condition consists mostly of stiff to dense sandy clay, which is highly plastic and expansive in nature. The aforementioned conditions within the City create hazardous conditions for which departure from California Building Standards Code is warranted.

Ordinance No. 5383

Ordinance of the Council of the City of Palo Alto Repealing and Restating Chapter 16.17 of the Palo Alto Municipal Code, California Energy Code, 2016 Edition, and Local Amendments and Related Findings

The Council of the City of Palo Alto does ORDAIN as follows:

<u>SECTION 1</u>. Chapter 16.17 of the Palo Alto Municipal is hereby amended by repealing in its entirety Chapter 16.17 and adopting a new Chapter 16.17 to read as follows:

16.17 CALIFORNIA ENERGY CODE

16.17.010 2016 California Energy Code adopted.

The California Energy Code, 2016 Edition, Title 24, Part 6 of the California Code of Regulations together with those omissions, amendments, exceptions and additions thereto, is adopted and hereby incorporated in this Chapter by reference and made a part hereof the same as if fully set forth herein. Except as amended herein, all requirements of the California Energy Code, 2016 Edition, Title 24, Part 6 of the California Code of Regulations shall apply.

Unless superseded and expressly repealed, references in City of Palo Alto forms, documents and regulations to the chapters and sections of the former California Code of Regulations, Title 24, shall be construed to apply to the corresponding provisions contained within the California Code of Regulations, Title 24, 2013. Ordinance No. 5345 of the City of Palo Alto and all other ordinances or parts of ordinances in conflict herewith are hereby suspended and expressly repealed.

One copy of the California Energy Code, 2016 edition, has been filed for use and examination of the public in the Office of the Building Official of the City of Palo Alto.

16.17.020 Violations -- Penalties.

Any person, firm or corporation violating any provision of this chapter is guilty of a misdemeanor and upon conviction thereof shall be punished as provided in subsection (a) of Section 1.08.010 of this code. Each separate day or any portion thereof during which any violation of this chapter occurs or continues shall be deemed to constitute a separate offense, and upon conviction thereof shall be punishable as provided in this section.

16.17.030 Enforcement -- Citation authority.

The employee positions designated in this section may enforce the provisions of this chapter by the issuance of citations; persons employed in such positions are authorized to exercise the authority provided in Penal Code section 836.5 and are authorized to issue citations for violations of this chapter. The designated employee positions are: (1) chief building official; (2) building inspection supervisor; and (3) code enforcement officer.

16.17.040 Local Amendments.

The provisions of this Chapter shall constitute local amendments to the cross-referenced provisions of the California Energy Code, 2016 Edition, and shall be deemed to replace the cross-referenced sections of said Code with the respective provisions set forth in this Chapter.

16.17.050 Section 100.3 Local Energy Efficiency Reach Code.

Section 100.3 California Energy Code is added to read:

100.3 Local Energy Efficiency Reach Code

- (a) **New single-family residential construction**. The performance approach specified within the 2016 California Energy Code shall be used to demonstrate that the TDV Energy of proposed single-family residential construction is at least:
 - 1. Ten percent (10%) less than the TDV energy of the Standard Design if the proposed building does not include a photovoltaic system; or
 - 2. Twenty percent (20%) less than the TDV Energy of the Standard Design if the proposed building includes a photovoltaic system.
- (b) **New multi-family residential construction**. The performance approach specified within the 2016 California Energy Code shall be used to demonstrate that the TDV Energy of proposed multi-family residential construction is at least:
 - 1. Ten percent (10%) less than the TDV energy of the Standard Design if the proposed building does not include a photovoltaic system; or
 - 2. Twelve percent (12%) less than the TDV Energy of the Standard Design if the proposed building includes a photovoltaic system.
- (c) **New non-residential construction.** The performance approach specified within the 2016 California Energy Code shall be used to demonstrate that the TDV Energy of proposed non-residential construction is at least:
 - 1. Ten percent (10%) less than the TDV energy of the Standard Design if the proposed building does not include a photovoltaic system or includes a photovoltaic system smaller than 5kW; or
 - 2. Equal to the TDV Energy of the Standard Design if the proposed building includes a 5kW or greater photovoltaic system.

16.17.060 Section 100.4 Exceptions to Local Energy Efficiency Reach Code

Section 100.4 of the California Energy Code is added to read:

100.4 Exceptions to Local Energy Efficiency Reach Code

New single-family residential, multi-family residential, and non-residential construction that is designed and built as to be all-electric shall be exempt from the requirements of Section 100.3, Local Energy Efficiency Reach Code. For the purposes of this Chapter, construction shall be

considered "all-electric" if electricity is the only permanent source of energy for water-heating, space-heating, space cooling, cooking, and clothes-drying. Nothing in this section shall relieve a project applicant from the meeting any other requirement of the California Energy Code, 2016 Edition, Title 24, Part 6 of the California Code of Regulations.

16.17.060 Section 110.10 Mandatory Requirements For Solar Ready Buildings.

Section 110.10 Mandatory Requirements for Solar Ready Buildings is amended as follows:

- (a) Subsection 110.10(a)1 is amended to read:
 - 1. **Single-family residences.** New single family residences shall comply with the requirements of Sections 110.10(b) through 110.10(e).
- (b) Subsection 110.10(b)1A is amended to read:
 - **A.** Single Family Residences. The solar zone shall be located on the roof or overhang of the building and have a total area no less than 500 square feet.

EXCEPTION 1 to Section 110.10(b)1A: Single family residences with a permanently installed solar electric system having a nameplate DC power rating, measured under Standard Test Conditions, of no less than 1000 watts.

EXCEPTION 2 to Section 110.10(b)1A: Single family residences with a permanently installed domestic solar water-heating system meeting the installation criteria specified in the Reference Residential Appendix RA4 and with a minimum solar savings fraction of 0.50.

EXCEPTION 3 to Section 110.10(b)1A: Single family residences with three habitable stories or more and with a total floor area less than or equal to 2000 square feet and having a solar zone total area no less than 150 square feet.

EXCEPTION 4 to Section 110.10(b)1A: Single family residences located in Climate zones 8-14 and the Wildland-Urban Interface Fire Area as defined in Title 24, Part 2 and having a whole house fan and having a solar zone total area no less than 150 square feet.

EXCEPTION 5 to Section 110.10(b)1A: Buildings with a designated solar zone area that is no less than 50 percent of the potential solar zone area. The potential solar zone area is the total area of any low-sloped roofs where the annual solar access is 70 percent or greater and any steep-sloped roofs oriented between 110 degrees and 270 degrees of true north where the annual solar access is 70 percent or greater. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

EXCEPTION 6 to Section 110.10(b)1A: Single family residences having a solar zone total area no less than 150 square feet and where all thermostats comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.

EXCEPTION 7 to Section 110.10(b)1A: Single family residences meeting the following conditions:

- A. All thermostats comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.
- B. Comply with one of the following measures:
 - Install a dishwasher that meets or exceeds the ENERGY STAR Program requirements with either a refrigerator that meets or exceeds the ENERGY STAR Program requirements or a whole house fan driven by an electronically commutated motor; or
 - ii. Install a home automation system capable of, at a minimum, controlling the appliances and lighting of the dwelling and responding to demand response signals; or
 - iii. Install alternative plumbing piping to permit the discharge from the clothes washer and all showers and bathtubs to be used for an irrigation system in compliance with the California Plumbing Code and any applicable local ordinances;
 - iv. Install a rainwater catchment system designed to comply with the California Plumbing Code and any applicable local ordinances, and that uses rainwater flowing from at least 65 percent of the available roof area.
- (c) Subsection 110.10(c) is amended to read:

(c) Interconnection pathways.

1. The construction documents shall indicate a location for inverters and metering equipment and a pathway for routing of conduit from the solar zone to the point of interconnection with the electrical service. For single-family residences the point of interconnection will be the main service panel.

2. Residential buildings shall provide conduit to support the installation of future solar requirements. The conduit shall be located adjacent to the solar ready area and shall extend from the roofline and terminate at the main electrical panel.

3. The construction documents shall indicate a pathway for routing of plumbing from the solar zone to the water-heating system.

(d) Subsection 110.10(f) is added to read:

(f) Existing tree canopies. In the event of a conflict between the provisions of this Code, the Solar Shade Act of 2009, and the Palo Alto Tree Ordinance (Chapter 8.10), the most protective of existing tree canopies shall prevail.

16.17.070 Infeasibility Exemption.

- (a) **Exemption.** If an applicant for a Covered Project believes that circumstances exist that makes it infeasible to meet the requirements of this Chapter, the applicant may request an exemption as set forth below. In applying for an exemption, the burden is on the Applicant to show infeasibility.
- (b) Application. If an applicant for a Covered Project believes such circumstances exist, the applicant may apply for an exemption at the time of application submittal in accordance with the Development Services administrative guidelines. The applicant shall indicate the maximum threshold of compliance he or she believes is feasible for the covered project and the circumstances that make it infeasible to fully comply with this Chapter. Circumstances that constitute infeasibility include, but are not limited to the following:
 - (1) There is conflict with the compatibility of the currently adopted green building ordinance and/or California Building Standards Code;
 - (2) There is conflict with other City goals, such as those requiring historic preservation or the Architectural Review criteria;
 - (3) There is a lack of commercially available materials and technologies to comply with the requirements of this Chapter;
 - (4) Applying the requirements of this Chapter would effectuate an unconstitutional taking of property or otherwise have an unconstitutional application to the property.
- (c) **Review by Architectural Review Board (ARB).** For any covered project for which an exemption is requested and Architectural Review is required by the ARB, the ARB shall provide a recommendation to the Director of Development Services or designee regarding whether the exemption shall be granted or denied, along with its recommendation on the project.
- (d) Granting of Exemption. If the Director of Development Services, or designee, determines that it is infeasible for the applicant to fully meet the requirements of this Chapter based on the information provided, the Director, or designee, shall determine the maximum feasible threshold of compliance reasonably achievable for the project. The decision of the Director, or designee, shall be provided to the applicant in writing. If an exemption is granted, the applicant shall be required to comply with this Chapter in

all other respects and shall be required to achieve, in accordance with this Chapter, the threshold of compliance determined to be achievable by the Director or designee.

- (e) **Denial of Exemption.** If the Director of Development Services or designee determines that it is reasonably possible for the applicant to fully meet the requirements of this Chapter, the request shall be denied and the Director or designee shall so notify the applicant in writing. The project and compliance documentation shall be modified to comply with this Chapter prior to further review of any pending planning or building application.
- (f) **Council Review of Exemption.** For any covered project that requires review and action by the City Council, the Council shall act to grant or deny the exemption, based on the criteria outlined above, after recommendation by the Director of Development Services.

16.17.080 Appeal.

- (a) Any aggrieved Applicant may appeal the determination of the Director of Development Services or designee regarding the granting or denial of an exemption pursuant to 16.17.070.
- (b) Any appeal must be filed in writing with the Development Services Department not later than fourteen (14) 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 by the City Council in accordance with the provisions of Section 18.77.070(f) of the City of Palo Alto Municipal Code.

<u>SECTION 2</u>. The Council adopts the findings for local amendments to the California Energy Code, 2016 Edition, attached hereto as Exhibit "A" and incorporated herein by reference.

SECTION 3. If any section, subsection, clause or phrase of this Ordinance is for any reason held to be invalid, such decision shall not affect the validity of the remaining portion or sections of the Ordinance. The Council hereby declares that it should have adopted the Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be held invalid.

<u>SECTION 4</u>. The Council finds that this project is exempt from the provisions of the California Environmental Quality Act ("CEQA"), pursuant to Section 15308 of the CEQA Guidelines, because it is a regulatory action for the protection of the environment.

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SECTION 5. This ordinance shall be effective on the commencement of the thirtyfirst day after the date of its adoption.

INTRODUCED: May 2, 2016

PASSED: May 23, 2016

AYES: BERMAN, BURT, DUBOIS, FILSETH, HOLMAN, KNISS, SCHARFF, SCHMID, WOLBACH

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

to Que

City Clerk

APPROVED AS TO FORM:

rich Brut Mayor

APPROVED:

Deputy City Attorney

Aanager

Director of Development Services

Director of Administrative Services

Exhibit A

FINDINGS FOR LOCAL AMENDMENTS TO CALIFORNIA ENERGY CODE, 2016 EDITION

Section 17958 of the California Health and Safety Code provides that the City may make changes to the provisions in the uniform codes that are published in the California Building Standards Code. Sections 17958.5 and 17958.7 of the Health and Safety Code require that for each proposed local change to those provisions in the uniform codes and published in the California Building Standards Code which regulate buildings used for human habitation, the City Council must make findings supporting its determination that each such local change is reasonably necessary because of local climatic, geological, or topographical conditions.

Local building regulations having the effect of amending the uniform codes, which were adopted by the City prior to November 23, 1970, were unaffected by the regulations of Sections 17958, 17958.5 and 17958.7 of the Health and Safety Code. Therefore, amendments to the uniform codes which were adopted by the City Council prior to November 23, 1970, and have been carried through from year to year without significant change, need no required findings. Also, amendments to provisions not regulating buildings used for human habitation, including amendments made only for administrative consistency, do not require findings.

Code: Cal Green								
Section(s)	Title	Add	Deleted	Amended	Justification (See below for keys)			
100.3 and 100.4	Local Energy Efficiency Reach Code and Exceptions	~			C & E			
110.10	Mandatory Requirements For Solar Ready Buildings	~		✓	С			

Key to Justification for Amendments to Title 24 of the California Code of Regulations

This amendment is justified on the basis of a local climatic condition. The seasonal climatic conditions during the late summer and fall create severe fire hazards to the public health and welfare in the City. The hot, dry weather frequently results in wild land fires on the brush covered slopes west of Interstate 280. The aforementioned conditions combined with the geological characteristics of the hills within the City create hazardous conditions for which departure from California Energy Code is required.

Failure to address and significantly reduce greenhouse gas (GHG) emissions could result in rises in sea level, including in San Francisco Bay, that could put at risk Palo Alto homes and businesses, public facilities, and Highway 101 (Bayshore Freeway), particularly the mapped Flood Hazard areas of the City. Energy efficiency is a key component in reducing GHG emissions, and construction of more energy efficient buildings can help Palo Alto reduce its share of the GHG emissions that contribute to climate change. The burning of fossil fuels used in the generation of electric power and heating of buildings contributes to climate change, which could result in rises in sea level, including in San Francisco Bay, that could put at risk Palo Alto homes and businesses 1 public facilities, and Highway 101. Due to decrease in annual rain fall, Palo Alto experiences the effect of drought and water saving more than some other communities in California.

Ε Energy efficiency enhances 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 sites by incorporating green practices into all development. The provisions in this Chapter are designed to achieve the following goals: (a) Increase energy efficiency in buildings;

(b) Increase resource conservation;

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

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

(e) Recognize and conserve the energy embodied in existing buildings; and

(f) Reduce disturbance of natural ecosystems.

This amendment is justified on the basis of a local geological condition. The City of Palo Alto is subject to earthquake hazard caused by its proximity to San Andreas fault. This fault runs from Hollister, through the Santa Cruz Mountains, epicenter of the 1989 Loma Prieta earthquake, then on up the San Francisco Peninsula, then offshore at Daly City near Mussel Rock. This is the approximate location of the epicenter of the 1906 San Francisco earthquake. The other fault is Hayward Fault. This fault is about 74 mi long, situated mainly along the western base of the hills on the east side of San Francisco Bay. Both of these faults are considered major Northern California earthquake faults which may experience rupture at any time. Thus, because the City is within a seismic area which includes these earthquake faults, the modifications and changes cited herein are designed to better limit property damage as a result of seismic activity and to establish criteria for repair of damaged properties following a local emergency.

Т The City of Palo Alto topography includes hillsides with narrow and winding access, which makes timely response by fire suppression vehicles difficult. Palo Alto is contiguous with the San Francisco Bay, resulting in a natural receptor for storm and waste water run-off. Also the City of Palo Alto is located in an area that is potentially susceptible to liquefaction during a

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major earthquake. The surface condition consists mostly of stiff to dense sandy clay, which is highly plastic and expansive in nature. The aforementioned conditions within the City create hazardous conditions for which departure from California Building Standards Codes is warranted.