

**DEVELOPMENT SERVICES – BUILDING DIVISION**

SUBMITTAL GUIDELINES: GREEN BUILDING STANDARD CONDITIONS OF APPROVAL CHECKLIST

SCOPE: RESIDENTIAL

APPLICABLE CODES: 2022 CBC, CEC, CALGreen, and PAMC

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.

DO NOT SUBMIT THIS DOCUMENT WITH PERMIT APPLICATION

In an effort to streamline the plan review process, please follow the steps outlined below to ensure that there is no delay in processing your application and reviewing your responses to these plan check comments.

Green Building Triggers:

- **CALGreen Mandatory:** Alterations and additions of multi-family or single-family construction projects where the scope increases the building's conditioned area, volume, or size.
 - Alterations and/or additions of Attached and Detached Accessory Dwelling Units, and ADU Conversions of Existing Structures
- **CALGreen Mandatory + Tier 1:** Alterations and/or additions of multi-family or single-family construction projects greater than 1,000 sq. ft.
- **CALGreen Mandatory + Tier 2:** All new constructed or substantial remodel projects.
 - **Substantial Remodel (50-50-50 RULE).** Any project or projects that affects the removal or replacement of 50% or more of the linear length of the existing exterior walls of the building, and/or 50% or more of the linear length of the existing exterior wall plate height is raised, and/or 50% or more of the existing roof framing area is removed or replaced, over a 3-year period.
 - Any permit(s) applied for will trigger a review of a 3-year history of the project. This review will result in determining if a substantial remodel has occurred.
 - The Chief Building Official or designee shall make the final determination regarding the application if a conflict occurs.

Permit Plans Instructions:

- Review the Green Building Verification Form on the “Compliance” page of the Green Building section of the of the Development Services webpage.
- Include the applicable “GB-1” sheet in the permit plans. For provisions marked as “Y” on the “GB-1” sheet, comply with the CALGreen provision instructions within this document. This does not exclude CALGreen and PAMC 16.14 requirements.
- In some cases, the provision includes only construction phase activities, and no plan check items are required. For the items that require construction phase requirements only, refer to the *Residential Green Building Inspection Guidelines* for compliance requirements.
- SPECIAL INSPECTION: For residential projects subject to Mandatory, Tier 1 or Tier 2 requirements, the project must hire a Green Building Special Inspector from the City’s approved list of Green Building Special Inspectors in accordance with PAMC 16.14.120. The Green Building Special Inspector shall review the permit plans and sign the “GB-1” sheet verifying that the CALGreen measures are included as outlined in the permit plans.
- For particular provisions, the Tier 1 and Tier 2 requirements are more stringent than similar requirements listed in the Mandatory provisions.
- Innovation concepts to be submitted for review and approval as an AMMR, Alternate Materials and Methods Request.

Revision and Resubmittal Instructions:

For projects that receive revision comments:

- Plan check comments will reference item numbers that are identified within these standards conditions.
- Revised plans and calculations shall incorporate or address all comments indicated in the standard conditions.
- Provide a written response to each comment and show where and how it has been addressed. Identify the sheet number and detail or reference note on the revised plans where the corrections are made. Provide cloud marker indication and delta revision numbers.
- Incomplete, indefinite, or faded drawings or calculations will not be accepted.


Inspections:

- Projects should reference the *Residential Green Building Inspection Guidelines* for details on Inspection Phase requirements.

How to Read the Enforcement Icons:


PLAN CHECK REQUIREMENTS



The requirements identified with the icon  are subject to **Plan Check** requirements as listed in this document. Unless otherwise indicated, for each applicable provision selected on the “GB-1” sheet, the design professional shall call out the requirements in the form of sheet note on the applicable discipline portion of the permit plans. Mandatory, Tier 1 and Tier 2 projects are subject to the Green Building Special Inspector requirements identified on page 2 of this document and the compliance process outlined on Green Building Compliance webpage.


FIELD INSPECTION



The requirements identified with the icon  are subject to **field inspection**. See *Residential Green Building Inspection Guideline* for requirements.


LOCALLY AMMENDED



The requirements identified with the icon  include local amendments to the 2022 California Green Building Code. Requirements identified with this icon are located within the Palo Alto Municipal Code 16.14.

TIER 1 AND TIER 2 MANDATORY



The requirements identified with the icon  include the prerequisite requirements listed in Division A4.6 and the local Palo Alto Municipal Code 16.14. These items are identified on the “GB-1” sheet as “Tier 1 Mand” or “Tier 2 Mand”.

CHAPTER 1: ADMINISTRATION

Section 102 Construction Documents and Installation Verification

1. Sec. 102.1. Submittal Documents. Because of special conditions, the City is requiring the construction documents to be prepared by a licensed design professional.
2. Sec 102.2. Information on construction documents. The construction documents shall provide sufficient clarity to indicate the location, nature, and scope of the proposed green building features.
3. Sec 102.3. Verification. Plans shall provide a method to verify compliance with all CALGreen requirements.

Chapter 3: GREEN BUILDING

Section 301 Scope

4. When CALGreen Mandatory is required, without triggering Tier 1 or Tier 2, 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 condition area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.
 - a. **Tier 1:** All residential building additions or alterations exceeding 1,000 square feet must meet the California Green Building Standards Code plus Tier 1 requirements, as amended in PAMC16.14 and applicable to the scope of work.
 - b. **Tier 2:** All newly constructed residential building must meet the California Green Building Standards Code plus Tier 2 requirements, as amended in PAMC 16.14 and applicable to the scope of work.
 - **Substantial Remodel (50-50-50 RULE).** Any project or projects that affects the removal or replacement of 50% or more of the linear length of the existing exterior walls of the building, and/or 50% or more of the linear length of the existing exterior wall plate height is raised, and/or 50% or more of the existing roof framing area is removed or replaced, over a 3-year period.
 - Any permit(s) applied for will trigger a review of a 3-year history of the project. This review will result in determining if a substantial remodel has occurred.
 - The Chief Building Official or designee shall make the final determination regarding the application if a conflict occurs. Substantial Remodel Projects are subject to Tier 2 requirements.

Section 302 Mixed Occupancy Buildings

5. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

Section 303 Phased Projects

6. Each phase of a project shall comply with those code measures relevant to the building components and systems.

Chapter 4: RESIDENTIAL MANDATORY MEASURES

Division 4.1 – Planning and Design

Section 4.106 Site Development

7. Sec. 4.106.2 Storm water drainage and retention during construction (less than one acre)



Submit storm water drainage plans for projects < 1 acre. Plans shall indicate how to manage storm water drainage during construction utilizing one or more of the following measures: 1. Use of retention basins of sufficient size to retain storm water on-site; 2. By filtering storm water with a barrier system, wattle, or other approved method when storm water is conveyed to a public drainage system, collection point, gutter, or similar disposal method; 3. By complying with a lawfully enacted storm water management Ordinance. (4.106.2)

Comply with Palo Alto’s Stormwater Pollution Prevention Ordinance (PAMC 16.11).

8. Sec 4.106.3 Grading and Paving



Submit site grading or surface drainage plans to indicate how surface water shall not enter buildings. Examples of methods to manage surface water include:

1. Swales;
2. Water collection and disposal systems;
3. French Drains;
4. Water retention gardens;
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge. (4.106.3)

Exception: Additions or alterations not altering the drainage path.

9. Sec 4.106.4 Electric Vehicle Charging for New Construction



The City of Palo Alto has adopted more stringent requirements in reference to Electric Vehicle Charging for New Construction (PAMC 16.14.420). Construction documents shall indicate the location of proposed EV spaces.

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 Standards Code, the more robust EV Charging requirements shall prevail.

New one-family, two-family and townhouse dwellings. (A4.106.8.1)

The following standards apply to newly constructed single-family and two-family residential structures.

In general: The property owner shall provide One (1) Level 2 electrical vehicle supply equipment (EVSE) or one (1) EV ready space (Low Power Level 2 EV Charging Receptacle is acceptable provided that the infrastructure complies with section 4.106.4.1) for each residence (except for accessory dwelling unit (ADU)).

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 regulations.

New Multi-Family Dwellings. (A4.106.8.2)

The following standards apply to newly constructed residences in a multi-family residential structure.

Resident parking. The property owner shall provide at least one (1) Level 2 electrical vehicle supply equipment (EVSE) or one (1) Level 2 EV Ready space for each residential unit in the structure (Low Power Level 2 EV Charging Receptacle is acceptable for 60% of the total EV parking spaces).

Guest parking. The property owner shall provide EV Capable Space, EV-Ready Space, 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.

Accessible spaces. Projects shall comply with the 2022 California Building Code requirements for accessible electric vehicle parking.

Minimum total circuit capacity. The property owner shall ensure sufficient circuit capacity, as determined by the Chief Building Official or designee, to support the EV requirements specified in (a) and (b) above.

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 regulations.

New Hotels and Motels (A4.106.8.3).

The following standards apply to newly constructed hotels.

In general. The property owner shall provide at least 30% EV Ready Space and at least 10% Level 2 EVSE installed for of the total parking spaces.

Accessible spaces. Projects shall comply with the 2022 California Building Code requirements for accessible electric vehicle parking.

Minimum total circuit capacity. The property owner shall ensure sufficient circuit capacity, as determined by the Chief Building Official or designee, to support a Level 2 EVSE in every location where EV-Ready space or EVSE Installed is required.

Location. The EVSE and/or receptacles, 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.

Exception - A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the California Electrical Code.

10. Sec. 4.106.5, PAMC 16.14.090 All-Electric Building / Site

Full electrification is required for new buildings, substantial remodels, and new outdoor appliances/equipment such as grill, stove, barbeque, fireplace, firepit, heater for swimming pool/spa, and similar equipment.

An all-electric building/site is a building or parcel of land whose sole source of energy is electricity and contains no combustion equipment or plumbing for combustion equipment.

Division 4.2 – Energy Efficiency**Section 4.201 General****11. Sec 4.201.1**

Provide documentation to indicate the project meets State energy efficiency standards. (4.201)

Division 4.3 – Water Efficiency and Conservation**Section 4.303 Indoor Water Use**

The plumbing fixture schedule shall indicate the flow and flush fixture performance values in this section. On smaller projects, if no such schedule is included in the permit application, indicate the requirements on the floor plans.

12. Sec 4.303.1.1 Water closets.

The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.

13. Sec 4.303.1.2 Urinals.

The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.

14. Sec 4.303.1.3.1 Single showerhead

Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

Note: A hand-held shower shall be considered a showerhead.

15. Sec 4.303.1.3.2 Multiple showerheads serving one shower.

When a shower is served by more than one showerhead, the combined flow rate of all shower-heads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.

Note: A hand-held shower shall be considered a showerhead.

16. Sec 4.303.1.4.1 Residential lavatory faucets.

The maximum flow rate of residential lavatory faucets shall not exceed 1.2 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.

17. Sec 4.303.1.4.2 Lavatory faucets in common and public use areas.

The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi.

18. Sec 4.303.1.4.3 Metering faucets.

Metering faucets when installed in residential buildings shall not deliver more than 0.2 gallons per cycle.

19. Sec 4.303.1.4.4 Kitchen faucets.

The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

20. Sec 4.303.2 Standards for plumbing fixtures and fittings.

Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet the applicable standards referenced in Table 1701.1 of the California Plumbing Code. (4.303.2)

21. SB407 NOTICE

Single-Family Residential Requirement: Existing single-family residential buildings constructed prior to January 1, 1994 are required to update all non-compliant water fixtures to be compliant with sections Sec 4.303.1.1, Sec 4.303.1.2, 4.303.1.3.1, 4.303.1.4.1, and 4.303.1.4.4.

Multi-Family Residential Requirement: Existing multi-family residential buildings constructed prior to January 1,

1994 with a building alteration value of greater than \$150,000 are required to update non-compliant water fixtures that service the specific area of improvement to be compliant with sections: 4.303.1.1, 4.303.1.2, 4.303.1.3.1, 4.303.1.4.1, 4.303.1.4.2, and 4.303.1.4.4

Section 4.304 Outdoor Water Use

22. Sec 4.304.1 Outdoor potable water use in landscape areas.



Residential developments shall comply with the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELo).

- a. The Model Water Efficient Landscape Ordinance (MWELo) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.
- b. MWELo and supporting documents, including a water budget calculator, are available at <https://www.water.ca.gov/>.

Section 4.306 Swimming Pool and Spa Covers

23. Sec. 4.306 Swimming Pool and Spa Covers.



Swimming pools and spas shall be provided with a vapor retardant cover.

Division 4.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

Section 4.406 Enhanced Durability and Reduced Maintenance

24. Sec 4.406.1 Rodent proofing



Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency. (4.406.1)

Section 4.408 Construction Waste Reduction, Disposal and Recycling

25. PAMC 16.14.250/ Sec A4.408.1 Enhanced Construction Waste Reduction



Nonhazardous construction and demolition debris generated at the site is diverted to recycle or salvage in compliance with the following: Projects with a given valuation of \$25,000 or more must have at least an 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.

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

Projects with job valuations less than \$25,000 shall meet State standards: Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste. (4.408.1)

GREEN HALO: Documentation shall be presented to the C&D Planner both prior to permit issuance and prior to final inspection using Green Halo. www.greenhalosystems.com

Section 4.420 Building Maintenance and Operation

26. Sec 4.410.1 Operation and maintenance manual.



Note on the drawings that an Operation and Maintenance Manual with content per 4.410.1 and in a digital or three-ring binder format shall be placed in the building at the time of final inspection. (4.410.1)

Note: HCD's Operation and Maintenance Manual template form customized and completed by builder/developers. (<https://www.hcd.ca.gov/building-standards/calgreen/forms-and-worksheets>).

27. Sec 4.410.2 Recycling by occupants.



Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible area(s) that serves all buildings on the site and are identified for the depositing, storage and collection of nonhazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals. (4.410.2)

Division 4.5 – ENVIRONMENTAL QUALITY

Section 4.503 Fireplaces

28. Sec 4.503.1 Fireplaces.



Any installed gas fireplace shall be a direct-vent sealed-combustion type. (4.503.1)

Note: Tier 2 and substantial remodel projects may only install an electric fireplace per PAMC 16.14.090.

Section 4.504 Pollutant Control

29. Sec 4.504.1 Covering of duct openings, protection of mechanical equipment during construction.



Covering of duct openings and protection of mechanical equipment during construction; all duct openings and other air distribution component openings shall be protected during storage on the construction site until final start-up with tape, plastic, sheet metal, or other acceptable methods to reduce the amount of dust and debris which may collect in the system. (4.504.1) Method shall be approved by the Special Inspector.

Include note on plans indicating construction requirements for contractor.

Examples of acceptable methods of implementation:

- Supply boots to cardboard and duct tape to specially designed rolled sheeting. Protection should have sufficient strength and be securely fastened to provide protection during the timeframe needed.
- Equipment, ducting, and plenums should be protected using a method that is successful during the

entire construction process.

- Equipment stored on the construction site for future installation should be wrapped or protected.

30. Sec 4.504.2 Finish material pollutant control.



Finish Material Pollutant Control; finish materials shall comply with this section. Provide applicable VOC limits within a table to be included on the permit plans. Include VOC limit requirements in the building specs.

31. Sec 4.504.2.1 Adhesives, sealants and caulks.



Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards:

- a. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products, as specified in Subsection 2. (4.504.2.1, subsection 1)
- b. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507. (4.504.2.1, subsection 2)

32. Sec 4.504.2.2 Paints and coatings.



Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3. (4.504.2.2)

33. Sec 4.504.2.3 Aerosol paints and coatings.



Aerosol paints and coatings: Aerosol paints and coatings shall meet the requirements of Sections 94522(a)(2), 94522(e)(1), and (f)(1) of California Code of Regulations, Title 17 commencing with Section 94520. (4.504.2.3)

34. Sec 4.504.2.4 Verification.



Verification of compliance with this section shall be provided as required by the Green Building Special Inspector during field inspection. Documents may include, but not limited to the following:

- a. Manufacturer's product specification
- b. Field verification of on-site product containers

35. Sec 4.504.3 Carpet systems.



All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from

Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

36. Sec 4.504.3.1 Carpet cushion.



All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350). (4.504.3.1)

37. Sec 4.504.3.2 Carpet adhesive.



All carpet adhesive shall meet the requirements of Table 4.504.1. (4.504.3.2)

38. Sec 4.504.4 Resilient flooring systems.



Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

39. Sec 4.504.5 Composite wood products.



Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.) as shown in Table 4.504.5.

- a. Indicate on plan submittal which standard will be used to comply with this section.
- b. Field documentation for verification shall be approved by the Green Building Special Inspector.

40. Sec 4.504.5.1 Composite wood products: documentation



Note on the plans that documentation shall be provided to indicate compliance with Section 4.504 and shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications. (4.504.5.1)
3. Product labeled and invoiced as meeting the Composite Wood Products regulation
4. Exterior grade products marked as meeting the PS-1or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, European 6363S, and Canadian CSA O121, CSA O151, CSA O153 and CSA O325 standards.
Other methods acceptable to the enforcing agency.

Section 4.505 Interior Moisture Control

41. Sec 4.505.2 Concrete slab foundations.



Concrete slab foundations required to have a vapor retarder by the California Building Code, Chapter 19 or concrete slab-on-ground floors required to have a vapor retarder by the California Residential Code, Chapter 5, shall also comply with this section.

42. Sec 4.505.2.1 Capillary Break.



A capillary break shall be installed in compliance with at least one of the following:

- a. A 4-inch-thick (101.6 mm) base of 1/2 inch (12.7 mm) or larger clean aggregate shall be provided with a vapor retarder in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.
- b. Other equivalent methods approved by the enforcing agency.
- c. A slab design specified by a licensed design professional.

43. Sec 4.505.3 Moisture content of building materials.



Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent moisture content. (4.505.3)

Note: Moisture meter testing shall be executed in the field.

Section 4.506 Indoor Air Quality and Exhaust

44. Sec 4.506.1 Bathroom exhaust fans.



Each bathroom shall be mechanically ventilated and shall comply with the following:

- a. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building.
- b. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control.
- c. Humidity controls 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.
- d. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in).

Note: 1) For the purposes of this section, a bathroom is a room which contains a bathtub, shower, or tub/shower combination. 2) Lighting integral to bathroom exhaust fans shall comply with the California Energy Code.

Section 4.507 Environmental Comfort

45. Sec 4.507.2 Heating and air-conditioning system design

Heating and air-conditioning systems shall be sized, designed and have their equipment selected using the following methods:

- a. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J—2016 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.
- b. Duct systems are sized according to ANSI/ACCA 1 Manual D—2016 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods.
- c. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S—2014 (Residential Equipment Selection) or other equivalent design software or methods.

PAMC 16.14.110 Section 4.509 Water Heater Replacement

46. Sec. 4.509 Water Heater Replacement

For existing residential building remodels or additions where the gas water heater is replaced or new water heater is added, the new water heater shall be a heat pump water heater (HPWH).

PAMC 16.14.410 Section 5.506 Indoor Air Quality.

47. Sec 5.506.3 Indoor Air Quality Management Plan.

Multi-family buildings.

Multi-family projects must submit an Indoor Air Quality Management Plan (IAQ) with building permit application in accordance with the Sheet Metal and Air Conditioning Contractors National Association (SMACNA IAQ) Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008-2008.

Appendix A4: RESIDENTIAL VOLUNTARY MEASURES

As required for Prerequisites and Electives for projects subject to Tier 1 and Tier 2.

Note: Provisions required for individual projects shall be indicated on the GB-1 sheet.

Division A4.1 – Planning and Design**Section A4.103 Site Selection****48. Sec A4.103.1 Site selection.**

The project is an infill site, a greyfield site, or an EPA recognized and remediated brownfield site. Indicate in a note on the GB-1 sheet how the requirement is met. (CGBC A4.103.1) Provide supplemental documentation for brownfield sites showing a Phase 1 Environmental Site Assessment or similar. (CGBC A4.103.1)

49. Sec A4.103.2 Community connectivity.

The project facilitates community connectivity in accordance with A4.103.2. Indicate in the “notes” section on the GB-1 sheet how the requirement is met or provide supporting documentation. (CGBC A4.103.2)

Section A4.104 Site Preservation**50. Sec A4.104.1 Supervision and education**

A green building professional will provide written instruction in accordance with A4.104.1. Indicate in a note on the GB-1 sheet how the requirement will be met. Prior to the beginning of construction, all parties shall receive a written guideline and instruction specifying the green goals of the project.

51. Sec A4.105.1 Deconstruction

Section A4.105.1 is not adopted as an elective measure . See Chapter 5.24 of the Municipal Code for the local deconstruction and source separation requirements.

52. Sec A4.105.2 Reuse of materials.

Non-hazardous materials which can be easily reused include but are not limited to the following:

- Light fixtures.
- Plumbing fixtures.
- Doors and trim.
- Masonry.
- Electrical devices.
- Appliances.
- Foundations or portions of foundations.

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

53. Sec A4.106.2.1 Soil analysis.

Soil analysis is performed by licensed design professional and the findings utilized in the structural design of the building. Indicate in a note on the GB-1 sheet how the requirement will be met. (CGBC A4.106.2.1)

54. Sec. A4.106.2.2 Soil protection.

The effect of development on building sites is evaluated and the soil is protected by one or more of the following:

1. Natural drainage patterns are evaluated, and erosion controls are implemented to minimize erosion during construction and after occupancy.
2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.
3. As allowed by other parts of the California Building Standards Code underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed, and the soil is replaced using accepted compaction methods.

Indicate in a note on the GB-1 sheet how the requirement will be met. (CGBC A4.106.2.2)

55. Sec. A4.106.2.3 Topsoil protection

These items are subject to field inspection. Topsoil shall be protected or saved for reuse as specified in this section.

Tier 1 Mandatory:

Displaced topsoil shall be stockpiled for reuse in a designated area and covered or protected from erosion.

Note: Protection from erosion includes covering with tarps, straw, mulch, chipped wood, vegetative cover, or other means acceptable to the enforcing agency to protect the topsoil for later use.

Tier 2 Mandatory:

The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area. Heavy equipment or vehicle traffic and material storage outside the construction area shall be limited to areas that are planned to be paved.

56. Sec. A4.106.3 Landscape design.

Postconstruction landscape designs shall accomplish one or more of the following:

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.
2. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.

Requirements for compliance shall be identified on the landscape design drawings or supporting specifications.

57. Sec. A4.106.4 Water permeable surfaces.*Tier 1 and Tier 2 Mandatory*

The site plan shall show a breakdown matrix of the square footage entitled “Water Permeable Surface Area” of all site paving elements and individually show if the paving material is permeable or not (paving for parking, walking or patio surfaces apply). The matrix must show calculations reflecting a minimum of 20% permeable surfaces for Tier 1 projects and 30% for Tier 2 projects. (CGBC A4.106.4)

Exceptions:

1. The primary driveway, primary entry walkway and entry porch or landing shall not be included when calculating the area required to be a permeable surface.
2. Required accessible routes for persons with disabilities as required by California Code of Regulations, Title 24, Part 2, Chapter 11A and/or Chapter 11B as applicable.

58. Sec. A4.106.5 Cool roof for reduction of heat island effect.*Tier 1 Mandatory*

Only for high-rise residential buildings, hotels and motels with a roof slope >2:12. Projects shall comply with sections A4.106.5.1 through A4.106.5.4.

Tier 2 Mandatory

Projects shall comply with sections A4.106.5.1 through A4.106.5.4.

59. Sec A4.106.6 Vegetated roof

The roof plan shall indicate the design of a vegetated roof. (CGBC A4.106.6)

60. Sec A4.106.7 Reduction of heat island effect for nonroof areas

The site plan shall include an analysis table listing paved surface material, the associated square footage, and one of the compliance methodologies including:

1. Trees or other plantings to provide shade and that mature within 15 years of planting.
2. Use high albedo materials with an initial solar reflectance value of at least 0.30
3. Use open grid pavement system or pervious or permeable pavement system.
4. Locate 50 percent of parking underground or use multi- level parking.

61. Sec A4.106.9 Bicycle parking.*Tier 1 and Tier 2 Mandatory*

Multi-family projects only. This section is not adopted as a Tier 1 and Tier 2 Elective measure. Projects must comply with the bike parking requirements in the [PAMC 18.54.060](#) for more detail.

62. Sec A4.106.10 Light pollution reduction.

Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 1-4 as defined in Chapter 10 of the California Administrative Code; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in 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.

Section A4.108 Innovative Concepts and Local Environmental Conditions

63. Sec A4.106.7 Reduction of heat island effect for nonroof areas



The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

Division A4.2 – Energy Efficiency

Section A4.203 Performance Approach for Newly Constructed Buildings

64. Sec. 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. New construction and substantial remodel projects are subject to the all-electric building/site requirements of PAMC 16.14.

Division A4.3 –Water Efficiency and Conservation

Section A4.303 Indoor Water Use

65. Sec A4.303.1 Kitchen faucets.



The maximum flow rate of kitchen faucets shall not exceed 1.5 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.5 gallons per minute at 60 psi.

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

66. Sec A4.303.2 Alternate water sources for nonpotable applications.

Alternate water sources will be used on the project. Include the design of such systems on the permit plans.

Note: All non-potable water applications must meet the requirements within the California Plumbing Code and the local health department requirements.

67. Sec A4.303.3 Appliances.

Install at least one qualified ENERGY STAR dishwasher or clothes washer.

1. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the California Code of Regulations.
2. Dish washers shall meet the following water use standards:
 - a. Residential—ENERGY STAR.
 - i. Standard Dishwashers – 4.25 gallons per cycle.
 - ii. Compact Dishwashers – 3.5 gallons per cycle.
 - b. Commercial—Shall be in accordance with ENERGY STAR requirements. Refer to Table A5.303.3.

Note: See Section A5.303.3 for nonresidential dishwashers and clothes washers.

68. Sec A4.303.4 Nonwater urinals and waterless toilets

Nonwater urinals or composting toilets are installed.

69. Sec A4.303.5 Hot water recirculation systems.

One- and two- family dwellings shall be equipped with a demand hot water recirculation system, as defined in Chapter 2. The demand hot water recirculation system shall be installed in accordance with the California Plumbing Code, California Energy Code, and the manufacturer's installation instructions.

Section A4.304 Outdoor Water Use**70. Sec A4.304.1 Rainwater catchment systems.**

An approved rainwater catchment system is designed and installed to use rainwater generated by at least 65 percent of the available roof area. Rainwater catchment systems shall be designed and installed in accordance with the California Plumbing Code.

71. Sec A4.304.2 Potable water elimination.

When landscaping is provided and as allowed by local ordinance, a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment shall be provided. Methods used to accomplish the requirements of this section shall comply with the requirements of the California Building Standards Code and shall include, but not be limited to, the following:

1. Use of captured rainwater.
2. Use of recycled water.
3. Water treated for irrigation purposes and conveyed by a water district or public entity.
4. Use of graywater.
5. Use of drought tolerant plants.

72. Sec A4.304.3 Irrigation Metering Device.

Dedicated irrigation meters from CPAU are to be installed in all new construction and rehabilitated landscapes when the landscape is greater than 1,000 square feet. Show location of dedicated irrigation meter on the plans.

Section A4.305 Water Reuse Systems**73. Sec A4.305.1 Graywater.**

Alternative plumbing piping is installed to permit the discharge from the clothes washer or other fixtures to be used for an irrigation system in compliance with the California Plumbing Code.

74. Sec 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.

75. Sec A4.305.3 Recycled water for landscape irrigation.

Recycled water is used for landscape irrigation. Include location and details of recycled water infrastructure on the plans.

Note: Only available in CPAU Recycled Water Areas.

76. Sec A4.305.3 Recycled water for landscape irrigation. Additions and Alterations.*Tier 1 and Tier 2 Mandatory*

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

Section A4.306 Innovative Concepts and Local Environmental Conditions**77. Sec. A4.306.1 Innovative concepts and local environmental conditions.**

The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

Division A4.4 –Material Conservation and Resource Efficiency**1. Sec. A4.403.2 Reduction in Cement Use**

Section A4. 403.2 is adopted as a mandatory measure for all Tier 1 and Tier 2 projects and is amended to outline local low carbon concrete requirements.

Two pathways of Compliance (the Cement Limit Pathway and the Embodied Carbon Pathway) are represented in Table A4.403.2.3.

Submit the applicable compliance form to the building department for plan review. The form should be accompanied by proof of mix design ideally placed on and/or attached to structural sheets. Sample mix specifications for compliance can be found on the StopWaste webpage: <https://www.stopwaste.org/concrete>.

Table A4.403.2.3 Cement and Embodied Carbon Limit Pathways

	Cement limits for use with any compliance method A4.403.2.3.2 to A4.403.2.3.5	Embodied Carbon limits for use with any compliance method A4.403.2.3.2 to A4.403.2.3.5
Minimum specified compressive strength f_c , psi (1)	Maximum ordinary Portland cement content, lbs/yd³ (2)	Maximum embodied carbon kg CO ₂ e/m ³ , per EPD
up to 2500	362	260
3000	410	289
4000	456	313
5000	503	338
6000	531	356
7000	594	394
7001 and higher	657	433
up to 3000 light weight	512	578
4000 light weight	571	626
5000 light weight	629	675
Notes		
(1) For concrete strengths between the stated values, use linear interpolation to determine cement and/or embodied carbon limits.		
(2) Portland cement of any type per ASTM C150.		

Section A4.404 Efficient Framing Techniques

2. Sec. A4.404.1 Lumber size



Beams, headers and trimmers are sized and installed as specified in Chapter 23 of the California Building Code, or Chapter 6 of the California Residential Code, as applicable.

3. Sec. A4.404.2 Dimensions and layouts



Building dimensions and layouts are designed to minimize waste by one or more of the following measures in at least 80 percent of the structure:

1. Building design dimensions in 2-foot increments are used.
2. Windows and doors are located at regular 16" or 24" stud positions.

4. Sec A4.404.3 Building systems.



Use premanufactured building systems to eliminate solid sawn lumber whenever possible. One or more of the following premanufactured building systems is used:

1. Composite floor joist or premanufactured floor framing system.
2. Composite roof rafters or premanufactured roof framing system.
3. Panelized (SIPS, ICF or similar) framing systems.

5. Sec A4.404.4 Pre-cut materials and details.

Material lists are included in the plans which specify the material quantity and provide direction for on-site cuts to be made from the material provided. Material lists and direction shall be provided for the following systems:

1. Floor framing.
2. Wall framing.
3. Ceiling and roof framing.
4. Structural panels and roof sheathing.

Section A4.405 Material Sources**6. Sec A4.405.1 Prefinished Building Materials**

Utilize prefinished building materials which do not require additional painting or staining when possible. One or more of the following building materials that do not require additional resources for finishing are used:

1. Exterior trim not requiring paint or stain.
2. Windows not requiring paint or stain.
3. Siding or exterior wall coverings which do not require paint or stain.

7. Sec A4.405.2 Concrete floors.

Floors that do not require additional coverings are used including but not limited to stained, natural or stamped concrete floors.

8. Sec A4.405.3 Recycled content.*Tier 1 and Tier 2 Mandatory*

Comply with the requirements for recycled content in Section A4.405.3.1.

9. Sec A4.405.3.1 Recycled content.

Tier 1. The RCV shall not be less than 10 percent of the total material cost of the project.

Required Total RCV (dollars) = Total Material Cost (dollars) × 10 percent (Equation A4. 4-1)

Tier 2. The RCV shall not be less than 15 percent of the total material cost of the project.

Required Total RCV (dollars) = Total Material Cost (dollars) × 15 percent (Equation A4. 4-2)

A4.405.4 Use of building materials from rapidly renewable sources.**10. Sec A4.405.4 Use of building materials from rapidly renewable sources.**

One or more of the following materials manufactured from rapidly renewable sources or agricultural by-products is used:

1. Insulation.
2. Bamboo or cork.

3. Engineered products.
4. Agricultural based products.

Note: The intent of this section is to utilize building materials and products which are typically harvested within a 10-year or shorter cycle.

Section A4.407 Water Resistance and Moisture Management

11. Sec A4.407.1 Drainage around foundations.



Install foundation and landscape drains which discharge to a dry well, sump, bioswale or other approved on-site location.

12. Sec A4.407.2 Roof drainage.



Install gutter and downspout systems to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, rainwater capture system or other approved on-site location.

13. Sec A4.407.3 Flashing details.



Provide flashing details on the building plans which comply with accepted industry standards or manufacturer's instructions. Details are shown on house plans at all of the following locations:

1. Around windows and doors.
2. Roof valleys.
3. Deck connections to the structure.
4. Roof-to-wall intersections.
5. Chimneys to roof intersections.
6. Drip caps above windows and doors with architectural projections.

Note: Reference details may be found in the Residential Sheet Metal Guidelines published by the Sheet Metal and Air Conditioning Contractors' National Association Inc.

14. Sec A4.407.4 Material protection.



Protect building materials delivered to the construction site from rain and other sources of moisture.

15. Sec A4.407.6 Door protection.



Exterior doors to the dwelling are covered to prevent water intrusion by one or more of the following:

1. An awning at least 4 feet in depth is installed.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

16. Sec A4.407.7 Roof overhangs.

A permanent overhang or awning at least 2 feet in depth is provided at all exterior walls.
Show supporting documentation in the building plans.

Section A4.411 Innovative Concepts and Local Environmental Conditions

17. Sec A4.411.1 Innovative concepts and local environmental conditions.

The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

Division A4.5 – Environmental Quality

Section A4.503 Pollutant Control

18. Sec A4.504.1 Compliance with formaldehyde limits.

Use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.

19. Sec A4.504.1 Compliance with formaldehyde limits.*Tier 1 and Tier 2 Mandatory*

Use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.

20. Sec A4.504.2 Resilient flooring systems.*Tier 1 and Tier 2 Mandatory*

Resilient flooring systems installed in the building shall meet the percentages specified in this section and meet the requirements of the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.2, January 2017 (Emission testing method for California Specification 01350).

Tier 1. At least 90 percent of the total area of resilient flooring installed shall comply.

Tier 2. 100 percent of the total area of resilient flooring installed shall comply.

Exception for Tier 2: An allowance for up to 5 percent specialty purpose flooring may be permitted.

Note: Documentation must be provided that verifies that finish materials are certified to meet the pollutant emission limits in this section.

21. Sec 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. (PAMC 16.14.270)

Tier 1. Install thermal insulation that meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

Tier 2. Install insulation which complies with Tier 1 plus does not contain any added formaldehyde.

Note: Documentation must be provided that verifies the materials are certified to meet the pollutant emission limits in this section.

Section A4.506 Indoor Air Quality and Exhaust**22. Sec A4.506.2 Construction filter**

High-Rise buildings.

Provide filters on return air openings rated at MERV 8 or higher during construction.

23. Sec A4.506.3 Direct-vent appliances.

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

Section A4.509 Innovative Concepts and Local Environmental Conditions**24. Sec A4.509.1 Innovative concepts and local environmental conditions.**

The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.