CITY OF PALO ALTO

PLANNING AND DEVELOPMENT SERVICES – BUILDING INSPECTION

INSPECTION GUIDELINES: "GB-1" SHEET SUBMITTALS

INSPECTION CODE: 151, 152, 153

SCOPE: NON-RESIDENTIAL

APPLICABLE CODES: 2019 CBC, CRC, CPC, CMC, CEC, CALGreen, CEnC, 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.

NON-RESIDENTIAL PROJECTS

☐ During the Green Building Pre-Construction Meeting (Inspection 151), Green Building Incremental Verification Inspection (Inspection 152) and the Green Building Final (Inspection 153), the general contractor, the Green Building Special Inspector (GBSI), and the City of Palo Alto Building Inspector should be ready to review the compliance provisions that follow based on the items that were selected as "Y" on the approved "GB-1" sheet.
- A third-party Green Building Special Inspector is required for Tier 1 and Tier 2 projects only.

☐ All references to the "Inspector" shall be interpreted as follows:
- For CALGreen Tier 1 or Tier 2 projects, the "Inspector" shall refer to the third-party Green Building Special Inspector (GBSI).
- For CALGreen Mandatory projects, the "Inspector" shall refer to the City of Palo Alto (CPA) Building Inspector.

5.1 & A5.1 PLANNING AND DESIGN

Water Pollution Prevention/Best Management Practices (BMPs) < One Acre of Land
(16.14.290, CGBSC 5.106.1, CGBSC 5.106.1.1, CGBSC 5.106.1.2)

☐ Stormwater enforcement is managed Enforcement is managed through the Public Works Department.

☐ See Chapter 16.11 Storm Water Pollution Prevention of the Palo Alto Municipal Code and CPA's "Pollution Prevention – It's Part of the Plan" sheet.
- Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMP's.
  - Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
    - Scheduling construction activity during dry weather, when possible.
    - Preservation of natural features, vegetation, soil, and buffers around surface waters.
    - Drainage swales or lined ditches to control storm water flow.
    - Mulching or hydroseeding to stabilize disturbed soils.
    - Erosion control to protect slopes.

- Protection of storm drain inlets (gravel bags or catch basin inserts).
- Perimeter sediment control (perimeter silt fence, fiber rolls).
- Sediment trap or sediment basin to retain sediment on site.
- Stabilized construction exits.
- Wind erosion control.
- Other soil loss BMPs acceptable to CPA.

▪ Good housekeeping BMPs to manage construction equipment, materials, non-storm water discharges, and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

- Dewatering activities.
- Material handling and waste management.
- Building materials stockpile management.
- Management of washout areas (concrete, paints, stucco, etc.).
- Control of vehicle/equipment fueling to contractor's staging area.
- Vehicle and equipment cleaning performed off site.
- Spill prevention and control.
- Other housekeeping BMPs acceptable to CPA.

Storm Water Pollution Prevention/Best Management Practices (BMPs) ≥ One Acre of Land
(PAMC 16.14.290, CGBSC 5.106.1, CGBSC 5.106.1.1, CGBSC 5.106.1.2)

☐ Comply with all lawfully enacted storm water discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale.

- Note:
  - ▪ Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale must comply with the postconstruction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).
  - ▪ The NPDES permits require postconstruction runoff (post project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conservation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.
  - ▪ Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

Short Term Bicycle Parking
(PAMC 18.54.060, CGBSC 5.106.4.1, CGBSC 5.106.4.1.1)

☐ 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.

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

☐ Project shows compliance with Palo Alto Zoning requirements or CALGreen requirements (whichever is most stringent).

Long Term Bicycle Parking
(PAMC 18.54.060, CGBSC 5.106.4.1, CGBSC 5.106.4.1.2, CGBSC 5.106.4.1.3, CGBSC 5.106.4.1.4, CGBSC 5.106.4.1.5)

☐ Project shows compliance with Palo Alto Zoning requirements or CALGreen requirements (whichever is most stringent).

☐ 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.

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

☐ Project shows compliance with Palo Alto Zoning requirements or CALGreen requirements (whichever is most stringent).

Parking Stall Markings
(CGBSC 5.106.5.2.1)

☐ Paint: In the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle:

CLEAN AIR/
VANPOOL/EV

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

Designated Parking

(CGBSC 5.106.5.2)

☐ In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

TABLE 5.106.5.2

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	0
10–25	1
26–50	3
51–75	6
76–100	8
101–150	11
151–200	16
201 and over	At least 8 percent of total

☐ 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. (Do not schedule on-site inspection until striping is completed.)

☐ 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.

Electric Vehicle (EV) Charging

(PAMC 16.14.430, CGBSC A5.106.5.3)

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

☐ The Inspector shall review the permit set of plans and location of the EV infrastructure. The Inspector shall verify that the electric vehicle pre-wiring infrastructure, EVSE-Ready and EVSE installed infrastructure for Non-Residential Structures, has been installed at the Final Inspection. All electrical inspections are outside the scope of the Green Building Special Inspector.

☐ Tier 2 Projects:

- The following standards apply to newly constructed non-residential structures other than hotels.
  - The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for at least 25 percent of parking spaces, among which at least 5 percent (and no fewer than one) shall be EVSE Installed.
  - Projects shall comply with the 2019 California Building Code requirements for accessible electric vehicle parking.

- 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.
- 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.

- The following standards apply newly constructed hotels.
  - The property owner shall provide Conduit Only, EVSE-Ready Outlet, or EVSE Installed for at least 30 percent of parking spaces, among which at least 10 percent (and no fewer than one) shall be EVSE Installed.
  - Projects shall comply with the 2019 California Building Code requirements for accessible electric vehicle parking.
  - 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.
  - 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.
- Refer to PAMC 16.14.430 Section A5.106.5.3 Definitions for more information.

Light Pollution Reduction
(PAMC 16.14.295, CGBSC 5.106.8)

☐ 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.

☐ Outdoor lighting systems shall be designed and installed with the following:
- The minimum requirements in the California Energy Code for Lighting Zones 0-4
- Backlight (B) ratings as defined in IES TM-15-11.
- Uplight and Glare ratings as defined in California Energy Code (Tables 130.2-A and 130.2-B)
- Allowable BUG ratings not exceeding those in Table 5.106.8 (see table below).
- See applicable exceptions.

FINAL INSPECTION
☐ The inspector shall visually verify that the fixture installed matches the fixture on the cut-sheet.

TABLE 5.106.8 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
Maximum Allowable Backlight Rating[3] (B)					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
Maximum Allowable Uplight Rating (U)					
For area lighting[4]	N/A	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	N/A	U1	U2	U3	U4
Maximum Allowable Glare Rating[5] (G)					
Luminaire greater than 2 MH from property line	N/A	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	N/A	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	N/A	G0	G0	G1	G1
Luminaire front hemisphere is less than 0.5 MH from property line	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for "all other outdoor lighting."
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

Grading and Paving

(CGBSC 5.106.10)

☐ The Special shall review the permit set of plans and review the grading and paving areas of work. Note the grading plan as designed.

☐ Inspector to 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.

☐ Construction plans shall indicate how site grading, or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to the following:

- Swales.
- Water collection and disposal systems.
- French drains.
- Water retention gardens.
- Other water measures which keep surface water away from buildings and aid in groundwater recharge.
- *Exception: Additions and alterations not altering the drainage path.*

Cool Roof for Reduction of Heat Island Effect

(CGBSC A5.106.11.2)

☐ The 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. If the project is complying with the minimum aged solar reflectance and thermal emittance requirements, the Inspector shall request a copy of the Roofing Submittal and verify the values meet the minimum requirement listed in the table below.

☐ Use roofing materials having a minimum aged solar reflectance and thermal emittance complying with Sections A5.106.11.2.1 and A5.106.11.2.2 or a minimum aged Solar Reflectance Index (SRI) complying with Section A5.106.11.2.3 and as shown in Table A5.106.11.2.2 for Tier 1 or Table A5.106.11.2.3 for Tier 2.

- *Exceptions:*
  - *Roof constructions that have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot.*
  - *Roof area covered by building integrated solar photovoltaic and building integrated solar thermal panels.*

Solar Reflectance

(CGBSC A5.106.11.2.1)

☐ Roofing materials shall have a minimum aged solar reflectance equal to or greater than the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2.

TABLE A5.106.11.2.1
VALUES OF SOILING RESISTANCE, ß, BY PRODUCT TYPE

PRODUCT TYPE	CRRC PRODUCT CATEGORY	ß
Field-applied coating	Field-applied coating	0.65
Other	Not a field-applied coating	0.70

TABLE A5.106.11.2.2 [BSC]
TIER 1

ROOF SLOPE	CLIMATE ZONE	MINIMUM AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	1–16	0.63	0.75	75
> 2:12	1–16	0.20	0.75	16

TABLE A5.106.11.2.3 [BSC]
TIER 2

ROOF SLOPE	CLIMATE ZONE	MINIMUM AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	1–16	0.68	0.85	82
> 2:12	1–16	0.28	0.85	27

Thermal Emittance

(CGBSC A5.106.11.2.2)

☐ Roofing materials shall have a CRRC initial or aged thermal emittance as determined in accordance with ASTM E408 or C1371 equal to or greater than those specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2.

Solar Reflectance Index Alternative
(CGBSC A5.106.11.2.3)

☐ Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2 may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

Community Connectivity
(CGBSC A5.103.1)

☐ The Inspector shall verify that compliance documentation shows ten basic services in a ½ mile radius.
- Including, but not limited, to one each of bank, place of worship, convenience grocery, day care, cleaners, fire station, barber shop, beauty shop, hardware store, laundry, library, medical clinic, dental clinic, senior care facility, park, pharmacy, post office, restaurant (two may be counted), school, supermarket, theater, community center, fitness center, museum, or farmers market. Other services may be considered on a case-by-case basis.

Brownfield or Greyfield Site Redevelopment or Infill Area Development
(CGBSC A5.103.2, CGBSC A5.103.2.1)

☐ Develop a site documented as contaminated by means of an ASTM E1903-97 Phase II Environmental Site Assessment or on a site defined as a brownfield by a local, state, or federal government agency. The site must be fully remediated in accordance with EPA regulations to the level required of the anticipated land use.

Reduce Development Footprint and Optimize Open Space
(CGBSC A5.104.1, CGBSC A5.104.1.1 – CGBSC A5.104.1.3)

☐ Optimize open space on the project site in accordance with Sections A5.104.1.1 – A5.104.1.3.
- Exceed zoning's open space requirement for vegetated open space on the site by 25 percent.
- Provide vegetated open space area adjacent to the building equal to the building footprint area.
- Provide vegetated open space equal to 20 percent of the total project site area.

Existing Building Structure (75 percent)
(CGBSC A5.105.1.1)

☐ Maintain at least 75 percent of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing) based on surface area.
- *Exceptions:*
  - *Window assemblies and nonstructural roofing material.*
  - *Hazardous materials that are remediated as a part of the project.*
  - *A project with an addition of more than two times the square footage of the existing building.*

Existing Non-Structural Elements
(CGBSC A5.105.1.2)

☐ Reuse existing interior nonstructural elements (interior walls, doors, floor coverings and ceiling systems) in at least 50 percent of the area of the completed building (including additions).
- *Exception: A project with an addition of more than two times the square footage of the existing building.*

Salvage

(CGBSC A5.105.1.3)

☐ Salvage additional items in good condition such as light fixtures, plumbing fixtures and doors as follows. Document the weight or number of the items salvaged.

- Salvage for reuse on the project items that conform to other provisions of Title 24 in an on-site storage area.
- Nonconforming items may be salvaged in dedicated collection bins for exempt projects or other uses.

Storm Water Design

(CGBSC A5.106.2)

☐ Design storm water runoff rate, quantity, and quality in conformance with Section A5.106.3 Low Impact Development (LID) or by local requirements, whichever are stricter.

Low Impact Development (LID)

(CGBSC A5.106.3)

☐ Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to:

- Bioretention (rain gardens)/filtration planters;
- Precipitation capture (Cisterns and rain barrels);
- Green roofs meeting the structural requirements of the building code;
- Roof leader or impervious area disconnection;
- Permeable and porous paving;
- Vegetative swales and filter strips; tree preservation; and
- Tree preservation and tree plantings;
- Landscaping soil quality;
- Stream buffer; and
- Volume retention suitable for previously developed sites.

Greyfield or Infill Site

(CGBSC A5.106.3.2)

☐ Manage 40 percent of the average annual rainfall on the site's impervious surfaces through infiltration, reuse, or evapotranspiration.

Changing Rooms

(CGBSC A5.106.4.3)

☐ For buildings with over 10 tenant-occupants, provide changing/shower facilities for tenant-occupants only in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.

TABLE A5.106.4.3

NUMBER OF TENANT-OCCUPANTS	SHOWER/ CHANGING FACILITIES REQUIRED [2]	2-TIER (12" X 15" X 72") PERSONAL EFFECTS LOCKERS[1, 2] REQUIRED
0-10	0	0
11-50	1 unisex shower	2
51-100	1 unisex shower	3
101-200	1 shower stall per gender	4
Over 200	1 shower stall per gender for each 200 additional tenant-occupants	One 2-tier locker for each 50 additional tenant-occupants

1. One 2-tier locker serves two people. Lockers shall be lockable with either padlock or combination lock.
2. Tenant spaces housing more than 10 tenant-occupants within buildings sharing common toilet facilities need not comply; however, such common shower facilities shall accommodate the total number of tenant-occupants served by the toilets and include a minimum of one unisex shower and two 2-tier lockers.

Designated Parking for Clean Air Vehicles

(CGBSC A5.106.5.1, A5.106.5.1.1, A5.106.5.1.2, A5.106.5.1.3)

☐ 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. (Do not schedule on-site inspection until striping is completed.)

☐ 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.

☐ Project shall designate parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Tables A5.106.5.1.1 or A5.106.5.1.2.
- Tier 1 Projects: Provide 10 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles per Table A5.106.5.1.1.
- Tier 2 Projects: Provide 12 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles per Table A5.106.5.1.2.

Parking Capacity

(CGBSC A5.106.6)

☐ Design parking capacity to meet but not exceed minimum local zoning requirements.

Reduce Parking Capacity

(CGBSC A5.106.6.1)

☐ With the approval of the enforcement authority, employ strategies to reduce on-site parking area by:
- Use of on street parking or compact spaces, illustrated on the site plan or

- Implementation and documentation of programs that encourage occupants to carpool, ride share or use alternate transportation.
- *Note: Strategies for programs may be obtained from local TMAs.*

Exterior Wall Shading

(CGBSC A5.106.7)

☐ Meet requirements in the current edition of the California Energy Code and comply with either Section A5.106.7.1 or A5.106.7.2 for wall surfaces. If using vegetative shade, plant species documented to reach desired coverage within 5 years of building occupancy.

Fenestration

(CGBSC A5.106.7.1, CGBSC A5.106.7.1.1, CGBSC A5.106.7.1.2)

☐ Provide vegetative or manmade shading devices for all fenestration on east-, south-, and west-facing walls.

☐ On East and West Walls, shading devices shall have 30-percent coverage to a height of 20 feet or to the top of the exterior wall, whichever is less. Calculate shade coverage on the summer solstice at 10 AM for east-facing walls and at 3 PM for west-facing walls.

☐ On South Walls, shading devices shall have 60-percent coverage to a height of 20 feet or to the top of the exterior wall, whichever is less.

Opaque Wall Areas

(CGBSC A6.106.7.2)

☐ Use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.

Hardscape Alternatives

(CGBSC A5.106.11.1)

☐ Use one or a combination of strategies 1 and 2 for 50 percent of site hardscape or put 50 percent of parking underground.

- Use light colored materials with an initial solar reflectance value of at least 30 as determined in accordance with American Society for Testing and Materials (ASTM) Standards E1918 or C1549.
- Use open-grid pavement system or pervious or permeable pavement system.

5.2 ENERGY REACH CODE

Option 1

(PAMC 16.17.080)

☐ The Palo Alto Energy Reach Code will be effective **April 1, 2020**. Projects will need to comply with one of the following options:

- Option 1: All-electric design. Refer to the energy sheets on the approved plans.
- Option 2: Mixed-fuel design w/ increased efficiency. Refer to the energy sheets on the approved plans.

ENERGY STAR Portfolio Manager

(PAMC 16.13.380)

☐ Complete the Energy Star Benchmark after the project has been occupied for 12 months and submit the score (if applicable) to the City of Palo Alto Building Division. https://www.cityofpaloalto.org/gov/depts/utl/business/benchmarking_your_building/default.asp

Performance Review

(PAMC 16.14.390, PAMC 16.14.400)

☐ Performance Review – Energy: For 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.

☐ Performance Review – Water: For sites over 1 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.

5.3 & A5.3 WATER EFFICIENCY AND CONSERVATION

Meters - New Buildings or Additions in Excess of 50,000 square feet
(CGBSC 5.303.1.1)

☐ 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, Including, but not limited to, spaces used for laundry or cleaners, restaurant, or food service, medical or dental office, laboratory, or beauty salon or barber shop. projected to consume more than 100 gallons/day.

☐ Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
- Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
- Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
- Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

Meters. – Excess Consumption
(CGBSC 5.303.1.2)

☐ 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 1,000 gallons/day.

Water Reduction
(CGBSC A5.303.2.3.1, CGBSC A5.303.2.3.2)

☐ The inspector shall field verify that the fixture cut sheet matches the fixture that was installed. Have cut sheets available on-site to verify installation.

☐ Tier 1 Projects: 12 percent savings
- A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 12 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the California Building Standards Code. The 12 percent reduction in potable water use shall be demonstrated by one of the following methods:
  - Prescriptive method. Each plumbing fixture and fitting shall not exceed the maximum flow rate at greater than or equal to 12 percent reduction as specified in Table A5.303.2.3.1
  - Performance method. A calculation demonstrating a 12 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

☐ Tier 2 Projects: 20 percent Savings
- A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. A calculation demonstrating a 20 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

TABLE A5.303.2.2
WATER USE BASELINE[3]

FIXTURE TYPE	BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS[2]
Showerheads	2.0 gpm @ 80 psi	5 min.	1	X[2a]
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	1.8 gpm @ 60 psi	4 min.	1	X[2b]
Replacement aerators	2 gpm @ 60 psi			X
Wash fountains	1.8 gpm/20 [rim space (in.) @ 60 psi]			X
Metering faucets	0.20 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	0.20 gallons/cycle/20 [rim space (in.) @ 60 psi]	.25 min.	1 male[1] 3 female	X
Gravity tank type water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	0.5 or 0.125[4] gallons/flush	1 flush	2 male	X

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. Refer to Table A, Chapter 4, 2019 *California Plumbing Code*, for occupant load factors.
   a. Shower use by occupants depends on the type of use of a building or portion of a building, e.g., total occupant load for a health club, but only a fraction of the occupants in an office building as determined by the anticipated number of users.
   b. Kitchen faucet use is determined by the occupant load of the area served by the fixture.
3. Use worksheet WS-1 to calculate baseline water use.
4. Floor-mounted urinals @ 0.5 GPF or wall-mounted urinals @ 0.125 GPF.

TABLE A5.303.2.3.1
FIXTURE FLOW RATES

FIXTURE TYPE	BASELINE FLOW RATE[2]	MAXIMUM FLOW RATE AT ≥ 12 PERCENT REDUCTION
Showerheads	2.0 gpm @ 80 psi	1.8 gpm @ 80 psi
Lavatory faucets nonresidential[3]	0.5 gpm @ 60 psi	0.35 gpm @ 60 psi
Kitchen faucets[3]	1.8 gpm @ 60 psi	1.6 gpm @ 60 psi
Wash fountains	1.8 gallons/cycle/20 [rim space (in.) @ 60 psi]	1.6 gpm/20 [rim space (in.) @ 60 psi]
Metering faucets	0.20 gallons/cycle	0.18 gallons/cycle
Metering faucets for wash fountains	0.20 gallons/cycle/20 [rim space (in.) @ 60 psi]	0.18 gallons/cycle 20 [rim space (in.) @ 60 psi]
Gravity tank type water closets	1.28 gallons/flush	1.12 gallons/flush[1]
Flushometer tank water closets	1.28 gallons/flush	1.12 gallons/flush[1]
Flushometer valve water closets	1.28 gallons/flush	1.12 gallons/flush[1]
Electromechanical hydraulic water closets	1.28 gallons/flush	1.12 gallons/flush[1]
Urinals	0.5 or 0.125[4] gallons/flush	0.44 or 0.11 gallons/flush

1. Includes water closets with an effective flush rate of 1.12 gallons or less when tested per ASME A 112.19.2 and ASME A 112.19.14.
2. See Table A5.503.2.2 for additional notes and references.
3. Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.
4. Floor-mounted urinals @ 0.5 GPF or wall-mounted urinals @ 0.125 GPF.

☐ *Note: 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.*

Indoor Water Use

(CGBSC 5.303.3, CGBSC 5.303.3.1, CGBSC 5.303.3.2, CGBSC 5.303.3.3, CGBSC 5.303.3.4)

☐ The inspector shall field verify that the fixture cut sheet matches the fixture that was installed. Have cut sheets available on-site to verify installation.

☐ Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

- Water closets:
  - The effective flush volume of all water closets shall not exceed 1.28 gallons per flush.
  - *Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.*
- Urinals:
  - Wall-mounted urinals shall not exceed 0.125 gallons per flush.
  - All other urinals shall not exceed 0.5 gallons per flush.
- Single Showerheads
  - Single showerheads shall not exceed 1.8 gallons per minute.
- Multiple Showerheads
  - When a shower is served by more than one showerhead, the combined flow rate of all showerheads 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.*
- Nonresidential Lavatory Faucets
  - Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.
- Kitchen Faucets
  - Kitchen faucets shall have a maximum flow rate of not more than 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.
- Wash Fountains
  - Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute.
- Metering Faucets
  - Metering faucets shall not deliver more than 0.20 gallons per cycle.
- Metering Faucets for Wash Mountains
  - Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per cycle/20 [rim space (inches) at 60 psi].
  - *Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.*

Commercial Kitchen Equipment and Food Waster Disposers

(CGBSC 5.303.4, CGBSC 5.303.4.1)

☐ Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.

Indoor Water Use: Areas of Addition or Alteration
(CGBSC 5.303.5)

☐ The provisions of Sections 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

Dual Plumbing
(PAMC 16.14.300, CGBSC 5.303.5)

☐ 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.

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.

Indoor Water Use: Standards for Plumbing Fixtures and Fittings - Areas of Addition and Alteration and Standards for Plumbing Fixtures and Fittings
(CGBSC 5.303.5, CGBSC 5.303.6)

☐ For additions and alterations, sections 5.303.3 and 5.303.4 apply. 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 and in Chapter 6 of this code.

Outdoor Potable Water use in Landscape Areas
(CGBSC 5.304.1)

☐ Nonresidential developments shall comply with the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO).

FINAL VERIFICATION

☐ 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.

Recycled Water Supply Systems
(CGBSC 5.305.1)

☐ All newly constructed nonresidential developments, where disinfected tertiary recycled water is available from a municipal source to a construction site, shall be provided with both a potable water supply system and a recycled water supply system. The recycled water supply system shall allow the use of reclaimed (recycled) water for aboveground and subsurface irrigation to all landscape irrigation

systems.

FINAL INSPECTION

☐ 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: 1) use of captured rainwater; 2) Use of recycled water using purple pipe (only in CPAU recycled water areas); 3) use of graywater.

☐ The Special Inspector shall review the Certificate of Compliance to verify the requirement has been achieved.

☐ The Special Inspector shall field verify that systems utilized to achieve the non-potable application has been installed and shall take photos as verification of the installation.

Invasive Species Prohibited

(PAMC 16.14.360, CGBSC 5.304.2)

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

☐ The inspector shall field verify that locally adaptive and/or noninvasive vegetation is installed. See planting schedule for list of plants.

Non-Residential Enhanced Water Budget

(PAMC 16.14.365)

☐ 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 or designee.

Indoor Water Use: 25 percent Reduction

(CGBSC A5.503.2.3.3)

☐ A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 25 percent shall be provided. A calculation demonstrating a 25 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

TABLE A5.303.2.2
WATER USE BASELINE[3]

FIXTURE TYPE	BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS[2]
Showerheads	2.0 gpm @ 80 psi	5 min.	1	X[2a]
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	1.8 gpm @ 60 psi	4 min.	1	X[2b]
Replacement aerators	2 gpm @ 60 psi			X
Wash fountains	1.8 gpm/20 [rim space (in.) @ 60 psi]			X
Metering faucets	0.20 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	0.20 gallons/cycle/20 [rim space (in.) @ 60 psi]	.25 min.	1 male[1] 3 female	X
Gravity tank type water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.28 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	0.5 or 0.125[4] gallons/flush	1 flush	2 male	X

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. Refer to Table A, Chapter 4, 2019 *California Plumbing Code*, for occupant load factors.
   a. Shower use by occupants depends on the type of use of a building or portion of a building, e.g., total occupant load for a health club, but only a fraction of the occupants in an office building as determined by the anticipated number of users.
   b. Kitchen faucet use is determined by the occupant load of the area served by the fixture.
3. Use worksheet WS-1 to calculate baseline water use.
4. Floor-mounted urinals @ 0.5 GPF or wall-mounted urinals @ 0.125 GPF.

Nonpotable Water Systems for Indoor Water Use
(CGBSC A5.503.2.3.4)

☐ Utilizing nonpotable water systems (such as captured rainwater, treated graywater and recycled water) intended to supply water closets, urinals, and other allowed uses, may be used in the calculations demonstrating the 12 percent, 20 percent, or 25 percent reduction. The nonpotable water systems shall comply with the current edition of the California Plumbing Code.

☐ 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.

Appliances and Fixtures for Commercial Application
(CGBSC A5.303.3)

☐ Appliances and fixtures shall meet the following:
- 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.
- Dishwashers shall meet the following water use standards:
  - Residential—ENERGY STAR.

- Standard Dishwashers – 4.25 gallons per cycle.
- Compact Dishwashers – 3.5 gallons per cycle.

▪ Commercial—ENERGY STAR. (See Table A5.303.3.)

- Ice makers shall be air cooled.
- Food steamers shall be connectionless or boilerless and shall consume no more than 2 gallons of water per pan per hour, including condensate water, for batch type steamers, and no more than 5 gallons of water per pan per hour, including condensate water, for cook to order steamers.
- The use and installation of water softeners that discharge to the community sewer system may be limited or prohibited by local agencies if certain conditions are met.
- Combination ovens shall use a maximum of 1.5 gallons of water per hour per pan, including condensate water.
- Commercial pre-rinse spray valves manufactured on or after January 1, 2006, shall function at equal to or less than 1.6 gpm at 60 psi and:
  - Be capable of cleaning 60 plates in an average time of not more than 30 secs. per plate.
  - Be equipped with an integral automatic shutoff.
  - Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gpm or less.
- Food waste pulping systems shall use no more than 2 gpm of potable water.
  - Note: potable water excludes on-site graywater use, such as dishwasher discharge water.

TABLE A5.303.3
COMMERCIAL DISHWASHER WATER USE

TYPE	HIGH-TEMPERATURE— MAXIMUM GALLONS PER RACK	LOW-TEMPERATURE— MAXIMUM GALLONS PER RACK
Single Tank Conveyor	0.70 (2.6 L)	≤ 0.79 (3 L)
Multiple Tank Conveyor	≤ 0.54 (2 L)	≤ 0.54 (2 L)
Stationary Single Tank Door	≤ 0.89 (3.4 L)	≤ 1.18 (4.5 L)
Under Counter	≤ 0.86 (3.3 L)	≤ 1.19 (4.5 L)
Pot, Pan, and Utensil	≤ 0.58 GPSF	≤ 0.58 GPSF
Single Tank Flight Type	GPH ≤ 2.975x + 55.00	GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	GPH ≤ 4.96x + 17.00	GPH ≤ 4.96x + 17.00

Note: GPSF = gallons per square foot of rack; GPH = gallons per hour;
X = square feet of conveyor belt/minute (max conveyor speed sf/min as tested and certified to NSF/ANSI Standard 3)

☐ The inspector shall review the approved set of plans to verify that the specified water-using appliances are installed.

Nonwater Supplied Urinals
(CGBSC A5.303.4.1)

☐ Nonwater supplied urinals are installed in accordance with the California Plumbing Code. Where approved, urinal, hybrids as defined in Chapter 2, shall be considered waterless urinals.

Outdoor Water Use – Irrigation Meter
(CGBSC A5.304.2)

☐ The inspector shall verify that a separate irrigation meter has been installed in accordance with CPAU requirements. The applicant should contact CPAU for any questions related to the installation.

☐ For new water service not subject to the provisions of Water Code Section 535, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas of at

least 500 square feet but not more than 1,000 square feet.

Restoration of Areas Disturbed by Construction
(CGBSC A5.304.6)

- ☐ The inspector shall field verify that locally adaptive and/or noninvasive vegetation is installed. See planting schedule for list of plants.
- ☐ Restore all landscape areas disturbed during construction by planting with local adaptive and/or noninvasive vegetation.

Previously Developed Sites
(CGBSC A5.304.7)

- ☐ On previously developed or graded sites, restore or protect at least 50% of the site area with adaptive and/or noninvasive vegetation. Projects complying with Section A5.106.3, Item 3 may apply vegetated roof surface to this calculation if the roof plants meet the definition of adaptive and noninvasive.
    - *Exception: Area of the building footprint is excluded from the calculation.*

Graywater Irrigation System
(CGBSC A5.304.8)

- ☐ Collect the Certificate of Compliance from the Contractor declaring that the requirements have been met in accordance with this section and the City of Palo Alto Graywater Submittals and Guidelines.

- ☐ The Special Inspector shall field verify that the graywater system utilized to achieve the non-potable application has been installed and shall take photos as verification of the installation.

- ☐ Install a graywater collection system for onsite subsurface irrigation using graywater collected from bathtubs, showers, bathroom wash basins and laundry water. See California Plumbing Code.

Nonpotable Water Systems
(CGBSC A5.305.1)

- ☐ Nonpotable water systems for indoor and outdoor use shall comply with the current edition of the California Plumbing Code.

Irrigation Systems
(CGBSC A5.305.2)

- ☐ Irrigation systems regulated by a local water efficient landscape ordinance or by the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) shall use recycled water.

5.4 & A5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

Recycled Content
(CGBSC A5.405.4)

☐ 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 Projects: 10 percent
- Tier 2 projects: 15 percent

☐ 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 to show compliance.
- The worksheet can be found on the HCD's website under "Documentation and Verification Forms": https://www.hcd.ca.gov/building-standards/calgreen/cal-green-forms.shtml.

Weather Protection
(CGBSC 5.407.1)

☐ Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1402.2 (Weather Protection), manufacturer's installation instructions or local ordinance, whichever is more stringent.

Moisture Control – Sprinklers
(CGBSC 5.407.2, 5.407.2.1)

☐ Design and maintain landscape irrigation systems to prevent spray on structures.

Moisture Control – Entries and Openings
(CGBSC 5.407.2, 5.407.2.2)

☐ Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

Exterior Door Protection
(CGBSC 5.407.2, 5.407.2.2.1)

☐ Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:
- An installed awning at least 4 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.
- Other methods which provide equivalent protection.

Flashing
(CGBSC 5.407.2.2.2)

☐ Install flashings integrated with a drainage plane.

☐ 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.
  - Verify flashing while it is exposed in cases when the design indicated concealed flashing o Take photographs verifying the installation of the system.

Construction Waste Management Plan and Company, Waste Stream Reduction Alternative, Documentation

(CGBSC 5.408.1, CGBSC 5.408.1.1, CGBSC 5.408.1.2, CGBSC 5.408.1.3, CGBSC 5.408.1.4)

☐ Verify the email sent by Planning Department for approval of construction waste reduction in Green Halo.

☐ *Note: The C&D requirements must be met, and the C&D Final shall be approved before the Green Building Final Inspection can be approved.*

Universal Waste

(CGBSC 5.408.2)

☐ Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Excavated Soil and Land Clearing Debris

(CGBSC 5.408.3)

☐ 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed. Exception: Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.

Enhanced Construction Waste Reduction

(PAMC 16.14.370, 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, if 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.

☐ Visit the C&D Debris Diversion Program webpage for instructions on compliance and Green Halo. https://www.cityofpaloalto.org/Departments/Planning-Development/Development-Services/Green-Building/Construction-Demolition-CD-Debris-Diversion-Program

Recycling by Occupants

(CGBSC 5.410.1)

☐ Provide readily accessible areas that serve the entire building and are identified for the depositing, storage, and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Commissioning and Commissioning Plan – New buildings 10,000 square feet and over
(CGBSC 5.410.2)

☐ Building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements.
- Commissioning requirements shall include:
  - Owner's or owner representative's project requirements.
  - Basis of design.
  - Commissioning measures shown in the construction documents.
  - Commissioning plan.
  - Functional performance testing.
  - Documentation and training.
  - Commissioning report.
- *Exceptions:*
  - *Unconditioned warehouses of any size.*
  - *Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.*
  - *Tenant improvements less than 10,000 square feet as described in Section 303.1.1.*
  - *Open parking garages of any size, or open parking garage areas, of any size, within a structure.*
  - *Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.*

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

☐ 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.

Owner's or Owner Representative's Project Requirements (OPR)
(CGBSC 5.410.2.1)

☐ The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

- Environmental and sustainability goals.
- Building sustainable goals.
- Indoor environmental quality requirements.
- Project program, including facility functions and hours of operation, and need for after-hours operation.
- Equipment and systems expectations.
- Building occupant and operation and maintenance (O&M) personnel expectations.

Basis of Design (BOD)
(CGBSC 5.410.2.2)

☐ 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. The Basis of Design document shall cover the following systems: Renewable energy systems, landscape irrigation systems, and water reuse systems.

Functional Performance Testing
(CGBSC 5.410.2.4)

☐ Functional performance tests shall demonstrate the correct installation and operation of each component, system, and system- to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

Documentation and Testing
(CGBSC 5.410.2.5)

☐ A systems manual and systems operations training are required, including Occupational Safety and Health Act (OSHA) requirements in California Code of Regulations (CCR), Title 8, Section 5142, and other related regulations.

Systems Manual
(CGBSC 5.410.2.5.1)

☐ Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:
  - Site information, including facility description, history, and current requirements.
  - Site contact information.
  - Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
  - Major systems.
  - Site equipment inventory and maintenance notes.
  - A copy of verifications required by the enforcing agency or this code.
  - Other resources and documentation, if applicable.

Systems Operations Training
(CGBSC 5.410.2.5.2)

☐ A program for training of the appropriate maintenance staff for each equipment type and/or system

shall be developed and documented in the commissioning report and shall include the following:

- System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
- Review and demonstration of servicing/preventive maintenance.
- Review of the information in the systems manual.
- Review of the record drawings on the system/ equipment.

Commissioning Report
(CGBSC 5.410.2.6)

☐ A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

Testing and Adjusting – New Buildings Less than 10,000 sq. ft or New System for Addition/Alteration
(CGBSC 5.410.4)

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

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

Systems
(CGBSC 5.410.4.2)

☐ Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include, as applicable to the project:

- Renewable energy systems.
- Landscape irrigation systems.
- Water reuse systems.

HVAC Balancing
(CGBSC 5.410.4.3, CGBSC 5.410.4.3.1)

☐ Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

☐ In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

Reporting
(CGBSC 5.410.4.4)

☐ After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

Operation and Maintenance (O&M) Manual
(CGBSC 5.410.4.5, CGBSC 5.410.5.1)

- ☐ Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.
- ☐ The contractor shall prepare and deliver the Operations and Maintenance (O&M) Manual to the owner and Special Inspector
- ☐ The inspector shall verify that the Operations and Maintenance (O&M) Manual is completed.

Inspection and Reports
(CGBSC 5.410.4.5.1)

- ☐ Include a copy of all inspection verifications and reports required by the enforcing agency.

Wood Framing
(CGBSC A5.404.1)

- ☐ Employ advanced wood framing techniques or OVE, as recommended by the U.S. Department of Energy's Office of Building Technology, State and Community Programs and as permitted by the enforcing agency.

Structural or Fire-Resistance Integrity
(CGBSC A5.404.1.1)

- ☐ The OVE selected shall not conflict with structural framing methods or fire-rated assemblies required by the California Building Code.

Framing Specifications
(CGBSC A5.404.1.2)

- ☐ Advanced framing techniques include the following:
  - Building design using 2' modules
  - Spacing wall studs up to 24" on center
  - Spacing floor and roof framing members up to 24" on center
  - Using 2-stud corner framing and drywall clips or scrap lumber for drywall backing
  - Eliminating solid headers in non-load-bearing walls
  - Using in-line framing, aligning floor, wall and roof framing members vertically for direct transfer of loads
  - Using single lumber headers and top plates where appropriate
  - Note: Additional information can be obtained from the U.S. DOE Energy Efficiency and Renewable Energy (EERE) website.

Regional Materials
(CGBSC A5.405.1)

- ☐ 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 in California or within 500 miles of project location.
  - For those materials locally manufactured, select materials manufactured using low embodied energy or those that will result in net energy savings over their useful life.

- Regional materials shall make up at least 10 percent, based on cost, of total materials value.
- If regional materials make up only part of a product, their values are calculated as percentages based on weight.
- Provide documentation of the origin, net projected energy savings and value of regional materials.

Bio-Based Materials
(CGBSC A5.405.2)

☐ Using receipts and records supplied by the building contractor, the inspector shall verify that building materials and products made from solid wood, engineered wood, bamboo, wool, cotton, cork, straw, natural fibers, products made from crops (soy-based, corn-based) and other bio-based materials contain at least 50-percent bio-based content.

Certified Wood
(CGBSC A5.405.2.1)

☐ Certified wood is an important component of green building strategies and the California Building Standards Commission will continue to develop a standard through the next code cycle.

Rapidly Renewable Materials
(CGBSC A5.405.2.2)

☐ The inspector shall verify, using receipts and certifications provided by the contractor, that the project has used materials from plants harvested within a ten-year cycle for at least 2.5% of the materials value based on the project cost.

Reused Materials
(CGBSC A5.405.3)

☐ The inspector shall verify, through receipts and other product-purchased documentation, that the percentage of building materials that have been salvaged, refurbished, refinished or reused (replacing the need for those additional "new materials") is 5% or greater of the total value, based on material cost of the project.

Alternate Method for Concrete
(CGBSC A5.405.4.5)

☐ When Supplementary Cementitious Materials (SCMs), such as fly ash or ground blast furnace slag cement, are used in concrete, an alternate method of calculating and reporting recycled content in concrete products shall be permitted. When determining the recycled content value, the percent recycled content shall be multiplied by the cost of the cementitious materials only, not the total cost of the concrete.

Cement and Concrete
(CGBSC A5.405.5)

☐ Use cement and concrete made with recycled products and complying with the following sections.

Cement

(A5.405.5.1)

☐ Cement shall comply with one of the following standards:
- Portland cement shall meet ASTM C150, Standard Specification for Portland Cement.
- Blended cement shall meet ASTM C595, Standard Specification for Blended Hydraulic Cement or ASTM C1157, Standard Performance Specification for Hydraulic Cement.
- Other Hydraulic Cements shall meet ASTM C1157, Standard Performance Specification for Hydraulic Cement.

Concrete

(A5.405.5.2)

☐ Unless otherwise directed by the Engineer of Record, use concrete manufactured with cementitious materials in accordance with Sections A5.405.5.2.1 and A5.405.5.2.1.1, as approved by CPA.

Supplementary Cementitious Materials (SCM)

(CGBSC A5.405.5.2.1)

☐ Use concrete made with one or more supplementary cementitious materials (SCM).

Mix Design Equation

(CGBSC A5.405.5.2.1.1)

☐ Use any combination of one or more SCM, satisfying Equation A5.4-14. When ASTM C595 or ASTM C1157 cement is used, the amount of SCM in these cements shall be used in calculating Equation A5.4-14.

Additional Means of Compliance

(CGBSC A5.405.5.3)

☐ Any of the following measures shall be permitted to be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with Section A5.405.5.2.

Alternative Fuels

(CGBSC A5.405.3.1.1)

☐ The use of alternative fuels where permitted by state or local air quality standards.

Alternative Power

(CGBSC A5.405.3.1.2)

☐ Alternate electric power generated at the cement plant and/or green power purchased from the utility meeting the requirements of Section A5.211.

Recycled Aggregates

(CGBSC A5.405.5.3.2.2)

☐ Concrete made with one or more of the following materials:
- Blast furnace slag as a lightweight aggregate in unreinforced concrete.
- Recycled concrete that meets grading requirements of ASTM C33, Standard Specification for Concrete Aggregates.

- Other materials with comparable or superior environmental benefits, as approved by the engineer and enforcing authority.

Mixing Water
(CGBSC A5.405.5.3.2.3)
☐ Water recycled by the local water purveyor or water reclaimed from manufacturing processes and conforming to ASTM C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

High Strength Concrete
(CGBSC A5.405.5.3.2.4)
☐ Concrete elements designed to reduce their total size compared to standard 3,000 psi concrete, thereby reducing the total volume of cement, aggregate and water used on the project, as approved by the Engineer of Record.

Choice of Materials
(CGBSC A5.406.1)
☐ Compared to other products in a given product category, choose materials proven to be characterized by one or more of the following.

Service Life
(CGBSC A5.406.1.1)
☐ Select materials for longevity and minimal deterioration under conditions of use.

Reduced Maintenance
(CGBSC A5.406.1.2)
☐ Select materials that require little, if any, finishing. For those with surface protection, choose materials that do not require frequent applications of toxic or malodorous finishes.

Recyclability
(CGBSC A5.406.1.3)
☐ Select materials that can be reused or recycled at the end of their service life in the project.

Life Cycle Assessment (ISO 14044 Compliant)
(CGBSC A5.409.1)
☐ Life cycle assessment shall be ISO 14044 compliant. The service life of the building and materials assemblies shall not be less than 60 years unless designated in the construction documents as having a shorter service life as approved by the enforcing agency.

Whole Building Life Cycle Assessment
(CGBSC A5.409.2)
☐ Conduct a whole building life assessment, including operating energy, showing that the building project achieves at least a 10 percent improvement for at least three of the impacts listed in Section A5.409.2.2, one of which shall be climate change, compared to a reference building of similar size, function, complexity and operating energy performance, and meeting the 2016 California Energy

Code at a minimum.

Building Components

(CGBSC A5.409.2.1)

☐ The building envelope, structural elements, including footings and foundations, interior ceilings, walls, and floors; and exterior finishes shall be considered in the assessment.

☐ *Exceptions:*

- *Plumbing, mechanical and electrical systems and controls; fire and smoke detection and alarm systems and controls; and conveying systems.*
- *Interior finishes are not required to be included.*

Impacts to be Considered

(CGBSC A5.409.2.2)

☐ Select from the following impacts in the assessment:

- Climate change (greenhouse gases).
- Fossil fuel depletion.
- Stratospheric ozone depletion.
- Acidification of land and water sources.
- Eutrophication.
- Photochemical oxidants (smog).

Materials and System Assemblies

(CGBSC A5.409.3)

If whole building analysis of the project is not elected, select a minimum of 50 percent of materials or assemblies based on life cycle assessment of at least three of the impacts listed in Section A5.409.2.2, one of which shall be climate change. Note: Software for calculating life cycle assessments for assemblies and materials may be found at the Athena Institute web site and the NIST BEES website.

Substitution of Prescriptive Standards

(CGBSC A5.409.4)

☐ Performance of a life cycle assessment completed in accordance with Section A5.409.2 may be substituted for other prescriptive Material Conservation and Resource Efficiency provisions of Division A5.4, including those made mandatory through local adoption of Tier 1 or Tier 2 in Division A5.6.

Verification of Compliance

(CGBSC A5.409.5)

☐ Documentation of compliance shall be provided as follows:

- The assessment is performed in accordance with ISO 14044.
- The project meets the requirements of other parts of Title 24.
- A copy of the analysis shall be made available to the enforcement authority.
- A copy of the analysis and any maintenance or training recommendations shall be included in the operation and maintenance manual.

5.5 & A5.5 ENVIRONMENTAL QUALITY

Fireplaces

(CGBSC 5.503.1)

☐ Install only a direct-vent sealed-combustion gas and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150.

Temporary Ventilation (MERV 8)

(CGBSC 5.504.1)

☐ 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 it meets a minimum of MERV 8.

Covering of Duct Openings and Protection of Mechanical Equipment During Construction

(CGBSC 5.504.3)

incremental

☐ At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

☐ 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.

☐ 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.

Adhesives, Sealants, and Caulks (Comply with VOC Limits)

(CGBSC 5.504.4.1)

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

- Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. 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, below.
- Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.

Paints and Coatings: Comply with VOC Limits (Table 5.504.4.3)

(CGBSC 5.504.4.3)

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

- Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

Aerosol Paints and Coatings

(CGBSC 5.504.4.3.1)

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

- Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

Verification

(CGBSC 5.504.4.3.2)

☐ Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

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

TABLE 5.504.4.1
ADHESIVE VOC LIMIT[1,2]
Less Water and Less Exempt Compounds in Grams Per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesive not specifically listed	50
SPECIALTY APPLICATIONS	
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

1. If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168, http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF.

TABLE 5.504.4.2
SEALANT VOC LIMIT
Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
SEALANT PRIMERS	
Architectural Nonporous Porous	 250 775
Modified bituminous	500
Marine deck	760
Other	750

Note: For additional information regarding methods to measure the VOC content specified in these tables, see South Coast Air Quality Management District Rule 1168.

TABLE 5.504.4.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2, 3]
Grams of VOC per Liter of Coating,
Less Water and Less Exempt Compounds

COATING CATEGORY	CURENT LIMIT
Flat coatings	50
Nonflat coatings	100
Nonflat-high gloss coatings	150
SPECIALTY COATINGS	
Aluminum roof 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
Fire resistive 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[1]	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	500
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers, and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs Clear Opaque	 730 550
Specialty primers, sealers and undercoaters	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340

1. Grams of VOC per liter of coating, including water and including exempt compounds.
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

Carpet Systems

(CGBSC 5.504.4.4)

☐ All carpet installed in the building interior shall meet at least one of the following testing and product requirements:

- Carpet and Rug Institute's Green Label Plus Program
- Compliant with the VOC-emission limits and testing requirements specified in 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 1.1, February 2010 (also known as CDPH Standard Method V1.1 or Specification 01350)
- NSF/ANSI 140 at the Gold level or higher
- Scientific Certifications Systems Sustainable Choice
- Compliant with the Collaborative for High Performance Schools California (2014 CA-CHPS) Criteria and listed in the CHPS High Performance Product Database.

Carpet Cushion

(CGBSC 5.504.4.4.1)

☐ All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program.

Carpet Adhesive

(CGBSC 5.504.4.4.2)

☐ All carpet adhesive shall meet the requirements of Table 5.504.4.1.

Composite Wood Products

(CGBSC 5.504.4.5)

☐ 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 "Ultra- low emitting formaldehyde."

☐ 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 (ATCM) for Composite Wood (17 CCR 93120 et seq.) See Table 5.504.4.5.

TABLE 5.504.4.5
FORMALDEHYDE LIMITS[1]
Maximum Formaldehyde Emissions in Parts per Million

PRODUCT	CURRENT 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[2]	0.13

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E1333. For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of $^{5}/_{16}$ inch (8 mm).

Documentation

(CGBSC 5.504.4.5.3)

☐ Verification of compliance with this section shall be provided as requested by CPA. Documentation shall include at least one of the following:

- Product certifications and specifications.
- Chain of custody certifications.
- Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
- Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
- Other methods acceptable to the enforcing agency.

Resilient Flooring Systems

(CGBSC 5.504.4.6, A5.504.4.7, A5.504.4.7.1)

☐ The inspector shall review the Material Safety Data Sheets (MSDS) of the resilient flooring material (i.e., Vinyl, linoleum). Each MSDS should show one of the following:

☐ Installed resilient flooring shall meet at least one of the following:

- Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
- Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
- Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
- Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).
  - *Exception: Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.*

☐ Mandatory Projects:

- For 80 percent of floor area receiving resilient flooring, meet requirements in 5.504.4.6.

☐ Tier 1 Projects:

- For 90 percent of floor area receiving resilient flooring, meet requirements in A5.504.4.7

☐ Tier 2 Projects:

- For 100 percent of floor area receiving resilient flooring, meet requirements in A5.504.4.7.1.

Thermal Insulation

(CGBSC A5.504.4.8, A5.504.4.8.1)

☐ Tier 1 Projects:

- Comply with thermal insulation meeting 2009 CHPS low-emitting materials list in Section A5.504.4.8.

- ☐ Tier 2 Projects:
    - Install thermal insulation meeting 2009 CHPS low-emitting materials list and does not contain any added formaldehyde.

Environmental Tobacco Smoke (ETS) Control
(CGBSC 5.504.7)

- ☐ Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

Outside Air Delivery (For Indoor Air Quality)
(CGBSC 5.506.1)

- ☐ For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the California Energy Code, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

Carbon Dioxide (CO_2) Monitoring (For Indoor Air Quality)
(CGBSC 5.506.2)

- ☐ 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).

- ☐ For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120.1(c)(4).

Indoor Air Quality Management Plan
(PAMC 16.14.410)

- ☐ All commercial and multifamily 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.

Acoustical Control (STC Values per ASTM E90 and ASTM E413)
(CGBSC 5.507.4)

- ☐ Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E90 and ASTM E413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.
    - Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exterior Noise Transmission – Prescriptive Method

(CGBSC 5.507.4.1)

☐ Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

- Within the 65 CNEL noise contour of an airport. Exceptions:
  - Ldn or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
  - Ldn or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.
- Within the 65 CNEL or Ldn noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

Noise exposure where noise contours are not readily available

(CGBSC 5.507.4.1.1)

☐ Buildings exposed to a noise level of 65 dB Leq-1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

Exterior Noise Transmission – Performance Method

(CGBSC 5.507.4.2)

☐ For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

Site Features

(CGBSC 5.507.4.2.1)

☐ Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

Documentation of Compliance

(CGBSC 5.507.4.2.2)

☐ An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

Interior Sound Transmission

(CGBSC 5.507.4.3)

☐ Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40. Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: http://www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

Chlorofluorocarbons
(CGBSC 5.508.1.1)
☐ Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

Halons
(CGBSC 5.508.1.2)
☐ Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

Supermarket Refrigerant Leak Reduction
(CGBSC 5.508.2)
☐ New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.
- Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO2), and potentially other refrigerants.

Refrigerant Piping
(CGBSC 5.508.2.1)
☐ Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4-inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

☐ Threaded connections are permitted at the compressor rack.

Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less. One-fourth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

☐ Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil. Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

☐ Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

Valves
(CGBSC 5.508.2.2)
☐ Valves and fittings shall comply with the California Mechanical Code and as follows.

☐ For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

☐ Only Schrader access valves with a brass or steel body are permitted for use.

- For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.
- If designed for it, the cap shall have a neoprene O-ring in place.
  - Chain tethers to fit over the stem are required for valves designed to have seal caps.
    - Exception: Valves with seal caps that are not removed from the valve during stem operation.

Service Cases

(CGBSC 5.508.2.3)

☐ Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

☐ Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

Receivers

(CGBSC 5.508.2.4)

☐ Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device that indicates the level of refrigerant in the receiver.

Pressure Testing

(CGBSC 5.508.2.5)

☐ The system shall be pressure tested during installation prior to evacuation and charging.

☐ The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

☐ Check the system for leaks, repair any leaks, and retest for pressure using the same gauge

☐ The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

Evacuation

(CGBSC 5.508.2.6)

☐ The system shall be evacuated after pressure testing and prior to charging.

☐ Pull a system vacuum down to at least 1000 microns (+/- 50 microns) and hold for 30 minutes.

☐ Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

☐ Pull a third vacuum down to a minimum of 300 microns and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

Indoor Air Quality (IAQ) – Temporary Ventilation

(CGBSC A5.504.1.1)

☐ Provide temporary ventilation during construction in accordance with Section 120.1 (Requirements for Ventilation) of the California Energy Code, CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 and as follows:

- Ventilation during construction shall be achieved through openings in the building shell using fans to produce a minimum of three air changes per hour.
- If the building is occupied during demolition or construction, meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.

Additional IAQ Measures

(CGBSC A5.504.1.2)

☐ Employ additional measures as follows:

- When using generators to generate temporary power, use generators meeting the requirements of CCR, Title 13, Chapter 9 or local ordinance, whichever is more stringent.
- Protect on-site absorbent materials from moisture. Remove and replace any materials with evidence of mold, mildew or moisture infiltration.
- Store odorous and high VOC-emitting materials off-site, without packaging, for a sufficient period to allow odors and VOCs to disperse.
- When possible, once materials are on the jobsite, install odorous and high VOC-emitting materials prior to those that are porous or fibrous.
- Clean oil and dust from ducts prior to use.

Postconstruction

(CGBSC A5.504.2)

☐ After all interior finishes have been installed, flush out the building by supplying continuous ventilation with all air handling units at their maximum outdoor air rate and all supply fans at their maximum position and rate for at least 14 days.

- During this time, maintain an internal temperature of at least 60°F and relative humidity no higher than 60 percent. If extenuating circumstances make these temperature and humidity limits unachievable, the flush-out may be conducted under conditions as close as possible to these limits, provided that documentation of the extenuating circumstances is provided in writing.
- Occupancy may start after 4 days, provided flush-out continues for the full 14 days. During occupied times, the thermal comfort conditions of Title 24 must be met.
- For buildings that rely on natural ventilation, exhaust fans and floor fans must be used to improve air mixing and removal during the 14-day flush-out and windows should remain open.
- Do not "bake out" the building by increasing the temperature of the space.
- If continuous ventilation is not possible, flush-out air must total the equivalent of 14 days of

maximum outdoor air. The equivalent of 14 days of maximum outdoor air (the target air volume) shall be calculated by multiplying the maximum feasible air flow rate (in ft3/m) by 14 days (20,160 minutes). The air volumes for each period of ventilation are then calculated and summed and the flush-out continues until the total equals the target air volume.

Testing
(CGBSC A5.504.2.1)

☐ If the engineer determines that building flush-out pursuant to Section A5.504.2 is not feasible, a testing alternative may be employed after all interior finishes have been installed, using testing protocols recognized by the United States Environmental Protection Agency (U.S. EPA).

Maximum Levels of Contaminants
(CGBSC A5.504.2.1.1)

☐ Allowable levels of contaminant concentrations measured by testing shall not exceed the following:
- Carbon Monoxide (CO): 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-Phenylcyclohexene (4-PCH), if fabrics and carpets with styrene butadiene rubber (SBR) latex backing, are installed: 6.5 micrograms per cubic meter; and
- Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.

Test Protocols
(CGBSC A5.504.2.1.2)

☐ Testing of indoor air quality should include the following elements:
- The contaminant sampling and averaging times and the measurement methods should be sufficient to achieve a Limit of Detection that is below the maximum allowable concentrations.
- Testing should be conducted with the HVAC system operated at the minimum design outdoor air ventilation rate.
- Air samplers and monitors should be located near likely sources of formaldehyde and other volatile organic compounds, at a height of 3 to 6 feet from the floor and well away from walls and air diffusers.
- The test protocols should be justified with documentation to show that appropriate sampling methods and times were used.

Noncomplying Building Areas
(CGBSC A5.504.2.1.3)

☐ For each sampling area of the building exceeding the maximum concentrations specified in Section A5.504.2.1.1, flush out with outside air and retest samples taken from the same area. Repeat the procedures until testing demonstrates compliance. Note: U.S. EPA-recognized testing protocols may be found on the Air Resources Board web site.

Acoustical Ceiling and Wall Panels
(CGBSC A5.504.4.9)

☐ Comply with Chapter 8 in Title 24, Part 2, the California Building Code and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its High-Performance Products Database.

Verification of Compliance
(CGBSC A5.504.4.9.1)

☐ Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.
- Note: Products compliant with CHPS criteria certified under the Greenguard Children & Schools program may also be used.

Entryway Systems - Hazardous Particulates and Chemical Pollutants
(CGBSC A5.504.5, A5.504.5.1)

☐ 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.
- Qualifying entryways are those that serve as regular entry points for building users.
- Acceptable entryway systems include, but are not limited to, permanently installed grates, grilles or slotted systems that allow cleaning underneath.
- Roll-out mats are acceptable only when maintained regularly by janitorial contractors as documented in service contract or by in-house staff as documented by written policies and procedures.

Isolation of Pollutant Sources
(CGBSC A5.504.5.2)
FINAL INSPECTION

☐ The inspector shall confirm, rooms where activities produce hazardous fumes or chemicals, such as garages, janitorial or laundry rooms and copy or printing rooms, are exhausted and isolated from adjacent rooms.
- Exhaust each space with no air recirculation in accordance with ASHRAE 62.1, Table 6-4 to create negative pressure with respect to adjacent spaces with the doors to the room closed.
- For each space, provide self-closing doors and deck to deck partitions or a hard ceiling.
- Install low-noise, vented range hoods for all cooking appliances and in laboratory or other chemical mixing areas.

Single-Occupant Spaces – Lighting and Thermal Comfort Controls
(CGBSC A5.507.1.1)

☐ Provide individual controls that meet energy use requirements in the California Energy Code (CEnC) in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2.

☐ Provide individual task lighting and/or daylighting controls for at least 90 percent of the building occupants.

☐ Provide individual thermal comfort controls for at least 50 percent of the building occupants.
- Occupants shall have control over at least one of the factors of air temperature, radiant temperature, air speed and humidity as described in ASHRAE 55-2004.
- Occupants inside 20 feet of the plane of and within 10 feet either side of operable windows can substitute windows to control thermal comfort. The areas of operable window must meet the requirements of Section 120.1 (Requirement for Ventilation) of the CEnC.

Multi-Occupant Spaces – Lighting and Thermal Comfort Controls
(CGBSC A5.507.1.2)

☐ Provide lighting and thermal comfort system controls for all shared multi-occupant spaces, such as classrooms and conference rooms.

Daylight
(CGBSC A5.507.2)

☐ Provide daylit spaces as required for top-lighting and sidelighting in the California Energy Code. In constructing a design, consider the following:
- Use of light shelves and reflective room surfaces to maximize daylight penetrating the rooms
- Means to eliminate glare and direct sun light, including through skylights
- Use of photosensors to turn off electric lighting when daylight is sufficient
- Not using diffuse daylighting glazing where views are desired

Views
(CGBSC A5.507.3)

☐ Achieve direct line of sight to the outdoor environment via vision glazing between 2 feet 6 inches and 7 feet 6 inches above finish floor for building occupants in 90 percent of all regularly occupied areas as demonstrated by plan view and section cut diagrams.

Interior Office Spaces
(CGBSC A5.507.3.1)

☐ Entire areas of interior office spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.

Multi-Occupant Spaces
(CGBSC A5.507.3.2)

☐ Include in the calculation the square footage with direct line of sight to perimeter vision glazing.

Hydro-Chlorofluorocarbons (HCFCs)
(CGBSC A5.508.1.3)

☐ Install HVAC and refrigeration equipment that do not contain HCFCs.

Hydrofluorocarbons (HFCs)
(CGBSC A5.508.1.4)

☐ Install HVAC complying with either of the following:
- Install HVAC, refrigeration and fire suppression equipment that do not contain HFCs or that do not contain HFCs with a global warming potential greater than 150.
- Install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a global warming potential no greater than 1.