City of Santa Cruz
Nonresidential Green Building Guideline

Guideline for

Nonresidential New Construction Checklist

and

Addition/Tenant Improvement Checklist

January 1, 2022

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Introduction to the City of Santa Cruz Green Building Program

The City of Santa Cruz continues to take a leadership role to ensure development in Santa Cruz is sustainable, practical, and achievable. Green building is quality design and construction that:

- Minimizes environmental impact
- Conserves and effectively utilizes natural resources and energy
- Provides a healthy living and workspace
- Reduces maintenance, utilities, and operating costs.

The City of Santa Cruz Green Building Program Has Been Updated

The California Building Standards Commission adopted the first mandatory statewide *Green Building Standards Code* (CALGreen), which went into effect on January 1, 2011. The mandatory CALGreen requirements preface the updated City of Santa Cruz's Green Building Program, and the City's Building Department is responsible for enforcing them. In addition to mandatory measures required by CALGreen, there are additional City green building measures from which applicants may choose in order to obtain their building permit.

All measures are described in the updated Santa Cruz Green Building Guidelines and associated Green Building Checklists. Some features of the updated program include:

- Highlighted CALGreen mandatory requirements for ease of identification that ensure your project complies with CALGreen.
- Updated user-friendly program guidelines and Checklists.
- Continued use of a flexible point system to achieve building permits (required), prioritized permit processing (optional), Green Building Certificate (optional), or Green Building Plaque for Exceptional Design (optional).

How to Use the Nonresidential Green Building Guidelines and Checklists

These Guidelines are for developers and builders planning to construct a new Nonresidential project, or addition/alteration for a Nonresidential project in the City of Santa Cruz. The Guidelines provide step-by-step guidance for compliance with the Green Building program requirements. The Guidelines assist in completion of the Nonresidential New Construction Checklist and the Nonresidential Additions/Alteration Checklist and provide resources to achieve (or exceed) compliance with the program.

The Nonresidential New Construction Checklist and the Nonresidential Additions/Alterations Checklist are available in hard copy and electronic format as Microsoft Excel documents. The Excel document calculates the point totals associated with selected green building measures. All program documentation, including the Checklists, can be downloaded from the City's Green Building Program webpage.

A Microsoft Excel version of each Green Building Checklist can be downloaded at: www.cityofsantacruz.com/greenbuilding

Compliance Requirements for Nonresidential New Construction and Tenant Improvements

The Green Building Program applies to all Nonresidential and Residential projects within the City of Santa Cruz and includes compliance standards (per the City of Santa Cruz Green Building Regulations, Chapter 24.15) for the following:

- All new Nonresidential construction.
- Nonresidential additions[1] and tenant improvements over 1,000 square feet[2]. Exempt projects are highly encouraged to voluntarily incorporate green measures.
- Residential and Nonresidential (Mixed-Use) will be considered separately. For example, a mixed-use project with ground-level commercial space and Residential space above will use the Nonresidential Checklist for the Nonresidential ground-level space and the Residential Checklist will be used for the residential space.

Permit applicants choose from the Checklist of green building measures, and each green building measure has an assigned point value. Applicants need to meet a minimum number of points for receipt of a building permit or other optional levels of action, such as Prioritized Permit Processing or a Green Building Award Certificate. Compliance is measured by the total points selected by the applicant, and points are verified by building inspectors during the inspection process.

The project must meet a minimum number of points for the following levels of actions:

1. **Receipt of a building permit (mandatory)**. *All projects must meet a calculated minimum number of points to receive a building permit.*
2. **Prioritized permit processing (optional)**. Upon review and approval by all required departments, priority is given to building permit issuance by expediting standard processing timelines. Time may be saved during the processing of the actual permit; however, inter-departmental review time is not reduced.
3. **Green Building Award Certificate (optional)**. Projects receive a Green Building Award Certificate and prioritized permit processing.
4. **Green Building Plaque for Exceptional Design (optional)**. Projects receive a Green Building Plaque and recognition by the City of Santa Cruz City Council and prioritized permit processing.

Permit applicants must complete an Index of Selected Green Building Measures to include it on the cover of the project's Building Plans.

As part of the permit application process, applicants must complete an *Index of Selected Green Building Measures* (Index) summarizing selected measures and include the Index on the cover of the building plans with selected measures identified on the plan set. Projects are required to implement the green measures identified in the Index. The Index serves as the basis of compliance against which measures are verified by building inspectors. Projects must successfully pass the final point verification during the final inspection process. When the project is completed and the required Green Building measures are implemented and verified, occupancy will be granted.

[1] Addition represents an extension or increase in floor area of an existing building or structure.
[2] Conditions that do not allow for full compliance may request an exemption. Exemptions will be considered for review by the building official.

STEP 1: Determine If Your Project Is Subject to the Green Building Program Requirements

The following project types have green building compliance requirements:

- All new nonresidential construction. All new construction projects must comply with CALGreen.
- All nonresidential additions of 1,000 square feet must comply with the City's Green Building program and with CALGreen.
- Mixed-use buildings that contain nonresidential and residential portions. The nonresidential portion of the project must meet the nonresidential green building requirements. The residential portion of the project must meet the residential green building requirements.
- All nonresidential projects greater than 10,000 square feet require building commissioning per the CALGreen code.

STEP 2: Determine the Point Requirements for Your Project

Calculating Point Requirements

1. Review the Nonresidential New Construction and Addition/Tenant Improvement Compliance Standards Table (below) to determine the point requirements for the desired level of action (e.g., permit issuance, prioritized permit processing, Green Building Award Certificate, or Green Building Plaque for Exceptional Design). All construction projects must comply with CALGreen.
2. Exceeding the minimum point requirements by 15-20% is recommended to allow for project modifications.

Nonresidential Project Compliance Standards

The following table is from the City of Santa Cruz Green Building Regulations (Chapter 24.15) and explains the required points for Nonresidential new construction and addition/alteration projects.

New Construction and Addition/Alteration Compliance Standards		
Action Level	**Points Required to Receive Action**	
	New Construction	**Additions/ Alterations**
C-1. Building Permit Issuance	7	5
C-2. Prioritized Building Permit Processing	33	29
C-3. Green Building Award Certificate	40	35
C-4. Green Building Plaque for Exceptional Design[1]	48	42

[1]Exceptional Design is determined by the principal planner, building official or their designee. The project is eligible for a Green Building Plaque that may be displayed on the structure and is recognized by the City of Santa Cruz.

The Nonresidential Program is performance-based, and the threshold for each level of action (described above) is not dependent on the project size. As a performance-based system, the program provides flexibility to accommodate a variety of designs and materials. The City does not require the various levels of LEED compliance (Certified, Silver, Gold, or Platinum); however, with the City's authorization, the development team may opt for full LEED certification through the USGBC system and may substitute compliance with the City's program.

The City's Nonresidential Checklists incorporate LEED's six major categories:

Sustainable Sites
Site selection affects energy consumption, commuting choices, local ecosystems, and infrastructure needs. Considerations include proximity to downtown, urban redevelopment, rehabilitation of adversely affected lands, minimizing building footprint, preserving natural ecosystems and agricultural lands, building orientation, landscaping, stormwater flow, and erosion control.

Water Efficiency
Maximize water conservation and water quality.

Energy and Atmosphere
Maximize use of renewable energy sources, energy efficiency, and passive solar design measures. Minimize fossil fuel and other non-renewable resource use.

Materials and Resources
Maximize use of reused/reusable and recycled content/recyclable materials. Minimize use of scarce resources and materials that create environmental or health problems during mining, production, transportation, building, use, or at the end of their useful life.

Indoor Environmental Quality
Maximize indoor air quality. Minimize or eliminate toxic emissions generated by chemical off-gassing from synthetic and treated materials or from mold, including chemicals in furniture, rugs, and prefabricated materials.

Innovation and Design
Encourage innovative approaches not specified in the other categories that enhance LEED objectives and City policies.

STEP 3: Review and Complete the Green Building Checklist

Review the checklist for green building measures that should be considered for integration **as early as possible in the project, during the planning stage**, well in advance of permit application. There are separate Checklists for Nonresidential New Construction projects and Nonresidential Additions/Alterations. For additional information and instructions, be sure to review the *Intent* statements associated with the measures.

Exceeding the minimum point requirement by several points is recommended to allow for project modifications.

For ease of reference, each Checklist includes mandatory measures (including CALGreen mandatory measures) highlighted at the beginning of each category. The following table summarizes the mandatory CALGreen residential measures.

STEP 4: Complete the "Index of Selected Green Measures"

After completion of the Checklist, include selected measures in an *Index of Selected Green Measures* (Index) on the coversheet of the plans submitted for the permit application. The Index must include the point category, measure, points, and plan page number. See the following table for an example of an *Index of Selected Green Measures*. The Index must be cross-referenced on the plan page with callouts specific to the green measure location, application, utilization, or installation. The points for the project will be verified and totaled during the plan check process.

Plans and applications will be reviewed relative to the level of action sought (e.g. permit issuance, green building award certificate, etc.) Plans that do not comply with the requirements will not be considered for further processing. Processing will proceed when plans are re-submitted to reflect the level of action desired. *The following is an abbreviated example of an Index and does not contain all required mandatory measures.*

EXAMPLE
Index of Nonresidential Selected Green Measures

Category and Measure	Plan Page	Points
A. Green Design for Planning Stage/Sustainable Site/Energy & Atmosphere		
M8. 5.106.8 – Light Pollution Reduction	A-2	M
M9. 5.106.10 – Grading & Paving	A-1	M
15. Heat Island Effect – Hardscape Alternatives and Cool Roof	A-3	1
B. Water Efficiency		
M6. 5.303.6 – Standards for Plumbing Fixtures and Fittings	L-1	M
M7. 5.304.1 – Outdoor Potable Use in Landscape Areas	L-1	M
14. Non-Potable Water System	L-1	2
C. Energy and Atmosphere		
M5. 5.508.1 – Ozone Depletion and Greenhouse Gas Reductions	S-1	M
M6. 5.508.2 – Supermarket Refrigerant Leak Reduction	S-1	M
8. Install NEEA Rated Commercial Heat Pump Water Heater	P-1	1
17. Elevators and Escalators	M-1	2
D. Materials and Resources		
M8. 5.408.3 – Excavated Soil and Land Clearing Debris	S-2	M
M9. 5.410.1 – Recycling by Occupants	S-2	M
D19. Use Alternative Drywall Materials	A-5	2
E. Indoor Environmental Quality		
M1. 5.507.4 – Acoustical Control	A-3	M
17. Entryway Systems	A-4	1
20. Composite Wood Products	A-4	1
F. Innovation in Design		
5. Green Building Accredited Professional	A-1	1
Total Points Achieved		**11**

An index similar to this example must be included in the plan set and must correspond to the reference measures within the construction documents.

STEP 5: Implement Selected Green Measures and Pass Inspections

Implement the green measures selected on the *Index of Selected Green Building Measures.* Minor green measure substitutions are allowed provided they are at least equal in merit to the original green measures indicated on the plans. Major changes require re-submittal in writing for approval/verification by the Building Department.

The Index is the basis of compliance and measures are verified by building inspectors during the inspection process. The inspectors will verify compliance with CALGreen and the City of Santa Cruz mandatory requirements. The following are examples of measures that would be inspected during the grading/site inspection, foundation inspection, underfloor/underslab inspection, prior to close-in inspection and the final inspection. Inspections must be successfully passed prior to concealing work or proceeding to the next phase of the project.

Grading/Site — Verify Grading and Site Development:

- (A. Site) Verify SWPPP and BMP measures in place and functional
- (D. Materials) Verify base materials for road or parking lot contain recycled concrete by the percentage specified, prior to placing pavement
- (D. Materials) Verify construction waste management plan and diversion, for 80%

Foundation/Under-floor/Under-slab — Prior to placing foundation concrete, covering under slab or under-floor work:

- (B. Water) Verify under-slab piping to use reclaimed condensate water for landscape irrigation
- (A. Site) Verify under-slab conduit runs to E.V. charging station and parking space

Framing/Rough MEP — Prior to concealing work in walls, chases or ceilings:

- (E. Interior Environment) Verify ducts and mechanical systems are protected and covered during construction
- (D. Materials) Verify flashing is integrated with drainage plane

Final Inspection — Prior to Certificate of Occupancy issuance:

- (C. Energy) Verify commissioning process and O&M manual
- (B. Water) Verify installation of soil moisture or weather-based landscape irrigation controllers

Projects must successfully pass the final measure and point verification during the final inspection process. If the project does not pass final inspection, the permit holder must remedy the deficiencies or occupancy will be denied until inspection is successful.

City of Santa Cruz Green Building Program

Green Building Measures Guidance and Intent Statements

The following information provides specific information regarding fulfilling the requirements for each measure and the intent statements for the Nonresidential Green Building measures.

A. Sustainable Sites

5.105 Deconstruction of Existing Structures

Effective July 1, 2024, alteration(s) to existing building(s) where the combined altered floor area is 100,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 100,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3. Effective January 1, 2026, the combined floor area shall be 50,000 square feet or greater.

Exception: Combined addition(s) to existing building(s) of two times the area or more of the existing building(s) is not eligible to meet compliance with Section 5.105.2

5.105.2 Reuse of existing building.

An alteration or addition to an existing building shall maintain at a minimum 45 percent combined of the existing building's primary structural elements (foundations; columns, beams, walls, and floors; and lateral elements) and existing building enclosure (roof framing, wall framing and exterior finishes). Window assemblies, insulation, portions of buildings deemed structurally unsound or hazardous, and hazardous materials that are remediated as part of the project shall not be included in the calculation.

5.105.2.1 Verification of compliance. Documentation shall be provided in the construction documents to demonstrate compliance with Section 5.105.2.

Note: Sample Worksheet WS-3 in Chapter 8 may be used to assist in documenting compliance with this section.

Intent: Encourage reuse of existing buildings and components, as well as provide guidance on what building components to be included in calculations, and to minimize potential landfill deposits.

5.106.1 – Stormwater Pollution Prevention for Projects that Disturb Less Than 1 Acre of Land

Indicate on the construction documents methods used to comply with the preceding requirements. One of the following must be indicated in the construction documents:

- How a local stormwater management ordinance is being met.
- The BMP that will be employed, specific to the site and season of construction.
- Stormwater Pollution Management Plan requirements listed.
- Delegation of stormwater control measures to the contractor for his or her separate submittal to the enforcing agency prior to commencement of excavation and grading.
- A descriptive method deemed acceptable to the enforcing agency.

No grading should be done until site and season-specific soil loss and housekeeping stormwater BMP have been approved by the enforcing agency. The contractor should employ the design BMP and any other control measure, as the need arises.

Intent: Prevent the loss of soil through wind or water erosion by implementing effective combination of erosion and sediment control and good housekeeping Best Management Practices (BMPs).

5.106.2 – Stormwater Pollution Prevention for Projects that Disturb ≥ 1 Acre of Land

If a project consists of a site that meets the criteria listed in Section 5.106.2, obtain the appropriate NPDES permit. Refer to the current applicable permit requirements on the State Water Resources Control Board website at:

Construction Stormwater Program | California State Water Resources Control Board

Intent: Alert the code user of two specific state permitting requirements for projects that disturb one or more acres of land, and in some cases even projects that disturb less than one acre but are part of a larger common plan of development or sale. These permitting requirements are administered by the State Water Resources Control Board (SWRCB) and are not a requirement in the CALGreen Code to be administered by the City of Santa Cruz.

5.106.4.1.1 – Short-Term Bicycle Parking

If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.

Exception: Additions or alterations which add nine or less visitor vehicular parking spaces.

5.106.4.1.2 – Long-Term Bicycle Parking

For new buildings with tenant spaces that have 10 or more tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces being added, with a minimum of one vehicle parking facility. This also applies to additions and alterations that add 10 or more tenant-occupant vehicular parking spaces and new shell buildings in phased projects. The acceptable parking facilities shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

Intent: Promote the use of bicycles as an alternative means of transportation by ensuring that newly constructed projects or additions and alterations provide short-term and/or long-term bicycle parking accommodations.

5.106.5.3 – Electric Vehicle (EV) Charging

Include on the construction documents the proposed location of the listed suitable cabinet(s), box(es), enclosure(s) or equivalent required for future EV equipment connections. Indicate on the plans the required service panel capacity with raceway to the approximate location of the future EV charging connections as required in the code Section 5.106.5.3. Use Table 5.106.5.3.1 to determine the required number of EV capable spaces and the required number of EVCS (EV capable spaces provided with EVSE). Lastly, for EV capable spaces, ensure that the service panel or subpanel(s) circuit directory is properly identified as being "EV CAPABLE" and that the raceway termination location is permanently and visibly marked as "EV CAPABLE."

Intent: Facilitate Electric Vehicle (EV) charging capability by installing electric vehicle charging stations and raceways for future electric vehicle supply equipment (EVSE).

5.106.5.4 – Electric Vehicle (EV) Charging: Medium-Duty and Heavy-Duty

On the plans, include the proposed location of the listed suitable cabinet(s), box(es), enclosure(s) or equivalent required for future EV equipment connections. Indicate on the plans the required minimum service panel capacity with raceway to the approximate location of the future EV charging connections as required in the code Section 5.106.5.4, subsections and Table 5.106.5.4.1.

Intent: Support installation of EV chargers for either depot or opportunity charging in new warehouses, grocery stores, and retail buildings with off-street loading spaces, such as loading docks or parking spaces set aside for loading and unloading of motor vehicles.

5.106.8 – Light Pollution Reduction

Comply with California Energy Commission regulations in the California Administrative Code (Part 1 of Title 24) and *California Energy Code* (Part 6 of Title 24) as cited in Section 5.106.8(1) and 5.106.8 (3). Those standards form a basis upon which to build for the purpose of light pollution reduction.

Intent: Light pollution is disruptive to the environment, wildlife, and humans. The intent of this requirement is to minimize light pollution in an effort to maintain dark skies and to ensure that newly constructed projects reduce the amount of backlight, uplight, and glare (BUG) from not-in-code exterior light sources.

5.106.10 – Grading and Paving

Construction plans are to indicate how site grading or a drainage system will manage surface water flows to keep surface water away from buildings. Some examples may include swales, water collection systems, French drains, water retention gardens, pervious surfaces or porous concrete/asphalt.

Intent: Correct grading and paving keeps water away from entering structure and extends the longevity of the exterior building walls and can reduce future problems with water intrusion and related human health issues from mold and mildew growth.

5.106.12 – Shade Trees [DSA-SS]

Detail shade trees or solar photovoltaic systems that covers a percentage of the parking lot in compliance with code sections 5.106.12.1, 5.106.12.2 and 5.106.12.3. This measure is mandatory for California's K-12 public schools, community colleges and state essential services facilities [DSA-SS].

Intent: Reduce heat islands. Healthy large canopy trees provide shade that keeps air temperatures and asphalt surfaces cooler. With less heating of asphalt surfaces, there is less heat radiating from those surfaces after sunset, allowing air temperatures to cool faster into the evening and overnight.

Development Density and Community Connectivity

Where feasible, locate project on a previously developed site within a 1/2-mile radius of at least 10 basic services, readily accessible by pedestrians, including, but not limited to, one each of bank, place of worship, convenience grocery, day care, cleaners, fire station, barber 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. The following link is a resource meant to assist the project team in confirming compliance: Get your Walk Score

Intent: Ensure the reuse of existing locations in developed areas for nonresidential districts to help minimize the impact on undeveloped lands, and local air and water quality, as well as to minimize the greenhouse gas emissions generated from the development of a new site.

Brownfield Redevelopment

Develop a site documented as contaminated by means of an ASTM E 1903-11 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.

Intent: Encourage infill, and the use of existing infrastructures, to both revitalize an existing site with economic growth while minimizing urban blight and sprawl. By reclaiming brownfield (previously unusable locations due to contamination), undeveloped land may be preserved and greenhouse gas emissions limited.

Stormwater Design and Low-Impact Development

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:

1. Bioretention (rain gardens) filtration planters;
2. Precipitation capture (cisterns and rain barrels);
3. Green roof meeting the structural requirements of the building code;
4. Roof leader or impervious area disconnection;
5. Permeable and porous paving;
6. Vegetative swales and filter strips; tree preservation;
7. Tree preservation and tree plantings;
8. Landscaping soil quality;
9. Stream buffer;
10. Volume retention suitable for previously developed sites.

Intent: Encourage low-impact development by reducing peak rain-water runoff, utilizing local Regional Water Quality Control Board mitigation measures and/or additional mitigation measures listed above.

Electric Vehicle Charging

On the plans, include the proposed location of the listed suitable cabinet(s), box(es), enclosure(s) or equivalent required for future EV equipment connections. Indicate on the plans the required minimum service panel capacity with raceway to the approximate location of the future EV charging connections as required in the code Section 5.106.5.4, subsections and Table A5.106.5.3.2.

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)
0-9	3	0
10-25	8	3
26-50	17	6
51-75	28	9
76-100	40	13
101-150	57	19
151-200	79	26
201 and over	45 percent of total parking spaces	33 percent of EV capable spaces

Intent: Facilitate Electric Vehicle (EV) charging capability by installing electric vehicle charging stations and raceways for future electric vehicle supply equipment (EVSE).

Reduce Development Footprint and Optimize Open Space

Provide vegetated open space equal to 20 percent of the total project site area. Note the location and calculations on the site or landscape plans.

Intent: Optimize the open space in a development to encourage the utilization of vegetation within available areas. Incorporation of these provisions can result in improving groundwater recharge, open space, and wildlife habitat preservation, as well as increasing the carbon sink effect, thus reducing greenhouse gas emissions.

Heat Island Effect – Hardscape Alternatives and Roof

Hardscape Alternatives – Use one or both of the following strategies for 50 percent of site hardscape areas or put 50 percent of parking underground.

1. Use light colored materials with an initial solar reflectance value of at least 0.30.
2. Use an open-grid pavement system or a pervious or permeable pavement system.

Roof – Consider adding rooftop with vegetated surfaces, or specify high-albedo materials to reduce the heat absorption and transmission. Information is available at Cool Roof Rating Council, www.coolroofs.org. CRRC Performance values must meet or exceed the following:

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

Intent: Minimize the creation of heat islands to reduce the energy load for building cooling and to moderate atmospheric temperature.

Changing Rooms and Shower Facilities

For buildings with over 10 tenant-occupants, provide on-site showers with changing facilities for tenant-occupants only in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities. Off-site showers and changing facilities are acceptable if they meet the needs of all occupants and are within a 1/4 mile (400 meters) walking distance.

NUMBER OF TENANT-OCCUPANTS	SHOWER/CHANGING FACILITIES REQUIRED	2-UNIT (12" X 15" X 72" total height) PERSONAL EFFECTS LOCKERS REQUIRED
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-unit locker for each 50 additional tenant-occupants

Intent: Encourage people to use bicycles as an alternative means of transportation. The mandatory long-term bicycle parking requirements further enhance the benefits of utilizing bicycles for daily transportation.

Bicycle Maintenance

Provide a permanently secured bicycle repair station that includes a complete set of tools and an air pump securely fastened to the repair stand in the area dedicated to long-term bicycle storage.

Intent: Reduce pollution and land development effects from automobile use through encouraging alternative transportation networks. To promote more livable and healthy communities through reduced vehicle miles traveled and associated emissions.

B. Water Efficiency

5.303.1.1 – New Buildings or Additions in Excess of 50,000 sf

Separate submeters shall be installed as follows:

1. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gal/day (380 L/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.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where the flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

Intent: Reduce potable water use in new or altered buildings by making building owners and/or tenants aware of their daily potable water consumption to encourage voluntary reduction. When the meters are installed, the building operator will have the ability to establish a water consumption baseline to monitor future water use. This will give the building operator the ability to isolate and identify areas within the potable water system that have significant increases in water use due to leaks, overuse, etc.

5.303.1.2 – Excess Consumption

A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

Intent: Reduce potable water use in new or altered buildings by making building owners and/or tenants aware of their daily potable water consumption to encourage voluntary reduction. When the meters are installed, the building operator will have the ability to establish a water consumption baseline to monitor future water use. This will give the building operator the ability to isolate and identify areas within the potable water system that have significant increases in water use due to leaks, overuse, etc.

5.303.3 – Water Conserving Plumbing Fixtures and Fittings

Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 5.303.2.2 of CALGreen.

Intent: Reduce the overall use of potable water within the building. Reduction of water use also results in decreasing the amount of energy needed to transport, process and treat water, thereby contributing to reduction of greenhouse gas emissions.

5.303.4.1 – Food Waste Disposers

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.

Intent: Reduce the overall use of potable water within the building. Reduction of water use also results in decreasing the amount of energy needed to transport, process and treat water, thereby contributing to reduction of greenhouse gas emissions.

5.303.5 – Areas of Addition or Alteration

For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

Intent: Reduce the overall use of potable water within the building. Reduction of water use also results in decreasing the amount of energy needed to transport, process and treat water, thereby contributing to reduction of greenhouse gas emissions.

5.303.6 – Standards for Plumbing Fixtures and Fittings

Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

Intent: Provide specifications for plumbing fixtures and fittings by referencing the *California Plumbing Code*.

5.304.1 – Outdoor Potable Use in Landscape Areas

Nonresidential developments shall comply with the City's Water Efficient Landscape Ordinance.

Intent: Reduce the overall outdoor water used for irrigation for both new landscaping areas and rehabilitated landscape projects.

Exceed the Mandatory Landscape Irrigation Budget by 50%

Install an irrigation system whose water budget meets one of the following threshold ≤ 0.50 Reference Evapotranspiration (ETo), or a water budget based on "one-half" (0.50) or less of the reference ETo. For example, if the reference ETo for a region is 44, you would need to obtain the water budget for a reference ETo of 22 or lower. As the reference ETo directly influences the water budget, halving the reference ETo halves the water budget. Calculations demonstrating that the water budget meets the ETo criteria levels need to be provided at final inspection.

The landscape professional must do the following:

1. Estimate the amount of water that will be needed by a particular landscape design on a specific site.
2. Use an approved methodology provided in the California Updated Model Water Efficient Landscape Ordinance AB 1881 or a local water-efficient landscape ordinance.
3. Ensure that the design can be compared to a water budget.
4. Ensure the water budget is met by incorporating hydrozoning, high-efficiency irrigation, a native plant palette, and other best practices.

Intent: Design a landscape that uses a performance approach based on site-specific conditions to significantly reduce irrigation needs.

Appliances and Fixtures for Commercial Application

Appliances and fixtures shall meet the following:

1. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commission's WF standards for commercial clothes washers found in Title 20 of the California Code of Regulations.
2. Dishwashers shall meet the following water use standards:
   a. Residential—ENERGY STAR
      i. Standard Dishwashers – 4.25 gallons per cycle.
      ii. Compact Dishwashers – 3.5 gallons per cycle.
   b. Commercial—Shall be in accordance with ENERGY STAR requirements. Refer to Table A5.303.3
3. Ice makers shall be air-cooled.
4. 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.
5. 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.
6. Combination ovens use a maximum of 1.5 gallons of water per hour per pan, including condensate water.
7. Food waste pulping systems shall use no more than 2 gpm of potable water.
   a. Note: potable water excludes 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 Conveyer	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)

Intent: Reduce indoor potable water use when a project includes water-using appliances supplied as part of the construction contract, not just plumbing fixtures.

Non-Water Urinals

All urinals must be non-water urinals with drain cleaning action installed in accordance with the *California Plumbing Code*.

Intent: Reduce indoor potable water use by providing non-water-supplied urinals as an allowed fixture.

Water Metering

Install permanent, independent water meters for two or more of the following water subsystems, as applicable to the project:

- Irrigation. Meter water systems serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.
- Indoor plumbing fixtures and fittings. Meter water systems serving at least 80% of the indoor fixtures and fittings, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.
- Domestic hot water. Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).
- Boiler with aggregate projected annual water use of 100,000 gallons (378,500 liters) or more, or boiler of more than 500,000 BtuH (150 kW). A single makeup meter may record flows for multiple boilers.
- Reclaimed water. Meter reclaimed water, regardless of rate. A reclaimed water system with a makeup water connection must also be metered so that the true reclaimed water component can be determined.
- Other process water. Meter at least 80% of expected daily water consumption for process end uses, such as humidification systems, dishwashers, clothes washers, pools, and other subsystems using process water.

Intent: Conserve low-cost potable water resources and support water management and identify opportunities for additional water savings by tracking water consumption.

Water Leak Detection and Monitoring

Install water sensors connected to a local network internet Building Management System (BMS) or metering solution on water using subsystems. The leak detection system should initiate an alarm upon a leak detection. The facility manager and/or tenant must be able to access the sensor data in real time via a local network, BMS, cloud service, app, or online database. Develop an action plan that addresses how the building manager or tenant will have access to data in real-time and how the building manager or tenant will address and remedy any detected leaks.

Water sensors must be installed on the following water subsystems:

- Project irrigation system at the point of entry, if irrigation is included in the project scope.
- At least 50% of the project's flush fixtures.
- Make-up water systems (e.g. hot water, swimming pools, chilled water systems, process water systems).

Intent: Support water conservation and management, reduce leakage, and limit potential material waste due to water leak damage through the installation of smart water submeters.

Non-Potable Water System

Provide a non-potable water system complying with the *California Plumbing Code*, as acceptable to the City of Santa Cruz. Detail the non-potable water system piping plan and specifications for system components. Examples include but are not limited to the following: Recycled or reclaimed water, stormwater, and greywater.

Intent: Promote the use of non-potable water systems to conserve potable water.

C. Energy and Atmosphere

5.201.1 – Energy Efficiency

Meet minimum energy standards of the *California Energy Code* (Title 24, part 6) and add Title 24 compliance documentation to plans.

Intent: To recognize that the California Energy Commission retains its authority for energy efficiency standards. Additionally, it is to reduce dependency on nonrenewable energy sources by improving the efficiency of our buildings.

5.410.2 – Commissioning [N] New Buildings 10,000 Square Feet and Over

For new buildings 10,000 square feet and over, 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 shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated by the *California Energy Code* Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section100) of the *California Energy Code*, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to *California Energy Code* Section 120.8 for commissioning requirements.

Commissioning requirements shall include:

1. Owner's or owner representative's project requirements. (5.410.2.1)
2. Basis of design. (5.410.2.2)
3. Commissioning measures shown in the construction documents.
4. Commissioning plan. (5.410.2.3)
5. Functional performance testing. (5.410.2.4)
6. Documentation and training. (5.410.2.5)
7. Commissioning report. (5.410.2.6)

Intent: Improve public health, safety, and general welfare by ensuring that the design and construction of buildings reduce negative environmental impacts and promote occupant comfort. Commissioning ensures that the building functions in the manner intended.

5.410.4 – Testing and Adjusting [N] New Buildings Less than 10,000 Square Feet

Design team: Specify the systems in the project to be tested and adjusted; the testing team members and their qualifications; the procedures, including those recommended by the manufacturer; and the report forms to be used in testing and adjusting.

Contractor:

- Maintain evidence of the qualifications of the testing and adjusting team and install the specified building systems in accordance with the plans and specifications. Examine systems for functional deficiencies that cannot be adjusted, and for reported deficiencies discovered before and during testing and adjusting.
- Prepare a testing and adjusting plan with step-by-step procedures and perform testing and adjusting of non-energy systems according to those procedures. Remedy any deficiencies that are discovered during testing.
- For HVAC balancing, use the balancing procedures defined by the organizations listed in the regulations, and perform additional testing and balancing as required to verify that balanced conditions are being maintained.
- Complete testing and adjusting reports as required.
- Prepare the Operation and Maintenance Manual to be given to the owner to encourage proper maintenance and optimum performance of the systems after the certificate of occupancy.

Intent: For construction projects less than 10,000 square feet, testing and adjusting the building systems can ensure maximum efficiency of the equipment operation as well as improve the indoor air quality for occupants. Additionally, testing and adjusting building systems can prolong the life of the systems and maximize the equipment's intended design parameters.

5.503.1 – Fireplaces

Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the *California Energy Code*, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves, and fireplaces shall comply with applicable local ordinances.

Intent: Prevent the use of indoor air for combustion and to prevent contaminated air and any unused fuel from escaping a fireplace, maintaining indoor air quality.

5.508.1 – Ozone Depletion and Greenhouse Gas Reductions

Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs or Halons.

Intent: Eliminate the use of chlorofluorocarbons and Halons in fire suppression, HVAC and refrigeration systems in order to assist in meeting statewide requirements for the reduction of greenhouse gas emissions to 1990 levels and to prevent ozone destruction.

5.508.2 – Supermarket Refrigerant Leak Reduction

Clearly note in the construction documents and specifications that the required leak reduction measures have been incorporated. 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.

Intent: Assist in meeting statewide requirements for the reduction of greenhouse gas emissions to 1990 levels and to prevent ozone depletion.

Energy Performance

Exceed minimum energy standards of the *California Energy Code* (Title 24, part 6) by 15%.

Intent: Energy consumption in homes accounts for 31% of the electricity consumed in California. Homes that exceed Title 24, Part 6 provide long-term energy efficiency, conservation and reduced utility costs. Documents need to show exceeding Title 24, part 6 by 15%.

Install NEEA Rated Commercial Heat Pump Water Heater

Provide the location of the heat pump water heater and provide manufacturer specifications and listings on the plan page specific to the installation location. Attached is a clickable link to the Qualified Product Lists of NEEA Rated heat pump water heaters: Northwest Energy Efficiency Alliance (NEEA)

Intent: Reduce consumption of energy required to heat water. Water heating accounts for a significant portion of a building's energy use.

Install Continuous, Exterior Rigid Insulation

Add section details to plans that demonstrate this minimum level of insulation for exterior wood-framed walls, roofs, raised floors, and/or beneath the slab. Avoid extruded polystyrene (XPS) due to the harmful blowing agents used in its production.

Intent: Continuous rigid insulation reduces thermal bridging, reduces noise transfer, assists in air sealing, and increases the building's lifespan by acting as an air, vapor, and weather-resistive barrier for the building's exterior.

Enhanced Refrigerant Management or No Refrigerants

Retail food stores greater than 8,000 square feet of conditioned floor area do not qualify for this credit. Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 750. A project that does not have refrigerant also qualify for this credit.

Intent: Reduce ozone depletion and minimize direct contributions to climate change.

Advanced Energy Metering

Install advanced energy metering for the following:

- All whole-building energy sources used by the building; and
- Any individual energy end uses that represent 10% or more of the total annual consumption of the building.

Advanced energy metering must have the following characteristics:

- Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
- Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.
- The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
- The system must be capable of storing all meter data for at least 36 months.
- The data must be remotely accessible.
- All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.

Intent: Support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

Green Power

Participate in a renewable energy portfolio program that provides a minimum of 50 percent of electrical power from renewable sources. Maintain documentation through utility billings. Indicate in the electrical plans and specifications the intent to enroll in the renewable energy portfolio of the local utility to purchase electricity at least at the 50-percent renewables level. The intent should be recorded in the operation and maintenance manual as a recommended practice in the operation of the building beyond the certificate of occupancy.

Intent: Encourage the purchase of electricity from a utility that offers a renewable energy portfolio, reducing dependency on carbon-based fuel for energy generation and associated greenhouse gas emissions.

Demand Response

Design the building and equipment for participation in demand response programs through load shedding or shifting.

- Design a system with the capability for real-time, fully automated DR based on external initiation by a DR Program Provider. Semi-automated DR may be utilized in practice.
- Enroll in a minimum one-year DR participation amount contractual commitment with a qualified DR program provider, with the intention of multiyear renewal, for at least 10% of the estimated peak electricity demand.
- Develop a comprehensive plan for meeting the contractual commitment during a Demand Response event.
- Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan.

Intent: Increase participation in demand response technologies and programs that make energy generation and distribution systems more efficient, increase grid reliability, and reduce greenhouse gas emissions. On-site electricity generation does not meet the intent of this credit.

Locate Prominent Stairway in Lobby

Locate in the plans and cross-reference on the checklist.

Intent: Adding a prominent stairway promotes using stairs instead of elevators to reduce energy usage.

Solar Hot Water

Provide a piping diagram showing the size, routing, and type of piping to be used. Show the proposed location of solar collectors and schematics on the plan indicating the routing for, types, sizes of conductors and raceways for conductors and service size.

Intent: Heating water uses a significant amount of energy. Installing a Solar Hot Water system uses direct, renewable energy for a majority of the energy needed to heat water and carries a 100% return on investment after a few years.

Elevators and Escalators

In buildings with more than one elevator or two escalators, provide systems and controls to reduce the energy demand of elevators and escalators as follows. Document systems operation and controls in the project specifications and commissioning plan.

- **Elevators:** Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion.
- **Car Lights and Fan:** Parked elevators shall turn off car lights and fans automatically until the elevator is called for use.
- **Escalators:** An escalator shall have a VVVF motor drive system that is fully regenerative when the escalator is in motion.
- **Controls:** Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6, and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, *California Building Code*.

Intent: Encourage the installation and features of elevators and escalators that conserve energy.

Warehouse Dock Seal Doors

Exterior loading dock doors that are adjacent to conditioned or indirectly conditioned spaces shall have dock seals or dock shelters installed at the time of permitting. This requirement shall apply to newly constructed buildings and to loading dock doors added to existing buildings.

Intent: Encourage greater building performance beyond the requirements in the 2022 California Energy Code

All-Electric Commercial Kitchen

Plans and schedules to demonstrate all electric cooking equipment within the commercial portions of the building. Natural gas infrastructure should not be connected to the building.

Intent: Reduce greenhouse gas (GHG) emissions and improve indoor air quality and health, and safety by eliminating fossil fuel use in adjacent commercial kitchen spaces.

D. Materials and Resources

5.407.1 – Weather Protection

Provide a weather-resistant exterior wall and foundation envelope as required by *California Building Code*, Section 1402.2 (Weather Protection), and manufacturer's installation instructions.

Intent: Provide a weather-resistant exterior wall and foundation envelope as currently required by the *California Building Code*, but go beyond those existing code provisions, increasing the integrity and longevity of the structure.

5.407.2.1 – Moisture Control: Sprinklers

Design irrigation systems to prevent spray on structures by specifying sprinkler heads that are adjacent to or near exterior walls to have a maximum degree head rotation or spray pattern or shielding that ensures protection of the building exterior.

Intent: Minimize water damage at exterior walls from possible effects of irrigation sprinkler systems.

5.407.2.2.1 – Moisture Control: Exterior Door Protection

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:

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

Intent: Protect from water intrusion at exterior entries and openings from wind-driven rain

5.407.2.2.2 – Moisture Control: Flashing

Install flashings integrated with a drainage plane.

Intent: Minimize the amount of moisture entering the wall assemblies of the building.

5.408.1 – Construction Waste Diversion

Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2, or 5.408.1.3.

Intent: Because construction waste makes up about 27 percent of the waste stream in California, this code requirement seeks to reduce the amount of waste from new construction and demolition that would be sent to landfills.

5.408.1.1 – Construction Waste Management Plan

Complete the City's Construction Waste Management Plan prior to permit issuance and add to plans. Designate how and what materials will be recycled on the Construction Waste Management Plan and provide materials to be recycled by types and volumes and their final disposition of the materials. Show a location on the site plan where material will be stored and classified during construction and demolition.

Intent: Develop a plan to recycle as much nonhazardous construction waste to meet and exceed the minimum 65 percent diversion threshold.

5.408.2 – Universal Waste [A]

For additions and alterations [A], add a list of prohibited waste materials to the construction documents and show what will be disposed of properly, diverted from the landfill and the type of disposal facility that will accept universal waste.

Intent: Ensure that universal waste materials are being disposed of properly.

5.408.3 – Excavated Soil and Land Clearing Debris

100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For phased and long-term projects, such material may be stockpiled on site until project completion.

Intent: Reduce high-volume site materials from filling up landfills as a result of clearing, and to encourage the market for nonhazardous land clearing debris. It is not intended to apply to the clearing of contaminated sites, such as for brownfield remediation.

5.409 – Life Cycle Assessment

Projects consisting of newly constructed building(s) with a combined floor area of 100,000 square feet or greater shall comply with either Section 5.409.2 or Section 5.409.3. Alteration(s) to existing building(s) where the combined altered floor area is 100,000 square feet or greater shall comply with either 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 100,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3.

Intent: Add new mandatory regulations for the Whole Building Life Cycle Assessment (WBLCA) and Product Global Warming Potential (GWP) compliance pathways, giving design professionals two additional methods to comply with embodied carbon reduction requirements.

5.409.2 Whole Building Life Cycle Assessment

Projects shall conduct a cradle-to-grave whole building life cycle assessment performed in accordance with ISO 14040 and ISO 14044, excluding operating energy, and demonstrating a minimum 10 percent reduction in global warming potential (GWP) as compared to a reference baseline building of similar size, function, complexity, type of construction, material specification, and location that meets the requirements of the California Energy Code currently in effect. Software used to conduct the whole building life cycle assessment, including reference baseline building, shall have a data set compliant with ISO 14044, and ISO 21930 or EN 15804, and the software shall conform to ISO 21931 and/or EN 15978. The software tools and datasets shall be the same for evaluation of both the baseline building and the proposed building.

Notes:

1. Software for calculating whole building life cycle assessment is available for free at Athena Sustainable Materials Institute (https://calculatelca.com/software/impact-estimator/) and OneClick LCA - Planetary (www.oneclicklca.com/planetary). Paid versions include, but are not limited to, Sphera GaBi Solutions (gabi.sphera.com), SimaPro (simapro.com), OneClick LCA (www.oneclicklca.com) and Tally for Revit (apps.autodesk.com).
2. ASTM E2921-22 "Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems" may be consulted for the assessment.
3. In addition to the required documentation specified in Section 5.409.2.3, Worksheet WS-9 may be required by the enforcing entity to demonstrate compliance with the requirements.

5.409.2.1 Building components. Building enclosure components included in the assessment shall be limited to glazing assemblies, insulation, and exterior finishes. Primary and secondary structural members included in the assessment shall be limited to footings and foundations, and structural columns, beams, walls, roofs, and floors.

5.409.2.2 Reference study period. The reference study period of the proposed building shall be equal to the reference baseline building and shall be 60 years.

5.409.2.3 Verification of compliance. A summary of the GWP analysis produced by the software and Worksheet WS-4 signed by the design professional of record shall be provided in the construction documents as documentation of compliance. A copy of the whole building life cycle assessment which includes the GWP analysis produced by the software, in addition to maintenance and training information, shall be included in the operation and maintenance manual and shall be provided to the owner at the close of construction. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

5.409.3 Product GWP Compliance – Prescriptive Path.

Each product that is permanently installed and listed in Table 5.409.3 shall have a Type III environmental product declaration (EPD), either product-specific or factory-specific.

5.409.3.1 Products shall not exceed the maximum GWP value specified in Table 5.409.3.
Exception: Concrete may be considered one product category to meet compliance with this section. A weighted average of the maximum GWP for all concrete mixes installed in the project shall be less than the weighted average maximum GWP allowed per Table 5.409.3 using Exception Equation 5.409.3.1. Calculations shall be performed with consistent units of measurement for the material quantity and the GWP value. For the purposes of this exception, industry wide EPD's are acceptable.

Exception EQUATION 5.409.3.1

$GWP_n < GWP_{allowed}$

where

$GWP_n = \Sigma (GWP_n)(v_n)$ and $GWP_{allowed} = \Sigma (GWP_{allowed})(v_n)$

and

n = each concrete mix installed in the project

GWP_n = the GWP for concrete mix n per concrete mix EPD, in kg CO_2e /m^3

$GWP_{allowed}$ = the GWP potential allowed for concrete mix n per Table 5.409.3

v_n = the volume of concrete mix n installed in the project, in m^3

5.409.3.2. Verification of compliance. Calculations to demonstrate compliance, Type III EPDs for products required to comply if included in the project, and Worksheet WS-5 signed by the design professional of record shall be provided on the construction documents. Updated EPDs for products used in construction shall be provided to the owner at the close of construction and to the enforcement entity upon request. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

TABLE 5.409.3
PRODUCT GWP LIMITS

Buy Clean California Materials Product Category [1]	Maximum acceptable GWP value (unfabricated) (GWP allowed)	Unit of Measurement
Hot-rolled structural steel sections	1.77	MT CO_{2e}/MT
Hollow structural sections	3.00	MT CO_{2e}/MT
Steel plate	2.61	MT CO_{2e}/MT
Concrete reinforcing steel	1.56	MT CO_{2e}/MT
Flat glass	2.50	kg CO_{2e}/MT
Light-density mineral wool board insulation	5.83	kg CO_{2e}/1 m^2
Heavy-density mineral wool board insulation	14.28	kg CO_{2e}/1 m^2

Concrete, Ready-Mixed [2, 3]

Concrete Product Category	Maximum GWP allowed value (GWP allowed)	Unit of Measurement
up to 2499 psi	450	kg $CO2_e/m^3$
2500-3499 psi	489	kg $CO2_e/m^3$
3500-4499 psi	566	kg $CO2_e/m^3$
4500-5499 psi	661	kg $CO2_e/m^3$
5500-6499 psi	701	kg $CO2_e/m^3$
6500 psi and greater	799	kg $CO2_e/m^3$

Concrete, Lightweight Ready-Mixed [2]

Concrete Product Category	Maximum GWP allowed value (GWP allowed)	Unit of Measurement
up to 2499 psi	875	kg CO2e/m3
2500-3499 psi	956	kg CO2e/m3
3500-4499 psi	1039	kg CO2e/m3

Footnotes:

1. The GWP values of the products listed in Table 5.409.3 are based on 175 percent of Buy Clean California Act (BCCA) GWP values, except for concrete products which are not included in BCCA.
2. For concrete, 175 percent of the National Ready Mix Concrete Association (NRMCA) 2022 version 3 Pacific Southwest regional benchmark values are used for the GWP allowed, except for High Early strength.
3. Concrete High Early Strength ready-mixed shall be calculated at 130 percent of the Ready mixed concrete GWP allowed values for each product category.

5.410.1 – Recycling by Occupants

Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals. Appropriate recycling areas and signage should be provided and identifiable on plans and on-site.

Intent: Support the existing law to provide areas for recycling by occupants, including collection and loading of recyclable materials.

Construction Waste Management: Divert 80% or Above

Divert 80 percent of nonhazardous construction waste from the landfill. Designate recyclable materials and their weight on the Construction Waste Management Plan and provide all waste tags and receipts. Show a location on the site plan where material will be stored and classified during the course of construction. (5.408.3). See City of Santa Cruz Waste Management Plan for additional information.

Intent: Divert nonhazardous construction waste from the landfill beyond the state requirement.

Regional Materials

Identify available sources of material products and choose the most sustainable and cost-effective source within 500 miles of the project site or within California. Identify in the construction documents those materials intended to be obtained locally. Keep receipts and records of material supply sources to present to the City of Santa Cruz for verification. Ensure that at least 10 percent of the project total of building materials, based on cost, are to be from a source within 500 miles of the project site, or from within California.

Intent: Conserve energy associated with the transportation of building materials over long distances to the job site.

Reused Materials

Use salvaged, refurbished, refinished or reused materials for a minimum value of 5 percent of the project's total materials cost, based on estimates in design and on actual in construction. Provide documentation as to the respective values. Identify in the construction documents reused materials intended to be used in the project, the value amounting to at least 5 percent of the project's materials estimated cost at design and actual cost at construction. Retain all documentation accompanying the reused materials for verification by the City of Santa Cruz.

Intent: Conserve materials through the reuse of at least 5 percent of the total building materials, based on a project's cost.

Recycled Content

The target values are in terms of estimated material cost. Indicate in the construction documents the recycled materials and calculations for the percentage of estimated materials cost. Retain all documentation as it relates to recycled content for verification by the City of Santa Cruz. If needed, contact the Green Building Specialist to assist with the calculations.

Intent: Reduce the use of virgin materials, in favor of pre- or post-consumer recycled content values (RCV).

Rapidly Renewable Materials

Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of the total materials value, based on estimated cost. Examples include but are not limited to the following: bamboo, wool, cotton, cork, straw, natural fibers, products made from crops (soy-based, corn-based), etc… Identify in the construction documents rapidly renewable materials intended to be used in the project amounting to at least 2.5 percent of the project's materials estimated cost at design and actual cost at construction. Retain all certifications accompanying the rapidly renewable component resources for verification by the City of Santa Cruz for these conservation measures.

Intent: Promote sustainable building practices by using self-regenerating materials wherever possible, as opposed to finite and limited resource materials.

Certified Wood

The cost of FSC-certified wood products must account for at least 15 percent of the total cost of all installed wood products. Identify in the construction documents FSC-certified products intended to be used in the project, amounting to at least 15 percent of the project's total wood products estimated cost at design and actual cost at construction. Provide FSC Certification and supply provider/lumberyard information to the inspector for verification at the time of framing inspection.

Intent: The Forest Stewardship Council provides independent assurance that the wood you buy supports forests managed to the highest standards.

Advanced Wood Framing Techniques

Incorporate all of the following Optimum Value Engineering (OVE) innovations and techniques, and shall not conflict with structural framing methods or fire-rated assemblies required by the California Building Code:

1. Building design using 2-foot modules
2. Spacing wall studs up to 24 inches on center
3. Spacing floor and roof framing members up to 24 inches on center
4. Using 2-stud corner framing and drywall clips or scrap lumber for drywall backing
5. Eliminating solid headers in non-load-bearing walls
6. Using in-line framing, aligning floor, wall, and roof framing members vertically for direct transfer of loads
7. Using single lumber headers and top plates, where appropriate

Intent: Decrease the quantity of wood needed to achieve structural framing standards that meet or exceed Title 24 wood framing requirements. A framing plan can do more than just lay out studs, openings, floor and roof joists, etc. There are opportunities to design the floor system to reduce joist count, yet ensure all plumbing and HVAC are coordinated with the floor framing. Following the "stack framing" concept yields efficient use of materials. Most importantly, many framing issues are resolved on paper, prior to the foundation being cast.

Cement and Concrete

Use cement and concrete made with recycled products and comply with the following: Show in the engineering specification that the concrete mix designs intended to be used on the project contain the required amount of supplementary cementitious materials (SCMs). Total SCMs including F, SL, and/or UF (as defined below) may be added in any combination that satisfies ASTM standards listed in this code section and Equation A5.4-1 where the total minimum SCMs for the amount of concrete being mixed is one (1). 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 the City.

Cement shall comply with one of the following standards:

1. Portland cement shall meet ASTM C150, Standard Specification for Portland Cement.
2. Blended cement shall meet ASTM C595, Standard Specification for Blended Hydraulic Cement or ASTM C1157, Standard Performance Specification for Hydraulic Cement.
3. Other Hydraulic Cements shall meet ASTM C1157, Standard Performance Specification for Hydraulic Cement.

Concrete is made with one or more supplementary cementitious materials (SCM) conforming to the following standards:

1. Fly ash conforming to ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
2. Slag cement (GGBFS) conforming to ASTM C989, Specification for Slag Cement for Use in Concrete and Mortars.
3. Silica fume conforming to ASTM C1240, Specification for Silica Fume Used in Cementitious Mixtures.
4. Natural pozzolan conforming to ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
5. Blended supplementary cementitious materials conforming to ASTM C1697, Standard Specification for Blended Supplementary Cementitious Materials. The amount of each SCM in the blend will be used separately in calculating Equation A5.4-1. If Class C fly ash is used in the blend, it will be considered to be "SL" for the purposes of satisfying the equation.
6. Ultra fine fly ash (UFFA) conforming to ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete, and the following chemical and physical requirements.
7. Metakaolin conforming to ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete, the following chemical and physical requirements.
8. Other materials with comparable or superior environmental benefits, as approved by the Engineer of Record and the City of Santa Cruz.

Mix design equation. Use any combination of one or more SCM, satisfying Equation A5.4-1. When ASTM C595 or ASTM C1157 cement is used, the amount of SCM in these cements shall be used in calculating Equation A5.4-1.

$F/25 + SL/50 + UF/12 \geq 1$ (Equation A5.4-14)

where:

F = Fly ash, natural pozzolan, or other approved SCM, as a percent of total cementitious material for concrete on the project.

SL = GGBFS, as a percent of total cementitious material for concrete on the project.

UF = Silica fume, metakaolin or UFFA, as a percent of total cementitious material for concrete on the project.

Example use of Equation A5.4-1:

For a batch of concrete that requires 400 pounds of cementitious materials with a 50-percent addition of cement and 50 percent SCMs

Using Equation A5.4-1 - $F/25 + SL/50 + UF/12 \geq 1$; adding 80 pounds of F or 20 percent and 120 pounds of SL or 30 percent, then

$20/25 + 30/50 + 0/12 = 0.8 + 0.6 = 1.4$, which is ≥ 1; so, mix is OK

Intent: Encourage the use of alternative supplementary cementitious materials (SCMs) which would otherwise be industrial byproducts that would make their way into the waste stream, as a replacement for the energy-intensive transformation of limestone and clay to cement in the manufacture of concrete. Using the ASTM standards listed above, see Equation A5.4-1 to determine minimum portions of the various SCMs that may be substituted for cement.

Use Alternative Drywall Materials

Provide product specifications and note on the plan page specific to the installation location. Products include but are not limited to the following: Synthetic, recycled, gypsum-free, bamboo, compressed fiber panels, hempcrete, and rammed earth panels. USG EcoSmart gypsum wallboards or similar products are also acceptable due to their reduced weight and the reduced energy and water consumption during manufacturing.

Intent: Drywall production has a noticeable environmental impact. Processing the gypsum releases particulates from the gypsum powder in addition to sulfur dioxide, nitrous oxide, and carbon monoxide. Heating gypsum also has a high energy cost.

E. Indoor Environmental Quality

5.504.1 – Temporary Ventilation

Specify in the plans. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8. Replace all filters prior to occupancy or, if the building is occupied during alteration, at the conclusion of construction.

Intent: Control air pollutants for workers during construction and ensure good air quality for occupants when the building is turned over to the owner. It allows ventilation using air-conditioning systems, when necessary, though this practice is noted not to be an optimum choice due to possible damage to equipment that may jeopardize a warranty.

5.504.3 – Covering of Duct Openings and Protection of Mechanical Equipment During Construction

At the time of rough installation and during storage on the construction site 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 City of Santa Cruz to reduce the amount of dust, water and debris which may enter the system.

Intent: To enhance HVAC equipment efficiency and indoor air quality at building occupancy by preventing construction debris from building up in the air ducts during construction.

5.504.4.1 – Adhesives, Sealants and Caulks

Add VOC Tables, note to plans, and provide the manufacturer's specifications.

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

Intent: Reduces the amount of pollutants brought into a building at points of entry from people's shoes and improves air quality.

5.504.4.3 – Paints and Coatings

Add VOC Tables, note to plans, and provide the manufacturer's specifications. 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 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.

Intent: Reduces the amount of pollutants brought into a building at points of entry from people's shoes and improves air quality.

5.504.4.4 – Carpet Systems, Cushions and Adhesives

Add VOC Tables, note to plans, and provide the manufacturer's specifications. All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers," Version 1.2, (January 2017) (Emission testing method for California Specification 01350).

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

5.504.4.4.2 – All carpet adhesives shall meet the requirements of Table 5.504.4.1.

Intent: Reduces the amount of pollutants brought into a building at points of entry from people's shoes and improves air quality.

5.504.4.4.5 – Composite Wood Products

Add VOC Tables, note to plans, and provide the manufacturer's specifications. 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.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

Intent: Reduces the amount of pollutants brought into a building at points of entry from people's shoes and improves air quality.

5.504.4.6 – Resilient Flooring

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

Intent: The purpose of these requirements is to reduce the volatile organic compounds (VOC) of finish materials commonly installed on a project, improving air quality for building occupants.

5.504.4.7 – Thermal Insulation

Add a note to the plans and provide the manufacturer's specifications. Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

Intent: The purpose of these requirements is to reduce the volatile organic compounds (VOC) of finish materials commonly installed on a project, improving air quality for building occupants.

5.504.4.8 – Acoustical Ceilings and Wall Panels

Add a note to the plans and provide the manufacturer's specifications. Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

Intent: The purpose of these requirements is to reduce the volatile organic compounds of finish materials commonly installed on a project, improving air quality for occupants.

5.504.5.3 – Filters

Add note to plans. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual. Installed filters shall be clearly labeled by the manufacturer, indicating MERV rating.

Intent: Filter particulate matter from the air by the use of at least MERV 13 rated filters, thereby improving air quality for building occupants.

5.504.7 – Environmental Tobacco Smoke Control

Include in the construction documents a signage specification that prohibits smoking for an outdoor area within 25 feet of building entries, outdoor air intakes and operable windows.

Intent: Improve indoor air quality and protect nonsmokers from second-hand smoke.

5.505.1 – Indoor Moisture Control

Include details on the construction documents that address moisture control and ventilation. Buildings shall meet or exceed the provisions of the *California Building Code*, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of the *Green Building Code*.

Intent: Direct the code user to other parts of Title 24, in addition to these provisions, intended to reduce the probability of mold and mildew growth, improving air quality for occupants.

5.506.1 – Outside Air Delivery

For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements for Ventilation) of the *California Energy Code* and Division 1, Chapter 4 of CCR, Title 8.

Intent: Point building designers and contractors to the ventilation requirements in the California Code of Regulations that are intended to improve indoor air quality for building occupants. Ventilation requirements are in Sections 120.1(a) through 120.1 (e) and ventilations flow rates are in Table 120.1-A of the *California Energy Code*, Part 6, Title 24, CCR.

5.506.2 – Carbon Dioxide (CO2) Monitoring

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. Specify and show CO2 sensor locations in the construction documents. The contractor should install the specified equipment to ensure that it is operating as designed.

Intent: When demand control ventilation is required by the *California Energy Code*, this provision intends to maintain CO2 levels that are within the range that established and recognized as safe for human occupancy. The *California Energy Code*, Section 120.1(c)4, identifies the sensors, controls and devices required to keep CO2 emissions to established levels.

5.507.4 – Acoustical Control

Determine if this code section applies; if so, then specify and detail wall and ceiling assemblies and show in the construction documents. Reference the attached links to determine if the project is located within a 65 or greater L_{dn} or CNEL noise contour:

- City of Santa Cruz General Plan Noise Element Update Background Report

If taking the performance approach (5.507.4.2), an acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record. Wall and floor-ceiling assemblies separating tenant spaces and public spaces shall have an STC of at least 40.

Intent: Where buildings are sited in the noisy areas described in this provision, the intent is to keep sound levels low enough to carry out the activities that take place inside the building without the distraction or discomfort of unwanted noise.

Entryway Systems

Specify in plans and install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors.

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

Intent: Reduce the amount of pollutants brought into a building at points of entry from people's shoes or rain-soaked apparel. This keeps the air and finish surfaces free of contaminants that may be tracked into regularly occupied spaces and is intended to maintain higher level air quality for building occupants.

Thermal Insulation

Add note to plans. Provide manufacturer's specifications. Thermal insulation is to comply with 5.504.4.7 and to not have any added formaldehyde.

Intent: Reduce the volatile organic compounds (VOC) of finish materials commonly installed on a project, which will help improve air quality for the building occupants.

Resilient Flooring Systems

Where resilient flooring is installed, 100 percent of the floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers," Version 1.2, (January 2017) (Emission testing method for California Specification 01350).

Intent: Reduce the volatile organic compounds (VOC) of finish materials commonly installed on a project, which will help improve air quality for the building occupants.

Composite Wood Products

Specify no-formaldehyde-emitting composite wood products on the construction documents. Use composite wood products approved by the California Air Resources Board (ARB) as no-added formaldehyde (NAF) based resins or ultra-low emitting formaldehyde (ULEF) resins.

Intent: Encourage the use of no-added formaldehyde (NAF) based resins or ultra-low emitting formaldehyde (ULEF) resins for products installed in a project.

Indoor Air Quality (IAQ) Testing

Include the requirements for testing of pollutant levels of air and materials in the project specifications for ventilation. Testing laboratory or other qualified personnel should be engaged to conduct IAQ tests according to protocols. Allowable levels of contaminant concentrations measured by testing shall not exceed the following:

1. Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;
2. Formaldehyde: 27 parts per billion;
3. Particulates (PM10): 50 micrograms per cubic meter;
4. 4-Phenylcyclohexene (4-PCH), if fabrics and carpets with styrene butadiene rubber (SBR) latex backing are installed: 6.5 micrograms per cubic meter; and
5. Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.

Testing of indoor air quality should include the following elements:

1. 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.
2. Testing should be conducted with the HVAC system operated at the minimum design outdoor air ventilation rate.
3. 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.
4. The test protocols should be justified with documentation to show that appropriate sampling methods and times were used.

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.

Intent: Promote practices to ensure healthy air quality at the close of construction.

F. Innovation in Design

Green Building Accredited Professional

Use a Certified/Accredited Green Building Project Staff:

1. **Designer**
2. **Builder**
3. **Management**

Provide certification/accreditation. Certifications/accreditations must be currently active to receive credit.

Intent: Having experienced, accredited professionals on staff helps ensure that the designated green features for the project are understood and implemented properly.

Pre-Construction Kickoff Meeting With Green Building Specialist

The builder is responsible for scheduling a call with the Green Building Specialist at the time of permit issuance to review the green building checklist.

Intent: Discussing implementation strategies and alternative methods of achieving or exceeding the Green Building requirements with the builder will help the project meet its Green Building goals.

Nonresidential Certified Energy Analyst (CEA) to Complete Title 24 Compliance Documentation

Have a Nonresidential Certified Energy Analyst complete the Title 24 compliance documentation and include their active certification number. Current, Nonresidential CEAs can be found here: Search All Nonresidential CEAs - CABEC.org

Intent: The *California Energy Code* becomes more complex and stringent with each code cycle update; having a qualified professional assess the energy related components and requirements in the design phase provides long-term benefits to the project.

Innovation Points

Complete the Innovative Measure Verification Form and submit it to the Green Building Specialist to determine the number of points earned.

The City recognizes the value of the participation in the program by the construction and design community and encourages use of new green building materials, practices or techniques that may not be included on the checklists. These approaches must meet the environmental goals identified in the Green Building Regulations, (refer to 24.15.010 Purpose and Findings) Proposals for innovative measures will be reviewed by staff on a case-by-case basis and points assigned by merit. Provide support documents or information at the time of submittal or plan check, including completed verification form(s).