City of Santa Cruz
Residential Green Building Guidelines

Guidelines for

Residential New Construction Checklist

and

Residential Remodels/Additions Checklist

January 1, 2014

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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;
- Conservation and effective use of natural resources and energy;
- Provides a healthy living and workspace; and
- 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 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 are required to 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 Residential Green Building Guidelines and Checklists

These Guidelines are for developers, builders, and homeowners planning to construct a new residential project, or remodel/ addition for a residential 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 Residential New Construction Checklist and the Residential Remodels/Additions Checklist and provide resources to help achieve (or exceed) compliance with the program.

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

The Residential New Construction Checklist and the Residential Remodels/Additions 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 can be downloaded from the City's website: www.cityofsantacruz.com/greenbuilding.

Compliance Requirements for Residential New Construction and Remodels/Additions

The Green Building Program applies to all residential and non-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 residential construction[1].
- Residential additions[2] and remodels 350 square feet or more[3].
- Residential projects that are single-family or multi-family residences.
- Residential and Non-Residential (Mixed-use) will be considered separately. A mixed-use project with ground level commercial space and residential space above will use the Non-residential Checklist for the non-residential ground level space. The Residential Checklist will be used for the residential space above.

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 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 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 and the 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] Construction of a detached unit on property with existing dwellings is considered new residential construction.
[2] Addition means a new building or structure expansion that is physically connected to a previously existing building.
[3] Stand-alone decks of less than 350 square feet are exempt from green building requirements.

STEP 1: Determine the Point Requirements for Your Project

Residential New Construction Projects

Calculating Point Requirements

1. Calculate project square footage[4] (building footprint + decks + porches).
2. Calculate the required points for each Action Level using the Point Calculation Table below (or use the Microsoft Excel Checklist to automatically calculate points). Enter square footage of project (A). Perform calculations B and C. Multiply by the appropriate multiplier for the desired level of action (e.g. permit issuance, prioritized permit processing, Green Building Award Certificate, or Green Building Plaque for Exceptional Design) to calculate D, E or F. Add to D, E or F the indicated number for the desired level of action to calculate total required points for the level of action.
3. Exceeding the minimum point requirements by 15-20% is recommended to allow for project modifications.

Residential New Construction Point Calculations	Value
Square feet (A) =	
Value used to determine additional required points (B) = A – 350	
Points per 100 square feet (C) = B ÷ 100	
Permit Issuance Multiplier (D) = C X 1.5	
Prioritized Permit Processing Multiplier **(E)** = C X 2.5	
Green Building Award Certificate Multiplier **(F)** = C X 3.5	
Permit Issuance (Required Points) = D + 20	
Prioritized Permit Processing (Optional) = E + 45	
Green Building Award Certificate (Optional) = F + 75	
Green Building Plaque for Exceptional Design (Optional) = (F + 75) X 1.2	

[4] Non-habitable structures may be approved with a lower point requirement, or may be exempt from program requirements. Non-habitable structures are detached or attached structures which are incidental to the main dwelling unit and do not have living quarters (e.g. kitchen, bathroom, living room or bedroom) and does not meet the California Building Code requirements for habitable space.

Residential New Construction Compliance Standards

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

New Construction Compliance Standards		
Action Level	**Points Required to Receive Action**	
	First 350 sq. ft.[1]	**Each Additional 100 sq. ft.**
R-N-1. Building Permit Issuance	20	1.5
R-N-2. Prioritized Building Permit Processing	45	2.5
R-N-3. Green Building Award Certificate	75	3.5
R-N-4. Green Building Plaque for Exceptional Design[2]	20% above minimum Green Building Award requirement	

[1]Decks less than 350 square feet are exempt.

[2]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.

Residential Remodel/Addition Projects

Calculating Point Requirements

1. Calculate project square footage[5] (footprint of addition + all remodel + all affected decks and porches).
2. Calculate the required points for each Action Level using the Point Calculation Table below (or use the Microsoft Excel Checklist to calculate points). Enter square footage of project (A). Perform calculations B and C. Multiply by the appropriate multiplier for the desired level of action (e.g. permit issuance, prioritized permit processing, Green Building Award Certificate, or Green Building Plaque for Exceptional Design) to calculate D, E or F. Add to D, E or F the indicated number for the desired level of action to calculate total required points for the level of action.
3. Exceeding the minimum point requirements by 15-20% is recommended to allow for project modifications.

[5] Non-habitable structures may be approved with a lower point requirement, or may be exempt from program requirements. Non-habitable structures are detached or attached structures, which are incidental to the main dwelling unit and do not have living quarters (e.g. kitchen, bathroom, living room or bedroom) and does not meet the California Building Code requirements for habitable space. Habitable structures meet Building Code requirements for habitable space that protect health and safety.

Residential Remodel/Addition Point Calculations	Value
Square feet (A) =	
Value used to determine additionally required points (B) = A – 350	
Points per 100 square feet (C) = B ÷ 100	
Permit Issuance Multiplier (D) = C X 1.1	
Prioritized Permit Processing Multiplier **(E)** = C X 1.9	
Green Building Award Certificate Multiplier **(F)** = C X 2.5	
Permit Issuance (Required Points) = D + 15	
Prioritized Permit Processing (Optional) = E + 35	
Green Building Award Certificate (Optional) = F + 45	
Green Building Plaque for Exceptional Design (Optional) = (F + 75) X 1.2	

Residential Remodel/Additions Compliance Standards

The following table is from the City of Santa Cruz Green Building Regulations (Chapter 24.15) and explains the required points for residential remodels and addition projects.

Remodel/Additions Compliance Standards		
Action Level	**Points Required to Receive Action**	
	First 350 sq. ft.[1]	**Each Additional 100 sq. ft.**
R-R/A-1. Building Permit Issuance	15	1.1
R-R/A-2. Prioritized Building Permit Processing	35	1.9
R-R/A-3. Green Building Award Certificate	45	2.5
R-R/A-4. Green Building Plaque for Exceptional Design[2]	20% above minimum Green Building Award requirement	

[1]Exception: no points required for additions or remodels less than 350 square ft. or decks less than 350 square ft.

[2]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.

Requirements for Residential Multi-Family Projects

Your project is Residential Multi-Family if it has one or more of the following characteristics:

1. Housing units have shared utility meters, **or**
2. Project has common space (e.g. community rooms, lobbies, meeting rooms, central laundry, or
3. Project has three or more housing units included within the same building envelope.

If your project qualifies as Residential Multi-Family, there are three methods for determining the square footage for the point's calculation:

1. The square footage of the largest unit if all fixtures in all of the units are similar, **or**
2. The average square footage of the units provided the fixtures in all units are similar, and the largest unit is not more than 25% larger than the rest of the units being averaged, **or**
3. The square footage of the each unit type, if each unit is to be considered separately.

STEP 2: Complete the Green Pre-Design/ Pre-Planning Stage Checklist

The *Green Pre-Design/ Pre-Planning Stage Checklist* (found in Section A of each Checklist) is a list of green building measures that should be considered for integration **as early as feasible in the project; during the planning stage**, well in advance of permit application. The measures on the *Green Pre-Design/ Pre-Planning Stage Checklist* are to be completed and submitted to the Green Building/Environmental Specialist prior to application for a building permit.

The following are the measures on the *Green Pre-Design/ Pre- Planning Stage Checklist*:

- Design smaller homes (see Home Size Table)
- Orient structure to obtain maximum solar access
- Conduct a Preconstruction green building conference
- Certified/Accredited green building project staff
- Design project without fencing
- Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMP's)
- Deconstruct existing structure
- Locate buildings to preserve open space and wildlife habitat
- Construct detached garage or carport
- Design & build grid neutral/net zero energy home
- Exceed California Energy Code (Title 24, Part 6) by 16-30%

STEP 3: Review and Complete the Green Building Checklist

There are separate Checklists for residential new construction projects and residential remodels/additions projects. The green building measures on the Checklists are grouped into sections corresponding to the stages of construction. The Green Building Checklists provide a wide variety of green measures that can be included in your project. For additional information and instructions, be sure to review the *Value and Intent Statements* (in Attachments) associated with the measures.

Exceeding the minimum point requirement by 15-20% 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.

#	Code Section	**CALGreen Mandatory Residential Measures** *Please reference 2013 California Green Building Standards Code for additional explanations, notes, exceptions and charts or tables.*
The mandatory provisions of Residential Measures shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. NOTE: On and after January 1, 2014, residential buildings undergoing permitted alterations, additions or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.		

#	Code Section	CALGreen Mandatory Residential Measures *Please reference 2013 California Green Building Standards Code for additional explanations, notes, exceptions and charts or tables.*
1	4.106.2	Storm water drainage and retention during construction. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site. 1. Retention basins of sufficient size shall be utilized to retain storm water on the site. 2. Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency. 3. Compliance with a lawfully enacted storm water management ordinance.
2	4.106.3	Grading and paving. Construction plans shall indicate how the site grading or drainage systems will manage all surface water flows to keep water from entering buildings. Examples of methods to manager surface water include, but are not limited to, the following: 1. Swales 2. Water collection and disposal systems 3. French drains 4. Water retention gardens 5. Other water measures which keep surface water away from buildings and aid in groundwater recharge. Exception: Additions and alterations not altering the drainage path.
3	4.303.1	Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
4	4.303.1.1	Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets. Note: the effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.
5	4.303.1.2	Urinals. The effective flush volume of urinals shall not exceed 0.5 gallons per flush.
6	4.303.1.3	Showerheads. 4.303.1.3.1 Single Showerhead. Showerheads shall have a maximum flow rate of not more than 2.0 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads. 4.303.1.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 2.0 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time. Note: A hand-held shower shall be considered a showerhead.
7	4.303.1.4	Faucets. 4.303.1.4.1 Residential lavatory faucets. The maximum flow rate of residential lavatory faucets shall not exceed 1.5 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi. 4.303.1.4.2 Lavatory faucets in common and public use areas. The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi. 4.303.1.4.3 Metering faucets. Metering faucets when installed in residential buildings shall not deliver more than 0.25 gallons per cycle. 4.303.1.4.4 Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi. Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

#	Code Section	CALGreen Mandatory Residential Measures *Please reference 2013 California Green Building Standards Code for additional explanations, notes, exceptions and charts or tables.*
8	4.303.2	Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet the applicable standards referenced in Table 1401.1 of the California Plumbing Code.
9	4.304.1	Irrigation controllers. Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final inspection shall comply with the items listed in 4.304.1 (refer to the 2013 CALGreen Code for additional information).
10	4.406.1	Rodent proofing. Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry, or a similar method acceptable to the enforcing agency.
11	4.408.1	Construction waste management. Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3, or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance (refer to the 2013 CALGreen Code for additional information).
12	4.408.2	Construction waste management plan. Submit a construction waste management plan in conformance with Items 1 through 5. The construction waste management plan shall be updated as necessary and shall be available during construction for examination by the enforcing agency. 1. Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale. 2. Specify if construction and demolition waste materials will be sorted on-site (source-separated) or bulk missed (single stream). 3. Identify diversion facilities where the construction and demolition waste material will be taken. 4. Identify construction methods employed to reduce the amount of construction and demolition waste generated. 5. Specify that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not both.
13	4.408.3	Waste management company. Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 4.408.1 (refer to the 2013 CALGreen Code for additional information).
14	4.408.4	Waste stream reduction alternative. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed four (4) lbs./sq. ft. of the building area shall meet the minimum 50 percent construction waste reduction requirement in Section 4.408.1. 4.408.4.1 Waste stream reduction alternative (HR). Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed two (2) pounds per square foot of the building area, shall meet the minimum 50-percent construction waste reduction requirement in Section 4.408.1.
15	4.408.5	Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 4.408.2, Items 1 through 5, Section 4.408.3 or Section 4.408.4 (refer to the 2013 CALGreen Code for additional information).
16	4.410.1	Operation and maintenance manual. At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the items listed in 4.410.1 (refer to the 2013 CALGreen Code for additional information) shall be placed in the building.
17	4.503.1	General. Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with US EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.

#	Code Section	CALGreen Mandatory Residential Measures *Please reference 2013 California Green Building Standards Code for additional explanations, notes, exceptions and charts or tables.*
18	4.504.1	Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of water, dust and debris, which may enter the system.
19	4.504.2.1	Adhesives, sealants, and caulks. Adhesives, sealants and caulks used on the project shall meet the requirements of the listed standards in Section 4.504.2.1 (refer to the 2013 CALGreen Code for additional information) unless more stringent local or regional air pollution or air quality management district rules apply.
20	4.504.2.2	Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3, 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 4.504.3 shall be determined by classifying the coatings 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 4.504.4 shall apply (refer to the 2013 CALGreen Code for additional information).
21	4.504.2.3	Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product- Weighted MIR Limits for ROC in Section 94522 (a)(3) and other requirements, including prohibitions on use of certain toxins 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.
22	4.504.2.4	Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following: 1. Manufacturer's product specification. 2. Field verification of on-site product containers.
23	4.504.3	Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the following: 1. Carpet and Rug Institute's Green Label Plus Program. 2. California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350.) - 4.504.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program. - 4.504.3.2 Carpet Adhesive. All carpet adhesive shall meet the requirements of Table 4.504.1.
24	4.504.4	Resilient flooring systems. Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall comply with one or more of the items listed in section 4.504.4 (refer to the 2013 CALGreen Code for additional information).
25	4.504.5	Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5 (refer to the 2013 CALGreen Code for additional information).
26	4.504.5.1	Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include one of the following items listed in Section 4.504.5.1 (refer to the 2013 CALGreen Code for additional information).

#	Code Section	CALGreen Mandatory Residential Measures *Please reference 2013 California Green Building Standards Code for additional explanations, notes, exceptions and charts or tables.*
27	4.505.2	Concrete slab foundations. Concrete slab foundations required to have a vapor retarder by the *California Building Code,* Chapter 19 or concrete slab-on-ground floors required to have a vapor retarder by the *California Residential Code,* Chapter 5, shall also comply with this section. - 4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following items listed in Section 4.505.2.1 (refer to the 2013 CALGreen Code for additional information).
28	4.505.3	Moisture content of building materials. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent moisture content. Moisture content shall be verified in compliance with the following items listed in Section 4.505.3 (refer to the 2013 CALGreen Code for additional information).
29	4.506.1	Bathroom exhaust fans. Each bathroom shall be mechanically ventilated and shall comply with the following: 1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building. 2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control. a. Humidity controls shall be capable of adjustment between a relative humidity range of < 50 percent to a maximum of 80 percent. A humidity control may utilize manual or automatic means of adjustment. b. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in) (refer to the 2013 CALGreen Code for additional information).
30	4.507.2	Heating and air-conditioning system design. Heating and air-conditioning systems shall be sized, designed and have their equipment selected using the following methods listed in Section 4.507.2 (refer to the 2013 CALGreen Code for additional information).

STEP 4: Complete the Index of Selected Green Measures

After completion of the Checklist, include your selected green measures in an *Index of Selected Green Measures* on the cover of the plans submitted for your permit application. The Index must include the point category, features, 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 your project will be verified and totaled during the plan check process.

EXAMPLE
Index of Selected Green Measures

Category and Measure	Plan Page	Points
A. Green Design for Planning Stage		
M1. Meet CA Energy Code Minimum Standards: Title 24	A-2	M
A6. Construct Detached Garage	A-1	2
B. Site		
M1. Recycle Job Site Construction & Demolition Waste: 50%	L-1	M
M2. Develop & Implement Storm Water Drainage Plan During Construction	L-1	M
M3. Install Weather-based Automatic Irrigation System	L-1	M
B7. Minimize Disruption of Existing Trees/Plants	L-1	1
B13. Utilize Permeable Paving for 50% of Non-structural site paved area	L-1	2

C. Foundation		
M1. Install Vapor Retarder & Capillary Break at Slab on Grade	S-1	M
M2. Create Drainage Swale at 2% Grade, 3' Away From Foundation	S-1	M
C3. Incorporate Recycled Flyash in Concrete	S-1	5
C9. Seal Crawl Space with Vapor Barrier & Install Sump Pump	S-1	10
C6. Use Recycled Content Aggregate for Building Pads, Pathways, Driveways	S-1	2
D. Structural Frame		
M1. Protect Annular Spaces Around Openings in Plates at Exterior Wall	S-2	M
D3. Use FSC-Certified Wood for Framing	S-2	10
D5. Use Steel Interior Web Trusses	S-2	2
D10. Use Recycled Content Steel Studs for Interior Framing	S-2	2
D15. Use Reclaimed Lumber for Non-structural Applications	S-2	3

STEP 5: Implement Green Measures Selected and Pass Inspections

Implementation of the measures on the *Index of Selected Green Building Measures* must be verified via inspections by city staff. Minor measure substitutions are allowed provided they are at least equal in merit to the original 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. The inspectors will verify compliance with CALGreen and City of Santa Cruz mandatory requirements. The following are examples of measures that would be inspected during the site/foundation inspection, under floor frame inspection, frame/insulation (close-in) inspection and the final inspection. These 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:

- (B. Site) **SWPPP and BMP'S measures in place and functional**
- (B. Site) **Verify 50% minimum construction waste management and diversion (required)**

Foundation – Prior to placing foundation concrete:

- (C. Foundation) **Verify re-usable forms**
- (C. Foundation) Verify fly ash in foundation concrete by percentage specified

Underfloor/Underslab – Prior to covering under slab or under-floor work:

- (C. Foundation) **Verify vapor retarder and capillary break for slab on grade are in place**
- (C. Foundation) Verify vapor barrier, sump pump or drain are placed in under floor crawl space

GB Frame (Close in) – Prior to concealing work in walls and ceilings:

- (D. Structural Frame) **Verify all annular spaces around pipes, conduits, cables and exterior openings are sealed**
- (L. Renewable Energy/Roofing) Verify wiring/piping for future Solar P.V. or Thermal systems is in place

Final Inspection – Prior to Certificate of Occupancy issuance:

- (N. Indoor Air Quality and Finishes) **Verify the use of low or no (VOC) emitting paints, sealants and finishes**
- (B. Site) **Verify installation of soil moisture or weather based landscape irrigation controllers**
- (O. Flooring) Verify finished concrete for 50% of flooring

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

ATTACHMENTS

The following pages include these important Residential Green Building Program materials:

1. Measure Verification Form
2. Proper Insulation Verification Form
3. Green Pre-Design/ Pre-Planning Stage Conference Form
4. Construction and Demolition Debris Recycling Form
5. Value and Intent Statements

The *Residential New Construction Green Building Checklist* and the *Residential Remodel/Addition Green Building Checklist* are available in hard copy at the City of Santa Cruz offices. The Checklists may also be downloaded as Microsoft Excel spreadsheets from www.cityofsantacruz.com/greenbuilding.

City of Santa Cruz Green Building Program

Attachment 1

Measure Verification Form

I, _____ from _____
verify that the information provided below is accurate, to the best of my knowledge.

The following measures have been implemented to the fullest extent of the City of Santa Cruz Green Building program guidelines, per the Residential Guidelines and Checklist. A brief narrative of each measure is attached. If necessary during any audit process, I can provide backup documentation for the measure(s) claimed below.

Category, Number & Letter	Feature or Material	Description of Implementation, Installation, Application or Utilization

Signed: _____ Date: _____

Title: _____ Permit #:_____

Email: _____ Phone: _____

City of Santa Cruz Green Building Program

Attachment 2

Proper Insulation Installation Verification Form

Per SCMC Title 24.15 all residential projects shall provide verification of insulation installation; completion of this checklist satisfies the requirement.

Checklist:

- Insulation shall be cut to fit around wiring and plumbing without compression
- Insulation shall be placed between the sheathing and the rear of electrical boxes without compression
- Insulation shall be cut to fit around junction boxes
- Insulation shall be cut to fit properly - There should be no gaps, nor should insulation be doubled over or compressed
- Facing shall be placed toward living space
- Narrow spaces at windows, between studs at corners, and at the intersections of partitions and walls shall be filled with small pieces of insulation; care should be taken not to compress the insulation

For insulation installed by specialty contractor, such as blown cellulous, verification form or other proof of proper insulation installation is allowed.

For a HERS Rating, third party verification is required.

Signed: _____ Date: _____
City of Santa Cruz Building Department Staff

City of Santa Cruz Green Building Program

Attachment 3

Pre-Design/ Pre-Planning Stage Conference Form

Job Location: _____ Permit #: _____

Owner: _____ Phone #: _____

Builder: _____ Phone #: _____

Trade	Name	Green Feature Responsibility
Site & Grading		
Concrete		
Landscaping		
Framing		
Plumbing		
Electrical		
Mechanical		
Exterior Finish		
Interior Finishes		
Roof		
Insulation		
Other		

Signed: _____ Date: _____
City of Santa Cruz Building Department Staff

Signed: _____ Date: _____
Authorized Project Representative

City of Santa Cruz Green Building Program

Attachment 4

Construction Waste Management Plan (CWM)

Project Address	
Job #	
Project Manager	
Waste Hauling Company (see notice below)	
Contact Name	
Contact Phone Number	
Contact E-mail	

- All Subcontractors shall comply with the project's Construction Waste Management Plan.
- All Subcontractor crew leaders shall sign the CWM Plan Acknowledgment Sheet.
- Subcontractors who fail to comply with the Waste Management Plan will be subject to back charges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designated for a single material type will be subject to back charge or withheld payment, as deemed appropriate.
- All debris from jobsite offices, meeting rooms, and other on site activities is subject to waste management regulations.
- Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
- When using waste stream reduction measures, the gross weight of the product is subtracted from a base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.

---

1. The project's overall rate of waste diversion will be _____ %.
2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedures to reduce broken and damaged materials and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.
3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.
4. Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the CWM Coordinator will present him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedures for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgment Sheet enclosed. The CWM Plan will be posted at the jobsite trailer.
5. Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.

6. Where necessary, The City of Santa Cruz will provide a commingled drop box at the jobsite for most of the construction waste. In cases where the City of Santa Cruz is not providing commingled drop boxes, all commingled materials will be taken to [Sorting Facility Name and Location] _____. The average diversion rate for commingled waste will be _____%. As site conditions permit, separate drop boxes will be used for particular phases of construction (e.g., concrete and wood waste) to ensure the highest waste diversion rate possible. For assistance in staging delivery and pick-up of drop-boxes for different materials, contact Lupe Sanchez, Resource Recovery Supervisor, 831-212-6581. Contractor will make weight tags available to the City of Santa Cruz, for inspection, if requested.
7. In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not commingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.
8. [Project Manager] _____ will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. [Project Manager] _____ will provide City of Santa Cruz with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. [Project Manager's] _____ monthly report will track separately the gross weights and diversion rates for commingled debris and for each source-separated waste stream leaving the project. In the event that The City of Santa Cruz does not service any or all of the debris boxes on the project, the [Project Manager] _____ will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials. Contractor will make weight tags available to the City of Santa Cruz, for inspection, if requested.
9. In the event that the Contractor, or their Subcontractors haul their own material (see note below) as part of their scope of work, such Subcontractors shall not be excluded from complying with the CWM Plan and will provide The City of Santa Cruz with all required documentation of weight and waste diversion data for the materials hauled.
10. In the event that site use constraints (such as limited space) restrict the number of debris boxes* that can be used for collection of designated waste the Project Manager will, as deemed appropriate, allocate specific areas onsite where individual material types are to be consolidated. These collection points are not to be contaminated with non-designated waste types.

NOTICE TO CONTRACTORS REGARDING REFUSE AND DEBRIS HAULING

If you need roll-off box services to haul construction debris or refuse from your project, you are required by the City of Santa Cruz Municipal Code, Chapter 6.12, to use the City's Resource Recovery Collection Program.

Private companies are not allowed to operate refuse/debris box services within the City limits, except under certain limited circumstances (see Santa Cruz Municipal Code section 6.12.160). Any questions regarding this provision may be directed to Bob Nelson, Superintendent of Solid Waste, 420-5548.

For City collection services and rates, call 420-5220 or contact Utility Customer Services, 212 Locust Street, Santa Cruz.

For assistance in staging roll-off boxes for different materials, contact Lupe Sanchez, Resource Recovery Supervisor, 831-212-6581.

Construction Waste Management (CWM) Worksheet

Project Address	
Job #	
Project Manager	
Waste Hauling Company (see notice on debris hauling)	
Contact Name	
Contact Phone Number	
Contact E-mail	

Material Type	**Diversion Method**	**Material Status**			**Projected Diversion Rate**
	Reuse	Recycle	Comingled and sorted on site	Source Separated on Site	
Asphalt					
Concrete					
Brick/Block/Shotcrete					
Metal					
Plastic					
Roofing					
Wood					
Rigid insulation					
Fiberglass insulation					
Acoustic ceiling tile					
Gypsum drywall					
Carpet/carpet pad					
Plastic pipe					
Plastic buckets					
Hardiplank siding and boards					
Glass					
Cardboard					
Pallets					
Job office trash, paper, glass & plastic bottles, cans, plastic					
Alkaline & rechargeable batteries, toner cartridges, and electronic devices					

CWM Plan Acknowledgment

The Foreman for each new Subcontractor that comes on site is to receive a copy of the Construction Waste Management Plan and complete this Acknowledgment Form.

I have read the Waste Management Plan for the project; I understand the goals of this plan and agree to follow the procedures described in this plan.

Date	Subcontractor Company	Crew leader Name	Signature

City of Santa Cruz Green Building Program

Attachment 5

Value and Intent Statements

A. Green Building Design Measures Checklist for Planning Stage

The most effective way to include any quality building measures into a project is by concentrating on quality results early in the design process. By establishing benchmarks of performance and incorporating sustainable features in the project from the outset, the impact on the environment is minimized and the project will be cost-effective.

Meet minimum energy standards of the California Energy Code (Title 24, Part 6)

Intent: Energy efficiency is the cornerstone of every green home. Improving energy efficiency is one of the most effective ways of reducing energy costs, improving air quality, and reducing greenhouse gas emissions.

Design Smaller Homes

Refer to Home Size Table below.

Intent: Building smaller homes conserves resources, lowers energy consumption and preserves open space. Please clearly show the number of bedrooms and total square footage on the cover sheet of the plans.

	Home Size Table				
	Number of Bedrooms				
	2	3	4	5+	Points
Area of Home (Square Feet)	1382	1890	2648	3424	**0**
	1332	1825	2555	3296	**1**
	1282	1756	2459	3172	**2**
	1232	1688	2363	3048	**3**
	1182	1619	2267	2925	**4**
	1132	1551	2171	2801	**5**
	1082	1482	2075	2677	**6**
	1032	1414	1979	2553	**7**
	982	1345	1883	2430	**8**
	932	1277	1788	2306	**9**

Orient Structure for Maximum Solar Access

Please note on the site plan the orientation of the roof to verify maximum solar gain and include a north arrow.

Intent: Orientation of the roof or structure allows for proper roof design for potential installation of PV panels, and also provides the maximum benefit of free energy from the sun.

Conduct Preconstruction Green Building Conference

Please reference on the green features index. Contact the Santa Cruz Green Building Environmental Specialist to set up a time for a conference.

Intent: Investing time in the design phase of a project to discuss green features with those responsible for their implementation, installation and application saves time and money in the long run. This is also the opportune time to consider a variety of design ideas which may not have been considered.

Include Certified/Accredited Green Building Project Staff:

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

Please provide verification of accreditation, and note on green features index.

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

Design Project without Fencing on Property

Make note on site plans and reference the green features index.

Intent: Not building a fence helps conserve resources by reducing the need to harvest virgin materials, typically redwood, for fences. It is also the intent of this measure to discourage temporary plastic fencing which has a limited use before needed to be discarded of in the landfill.

Deconstruct Existing Structure

Please designate how and what type of structures will be deconstructed. Please provide index of materials to be reclaimed after deconstruction by type and volumes and note the final disposition of the materials. Show a location on the site plan where material will be stored and classified during the course of deconstruction and construction.

Intent: Disassembling and reusing materials from a structure reduces pressure on landfills and reduces the need to harvest new resources.

Construct Detached Garage or Carport

Please note on plan and plot map the construction of a detached garage or carport.

Intent: Garages contain many toxic gases released from cars, paints, power tools and other typical household goods. By separating the garage from the house, or constructing a carport, these fumes and gases are stopped from entering the home and degrading the indoor air quality.

Design and Build a Zero Energy Home

Please provide documentation showing the annual energy consumption versus the annual energy production of the building to verify that the structure has a net zero energy ratio of +/- <9.9%

Intent: Homes that annually produce an equivalent of what they consume are maximizing their conservation of energy.

B. Site

Intent: The concepts of green building extend beyond the walls and foundation of a building. Integrated system design and thinking includes the surrounding environment as a necessary component of the building process. By being conscientious of the existing flora and fauna on the building site, the water that runs on, under and away from the site, and the materials hauled away as garbage or recycling, the impact that construction has on our environment can be mitigated.

Fact: 75% of construction and demolition byproducts can be recycled, yet only 20% are typically recycled.

Recycle Job Site Construction & Demolition Waste. 50% Recycle Rate Required

Please complete the City's Construction Waste Management Plan prior to permit issuance. Please designate how and what materials will be recycled. Please provide index of materials to be recycled by type and volume and specify the final disposition of materials. Show a location on the site plan where materials will be stored and classified during the course of construction.

Intent: Promotes recycling efforts, reduces pressure on the landfills and the need to harvest new resources.

Develop and implement a plan to manage storm water drainage during construction

Refer to City's Storm Water Management Plan. http://www.cityofsantacruz.com/index.aspx?page=138

Intent: Careful planning to manage storm water drainage and minimize erosion can mitigate negative effects on the site and adjacent areas.

Install weather-based automatic irrigation systems controllers

Intent: Watering yards/landscapes is the largest use of all urban water in California and there are significant amounts of wasted water due to overwatering. Water consumption can be greatly reduced with weather-based controllers that automatically adjust irrigation in response to plant needs as weather conditions change. Final inspection will ensure automatic irrigation systems controllers are weather-based.

Recycle Job Site Construction & Demolition Waste. 50% Recycle Rate Required

65% Recycling Rate = 1 point
75% Recycling Rate = 2 points
80% Recycling Rate = 4 points

Please designate how and what materials will be recycled. Please provide index of materials to be recycled by type and volume and specify the final disposition of materials. Show a location on the site plan where materials will be stored and classified during the course of construction.

Intent: Promotes recycling efforts, reduces pressure on the landfills and the need to harvest new resources.

Donate Unused Materials

Please specify the types and quantities of materials and indicate who will be the recipient of donated materials (church group, Goodwill, etc.).

Intent: Donating unused or old but still useful material and appliances has the double benefit of helping those in need and reducing materials sent to the landfill.

Protect Native Soil

Please show how this will be accomplished. Please indicate on the plans areas to be protected and the measures to be used to protect them such as mulches, coverings etc. Provide source verification for materials to be used.

Intent: Preserve the existing and healthy topsoil, landscape and vegetation. Reduce the effort and resources needed to rebuild soils and landscape with new, non-native, less stable and established soils and plants. Reduce water runoff during construction, as well as water needed to establish new plants.

Minimize Disruption of Existing Plants/ Trees

Please provide details of how this will be accomplished. Please show on the plans location of and the types of measures implemented such as temporary fencing, barricades, covering, etc. that will be used during the course of construction.

Intent: Protecting existing plants and trees decreases the need to re-vegetate with foreign, non-native, newly harvested plants. Plants and trees also stabilize the project site during and after construction.

Protect Water Quality with Landscape Design

Please show how this will be accomplished. Please show on plans location of and types of measures to be implemented such as bio-filters, swales, rain-catchment systems.

Intent: These types of measures help recharge the ground water system as well as allow property owners to store water during the wet season for irrigation during the dry season.

Design Resource and Water-Efficient Landscapes

Provide at a minimum a landscape plan specifying, documenting, and incorporating the following features: Plant non-invasive species as listed by Cal-IPC (California Invasive Plant Council), Plant no species that require shearing, Plant 75% California native or Mediterranean species. Please verify that they are California native or other Mediterranean species that are appropriate for the soil type and microclimate.

Intent: Planting with native species, hydro-zoning (placing plants that require similar amounts of sun and water in zones together) and installing high efficiency irrigation (bubblers, timers, and soil moisture sensors) saves water and decreases the flow of green waste to the landfills.

Reuse Materials/ Use Recycled Content Materials for Landscape Areas

Please specify on plans location and types of materials to be used. (Example: use recycled plastics or composites for benches or edging, concrete debris as planters or pathways) and note on plan page specific to the installation/ utilization location.

Intent: Recycling and using recycled materials decrease the flow of waste to the landfill, and minimizes the harvest of raw materials.

Install High Efficiency Irrigation System

Please specify H/E sprinkler manufacturer and show schematic drawing on plan page specific to the installation location.

Intent: Installing high efficiency irrigation (bubblers, timers, and soil moisture sensors) saves water by minimizing waste and insuring irrigation takes place only when and where required.

Provide for On-Site Water Catchment/ Retention

Please provide specifications for and show location details for onsite water retention system, cistern, or other water storage device including source of water, connection and distribution schematics.

Intent: Storing water during the wet season to use during the dry season for irrigation decreases the demand on water sources, both municipal and private wells.

Utilize Permeable Paving for 50% of Non-structural Site Paved Area

Please provide specifications for and show location of area to be paved on plan page specific to the installation location.

Intent: Using permeable paving allows for water to be absorbed back into the soil. This has the double benefit of reducing runoff into street and neighboring properties and recharging the ground water system.

Install Outdoor Solar (PV) Lights

Please show location(s) of the lights on the plot or landscape plans and provide manufacturers specifications.

Intent: Solar walkway lights store energy from the sun during the day for use at night. This conserves energy and resources. The lights do not have to be hard wired, saving copper, piping and other resources.

C. Foundation

Intent: Building a comfortable and green home starts at the foundation. Sustainable practices such as replacing a percentage of the Portland cement in your concrete with flyash, or reusing form boards for framing saves resources and diverts materials from the landfill.

Fact: For each ton of Portland cement produced, one ton of CO_2 is released into the atmosphere.

Install vapor retarder and capillary break at slab on grade

Intent: Installing vapor retarder and capillary break at slab on grade can keep moisture from accumulating and causing damage to the structure and floor finishes and prevents mold growth.

Create Drainage Plane @ 2% Grade for 3' Away From Foundation

Please show as a detail on the plan page specific to the application location.

Intent: A slope away from the foundation helps protect against moisture intrusion.

Incorporate Recycled Flyash in Concrete up to 15% = 2 points; Add 1 point for every 10% increase in Flyash up to 5 points.

Please make a note of this feature on the plans specific to the location where the feature will be used. Example: 15% flyash mixture will be used in the buildings foundations and slabs, concrete mix design will be provided as verification, load tickets to be provided for verification as requested.

Intent: Flyash is a byproduct of burning coal in power plants. It can be used to replace a percentage of Portland cement in concrete with no deleterious effects. Using flyash diverts it from the landfills and reduces the need to create new Portland cement.

Reuse Form Boards

Please specify how forms will be reused, index and note on plan page specific to the installation location.

Intent: Reuse of lumber minimizes the need for harvest of raw materials.

Re-Usable Metal Forms

Please note this feature on the plans (example: metal forms will be provided by a specialty concrete contractor and reused on other projects).

Intent: Metal forms can be used many times. This reuse eliminates the need to cut, fit and throw away wood formboards.

Use Recycled Content Aggregate

On the plan please identify the materials supplier, specify the concrete mix design and note the location where the concrete will be placed.

Intent: Crushing concrete to use as underlayment diverts it from the waste stream and is cost and time effective.

Install Rigid Foam, Insulate Concrete Forms (ICF's)

Please provide information on material to be used, methodology, and specifications from the engineer. Make note of location on the plans, and cross-reference on the Checklist.

Intent: Reduce waste generation through a more efficient construction process. Increase the R-value, air tightness, durability and structural strength of the building envelope.

C.8. Use Rammed Earth Foundation (must meet engineering requirements for seismic zone 4)

Please provide information on material to be used, methodology, and specifications from the engineer. Make note of location on the plans, and cross-reference on the Checklist.

Intent: Using material that is onsite decreases the need to ship and harvest raw materials. Rammed earth walls also provide excellent insulation.

Seal Crawl Space with Vapor Barrier & Install Sump Pump

Please provide schematic and product listings for vapor barrier (5 mil minimum thickness) and sump pump. The vapor barrier must extend up the walls of the foundation 1 foot and be completely attached to the foundation walls.

Intent: The primary purpose of sealing the under floor crawl space is to keep moisture from accumulating and causing damage to the structure of the home. As a secondary benefit, dust and other particulates are kept from entering the ducts in the HVAC system.

Install Drainage Plane and Barrier Adjacent to Foundations (No Plant Strip 3' Extending from Foundation.

Please show as a detail on the plan page specific to the application location.

Intent: Vegetation attracts insects and traps moisture that is detrimental to the structure of your home.

D. Structural Frame

Interesting Fact: Construction of a 2085 sq ft home uses 1.5 acres of forest. (16,000 board feet or twenty three 20" diameter trees) (Source: Natural Resources Defense Council, NRDC).

Protect annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls

Intent: Protection of annular spaces around pipes, electric cables, conduits or other wall openings protects against the passage of rodents by closing openings. Close openings with cement mortar, concrete masonry or other method acceptable by the City.

Substitute Solid Sawn Lumber with Engineered Lumber

Note location and type of engineered lumber on plans. (Glulam, LVL, LSL, PSL, OSB) Please provide the specifications for the lumber and note on plan page specific to the installation location.

Intent: The vast majority of our national forests have been logged into extinction. Aside from the obvious effects on the environment, we are now seeing the effects at our local lumber yards as well; the lumber that is available is expensive and of poor quality. Engineered lumber such as laminated beams and I-Joists provide solutions to both of these issues. These products are produced using younger, rapidly renewable species of trees. They are also straighter, stronger and cheaper than their solid sawn counterparts.

Use FSC Certified Wood for Framing (for every 10% of FSC lumber used =2 points up to 10 points)

Provide FSC Certification and supply provider/ lumber yard information to inspector for verification at time of framing inspection.

Intent: The Forest Stewardship Council (FSC) guarantees that the lumber that they certify comes from a sustainably harvested forest.

Use Wood I-Joists for Floor and Ceilings

Note location and type of engineered lumber on plans. (Glulam, LVL, LSL, PSL, OSB) Please provide the specifications for the lumber and cross reference to the Checklist.

Intent: Engineered lumber comes from smaller, younger, rapidly renewable sources and minimizes the demand on old growth forests.

Use Steel Interior Web Trusses

Please note location of web trusses on plan page specific to the installation location. Please provide specifications for the trusses and cross reference to the Checklist.

Intent: Increases durability of construction by installing materials that reduce damage caused by common pests, rot and fire. Promote recycling efforts and reduce pressure on landfills by using recycled content and recyclable steel.

Design Energy Heels on Trusses

Note location and design of trusses on plan page specific to the installation location and cross reference to the Checklist.

Intent: Designing trusses with energy heels allows for more efficient insulation and increase the comfort and performance of your home.

Use Oriented Strand Board (OSB)

Please delete all references to plywood and note location of Oriented Strand Board (OSB) and specifications on plan page specific to the installation location.

Intent: Engineered lumber comes from smaller, younger, rapidly renewable sources and minimizes the demand on old growth forests.

Use Finger-Jointed Studs for Non-Structural Vertical Applications

Please note and show location of finger jointed studs on plan page specific to the installation location. Provide specifications and cross reference to the Checklist.

Intent: Finger jointed studs are fabricated using small sections of lumber. The result is straighter studs that reduce the demand for solid sawn lumber.

Use Engineered Studs for Vertical Applications

Note location and type of engineered studs on plan page specific to the installation location. Please provide specifications and cross reference on the Checklist.

Intent: Engineered lumber comes from smaller, younger, rapidly renewable sources and minimizes the demand on old growth forests.

Use Recycled Content Steel Studs for Interior Framing

Intent: Increases durability of construction by installing materials that reduce damage caused by common pests, rot and fire. Promote recycling efforts and reduce pressure on landfills by using recycled content and recyclable steel.

Reduce Lumber Framing and Improve Thermal Performance with Alternative Wall Construction

Please note and show location of alternative techniques on plans. (Example: Energy heels in trusses, or use of only two studs in the corner. Both of these techniques allow for more efficient application of insulation at the houses perimeter.) Please cross reference the Checklist and make note of techniques on the plan page specific to the utilization location.

Intent: Designing with insulation installation in mind allows for Proper Insulation Installation and improves the performance of your home.

Design with 8 Foot High Plate: 2 Points for Each Floor Where Used

Please note location of this feature on the plan page specific to the utilization location and cross reference the Checklist.

Intent: Designing and building 8’ high plates maximizes the dimensions of studs and reduces waste of materials.

Design Using 2' Modules, 1 Point Per Dimension (Length/Width) Up To 2 points

Please note location of this feature on the plan page specific to the utilization location and cross reference on the Checklist.

Intent: Designing and building in 2' modules maximizes the dimensions of lumber and reduces waste of materials. (Example: rooms that are 20'x20', 22'x26')

Apply Advanced Framing Techniques

Please note and show location of advanced framing techniques on plans. (Example: framing 24 inches on center instead of 16 inches on center) Cross reference the Checklist and note on the plan page specific to the installation and utilization location.

Intent: Reduce framing material consumption and related costs. Increase the comfort and performance of the home by decreasing thermal bridging.

Use Reclaimed Lumber for Non-Structural Applications

Please note and show location of reclaimed lumber usage on plan page specific to the installation location. Cross reference on the Checklist.

Intent: Reduces pressure on landfills and the need to harvest new resources.

E. Exterior Finish

Intent: Durability is a key characteristic of any material that you choose to use during the construction of your home. Materials that maintain their integrity do not require replacement, save money on maintenance costs, and protect the house from the moisture and sun damage that occurs when products deteriorate. Interesting Fact: Beware of "green-washing." There are many products advertised as green, that are not truly environmentally friendly. Be sure to thoroughly research the green products you intend to use.

Use Sustainable Decking Materials

Show and reference the specific location of the decking material to be installed and provide products information, listings and approvals in the form of a notation on the plan page specific to the installation location.

Intent: Promote recycling efforts, reduce pressure on landfills, and the need to harvest new resources. Promote use of sustainably harvested materials as designated by the premiere sustainable forestry program.

Use Non-CCA Treated Wood

Please specify product to be used, verify product is not treated with CCA and index on plan page specific to the installation location.

Intent: Chromated copper arsenate (CCA) is a chemical wood preservative containing chromium, copper and arsenic. CCA is used in pressure treated wood to protect wood from rotting due to insects and microbial agents. It is harmful to the environment and is not allowed in residential construction.

Install House Wrap under Siding

Please specify product to be installed and index and note on plan page specific to the installation location.

Intent: Promote durability and reduce unwanted moisture in exterior walls by providing a clear area for positive water movement and a barrier to moisture intrusion.

Use Alternative Siding Materials

These features must be qualified. Show and reference the location of the siding material to be installed and provide product information and listings in the form of a notation on the plan page specific to the installation location.

Intent: Promote durability and reduce material consumption with long lasting products. Increase safety by use of noncombustible materials.

Use Low/ No VOC Exterior Paint

Please specify product to be used, provide manufacturers information (MSDS Sheet) to verify product is low VOC and note on the plan page specific to the application location.

Intent: Volatile Organic Compounds pose health risks outside the home as well as inside the home.

Provide Advanced Flashing/ Weather Proofing Details

Please provide detailed plans showing advanced flashing and water proofing and cross reference green feature index.

Intent: Advanced Flashing and other water proofing procedures decrease moisture intrusion that leads to better indoor air quality, and increased life of the structure.

F. Plumbing

Intent: By conserving water, we are also saving energy. It takes an enormous amount of electricity to move and treat the water we use every day. With the average American using between 140-170 gallons of water per day, the energy use adds up fast. By installing low flow and high efficiency fixtures, we can save resources and money.

Interesting Fact: Landscaping accounts for about half the water Californians use at home. Toilets use about 20 percent, while showers account for another 18 percent.

Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads)

Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with specified performance requirements in CALGreen.

Intent: Compliance with the requirements will significantly reduce indoor water consumption. Approximately 65 gallons per day can be saved using a low flush toilet (i.e. 1.28 gallons per flush) for a typical family of four.

Reduce indoor water use by 20%

For multiple showerheads serving one shower, the combined flow of all the showerheads is not to exceed the maximum flow rate specified in CALGreen, or the shower is to be designed to only allow one showerhead to be in operation at a time. Indoor water use to be reduced by using water flow restrictors and or water saving fixtures as specified in CALGreen.

Insulate all Hot Water Pipes

Please provide product information including R-value, note and cross reference index on plan page specific to the installation location.

Intent: Decreases energy consumption by minimizing heat loss from hot water pipes.

Pre-Plumb for Grey Water Conversion

Please provide piping diagram showing size, routing and type of piping to be used. Also show proposed location of Graywater system.

Intent: Reduce potable water consumption and pressure on sewage infrastructure and treatment facilities by utilizing Graywater for irrigation purposes. (See City ordinance at http://www.cityofsantacruz.com/index.aspx?page=1402) Graywater systems must register with the Department of Public Works.

Install Indoor Grey Water Recovery/Reuse System

Please provide manufacturers specifications and system information as well as piping diagram showing size, routing, and type of piping to be used. Also show proposed location of Graywater system.

Intent: Reduce potable water consumption and pressure on sewage infrastructure and treatment facilities by utilizing Graywater for irrigation purposes. (i.e. Capturing water from the bathroom sink to flush in the toilet.)

Install Chlorine Filter on Showerhead/Install Whole House Chlorine Filter

Please show the location of this feature on the plans and specify by note the make or manufacturer of the showerhead filter/whole house chlorine filter on the plan page specific to the installation location.

Intent: Removes harmful effects of chlorine in household water usage.

Install High Efficiency Water Heater

Please provide detail for location of water heater and provide manufacturers specifications and listings on plan page specific to the installation location.

Intent: Reduce consumption of energy required to heat water. Water heating accounts for a significant portion of a household's energy use. Installation of a High Efficiency water heater can save money and energy.

Install On Demand Hot Water Circulation Pump

The pump must be an on demand type, equipped with an activation switch (at the fixture) and be activated at the fixture furthest from the water heater. Please provide specification for pump on the plan page specific to the installation location.

Intent: An on demand hot water circulation pump speeds the rate of hot water delivery to the shower or faucet and most importantly, reduces water wasted down the drain while waiting for hot water to arrive at the plumbing fixture.

Install Pans/Drains Under Water Using Appliances

Please note location on the plans.

Intent: Reduces water damage potential by installing pans/drains under water using appliances.

Install Rainwater Collection and Storage (2500-5000 gallon capacity)

Please provide piping diagram and schematic showing size, routing, and type of piping to be used. In addition, show proposed location of collection and storage unit. Please include manufacturer's specifications including listings, approvals for all collection and storage system equipment and cross reference on the Checklist.

Intent: Reduces potable water consumption by storing rain water during the wet season for use during the dry season.

G. Electrical

Intent: Title 24, the California State Energy Code, ensures that our homes outperform those in other states. By exceeding Title 24 requirements we can assure that our homes are more efficient and comfortable to live in.

Interesting Fact: Standing in moving air under a ceiling fan makes the body feel 4 degrees cooler, which helps to reduce the need for air conditioning.

Install High Efficiency Ceiling Fans with CFL's (1 point each fan, up to 4 points)

Please clearly indicate the type and location of all high efficiency fans on the plans by number and symbol.

Intent: Fluorescent bulbs use less energy than incandescent bulbs and have a longer life. Ceiling fans are an energy efficient way to make the interior environment more comfortable.

Rough-in for dedicated 40 Amp/ 220V service for charging electric vehicle

Intent: Encouraging homeowners to rough in and/or install service to charge electric vehicles in their homes can assist in reducing the greenhouse gas emissions from the largest source of emissions in California, transportation.

H. Appliances

Intent: Electricity is costly monetarily and environmentally. By installing efficient appliances, we can lower the demand on the power grid as well as our wallets. Interesting Fact: ENERGY STAR qualified appliances incorporate advanced technologies that use 10–50% less energy and water than standard models.

Install ENERGY STAR Dishwasher

Provide product information and show this feature as a notation on the plan page specific to the installation location.

Intent: High efficiency dishwashers reduce water and energy use.

Install ENERGY STAR Horizontal Axis Washing Machine

Provide product information and show these features as a notation on the plan page specific to the installation location.

Intent: Qualified washing machines use substantially less water and energy than conventional washers.

Install ENERGY STAR Refrigerator

Provide product information and show these features as a notation on the plan page specific to the installation location.

Intent: Energy Star qualified refrigerators can reduce the total annual electricity bill by more than 10%. Choosing a refrigerator that is properly sized for your home will further reduce energy consumption.

Install Built-In Recycling Center

Please specify the location of this feature (cabinet detail) on the plans page specific to the installation location.

Intent: Recycling reduces the amount of material that enters landfills and can save money for homeowners through reduced fees.

Locate mechanical room at centralized location, aggregated, accessed only from exterior

Intent: Providing one aggregated location for services, accessible only from the outside can facilitate usage that is more efficient and servicing that is more convenient.

I. Insulation

Intent: The most efficient way to increase the comfort and performance of your home is to install your insulation properly. By insuring that all points of infiltration are sealed, you can increase the heat retention of an average home by 25%. Interesting Fact: A single 4" gap reduces the effectiveness of a batt of insulation by 40%.

Practice Proper Insulation Installation

Please provide completed Proper Insulation Installation Verification Form.

Intent: Effectively installed insulation creates a more comfortable home and reduces the owner's utility costs. Lower energy demand reduces pollution and improves public health.

Upgrade Insulation to Exceed Title 24 Requirements by 20% (Walls/Ceilings)

Please provide type of insulation to be used, location of installation and specifications as a note on the plan page specific to the installation location. Cross reference on the Checklist.

Intent: Increased ceiling, wall and floor insulation improves comfort, decreases heating and cooling requirements, saves money and makes the home quieter.

Install insulation after building is weather tight and install outside of rainy season (October 1st to April 1st)

Intent: Installing insulation outside of the City of Santa Cruz's rainy season, October 1st through April 1st, can protect against moisture exposure and ensure dry installation of wall, floor and ceiling insulation. Poorly installed or damp insulation severely decreases the installation value and can cause mold issues.

Install Recycled-Content, Formaldehyde-Free Fiberglass Insulation

Provide product specification and show this feature on the plans as a notation specific to the installation location.

Intent: Improve indoor air quality by installing insulation with reduced levels of toxic chemicals.

Use Environmentally Preferable Insulation Materials, Wool, Foamed Concrete, Soy-Based Polyurethane (Walls and Ceilings)

Please specify type of insulation, manufacturer, R-value, and location on plan page specific to the installation location.

Intent: Using materials made with recycled content reduces reliance on virgin raw materials. Using materials made with post-consumer recycled content closes the loop in the curbside recycling process and reduces waste to landfill.

Install Straw Bale Insulation at Least 18" Thick

Please provide engineers calculations on plans and reference the green features index.

Intent: When designed and build correctly, straw bale homes can be beautiful, efficient and long lasting. Straw is an inexpensive, rapidly renewable resource used as a building material for hundreds of years.

J. Windows

Intent: Natural light increases productivity and is good for our health and well being. By installing high efficiency fenestration products we can achieve better insulation and maintain day lighting. Interesting Fact: In 1990 alone, the energy used to offset unwanted heat losses and gains through windows in residential and commercial buildings cost the United States $20 billion (25% of all the energy used for space heating and cooling).

Install Energy-Efficient Windows

Please specify the window types and features on the window schedule or on the plan page specific to the installation location. Please cross reference on the Checklist.

Intent: Windows play a big role in the energy efficiency of homes. In the summer, they can allow unwanted heat into the house, and in the winter, they can account for as much as 25% of the home's heat loss. High performance windows reduce heating and cooling costs and keep the home more comfortable.

K. Heating, Ventilation and Air Conditioning

Intent: The average American spends 90% of their time indoors. Modern homes are sealed tightly to conserve energy and to insure against moisture and air leaks. As a result, proper ventilation has become increasingly important to ensure that the air inside of our homes is part of a safe and comfortable environment.

Cover duct openings and other related air distribution component openings during construction

Intent: Ensuring air distribution component openings are covered will reduce the amount of debris and dust that can accumulate in the system and cause air quality issues.

Design duct system for CALGreen compliance

Design duct system in compliance with CALGreen.

Intent: Ducts leak an average of 30%, waste energy, and reduce comfort levels. Ensuring air distribution components openings are covered will reduce the amount of debris and dust that can accumulate in the system and cause air quality issues.

Use Duct Mastic on all Duct joints

Please specify mastic manufacturer to be used and make installation note on the plan page specific to the installation location.

Intent: Leaks in the joints between ductwork have been shown to allow an average of 20-30% of the conditioned air to leak. Leaky air ducts can cause negative pressure in the house, which can draw many outdoor and indoor contaminates into the home, including carbon monoxide from gas water heaters and furnaces. To maintain a long-term tight seal, use a water-based mastic at every duct joint and seam.

Vent Range Hood to the Outside

Please note and show this feature on the plan page specific to the installation location.

Intent: Venting fumes from cooking from the conditioned space to the outside space helps maintain good indoor air quality.

Install compliant Whole House Fan

Install whole house fan with insulated louvers or covers that close when the fan is off. Ensure the louvers or covers have a minimum R-4.2 insulation value.

Install direct-vent sealed-combustion type gas fireplace OR EPA Phase II Woodstove/Pellet Stove

Ensure all installed gas fireplace is a direct-vent sealed-combustion type. Any installed woodstove or pellet stove is to comply with US EPA Phase II emission limits and with local requirements.

Intent: Typical fireplaces have very low efficiency, some as low as 13%. Installing fireplaces with new requirements consume less energy and reduce winter heating costs.

Install Ductwork within Conditioned Space

Please clarify this feature by providing a schematic drawing or graphic depiction detailing how ducting will be run within the heated conditioned space of the building.

Intent: Poorly designed and installed ductwork lowers heating and cooling system efficiency and capacity, and can contribute to poor indoor air quality and comfort problems. Installing ductwork within conditioned space minimizes heat loss and infiltration of particulates.

Clean All Ducts Before Occupancy

Please provide verification/ documentation that all ducts have been cleaned before occupancy and make note of this on plans.

Intent: Debris and dust from construction can settle in the HVAC units and the ductwork, potentially causing occupants to have allergic reactions and reducing the effectiveness of the blower fan and heating/cooling elements. As soon as the ducts are installed, completely seal off each duct register and the HVAC unit to block out construction dust. Use methods that will stay in place under the wear and tear of a typical construction site. After construction has been completed, vacuum the blower unit and ductwork as necessary.

Install Attic Ventilation System

Please specify manufacturer and provide listings of the attic ventilation system. Show location of the fan, ducting and discharge termination on the plan page specific to the installation location.

Intent: During the summer months an attic can act as an oven, capturing heat and increasing the ambient temperature of the rooms below. An attic ventilation system evacuates that hot air and increases the efficiencies of the cooling systems in the home.

Install Sealed Combustion Units/Furnaces and Water heaters

Please clarify by providing manufacturers specifications to verify water heater/ furnace is either a power or direct vent sealed combustion type. Note this feature on the plans.

Intent: Sealed combustion furnaces, boilers, and water heaters duct outdoor air directly into a sealed jacket around the combustion chamber so that air from inside the house is not used for combustion. These products also vent combustion gasses directly outdoors so they do not pollute the home.

Install 13 SEER/ 11 EER or Higher AC with a TXV

Please clarify by providing manufacturers specifications to verify water AC unit is 13 SEER/ 11 EER or higher. Note on the plan page specific to the installation location.

Intent: Choose an air conditioner with a SEER of 13 or higher or an EER of 11 or higher. While these units usually have higher upfront costs, they are a good long-term investment. Many utilities offer rebates for higher efficiency units.

Install AC with Non- HCFC Refrigerants

Please note and show location on plan page specific to the installation location. Provide specifications to verify that the AC unit is using non–HCFC refrigerants and cross reference on the Checklist.

Intent: Environmentally sound refrigerants reduce the risk of damage to the ozone layer.

Install 90% Annual Fuel Utilization Efficiency (AFUE) Furnace

Please note and show location on the plans page specific to the installation location. Provide manufacturers specifications for the furnace to verify the AFUE. Cross reference on the Checklist.

Intent: High efficiency heating equipment increases comfort, reduces pollution, and lowers energy use and associated greenhouse gas emissions.

Install Zoned, Hydronic Radiant Heating

Please provide a system schematic, product listings and cross reference the green features index.

Intent: Hydronic radiant heating can provide even heat throughout a room, reduce drafts and eliminate duct leakage. The hydronic radiant heating system area is easily zoned, allowing residents to turn off heat in areas it is not being used.

Install High Efficiency Air Filter (MERV)

Please provide manufacturers specifications as a note and show location on plan page specific to the installation location. Cross reference on the Checklist.

Intent: HVAC filters remove particulates from the air. MERV, or Minimum Efficiency Reporting Value, is a metric used to measure an air filter's efficiency. Use HVAC air filters rated at MERV 6-10. These filters are recommended for cleaner air without compromising the performance of standard mechanical systems.

Install Heat Recovery Ventilation Unit (HRV)

Please note and show location on the plan page specific to the installation location. Please provide the manufacturers specification and cross reference on the Checklist.

Intent: Conserves energy by recovering heat from conditioned air exiting the building to pre-heat air that is to be conditioned.

Install Separate Garage Exhaust Fan

Please provide manufacturers specifications as a note on the plan page specific to the installation location.

Intent: A fan that comes on when either the garage door closes, or the door between the house and the garage opens helps keep VOC's and other compounds released from chemicals, equipment and vehicles from entering the residence while protecting indoor air quality.

L. Renewable Energy and Roofing

Intent: California is rich with solar energy. In fact, Northern California receives more energy per square foot from the sun than Texas. With careful consideration we can build homes that take advantage of this natural resource.

Pre-Plumb for Solar Water Heating

Please provide piping diagram showing size, routing, and type of piping to be used. In addition, show proposed location of solar collectors.

Intent: Many solar water heating systems can provide all the hot water needed during summer months. Pre-plumbing for a solar hot water system greatly increases the chances that a system will be installed in the future.

Install Solar Water Heating System

Please provide piping diagram showing size, routing, and type of piping to be used. In addition, show proposed location of solar collectors. Please include manufacturer's specifications including listings, approvals for all solar water heating equipment.

Intent: Solar hot water heating systems use solar panels and water storage to collect and store heat from the sun for domestic hot water use or space heating. Solar water heating is more cost effective now as a result of advances in technology, especially with increasing energy costs.

Pre-Wire for Future Photovoltaic (PV) Installation

Please show schematic on the plan indicating the routing for, types, sizes of conductors and raceways for conductors and service size and location on plans.

Intent: Pre-wiring greatly increases the chances that a PV system will be installed in the future.

Install Photovoltaic (PV) Panels

Please show schematic on the plan indicating the routing for, types, sizes of conductors, raceways for conductors and service size and location. Please include manufacturer's specifications including listings and approvals for all photovoltaic equipment (invertors, panels etc).

Intent: Benefits of installing PV panels include lower energy costs, reduced greenhouse gas and other emissions from fossil fuel-burning power plants, reduced need to develop new power plants and improved national energy security.

Install Solar Tubes

Please note and show on plans installation location of solar tubes and reference the green features index.

Intent: Utilization of natural light decreases the need to use artificial sources and thus conserves energy. Natural light has the added benefits of increased productivity and elevated moods.

Select Safe and Durable Roofing Materials

Please specify roof materials, class and rating note or otherwise show this feature on the plans page specific to the installation location. Must be at least a class A, 40 year rated roof to qualify.

Intent: Short-lived roofing materials result in more waste going to landfills and more money spent on roof replacement. In extreme cases, early failure of roofing material can result in water damage.

Install Radiant Barrier Roof Sheathing Material

Please show location of radiant barrier and provide manufacturers installation specifications.

Intent: A radiant barrier reflects heat energy from the sun that would normally be trapped in the attic or crawl space and radiated into the home.

Select EPA ENERGY STAR Cool Roofing Material

Please note and show on plan page specific to the installation location. Please provide manufacturers specifications to verify EPA Energy Star and cross reference on the Checklist.

Intent: Installing a 'cool' roof material that is rated high in reflectivity and emissivity will reduce the amount of heat that is driven through the roofing assembly and into the attic. Cool roofing materials and radiant barriers reduce heat build-up and can prevent 97% of the sun's radiant heat from entering the home lowering the temperature in the attic by 30-40 degrees.

Use Roofing Materials with at Least 33% Recycled Content

Please note and show on plans. Please provide manufacturers specifications to verify content and cross reference on the Checklist.

Intent: Utilization of recycled materials keeps waste out of landfills and reduces the need for the harvest of virgin materials.

Install a Green Roof (Sod or other Living Roof)

Please provide engineers calculations as well as landscape plan and reference the green features index.

Intent: Living roofs decrease the heat island effect by absorbing rather than reflecting light and heat.

M. Natural Heating and Cooling

Intent: By taking extra care in the planning stage, our homes can take advantage of the most abundant and rapidly renewable resource, the sun. Time tested techniques such as thermal mass, solar orientation and new Photo Voltaic technology allows modern homes to be more comfortable while consuming less energy.

Incorporate Passive Solar Heating

Please note and show on plans. Please provide information on the thermal mass characteristics of the house; window locations and specifications (including solar heat gain coefficient and low-e ratings and varying placement of these windows to allow for solar heating qualities); house orientation with the long axis running east-west.

Intent: In the winter the sun's energy is captured and stored during the day in a thermal mass, such as concrete, stone or ceramic tile floors. In the evening, the thermal mass radiates its' heat to interior spaces, reducing the need to run the heating system.

Install Ground Coupled Heat Exchangers

Please provide piping diagram showing size, routing, and type of piping to be used and location of system on the site map. Please cross reference on the Checklist.

Intent: At a depth of 6' the earth maintains a temperature of +/- 55°. By running air through tubes that are buried at this level, air can be conditioned to 55° before being either heated or cooled. This lowers the energy consumed for heating and or cooling.

Construct Overhangs or Awnings on South Facing Walls/Windows

Please provide building elevation and graphic depiction showing overhangs and windows relative to the angle of the sun to verify seasonal shading effects. Ideal target is complete window shading 10 a.m. to 2 p.m. June 21 and no shading December 21.

Intent: By shading the sun during the summer, and allowing sunlight during the winter, overhangs and awnings take advantage of thermal mass to moderate temperature swings by way of passive heating or cooling.

Construct Oversized Overhangs Around Entire Structure for Increased Weather Proofing

Please note and illustrate increased size of overhangs and reference on the Checklist.

Intent: Larger overhangs decrease moisture intrusion that leads to better indoor air quality, and increased life of the structure.

Plant Deciduous Trees on the West and South Sides

Please note species of tree and location on plot plans.

Intent: During the spring and summer, deciduous trees provide shade. During the winter and fall, after they drop their leaves, deciduous trees let sunlight into the home that helps to naturally heat the space.

N. Indoor Air Quality and Finishes

Intent: The Environmental Protection Agency considers 60% of US Homes sick. "…sick building syndrome (SBS) symptoms, may include irritation of eyes, nose, and skin, headache, fatigue, and difficulty breathing." Indoor pollutant levels inside can be 2-5 times higher and sometimes as much as 100 times more polluted than outside air(US EPA). A major contributing factor to the quality of indoor air is the off gassing of Volatile Organic Compounds (VOC's) contained in almost all of the standard building materials in use today. Carpet, paint, cabinets, furniture, insulation, adhesives, cleaners, and many other products release formaldehyde and hundreds of other chemicals into the air that we breathe. Interesting Fact: 40% of children born today will develop some form of respiratory disease. Studies have shown that poor indoor air quality is linked to the increased occurrence of childhood asthma.

Use Aerosol paints, coatings, adhesives, sealants, caulks that are CALGreen compliant.

Ensure adhesives, sealants, caulks, paints and coatings meet the requirements of CALGreen. Provide documentation and verification to City.

Intent: Paints and coatings that are compliant benefit homeowners by ensuring indoor air quality is not compromised and compounds and pollutants are kept to a minimum level.

Provide documentation to Verify use of Compliant VOC Limit Finish Materials

Please provide documentation and manufactures specifications to verify VOC limit for finish materials.

Intent: Conventional petrochemical-based wood finishes can off gas for months and be harmful to children and chemically sensitive individuals. Low VOC wood finishes contain less than 250 gpl of VOC's.

Provide exhaust fans in bathrooms

Intent: Properly ventilated bathrooms reduce the possibility of mold, rot and other moisture problems. Ensure bathroom fans exhaust and terminate to the outside.

Use Low VOC, Water Based Wood Finishes

Ensure that 80% of floor area receiving resilient flooring complies with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-Emitting Materials List or be certified under the Resilient Floor Covering Institute (RFCI) Floor Score Program. Provide documentation and verification to City. Ensure wood finishes meet the requirements of CALGreen. Verification and documentation is to be provided to City.

Use Solvent –Free Adhesives

Please note and show location on plans. Please provide manufactures specifications to verify solvent free adhesives and cross reference points on the Checklist.

Intent: The solvents in standard adhesives emit pollutants that are potentially harmful and may have detrimental health impacts. Low VOC caulks and adhesives have 70 gpl VOC's.

Use Formaldehyde-Free Particleboard

Please note and show location on plans. Provide specifications to verify that the particleboard is formaldehyde free and cross reference on the Checklist.

Intent: Reducing formaldehyde exposure helps protect the health of residents, particularly children, who are the most susceptible.

Use Formaldehyde-Free MDF Materials

Please show manufactures specifications for this product note and detail locations where product is to be installed.

Intent: Reducing formaldehyde exposure helps protect the health of residents, particularly children, who are the most susceptible.

Check moisture content of building materials for wall and floor before enclosure

Intent: Ensuring building materials meet or are under required moisture content will protect wall and floor materials, prevent indoor air quality issues, and reduce likelihood of mold growth.

Install Whole House Vacuum System

Please provide manufacturers specifications and note installation location on the plans.

Intent: Locating the vacuum motor and filters in the garage minimizes the spread of dust and other organic particulates.

Use Low/ No VOC Paint, Exceed Mandatory

Please provide product specifications, such as MSDS or product listing and reference this information as a notation on the plans specific to the application location.

Intent: Most interior paints contain volatile organic compounds (VOC's), a major class of indoor and outdoor air pollutants. Besides affecting indoor air quality, certain VOC's react with other chemicals in the atmosphere, producing ground-level ozone (smog) that can affect human health. Low VOC paints contain less than 150 grams per liter (gpl) of VOC's for nonflat finishes, and 50 gpl or less for flat finishes.

Use Exterior Grade Plywood for Interior Applications

Please note this on the plan page specific to the installation and utilization location.

Intent: Exterior grade plywood is manufactured using phenol formaldehyde rather than urea formaldehyde. Both are potent mucous membrane irritants, but of the two, phenol is less toxic.

Use FSC Certified Materials for Interior Finish

Please note and show location on plans. Provide FSC Certification to inspector for verification at time of framing inspection.

Intent: The Forest Stewardship Council guarantees that the lumber they certify comes from a sustainable harvested forest.

Use Finger-Jointed or Recycled Content Trim

Please note and show location on plans. Provide specifications and note on the plan page specific to the installation location.

Intent: Finger jointed trim, studs and fascia are manufactured from short pieces of wood glued together to create finished material. Finger-jointed elements are straighter and more stable than conventional clear wood, and is a more efficient use of raw materials.

Use Recycled Content Counter Tops and Finishes

Provide products listing and documentation (from supplier) that verify recycled content in ceramic counter tops and finishes and show location on plans.

Intent: Recycled content materials decrease the flow of waste to the landfill, and minimize the harvest of raw materials.

O. Flooring

Intent: There are many options for high quality 'green' flooring. From FSC certified hardwoods and bamboo, to recycled content tile and finish concrete. All of these options provide durable, rapidly renewable options that will increase the beauty of your home, without harm to the environment.

Install Recycled Content Carpet with Low VOC's

Provide documentation from supplier that the carpet is CRI (Carpet and Rug Institute) Green Label Certified and complies with CA Section 01350 low VOC. Show this feature as a notation on the plans specific to the installation location.

Intent: Recycled content carpet can be used in all applications where conventional carpet is specified, and is comparable in appearance, performance and price to conventional synthetic carpet made from virgin materials.

Use FSC Certified Wood Flooring

Please Provide FSC Certification and supply provider/ lumber yard information to inspector for verification at time of inspection.

Intent: The Forest Stewardship Council guarantees that the lumber they certify comes from a sustainable harvested forest.

Use Rapidly Renewable Flooring Materials

Provide products listing and documentation (from supplier) that verify flooring is certified as a rapidly renewable material and show location on plans.

Intent: Rapidly renewable flooring materials are attractive, durable, low-toxic, perform well and reduce pressure to harvest forests.

Use Salvaged or at Least 20% Recycled Content Ceramic Tiles

Provide products listing and documentation (from supplier) that verifies 20% or greater recycled content in ceramic tiles and show location on plans.

Intent: Recycled-content ceramic tiles can contain up to 70% recycled glass or other recycled materials.

Install Natural Linoleum in Place of Vinyl

Please provide manufacturers specifications and note location on plans.

Intent: Natural linoleum is fire and moisture resistant as well as a sound absorber. It is manufactured primarily from renewable materials such as cork, wood flour and linseed oil.

Use Finished Concrete for 50% or More of the Floor Area on the Ground Floor

Please note location of this feature on the plans and specify materials to be used as finish, please provide product or manufacturer's specifications and listings and note location of this feature on the plans and designate areas to be finished by shading, dotting, cross hatching etc.

Intent: With slab-on-grade construction, the concrete can be polished, scored with joints in various patterns, or stained with pigments to make an attractive finished floor.

P. Other

Incorporate List of Green Features into Cover of Plans

Please note on cover of plans. Listing should include all Green Building Measures.

Develop Homeowner Manual of Green Measures and Benefits

Create a document separate from the plans that list the Green Building Measures and benefits that are realized by incorporating Green Building measures into this particular residence.

Energy Rating for every 1% above 15% (16-30%) receive 2 points, (30 points maximum)

Intent: Exceeding Title 24, part 6, California's State Energy Code can result in lower utility bills and being part of the solution to global warming. Energy generation is a major contributor to global climate change; meeting or exceeding Title 24 energy requirements ensures homes are energy efficient, have good indoor air quality and are comfortable. The California Energy Commission believes a green building should achieve at least a 15% reduction in energy usage when compared to the State's mandatory energy efficiency requirements.

Innovation Points

Design, Provide and Install Compost Bin

Please note and show location of compost bin on plan page specific to the installation location.

Intent: Diverting organic materials from the landfill by composting on site decreases matter sent to our landfills and produces high quality fertilizer.

Turf Less than 10% of Total Lot Area Minus Building Footprint

Please note and show clearly on the plot map or site plan locations with alternative ground covers.

Intent: Kentucky blue grass, the most common species of grass used to plant lawns is not a native species adapted to our climate. As a result, a typical lawn requires at least as much, if not more water to survive than the people inhabiting the residence.

Formaldehyde Level <27 PPB, Install CO Monitor, Install Humidity Monitors

Please provide verification that a test has been conducted and results show levels <27 ppb. Note and show location of CO2 monitor and humidity monitors on plan page specific to the installation location.

Intent: The quality of the indoor environment is affected by the chemicals and organics that are contained in our homes. Formaldehyde is toxic but levels below 27 parts per billion are considered acceptable. Monitors for CO and moisture will assure that your home remains a safe and comfortable environment by alerting you when undesirable conditions occur.

Conduct and Pass a Duct Blower Test

Please provide verification that a duct blower test was conducted and passed.

Intent: Checking for leaks helps maximize the efficiency of your homes HVAC equipment.

Install Mudroom with Bench, Shoe Rack, and Hard Floor to Protect IAQ

Please note and show location of mudroom on plans.

Intent: A mudroom provides a location to take off shoes and quarantine any chemicals or harmful organics that may otherwise be tracked into the house.

Install Permanent Clothes Line

Please note and show location on the plan page specific to the installation location.

Intent: Use of a clothes line rather than an electric drier decreases energy consumption significantly.

Increased Damp Proofing of Bathrooms

Please note and show detailing on plan page specific to the application of increased damp proofing.

Intent: Mold grows in damp areas. Keeping moisture off and out of the walls in bathrooms decreases the risk of mold growth and helps maintain good indoor air quality.

Other (Requires Submittal of Verification Form)

Implement six (6) Universal Design Components as identified in "Accessible Home Design and Remodel Checklist"

Intent: Implementing six components from the "Accessible Home Design and Remodel Checklist" supports home design that allows increased access and maneuverability. These design components can assist people with vision, hearing, mobility, cognitive awareness and other challenges in their efforts to "age in place", or remain in the housing circumstances of their choice.