

Appendix C

Application Number: _____

Project Address: _____

CITY OF CAPITOLA GREEN BUILDING PROGRAM



Residential Construction Green Building Checklist

July 2009
Version 2

Compliance Process

Plan Submittal Requirements:

- Plans Submitted for permit application must include an index of the green features and techniques to be implemented
- The Index must be specific to the project
- The Index must include the point category, features, points and plan page number
- The points must be taken from appendices B or C
- The Index must show the points required for the desired level of action
- The Index must be cross referenced on the plan page specific to the features location, application, utilization, or installation
- Exceeding the minimum point requirement by 15%-20% is suggested to allow for project modifications such as unavailability of materials or design changes
- The Green points for the projects are verified and totaled during the plan check process.

Plan Review Requirements: Levels of Action

Permit Issuance

- Pass Plan Check =
Approved for Permit Issuance
- Fail Plan Check =
Revisions and Clarification Required
Resubmit Revised Plans for Re-Check

Green Building Award

- Pass Plan Check =
Approved for Permit Issuance
Plans and Application Flagged for Accelerated Processing
Application Marked for Early Fee Assignment
- Fail Plan Check =
Revisions and Clarification Required
Resubmit Revised Plans for Re-Check

Plans and applications will be reviewed relative to the level of action sought. Plans that are not in compliance with the requirements specified level of action will not be considered for further processing. Processing will proceed when plans are re-submitted to reflect the level of action desired.

Inspection Requirements:

- Green Features are verified by the building inspectors during the inspections process. Changes or substitutions are allowed provided they are at least equal in merit to the original features indicated on the plans. Minor changes and upgrades can be field verified by the inspection staff. Major changes require re-submittals in writing or renderings for approval/ verification by the Building Department.

- As part of the final inspection process and prior to authorization for occupancy or the issuance of a certificate of occupancy the project must successfully pass a final green point verification/inspection. The project must meet the points required for the level of action specified on the project plans green index. If the project does not pass final verification/inspection it will be incumbent upon permit holder to remedy any deficiencies or occupancy will be denied until inspection is successfully passed or verification completed

Inspection Sequence:

Site/Foundation Inspection: GB01

Verify points taken for features prior to placing foundation concrete, examples B.5.Storm Water Management (BMP'S) and C.3. re-usable metal forms.

Under-Floor Frame: GB02

Verify points taken for features that will be covered by sub-floor or slab on grade concrete placement, examples F.1.Plumbing insulate hot water piping and K.1. HVAC use duct mastic.

Frame/Insulation (Close-in**): GB03

Verify points for features taken prior to covering the walls, example D.3. Structural Frame wood I-joist, K.2 HVAC ductwork in conditioned spaces and L.3 Pre-wire for Solar Panels

Final Inspection: GB15

Verify all points for features taken prior to occupancy, example Exterior Finish E.1. Recycled content decking, O.1. Use FSC flooring and O.6. Use Finished or Exposed Concrete for 50% or More of the Project Floor Area on the Ground Floor

**At this phase the project must pass the required proper insulation installation verification/inspection.

Prerequisites & Program Requirements:

Requirements:

1. All projects, Addition/Remodel and New Construction, must provide verification of Proper Insulation Installation.

Multi-Family Residential

Multi-Family residential projects have one or more of the following characteristics:

1. The housing units have shared utility meters.
Or
2. The project has common spaces such as community rooms, lobbies, meeting rooms, offices, retail space, central laundry, or hallways within the same building envelope as the residential units.
Or
3. The project has 4 or more housing units included within the same building envelope.

If the project qualifies as multi-family, there are three methods for determining the square footage that is to be used for the calculation of points required for permit issuance or a green building award. (Use conditioned space)

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 each unit type, if each unit is to be considered separately.

Multi-Family Program Prerequisite:

- **Must participate in a Green Building conference with designated Building Department Staff prior to commencing construction.**

A. Integrated Design Features

	New Homes	Remodel & Additions
1. Design Smaller Homes (See Chart on Following Page)	9	9
2. Orient Roof to Obtain Maximum Solar Access	1	1
3. Orient Buildings on E/W Axis for Solar Access	1	1
4. Conduct Preconstruction Green Building Techniques/ Methods/ BMP Conference	10	10
5. Certified/Accredited Green Building Project Staff: a. Designer b. Builder c. Management	1 point each up to 3	1 point each up to 3
6. Design Project Without Fencing	1	1
7. Deconstruct Existing Structure	5	5
8. Locate Buildings to Preserve Open Space and Wildlife Habitat	1	1
9. Construct Detached Garage or Carport	2	2
10. Design and Build a Zero Energy Home	10	10
Available Points	43	43

Home Size Chart

Number of Bedrooms

	2	3	4	5+	<u>Points</u>
A	1382	1890	2648	3424	0
R	1332	1825	2555	3296	1
E	1282	1756	2459	3172	2
A	1232	1688	2363	3048	3
<u>of</u>	1182	1619	2267	2925	4
H	1132	1551	2171	2801	5
O	1082	1482	2075	2677	6
M	1032	1414	1979	2553	7
E	982	1345	1883	2430	8
(Square Feet)	932	1277	1788	2306	9

(Chart Based on ANSI z765 3003)

B. Site

	New Homes	Remodel & Additions
1. Recycle Job Site Construction and Demolition waste 50% required 65% Recycling Rate = 1 point 75% Recycling Rate = 2 points 80% Recycling Rate = 4 points <i>*maximum of 4 points</i>	4	4
2. Donate Unused Materials	2	2
3. Protect Native Soil	1	0
4. Minimize Disruption of Existing Plants/ Trees	1	1
5. Implement Construction Site Storm water Practices	2	2
6. Protect Water Quality with Landscape Design	2	0
7. Design Resource and Water- Efficient Landscapes	2	2
8. Reuse Materials/ Use Recycled Content Materials for Landscape Areas	2	2
9. Install High Efficiency Irrigation System	2	2
10. Provide On-Site Water Catchment/ Retention	2	2
11. Utilize Permeable Paving for 50% of Non- Structural Site Paved Area	2	2
12. Install Solar Walkway Lights	2	2
Available Points	24	21

C. Foundation

	New Homes	Remodel & Additions
1. Incorporate Recycled Flyash in Concrete up to 15% = 2 points; Add 1 Point for Every 10% Increase in Flyash, Up to 5 Points	5	5
2. Reuse Form Boards	1	1
3. Re-usable Metal Forms	2	2
4. Use Recycle Content Aggregate for building pads, pathways, driveways etc.	2	2
5. Insulate Foundation/ Slab Before Backfill	3	3
6. Install Rigid Foam, Insulated Concrete Forms (ICF's)	3	3
7. Rammed Earth Foundation (Must Meet Engineering Requirements for Seismic Design Category D)	5	5
8. Use Non-Toxic Release Agents on Concrete Forms	1	1
9. Seal Crawl Space with Vapor Barrier & Install Sump Pump	10	10
10. Create Drainage Swale @ 2% Grade For 3' Away From Foundation	2	2
11. Install Drainage Plane and Barrier Adjacent To Foundations (No Plant Strip 3' Extending From Foundation)	2	2
Available Points	36	36

D. Structural Frame

	New Homes	Remodel & Additions
1. Substitute Solid Sawn Lumber with Engineered Lumber		
A. Floors	1	1
B. Headers (non-structural)	1	1
C. Structural Beams and Headers	1	1
2. Use FSC Certified Wood for Framing (For every 10% of FSC lumber used = 2 points, up to 10.)	10	10
3. Use Wood I- Joists for Floor and Ceilings	2	2
4. Use Steel Interior Web Trusses	2	2
5. Use Energy Heels on Trusses	2	2
6. Use OSB		
A. Sub-floors	1	1
B. Sheathing	1	1
7. Use Finger- Jointed Studs for Non- Structural Vertical Applications	2	2
8. Use Engineered Studs for Vertical Applications	2	2
Continued on Next Page		

	New Homes	Remodel & Additions
9. Use Recycled Content Steel Studs for Interior Framing	2	2
10. Reduce Lumber Framing by Utilizing Alternative Wall Construction Such As: -Insulated concrete forms** -Rammed-earth and pressed earthen block** -Straw bale** -Structural bamboo** -2 points for every 10% reduction in framing compared to standard framing. <i>*Steel framing is not eligible for this point due to thermal performance. ** Must meet code requirements for Seismic Design Category D</i>	20	20
11. Design with 8 foot high plate: 2 points for each floor where used	6	6
12. Design Using 2' Modules, 1 Point Per Dimension (Length/Width) Up To 2 points	2	2
13. Apply Advanced Framing Techniques	4	4
14. Use Reclaimed Lumber for Non-Structural Applications	3	3
Available Points	62	62

E. Exterior Finish

	New Homes	Remodel & Additions
1. Use Sustainable Decking Materials		
A. Recycled Content	3	3
B. FSC Certified Wood	3	3
2. Use Non-CCA Treated Wood	1	1
3. Install House Wrap Under Siding	1	1
4. Use Alternative Siding Materials		
A. Recycled Content	1	1
B. Fiber-Cement	3	3
C. Earth and/or Plaster	3	3
5. Use Low/No VOC Exterior Paint	2	2
6. Provide Advanced Flashing/ Weather Proofing Details	2	2
Available Points	19	19

F. Plumbing

	New Homes	Remodel & Additions
1. Insulate All Hot Water Pipes	2	2
2. Install Flow Reducers to Reduce Flow to Less Than is Currently Required By SCMC		
A. Faucets (1 point each up to 2 points)	2	2
B. Showerheads (1 point each up to 2 points)	2	2
3. Install Dual Flush/High Efficiency Toilets (1 point each up to 4 points)	4	4
4. Install Chlorine Filter on Showerhead (1 Point Per Showerhead up to 4) or A Whole House Chlorine Filter (4 Points)	4	4
5. Install High Efficiency Water Heater	2	2
6. Pre-Plumb for Grey Water Conversion	4	4
7. Install Indoor Grey Water Recovery/ Reuse System	10	10
8. Install water Filtration Units as Faucets (2 points each up to 4 points)	4	4
9. Install On-Demand Hot Water Circulation Pump	4	4
10. Install Pans/ Drains Under Water Using Appliances	2	2
11. Install Rainwater Collection and Storage		
A. 2500 Gallon Capacity	5	5
B. 5000 Gallon Capacity	10	10
12. Install Drain Water Heat Recovery Fixtures	3	3
Available Points	58	58

G. Electrical

	New Homes	Remodel & Additions
1. Install Compact Fluorescent Light Bulbs- CFL's -6 bulbs = 2 points -12 bulbs = 4 points *up to a max of 4 points	0	4*
2. Install Air-Tight Insulation-Compatible Recessed Fixtures for CFL's (1 point each up to 5 points, T-24 required)	0	5
3. Install Lighting Controls (1 point per fixture up to 4 points)	0	4
4. Install High Efficiency Ceiling Fans with CFL's (1 point each up to 4 points)	4	4
Available Points	4	17

* Only CFL's located in the remodeled and existing portions of the project are counted. Those located in the addition will not be.

H. Appliances

	New Homes	Remodel & Addition
1. Install ENERGY STAR Dishwasher	1	1
2. Install ENERGY STAR Horizontal Axis Washing Machine	1	1
3. Install ENERGY STAR Refrigerator	1	1
4. Install Built-In Recycling Center	1	1
Available Points	3	4

I. Insulation

	New Homes	Remodel & Additions
1. Upgrade Insulation to Exceed Title 24 Requirements by 20%		
A. Walls	2	2
B. Ceilings	2	2
2. Install Recycled-Content, Formaldehyde-Free Fiberglass Insulation	1	1
3. Practice Proper Insulation Installation	Required	Required
4. Use Environmentally preferable Insulation Materials (Wool, Foamed Concrete, Soy-Based Polyurethane)		
A. Walls	4	4
B. Ceilings	4	4
5. Install Straw Bale Insulation at Least 18” thick	6	6
Available Points	19	19

J. Windows

	New Homes	Remodel & Additions
1. Install Energy-Efficient Windows		
A. Double-Paned	0	1
B. Triple-Paned	1	1
C. Low-Emissivity (Low-E)	0	2
D. Low Conductivity Frames	0	2
Available Points	1	6

K. Heating Ventilation and Air Conditioning

	New Homes	Remodel & Additions
1. Use Duct Mastic on All Duct Joints	0	1
2. Install Ductwork Within Conditioned Space	3	3
3. Vent Range Hood to the Outside	0	1
4. Clean All Ducts Before Occupancy	1	1
5. Install Attic Ventilation System	1	1
6. Install Whole House fan	3	3
7. Install Sealed Combustion Units		
A. Furnaces	3	3
B. Water Heaters	3	3
8. Install 13 Seer/11 EER or Higher AC with a TXV	3	3
9. Install AC with Non-HCFC Refrigerants	2	2
10. Install 90% Annual Fuel Utilization efficiency (AFUE) Furnace	2	2
11. Eliminate Wood Burning Fireplaces	1	1
12. Install Zoned Hydronic Radiant Heating	3	3
13. Install High Efficiency Air Filter (MERV 6+)	4	4
14. Install Heat Recovery Ventilation Unit (HRV)	5	5
15. Install Separate Garage Exhaust Fan	3	3
Available Points	37	39

L. Renewable Energy and Roofing

	New Homes	Remodel & Additions
1. Pre-Plumb for Solar Hot Water	4	4
2. Install Solar Hot Water Heating System	14	14
3. Pre-Wire for Future Photovoltaic Installation	4	4
4. Install Photovoltaic Panels	14	14
5. Install Solar Tubes (1 point each up to 5 points)	5	5
6. Select Safe and Durable Roofing Material, (Class 'A', 40 year)	3	3
7. Install Radiant Barrier Roof Sheathing Material	3	3
8. Select EPA ENERGY STAR Cool Roofing Material (California Cool Roof Rated)	3	3
9. Use Roofing Materials with at least 33% Recycled Content	3	3
10. Install a Green Roof (Living Roof)	12	12
Available Points	65	65

M. Natural Heating and Cooling

	New Homes	Remodel & Addition
1. Incorporate Passive Solar Heating	5	5
2. Install Subterranean Cooling Tubes (Ground Coupled Heat Exchangers)	3	3
3. Overhangs or Awnings on South Facing Walls and/or Windows designed for optimum passive solar benefit.	3	3
4. Oversized Overhangs Around Entire Structure for increased weather proofing: 16" = 1 point 24" = 2 points	3	3
5. Plant Deciduous Trees on the West and South Sides	3	3
Available Points	17	17

N. Indoor Air Quality and Finishes

	New Homes	Remodel & Additions
1. Install Whole House Vacuum System	3	3
2. Use Low/No VOC Paint	1	1
3. Use Low VOC, Water Based Wood Finishes	2	2
4. Use Solvent-Free Adhesives	3	3
5. Formaldehyde Free Particleboard	6	6
6. Use Exterior Grade Plywood for Interior Uses	1	1
7. Use Formaldehyde-Free MDF and Materials	4	4
8. Seal All Exposed Particleboard or MDF	4	4
9. Use FSC Certified Materials for Interior Finish	4	4
10. Use Finger-Jointed or Recycled Content Trim	1	1
11. Use Recycled Content Counter Tops and Finishes	3	3
Available Points	32	32

O. Flooring

	New Homes	Remodel & Additions
1. Select FSC Certified Wood Flooring	6	6
2. Use Rapidly Renewable Flooring Materials	4	4
3. Use Salvaged or at least 20% Recycled Content Ceramic Tiles	3	3
4. Install Natural Linoleum in Place of Vinyl	5	5
5. Install Recycled Content Carpet with Low VOC's	4	4
6. Use Finished or Exposed Concrete for 50% or More of the Project Floor Area on the Ground Floor	6	6
Available Points	28	28

P. Other

	New Homes	Remodel & Additions
1. Incorporate Listing of Green Features into Cover of Blueprints	1	1
2. Develop Homeowner Manual of Green Features and Benefits	1	1
3. Energy Ratings: Every 1 % Reduction in Whole House Energy Beyond Title 24 = 1 point up to 30 points. Use Energy Software to Show Improvement over California Residential Energy Standards (Title 24)	30	30
4. Innovation Points – These points are given for innovations or new approaches, new materials or practices. These Approaches must meet environmental goals identified in the Residential Green Building Guidelines	-	-
a. Design, Provide and Install Compost Bin	1	1
b. Turf Less than 10% of Total Lot Area Minus Building Footprint, Decking, Patios, Driveways	8	8
c. After Installation of Finishes, Indoor Air Tests Show Formaldehyde Level <27 ppb, Install CO Monitors, Install Humidity Monitors	5	5
d. Conduct and Pass a Duct Blower Test	5	5
e. Install Mudroom with Bench, Shoe Rack, and Hard Floor to Protect IAQ	3	3
f. Install Permanent Clothes Line	1	1
g. Increased Damp Proofing of Bathrooms	2	2
h. Features Not Listed: Requires Submittal of Verification Form and Must be Approved by Green Building Department		
Available Points	57	57

Tables:

TABLE 2: RESIDENTIAL NEW CONSTRUCTION ACTIONS AND POINT REQUIREMENTS

Total Points Available	506	
<i>Action</i>	<i>Points required to receive action:</i>	
	<i>First 350 Square Feet</i>	<i>Each Additional 100 Square Feet</i>
R-N-1. Receipt of building permit	20	1.5
R-N-2. Green Building Award	75	3.5

*Exceptions:

- These points are not required for stand alone Decks less than 350 square feet

TABLE 3: RESIDENTIAL REMODEL AND ADDITION ACTION POINT REQUIREMENTS

*Exceptions:

Total Points Available	523	
<i>Action</i>	<i>Points required to receive action:</i>	
	<i>First 350 Square Feet</i>	<i>Each Additional 100 Square Feet</i>
R-A/R-1. Receipt of building permit*	15	1.1
R-A/R-2. Green Building Award	45	2.5

- These points are not required for additions and/or remodels of less than 350 square feet.
- These points are not required for stand alone Decks less than 350 square feet.

To Calculate Project Square Footage Add The Following:

New Construction:

- Building Footprint + Decks + Porches

Remodel/Addition:

- Footprint of Addition + All Remodel + All Effected Decks + Porches

Residential Buildings

Unless exempted from the Green Building Program by CMC Sec. 17.10.040, your project must comply with the minimum number of points to obtain a building permit for your new or remodeled building or addition. For eligibility for a Green Building Award, the appropriate number of points must be attained as outlined in Tables 2 and 3 on the preceding page.

To figure out the points required for your project, enter the square footage of your project in line (A). Proceed through the equation, from (A) to (B) to (C). Multiply by the appropriate multiplier for the desired level of action, permit issuance or accelerated processing or Green Building Award, to calculate (D). Add the appropriate number for the desired level of action, permit issuance or accelerated processing or Green Building Award, to calculate the total required points.

NEW CONSTRUCTION:

(A) _____ (Sq. Ft.) – 350 (Sq. Ft.) = (B) _____ (Sq. Ft.)

(B) _____ (Sq. Ft.) / 100 = (C) _____ (points per 100 Sq. Ft.)

(C) _____ X 1.5 (Permit issuance multiplier) = (D) _____ (additionally required points)
or
X 3.5 (Green Building Award)

(D) _____ + 20 (Permit issuance) = _____ (**required points**)

or
+ 75 (Green Building Award)

Enter the square footage of the project on line (A), subtract 350, multiply by the chosen multiplier (Permit Issuance or Award) and then add the corresponding points to figure out how many points are required for your project

REMODEL/ADDITION:

(A) _____ (Sq. Ft.) – 350 (Sq. Ft.) = (B) _____ (Sq. Ft.)

(B) _____ (Sq. Ft.) / 100 = (C) _____ (points per 100 Sq. Ft.)

(C) _____ X 1.1 (Permit issuance multiplier) = (D) _____ (additionally required points)
or

X 2.5 (Green Building Award)

(D) _____ + 15 (Permit issuance) = _____ (**required points**)

or
+ 45 (Green Building Award)

Enter the square footage of the project on line (A), subtract 350, multiply by the chosen multiplier (Permit Issuance or Award) and then add the corresponding points to figure out how many points are required for your project

Permit Number: _____	Square Footage: _____
<u>Type of Project: (Check One)</u>	New: _____ Addition/Remodel: _____
<u>Level of Action Desired: (Check One)</u>	-Permit Issuance: _____
	-Green Building Award: _____
<u>Points By Category:</u>	
A: Integrated Design Features: _____	I: Insulation _____
B: Site: _____	J: Windows _____
C: Foundation _____	K: HVAC _____
D: Structural Frame _____	L: Renewable Energy & Roofing _____
E: Exterior Finish _____	M: Natural Heating & Cooling _____
F: Plumbing _____	N: Indoor Air Quality & Finishes _____
G: Electrical _____	O: Flooring _____
H: Appliances _____	P: Other _____
Total Points: _____	Verified By: _____