



GreenPoint Rated Multifamily RATING MANUAL

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INTRODUCTION

This publication is a companion document to the Multifamily Green Building Guidelines published by Green Building in Alameda County. The intended audience is third-party raters who are verifying homes as part of the GreenPoint Rated program, but the document is useful as well for building professionals involved in the delivery of a GreenPoint Rated project. The Multifamily Guidelines and GreenPoint checklist can be downloaded at www.BuildItGreen.org. Raters should consult the GreenPoint Rater Handbook for a description of program policies and procedures.

INSTRUCTIONS

Assume unless otherwise specified that each measure applies to the entire multifamily project, including building, site work, landscaping and street work.

The Multifamily GreenPoint Rated Rating System is designed to rely on reviews of project plans and specifications, followed by observation of the project in two distinct phases (pre-drywall installation and again at final completion of the project). Documentation is required only on those measures where project plans or on-site observations are not sufficient to prove compliance with a measure.

The four verification procedures are Plan Review, Rough, Final, and Documentation. Any combination of documentation, plan check and observation are required for compliance. Some green building measures will require physical verification or on-site observation to verify compliance. Others require documentation in the form of product data sheets, invoices, receipts, calculation worksheets, accountability forms, photographs or other paperwork. Some areas of green building such as site and structural elements can be verified during plan check. Finally, some areas such as tight ductwork or envelope leakage will be typically verified by a field performance test. Each verification method is described below.

PLAN REVIEW

Reviewing a set of project plans can sometimes provide proof of compliance for green building measures in the GreenPoint Rating System. The term “plans” in this case is taken to represent building plans (blueprints) along with other supporting documentation like specifications. For measures that call for Plan Review, sets of drawings must be at least from the 100% Construction Documents (CDs) phase. Earlier sets of plans or specifications, such as Design Documents or 50% CDs are NOT eligible as proof of verification since plans in these earlier phases tend to change.

ROUGH AND FINAL OBSERVATION

Two distinct site visits have been identified to prove compliance with numerous measures. The rough observation is typically at the pre-drywall phase. This can be any time on-site before a majority of the building interior walls have been closed with drywall or other wall coverings. This stage is the time to check measures in sections covering community design, protection of soil and plants, foundation, framing, plumbing, and HVAC. This stage is also the time to check early site work measures, such as aggregate type used, location of existing utilities, types of neighborhood businesses, and more. A second observation is required upon completion of the project, called the final observation. This verification is necessary to check those measures that were not visible from the first site visit. Examples of measures that apply to this include interior finishes and other work that is installed immediately prior to occupancy.

For all site visits, take photographs of each element being verified. This will prove verification and act as a backup should the measure be audited.

DOCUMENTATION

In some cases the information needed to verify compliance cannot be found on project plans or through observation in the field. In such instances, documentation is necessary to claim compliance with the measure. Documentation can take numerous forms, from copies of product literature information sheets (cut-sheets), to copies of Owners Manuals or other written procedural plans, to signed Accountability Forms. An Accountability Form is intended to reduce the paperwork burden by allowing someone responsible for the particular measure to sign-off that the measure has been followed or implemented and to facilitate verification in situations when some of the measure's issues are beyond the technical knowledge of the Rater. The individual signing the Accountability Form must be the person in charge of making project decisions on the measure in question, such as the owner, project architect, engineer, landscape architect, renewable energy installer, developer, contractor, or other design professional. While an Accountability Form may streamline the verification process, the person signing the form must be prepared to show proof of compliance if the measure is audited. The Rater must also feel confident that the measure is truly being implemented.

AUDITS BY BUILD IT GREEN

Due to regular quality assurance audits, Raters must retain backup documentation or other means adequate to defend a position on any specific measure for a minimum of two years and a maximum of five years. In the case of Plan Review measures, this is likely to be selected sheets from a set of 100% CDs (or later) and specifications. For observation measures (Rough and Final), the Rater must provide relevant photographs of each measure. For Documentation, keep a copy of any backup calculations, signed forms, or other means of documentation that will help defend a measure.

WHEN TO USE THE MULTIFAMILY RATING SYSTEM

The GreenPoint Rated program is available for both single family and multifamily homes. To determine the best rating system for a housing type, answer the following questions:

- Do the housing units include any commonly metered utilities?
- Does the project include any common spaces, such as community centers, meeting rooms, offices, lobbies, storage, retail space, central laundry, or hallways within the same building envelope as the residential units?
- Are 4 or more housing units included within the same building envelope?

If the answer to any of the above questions is "yes", then the project should be rated as a multifamily project. If the answer to all three is "no", then consider using the Single Family Rating System. For assistance deciding on a rating system, contact Build It Green.

Once the determination has been made to use the Multifamily Guidelines and GreenPoint Rating System, follow the rules governing residential and non-residential areas of the project.

RESIDENTIAL VS. NON-RESIDENTIAL AREAS

Most multifamily projects have elements of both residential and non-residential construction. Residences or dwelling units are where occupants live, including all bedrooms, living rooms, kitchens, baths, and other areas. Non-residential areas are the supporting areas of buildings, such as hallways/ corridors, storage areas, mechanical rooms, property management offices, maintenance rooms, community centers, lobbies, etc. Some buildings will also include mixed-use facilities on-site. These are retail or other commercial spaces attached to the building.

All parts of a project can and should include green building strategies. Any non-residential conditioned area that encompasses 10% or more of the total conditioned floor area will be able to follow guidelines for both usage types, and include many of the green building measures in both types. Therefore, mixed-use projects that include significant non-residential areas have been captured in the GreenPoint Rated system in selected measures. Points for applicable

measures will be weighted based on the representative size of the non-residential spaces as compared to the residences.

If less than 10% of project conditioned floor area is dedicated to non-residential uses (as defined by the Title 24 energy code), then the entire building will be considered residential and the non-residential portion will not be rated.

Do not include spaces that are not being built in the normal project schedule or budget, or for spaces that will need to be finished out by tenants, unless they are required to meet Title 24 energy standards.

HERS RATINGS

A number of Title 24 related measures are required to be verified by a qualified HERS Rater. HERS Raters are trained and certified in basic HERS procedures which allow them to verify primary Title 24 measures such as tight ducts and TXV. They have the option to acquire additional certifications which allow them to verify other specific Title 24 such as building envelope tightness, ducts (buried, partially buried, and in conditioned space), solar photovoltaics, and quality of insulation installation. HERS Raters (who may also be GreenPoint Raters) will conduct verifications and generate the appropriate forms required by local jurisdictions and the State of California. GreenPoint Raters shall acquire appropriate documentation from the HERS Rater.

A NOTE ON CHANGES

Green building is an area with incredible growth and evolution, and consequentially, this Rating Manual may differ in some areas from the latest edition of the Multifamily Green Building Guidelines. As changes or updates to the Rating System occur, they will be specifically noted in the text of this document and each document will maintain a version number. **Revisions in the text are noted with a line in the margin adjacent to the revised text.**

As this document is reviewed, Build It Green welcomes feedback and corrections in order to improve future editions of this document. Submit comments to GreenPointRated@BuildItGreen.org.

GUIDELINES DISCLAIMER

The green building guidelines, measures, and compliance protocols contained in this document (and any other Build It Green document) are a set of voluntary best practices in the field of green building. These measures have been reviewed by a wide array of expert industry and government stakeholders for technical accuracy and as recommended best practices. Build It Green assumes no legal liability for the effects of proper or improper implementation of these measures on any building. Design and construction teams follow these guidelines, measures, and protocols on a voluntary basis and assume their own liability for the results of their specific designs and construction

A. PLANNING & DESIGN

1. INFILL SITES

A. Project is Located Within an Urban Growth Boundary & Avoids Environmentally Sensitive Sites

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Project is located within an urban growth boundary defined by a city or county General Plan. Project improvements are not located on wetlands or steep slopes, prime farmland or parkland (as defined by the U.S. Department of Agriculture), within 100 feet of wetlands, or in an area identified as habitat for any species on Federal or State threatened or endangered lists.

VERIFICATION

Submit an Accountability Form signed by the Owner or Developer stating compliance with this measure.

B. Project Includes the Redevelopment of At Least One Existing Building

APPLICATION

Any project where previous development has occurred.

CRITERIA FOR QUALIFICATION (1 point)

At least one substantial existing building on site has been redeveloped. At least 50% of the existing walls, floors and roof will remain in place, excluding window assemblies, siding, and roofing materials and the existing structure must comprise at least 10% of the final project floor area.

VERIFICATION

Rater shall review the demolition and construction plans and verify that existing building(s) are to remain and verify at rough and/ or final verification. OR Submit an Accountability Form signed by the Owner or Developer stating that at least one building will be redeveloped according to the measure criteria.

C. Housing Density of 15 Units Per Acre or More

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (up to 10 points)

Minimum density is 15 units per acre (1 point). One point is awarded for each additional 5 units per acre increase up to a maximum of 10 points (density of 60 units/acre or more).

Density is calculated as: total number of dwelling units after construction, divided by the acreage of the entire tract down to one decimal point, minus dedicated acreage of public street rights of way, and easements; land occupied by other non-project buildings; land excluded from residential development by law or agreement; or buffered wetlands and dedicated open space, down to one decimal point.

Density points will automatically be calculated on the Data Collection Form based on the inputs from the Project Application tab.

VERIFICATION

Rater to review the plans and verify the number of units per acre. OR Submit an Accountability Form signed by the Owner or Developer stating the project density with calculation.

D. Locate Within Existing Community that has Sewer Line & Utilities in Place

APPLICATION

Usually urban infill or redevelopment projects.

CRITERIA FOR QUALIFICATION (1 point)

Sanitary sewer line extensions and electric/gas utility connections are 1,000 feet (of piping) or less from any point of the property line of the tract being developed or are already in place on-site.

VERIFICATION

Provide a site map showing existing utilities and distance (in linear feet of piping, not radius) from the site. Rater will conduct field compliance verification that sewer and utilities are already in place or are within 1,000 feet of the property line.

E. Project Redevelops a Brownfield Site or is Designated a Redevelopment Area by a City

APPLICATION

All projects that inhabit a previously developed or used site.

CRITERIA FOR QUALIFICATION (1 point)

Part or all of the site to be built upon has been either (1) documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program) (2)has been defined as a brownfield by a local, state or federal government agency or (3) is designated a redevelopment area by the local jurisdiction. Brownfields are those that have been or may be contaminated by previous development, such as gas stations, manufacturing facilities, industrial yards, and more. The redevelopment of buildings does not apply to this credit unless the redevelopment was part of a deliberate city or county redevelopment area plan. For building salvage/redevelopment, take credit under Construction & Demolition Waste Management (see measure B1a. and A1b.).

VERIFICATION

Submit an Accountability Form signed by the Owner or Developer stating this measure has been met.

F. Site has Pedestrian Access Within ½ Mile to Neighborhood Services:

APPLICATION

All projects; usually in urban neighborhoods.

CRITERIA FOR QUALIFICATION (2 points)

5 Services Below (1 point)

10 Services Below (1 point)

- | | | | |
|-------------------------------|--|------------------------|---|
| 1. Bank | 2. Place of Worship: | 3. Grocery/Supermarket | 4. Day Care |
| 5. Laundry/ Cleaners | 6. Fire Station | 7. Hair care | 8. Hardware |
| 9. Fitness Center | 10. Library | 11. Medical/Dental | 12. Senior Care Facility |
| 14. Pharmacy | 15. Post Office | 16. Restaurant | 17. School |
| 13. Public Park | 18. After School Program | 19. Convenience Store | 20. Community Center |
| 21. Theater
/Entertainment | 22. Commercial Office/
Major Employer | 23. Police Station | 24. Other
Neighborhood Serving
Retail |

The basic services listed above can be in place prior to construction, at time of final verification, or up to one year after completion (i.e. a redevelopment zone or master plan where specific tenants are targeted for the development but have not been built-out at time of project completion). Services located within the development footprint are eligible if the tenants are leased at time of project completion.

Note: distances to be measured as public, standard, and safe pedestrian path of travel from home. For developers of larger communities, the distances can be measured from the center of the community, as long as the distance from the center of the community to the furthest home does not exceed ¼ mile. Using this approach, whole communities can be qualified for this credit. For any homes further than ¼ mile from the center of the community, distances must be recalculated for each home.

VERIFICATION

Submit an Accountability Form signed by the Owner, Developer, or Architect stating this measure has been met and include a map with a ½ mile radius circle drawn-in that highlights and identifies eligible services within the radius. Rater will conduct field compliance verification to verify neighborhood services at time of project completion.

G. Proximity to Public Transit

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (2 points)

Development is Located within 1/2 Mile of a Major Transit Stop.

Major transit stop is defined as a light rail, subway, passenger rail, ferry stop or at least two or more bus lines, constituting 60 or more transit rides per weekday (combined bus, rail, and ferry).

Note: "Transit rides per weekday" are to be calculated as follows:

1. Count all the transit stops within a ½ mile;
2. Multiply each transit stop by the number of buses/trains/ferries that pass through that stop in a 24 hour period;
3. Add the total number of rides available at each stop within ½ mile together.

Example: if there are 4 bus stops, and at each bus stop the service frequency is half-hourly (48 times per day), the total transit rides per day would be 192.

Note: Distance is measured as public, standard, and safe pedestrian path of travel from home. For developers of larger communities, the distances can be measured from the center of the community, as long as the distance from the center of the community to the furthest home does not exceed ¼ mile. Using this approach, whole communities can be qualified for this credit. For any homes further than ¼ mile from the center of the community, distances must be recalculated for each home.

Note: Planned transit must be operational within a year of project completion.

VERIFICATION

Most preferably, submit a map with ¼ and ½ mile walking distances drawn-in and highlighted to identify transit access points OR submit traffic study OR Submit an Accountability Form signed by the Owner, Developer or Architect stating this measure has been met. Rater will conduct field compliance verification to verify transit stops and schedules at time of project completion.

H. Reduced Parking Capacity

APPLICATION

All projects. More difficult in suburban areas than in urban areas.

CRITERIA FOR QUALIFICATION (up to 2 points)

Calculate the ratio of parking spaces to number of residential units. One point is awarded for less than 1.5 parking spaces per unit; an additional point is awarded for less than 1.0 parking space per unit. Parking spaces that are not allowed for use by residents can be excluded from this calculation, such as commercial spaces or parking for visitors only. Spaces that have multiple uses including resident parking (such as parking for businesses and residents) may be excluded in the calculations. Handicap parking is included in the calculations if their use is specifically for residents of the building. Carpool/vanpool spaces for resident use can be subtracted from these calculations provided they are reserved for carpool/vanpool vehicles only.

VERIFICATION

Plans should indicate number of units and parking spaces.

Rater will conduct field compliance verification to verify the parking capacity of the site.

2. MIXED USE DEVELOPMENTS

A. At least 2% of Development Floorspace Supports Mixed Use (Non-Residential Tenants)

APPLICATION

All projects that include non-residential tenants.

CRITERIA FOR QUALIFICATION (1 point)

At least 2% of development floorspace (conditioned) supports mixed use (non-residential tenants) such as businesses, retail stores, offices, neighborhood services, etc. Tenants must be committed to the space with leases in place in order to earn points. This does not include live/work units (take credit for live/work in credit A.10.b).

VERIFICATION

- Rater will review plans and verify non-residential tenant space uses and complete field compliance verification.

B. At least 1% of Non-Residential Floorspace is Dedicated to Residents of the Development

APPLICATION

All projects that include non-residential tenants with neighborhood services.

CRITERIA FOR QUALIFICATION (1 point)

At least half of the commercial floorspace (conditioned) supports mixed use (non-residential tenants) and at least 1% of the commercial space includes services that may be used by residents of the development and by neighbors. Live/work units are not eligible for this measure (take credit for live/work in credit A10b.). This must include at least one of the following:

Grocery/Supermarket Where Produce is Sold; Day Care/Child Care; Restaurant/Cafe; Community Center; Hardware; Gym; Salon; or Cleaners.

VERIFICATION

Submit an Accountability Form signed by the Owner, Developer or Architect stating this measure has been met, OR provide other documentation of non-residential tenants such as lease agreements, municipal conditions of approval, or other equivalent commitments. Rater may complete filed compliance verification.

3. BUILDING PLACEMENT & ORIENTATION

A. Protect Soil & Existing Plants & Trees

APPLICATION

Most applicable to suburban sites built on greenfields or partial greenfields.

CRITERIA FOR QUALIFICATION (1 point)

A project must meet minimum local regulations for protecting soil, and then go obviously and measurably beyond those measures. Take deliberate protective actions to protect or remove and stockpile and preserve the quality topsoil (6"-12") from the disturbed work site, protect it during storage, and reuse topsoil via the following sample actions: avoid driving trucks over portions of the site, stabilizing disturbed soils, building swales and vegetative buffers, using organic compost filter berms and socks, hydroseed, covering with mulch, scraping and stockpiling, covering with plastic, etc.

Trees and plants that will remain on site need to have buffers in place for protection during construction. A good reference manual is "Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13" (http://compostwashington.org/PDF/SOIL_MANUAL.pdf) Temporary barriers must at least encompass the entire tree root zone or plant's footprint, as reflected from the canopy. A typical basic requirement of a jurisdiction is to fence trees at the drip line. Incorporate at least 3 of the following other deliberate actions including:

- A tree / plant preservation plan with no-disturbance zones clearly delineated on drawings
- Effectively implementing the no-disturbance zones on the building lot during construction. Zones must go much beyond the tree drip lines or limited landscape beds
- Preparation of plants through pruning of limbs and roots, watering, fertilizing, etc. for protection from construction activities
- Reduce soil compaction from construction equipment by laying local mulch chipped wood, etc.
- Leaving undisturbed at least 40% of previously undeveloped lot area
- Create contract language for the subcontractors to follow regarding reducing minimizing site disturbance. Train workers on implementing these practices
- Establish contractual penalties for destruction of trees and disturbance of site areas noted for protection
- Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas

VERIFICATION

Rater to review plans and verify that existing vegetation to remain is sufficiently protected for the new development. Rater will conduct field compliance verification at rough and final.

4. WALKING & BICYCLING

A. Sidewalks Are (Physically Separated Buffered) from Roadways & Are 5 Feet Wide (8 feet for retail areas)

APPLICATION

All projects that include sidewalks as part of the construction that are built by the developer. City constructed sidewalks or street improvements do not count.

CRITERIA FOR QUALIFICATION (1 point)

Sidewalks have at least a 5 foot wide (8 feet for retail areas) clear path of travel and are buffered from roadways with a protection zone such as: landscaping, railing, etc. Rows of trees or other fragmented landscaping is acceptable if installed such that users are physically, psychologically or visually discouraged from traveling directly adjacent to roadways. An example of an acceptable buffer is a row of street trees spaced close enough together so pedestrians would not weave

between trees along the sidewalk. Unacceptable paths are those with curvy or meandering sidewalks that take users within 1 foot of roadways for more than 10% of their length.

VERIFICATION

Rater to verify sidewalk widths and physical separation during plan review and/ or final verification.

B. Traffic Calming Strategies Are Installed

APPLICATION

Applicable to projects that include street improvements or new travel paths built by the developer.

CRITERIA FOR QUALIFICATION (1 point)

At least two of the following traffic-calming strategies are in place to provide significantly positive effects on reducing traffic speed, traffic calming and pedestrian access on adjacent roadways within ¼ mile of site:

- Designated bicycle lanes that are physically separated from roadway(s) by curb or planted buffer;
- Ten-foot vehicle travel lanes;
- Street crossings closest to site are located less than 300 feet apart;
- Streets have speed humps, raised crosswalks, bulbouts, or refuge islands at crosswalks.

VERIFICATION

Rater will verify that plans include traffic-calming strategies and/or complete field compliance verification. OR Submit an Accountability Form signed by the Owner or Developer stating this measure has been met.

C. Provide Covered & Secure Bicycle Storage for 15% of Residents

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

For residences, assume that every bedroom in the project is occupied by one resident. Add up all residents (calculated for each unit as number of bedrooms plus 1) and provide covered and secure storage (has the ability to be locked to the rack or is a lockable enclosure or indoor area) for 15% of the total number of residents. Covered storage can be under building overhangs, stairwells (inside or out), bike lockers, in parking garages, or other means. Storage of bikes within units does not count unless there is a clearly identifiable and designated hardware for bike storage.

VERIFICATION

Rater will verify that plans include an adequate number of bike securing spaces for residents and/or complete field compliance verification.

D. Provide Secure Bicycle Storage for 5% of Non-Residential Tenant Employees & Visitors

APPLICATION

All projects that include non-residential tenants.

CRITERIA FOR QUALIFICATION (1 point)

For mixed-use space, estimate the maximum number of visitors and employees expected at one time during the day and provide secure storage (has the ability to be locked to the rack or is in a lockable enclosure) for 5% of those visitors and employees. Secure storage must be in a publicly accessible area, but can be in multiple locations as long as all locations are within 100 yards of the building. Alternatively, instead of calculating the number of expected visitors and employees,

provide 1 secure storage area/facility for every 1,000 square feet of non-residential tenant floor area within the development.

VERIFICATION

Rater will verify that plans include an adequate number of bike securing spaces for non-residential tenants/visitors and/or complete field compliance verification. OR Builder, developer, or Architect to provide documentation as necessary to illustrate the number of expected visitors to mixed-use spaces and the number of secure bike storage spaces provided.

5. SOCIAL GATHERING PLACES

A. Outdoor Gathering Places for Residents (50 sf per unit)

APPLICATION

All projects. Suburban sites will likely have more area for parks and open space.

CRITERIA FOR QUALIFICATION (1 point; mutually exclusive to B)

Development includes at least, in aggregate, 50 square feet per unit of usable outdoor gathering space. Applicable outdoor common areas include courtyards, public balconies or patios, sports facilities, play structures, turf areas, rooftop gardens, community gardens, or other outdoor spaces that encourage interaction and spontaneous gathering. Outside areas that discourage foot traffic are not eligible (i.e. decorative landscaping, swimming pool). Pathways and passageways do not count.

VERIFICATION

Rater will verify that plans include the appropriate amount of outdoor gathering spaces and complete field compliance verification at final.

B. Outdoor Gathering Places Provide Natural Elements

APPLICATION

Urban projects with density of 50 units per acre or greater.

CRITERIA FOR QUALIFICATION (1 point; mutually exclusive to A)

If the project has less than 50 sf/ unit of usable outdoor space, then the project can get points for including natural elements as part of any gathering space (does not necessarily need to meet the size requirement of A5a.). Natural elements need to be of a significant size and effect and include: planter boxes, water features, walkable green roofs, trees, and more. To be eligible, outdoor gathering places with natural features must face or be within common areas that allow for sitting and interacting.

VERIFICATION

Rater will conduct field compliance verification at final.

6. SAFETY AND NATURAL SURVEILLANCE

A. All Main Entrances are Prominent & Visible from the Street

APPLICATION

All projects. Urban projects with fewer entrances are most applicable. Suburban sites with large grounds will find this measure challenging due to all the side entrances common to these development types.

CRITERIA FOR QUALIFICATION (1 point)

Make all entrances to the development highly visible through the use of visual cues. Lighting, steps, fences, pathways, lighting and overhangs can create a focal point for main entrances. All main entrances should be prominent and clearly visible from the street or from an equivalent general parking area. Cluster common indoor areas—such as management offices, lobbies, mailrooms and laundry areas—around main entrances to help define the development’s access pathways. All entrances must lend themselves to effective surveillance. Entrances must also be designed to avoid awkward passageways or architectural features where an intruder could hide.

VERIFICATION

Rater will conduct field compliance verification and be able to clearly identify main entrances to the development by standing across the street/streets and looking at the development.

B. Residence Entries Have Views to Callers (Windows or Double Peep-Holes) & Can Be Seen By Neighbors

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Visitors standing outside a unit’s door must be visible from inside the unit, even for children or the disabled. This requires double peep-holes, doors with clear windows, or side windows that allow inside residents at all heights to view and identify callers. The height recommendation is roughly 32 inches.

Additionally, each residence entrance must be visible from at least one other residential unit via a window, balcony or door peephole. Double-loaded corridors count if there is a clear line of sight to each unit entry area from at least one other unit.

VERIFICATION

Rater will conduct field compliance verification.

7. LANDSCAPING

NOTE: Sites with less than 10% of the total site area dedicated to landscaping can only earn up to 3 points in this section. Calculate the landscape area percentage by dividing the landscape area into the total site area. Include the building footprint(s) and all other developed portions of the site up to the site boundaries.

NOTE: All of these measures apply to all landscaping planted by the developer. Unless desired, exclude landscaping which is not installed by the builder from this calculation.

A. No Plant Species will Require Shearing

APPLICATION

All projects that include landscaping (includes planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (1 point)

Turf is excluded from this measure.

The need for shearing is determined by a combination of plant species and plant location (proximity to neighboring plants, walkways, walls, driveways, etc.). If all the plants can grow and spread to their natural shape and size with very limited (once per year or less) shearing/pruning and the branches never impede the pathway between maintenance cycles, then the landscape qualifies for

points under this measure. Avoid over-planting for instant effect. Select trees with mature height of less than 20 feet when planting near power lines.

VERIFICATION

Submit an Accountability Form signed by Landscape Architect stating that no plant species will require shearing. Rater has the option of conducting field observations to verify the Accountability Form.

B. No Plantings are Listed on the Invasive Plant Inventory by the California Invasive Plant Council APPLICATION

All projects that include landscaping (includes planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (1 point)

Turf is included in this measure.

No plantings are listed on the Invasive Plant Inventory by the California Invasive Plant Council. Go to www.cal-ipc.org and search or download the "Invasive Plant Inventory" for a list of invasive plants.

VERIFICATION

Submit an Accountability Form signed by the Landscape Architect stating this measure has been met or other documentation stating that no invasive plants are included in the landscape areas. Rater has the option of conducting field observations to verify the Accountability Form.

C. Specify Drought-tolerant California Natives, Mediterranean or Other Appropriate Species APPLICATION

All projects that include landscaping (includes planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (1 point)

Turf is excluded from this measure.

A minimum of 75% of the total plants in non-turf areas must be planted with drought tolerant California native, Mediterranean, or other site-appropriate species that require zero, infrequent, or occasional summer watering. The 75% threshold is based on the number of plants (not by area), excluding turf. To qualify for this measure 75% of plants must meet the listed designations from any one of the following four reference sources or equivalent local resources:

- East Bay MUD's "Plants and Landscapes for Summer Dry Climates" (occasional, infrequent or none designation) (www.ebmud.com)
- Sunset Magazine's "Western Garden Book" (watering standard designation or 1 or 2)
- The University of California Cooperative Extension's "Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" (low or very low designations, species factor 0.3 or less) (www.owue.water.ca.gov/docs/wucols00.pdf)
- CA Native Plants for the Garden, by Bornstein, Fross and O'Brien (occasional, infrequent or drought tolerant water use designation)

VERIFICATION

Accountability Form signed by the landscape architect stating compliance with specified measures. Builder, Developer, Landscape Architect will provide a plant list cross-referenced to the above low-water planting guidelines. Include a calculation that shows over 75% of plants meet the measure requirements. Rater has the option of conducting field observations to verify the Accountability Form.

D. Create Drought Resistant Soils:

- i. Mulch All Planting Beds to a Depth of 2 Inches or Greater as Per Local Ordinance
- ii. Amend with Two Inches of Compost or as per Soil Analysis to Reach 3.5% to 5% Soil Organic Matter

APPLICATION

All projects that include landscaping (includes planter boxes in i, does not include planter boxes ii). No landscaping, no points.

CRITERIA FOR QUALIFICATION (up to 2 points)

i. Mulch All Planting Beds to a Depth of 2 Inches or Greater as Per Local Ordinance (1 point)

Turf is excluded from this measure.

Apply and maintain a minimum of 2 inches of natural mulch to all soil surfaces until plants grow to cover the soil. Do not place mulch directly against any plant stem or tree. Designate areas under trees and away from hardscapes or storm drains as repositories for fallen leaves to remain as mulch. Show a preference for buying mulch produced from urban plant waste debris, or from local suppliers within a 150-mile radius. Select organic mulch that will improve soil structure and provide nutrients as it decomposes. Some local jurisdictions may require more mulch or amendments than those stated herein. Check with local officials. Recommended to specify three inches of mulch to account for settling and assure that two inch minimum will be met.

ii. Amend with Two Inches of Compost or as per Soil Analysis to Reach 3.5% to 5% Soil Organic Matter (1 point)

Turf is included in this measure.

Incorporate 2 to 4 inches of compost into the top 6 to 12 inches of soil, or as much as is required to bring the soil organic matter content to 3.5% for turf and 5% for planting beds, except for plant species that will not thrive in such soils. Use fully stabilized certified compost as a soil amendment where appropriate. Loosen all planting and turf areas to a minimum depth of 6 inches prior to final landscape grading.

VERIFICATION

For i. Mulch All Planting Beds to a Depth of 2 Inches or Greater as Per Local Ordinance the following is required:

Rater will conduct field compliance verification at final and verify mulch depth and compare to local ordinance if appropriate.

For ii. Amend with Two Inches of Compost or as per Soil Analysis to Reach 3.5% to 5% Soil Organic Matter the following is required:

Submit an Accountability Form signed by the Landscape Architect stating that the above actions have been enacted for the landscaping and this measure has been met.

E. Design & Install High-Efficiency Irrigation System

- i. Specify Smart (Weather-Based) Irrigation Controllers
- ii. Specify Drip, Bubblers or Low-Flow Sprinklers

APPLICATION

All projects that include landscaping (does include planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (up to 2 points)

Specify the following high efficiency irrigation techniques and systems.

i. Specify Smart (Weather-Based) Irrigation Controllers

Turf is included in this measure.

A smart irrigation controller is used to automatically adjust the frequency and/or duration of irrigation times in response to changing weather or soil moisture conditions. The smart irrigation controller has at a minimum the following capabilities 1) automatic periodic adjustments to the irrigation program accomplished through external sensors, internally stored historical weather data or a provider-supplied signal; 2) multiple start times; 3) run-times able to support low-volume applications; 4) irrigation intervals for days of the week or same-day intervals; and 5) more than one operating program (for example, A=turf, B=shrubs, C=water features). The controller is operating and properly programmed according to the manufacturer's instructions. A copy of the irrigation schedule is provided to the property owner. A rain sensing device is installed and operating to prevent irrigation during rainy weather. A good resource list for specifications and products is www.bewaterwise.com.

ii. Specify Drip, Bubblers or Low-Flow Sprinklers

Turf is included in this measure.

The project landscape design provides for efficient irrigation and considers irrigation head performance specifications; narrow and odd-shaped turf areas are avoided. Shrub areas are irrigated with drip, bubblers, or low-flow sprinklers (microspray). Maximum flow rate is 1 gpm for non-turf, areas. Turf areas are irrigated with efficient spray heads with a maximum flow rate of 1 inch per hour, such as multi-stream rotators. Turf irrigation design does not exceed 100% head-to-head coverage. No impact sprinklers or standard spray heads that create misting are used.

VERIFICATION

For i: Accountability Form signed by the Landscape Architect or Irrigator OR secondarily, an Irrigation Plan submitted that specifies the type of irrigation controller and rain sensor. Rater has the option of conducting field observation.

For ii: Accountability Form signed by the Landscape Architect or Irrigator OR secondarily, an Irrigation Plan submitted that shows the sprinkler system layout and obvious low flow components to show compliance with the measure, as described in the Application section. Rater has the option of conducting field observation to verify the Accountability Form.

F. Group Plants by Water Needs (Hydrozones) in Planting Plans & Identify Hydrozones on Irrigation Plans

APPLICATION

All projects that include landscaping (includes planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (1 point)

Turf is included in this measure.

Plants shall be grouped in hydrozones in accordance with their respective water, cultural (soil, climate, sun and light) and maintenance needs. Each hydrozone shall be clearly delineated on the site, irrigation, and planting plans.

VERIFICATION

Accountability Form signed by the Landscape Architect that hydrozones have been designed into the project landscaping OR secondarily, an Irrigation Plan submitted showing detailed mapping of hydrozoning application.

G. Minimize Turf in Landscape Installed by Builder

- i. Do Not Specify Turf on Slopes Exceeding 10% or in Areas Less Than 8 Feet Wide
- ii. Less Than 33% of All Landscaped Area is Specified as Turf AND All Turf will have a Water Requirement Less Than or Equal To Tall Fescue

APPLICATION

All projects that include landscaping (does not include planter boxes). No landscaping, no points.

CRITERIA FOR QUALIFICATION (up to 2 points)

i. Do not specify turf on slopes exceeding 10% or in areas less than 8 feet wide (1 point)

ii. Less than 33% of all landscaped area in specified as turf (1 point)

Do not include any hardscapes in this calculation; this measure only includes landscape areas that are planted in the ground. Specify that all turf will have a water requirement less than or equal to Tall Fescue (≤ 0.8 plant factor) (www.owue.water.ca.gov/docs/wucols00.pdf).

VERIFICATION

Rater will review landscaping plans to verify percentage of turf area and/or slopes and conduct field compliance verification as necessary. OR Accountability Form signed by the Landscape Architect with documentation that slopes over 10% do not have turf and/or that turf water requirement is less than Tall Fescue.

8. BUILDING PERFORMANCE

A. Residences:

APPLICATION

All Projects.

CRITERIA FOR QUALIFICATION (15% above Title 24 is Required) (2 Points for Every 1% Above Title 24 for Residential and 1 Point for Every 1% above Title 24 for Non Residential based on floor area)

Build to exceed the California Title 24, Part 6 (2005) building energy efficiency standards. Title 24 has two versions for multifamily residential buildings:

- Low-rise (up to 3 habitable stories) – CF-1R (This includes 3 habitable stories over a garage)
- High-rise (4 habitable stories or more) – PERF-1 (This includes 3 habitable stories over retail/commercial)

Multifamily project requiring a PERF-1 calculation may find it difficult to meet the minimum threshold of 15% above Title 24. Below are adjustments and considerations to assist in meeting the criteria.

A Title 24 report shows the percentage above code in the CF-1R form for low-rise residential buildings, and form PERF-1 for residential buildings over three stories, nonresidential and mixed-use. The final simulation report (approved by the building department) must be used to show evidence of beating Title 24. The report must include actual building components (envelope), lighting, and HVAC systems included in the final building design (i.e. simulation is run off of plans at least at the 100% Construction Documents phase).

All Title 24 calculations must be compliant with Title 24 rules.

Adjustments for High-rise

The high-rise residential PERF-1 report uses equivalent default values for dwelling unit lighting, receptacle loads, and process loads for both the standard and proposed energy budgets. By including these default values, the net energy use in kBtu/sf is different than what is warranted by Title 24 for low-rise residential dwelling units. The lighting, receptacle, and process loads should be eliminated from the compliance margin calculation for high-rise buildings. This adjustment results in an 'apples-to-apples' comparison with low-rise residential buildings where lighting and receptacle loads are not included in the compliance calculations. This adjustment is consistent with procedures for utility rebate programs.

Considerations for Corridors

According to Title 24 requirements, a low-rise residential building with greater than 10% of the area used for non residential occupancy, the non residential area must be modeled under the non residential energy code. The following evaluation can be used to determine the status of the corridors and whether or not these would contribute to the non residential or residential area. It is necessary to assess whether or not the corridors are conditioned to evaluate whether or not the corridors need to be calculated in the compliance calculations.

The corridors can be considered unconditioned or not conditioned if all of the following conditions apply:

- The corridors are tempered with < 10btu/square foot of heating
- The corridors are tempered with < 5btu/square foot of cooling
- The doors to all units are weather-stripped
- The shared wall between the corridors and all units are insulated

These elements create a thermal break between the corridors and the units, creating unconditioned space, therefore the conditioned space of the units is not indirectly affecting the corridors and the corridors themselves are not conditioned.

If the corridors do not meet all of the above conditions, the corridors are considered conditioned and must meet nonresidential standards unless they fall under the 10% rule.

Title 24 makes a distinction between 'living quarters' and 'other areas' within the building. Living quarters are those non-public portions of the building in which a resident lives. Corridors are considered 'other areas' The 'other areas' must meet nonresidential standards unless they meet the 10% rule.

If more than one Title 24 report is available for the residential portions of the project, use the worst case scenario for the rating.

VERIFICATION

Rater to discuss the Title 24 report with the Title24 consultant and gain an understanding of

- how the % compliance was established for low or high-rise buildings
- how the associated lighting, receptacle, and process loads are calculated or not
- whether the calculation for percent above Title 24 was done unit by unit or for the building as a whole (If the Title 24 is calculated for each individual unit, then the worst case compliance margin will be used.)

Rater to review Title 24 report(s) found on building plans showing percent above Title 24 and conduct field compliance verifications. Title 24 consultant must also supply electronic copies of the CF-1R or PERF-1 forms to the Rater, who in turn submits them to Build It Green.

Note: Build It Green requires the projects to also submit a source energy run for all computer simulated buildings. For MICROPAS, the simulation should be run in C-HERS mode rather than compliance mode. Alternatively, the rater can submit the MICROPAS input file (FILENAME.MP7) or the EnergyPro input file (FILENAME.BLD).

B. Non-Residential Spaces:

APPLICATION

Non-residential spaces only. Typically only applicable on projects with more than 10% conditioned floor area dedicated to non-residential uses. If the building(s) have non residential spaces that are >10%, then a non residential compliance run must be completed. A Title 24 report will show the percentage above code on the form PERF-1 for commercial and non-residential portions of the building(s). The report must include actual building components and HVAC systems included in the final building design (i.e. simulation is run off of plans at least at the 100% Construction Documents phase).

CRITERIA FOR QUALIFICATION (2 Points for Every 1% Above Title 24)

It is **not** required for the non residential portions of the building to exceed Title 24 by 15%. Points are awarded for every percentage above Title 24 requirements. If more than one Title 24 report is available for the non-residential portions of the project, use the worst case scenario for the rating. For both low-rise and high-rise buildings, points for nonresidential areas are only available where the nonresidential floor area exceeds 10% of the entire building conditioned space floor area. To achieve GPR points, the nonresidential area must be modeled in a separate compliance report from the residential area.

For considerations to assist in meeting the criteria, refer to Considerations for Corridors in measure A8a.

VERIFICATION

Rater will review Title 24 report(s) found on building plans showing percent above Title 24 and conduct field compliance verifications. Title24 consultant must supply Rater with electronic copies of the PERF-1 form. The rater will submit these electronic forms to Build It Green.

Note: Build It Green requires the projects to also submit a C-HERS run for energy efficiency results for all computer simulated buildings

9. COOL SITE**A. At least 30% of the Site Includes Cool Site Techniques****APPLICATION**

Cool site measures are most important in urban environments where large areas of asphalt and buildings retain heat and increase temperatures in the surrounding environment.

CRITERIA FOR QUALIFICATION (1 point)

At least 30% of the non building footprint site area (e.g. walkways, driveways, plazas and parking areas), excluding the building footprint, incorporate one or more of the following cool site techniques:

- Covered parking (underground, parking garage or under overhangs/awnings/roof)- roof or exposed podium patio must meet the criteria of solar reflectance ≥ 0.3 or Solar Reflectance Index $\geq 29\%$ (this is the color equivalent of uncolored concrete with any percentage of fly ash and/or slag).
- Light-colored concrete, paving materials or pavers with an solar reflectance (albedo) ≥ 0.3 or Solar Reflectance Index $\geq 29\%$ (this is the color equivalent of uncolored concrete with any percentage of fly ash and/or slag).
- Open-grid paving, pervious concrete, or crushed rock systems (defined as being at least 50% pervious and containing vegetation in the open cells). Pervious asphalt does not qualify due to dark color.
- Shade from trees, shrubs, overhangs or other shading elements (calculate tree shading by estimating the diameter of the tree crown after five years of planting) to shade at least 50% of sidewalks, patios, and driveways within 50 feet of building(s) (based on noon on June 21 at 5 years' growth). Shading from buildings, trees or other structures/objects not on the building site are not eligible for this measure unless a shade study is conducted. The study should calculate coverage at 10am, noon and 3pm, and the arithmetic mean of these three values will be used as the effective shaded area.

Definitions:

Solar reflectance is a measure of the ability of a surface material to reflect sunlight – including the visible, infrared, and ultraviolet wavelengths – on a scale of 0 to 1. Solar reflectance is also called "albedo." Solar Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549.

Emittance of a material refers to its ability to release absorbed heat. Scientists use a number between 0 and 1 or 0% and 100% to express emittance. With the exception of metals, most construction materials have emittance above 0.85 (85%). Emittance is measured according to ASTM E 408 or ASTM E 903.

Solar Reflectance Index (SRI) is a value that incorporates both solar reflectance and emittance in a single value to represent a material's temperature in the sun. SRI quantifies how hot a surface would get relative to standard black and standard white surfaces. It is expressed as a fraction (0.0 to 1.0) or percentage (0% to 100%). SRI is calculated using equations based on previously measured values of solar reflectance and emittance as laid out in the ASTM E 1980.

VERIFICATION

Rater will review the site and/or landscape plans to verify cool site techniques and calculate the area percentage. Rater will conduct field compliance verification. OR Accountability Form and relevant calculations signed by the Landscape Architect that show compliance with this measure.

10. ADAPTABLE BUILDINGS

A. Include Universal Design Principles in Units

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point for 50% of units; 1 additional point for 80% of units)

The project design incorporates the principles of Universal Design in at least half of the project's units by including all of the following design measures:

Entrance to building must be an accessible route. (CBC Section 1107A)

- An accessible route means a continuous, unobstructed path connecting accessible elements and spaces within a building or site that can be negotiated by a person with a disability who uses a wheelchair, and that is also safe for and usable by people with other disabilities.
- An accessible entrance is a building entrance connected by an accessible route to public transit stops, accessible parking, and passenger loading zones, or public streets and sidewalks.

Accessible routes within the dwelling unit include (CBC section 1133A)

- Changes in level must not exceed 1/2" in vertical change or must be <5% slope.
- Interior hallways must be 36" clear
- Door ways must be 32" clear
- Interior doors must have lever handles

Bathrooms- Full bath on first floor is accessible (CBC Section 1143A)

- Accessible shower or tub with 60" clearance in front of shower or tub
- 60" diameter clear area or "T" shaped access as described in CBC section 1143A.
- Grab bars installed at tub/ shower (Refer to CBC section 1127A.4) or blocking for future grab bars centered at 33" on all three sides of shower/ tub extending a minimum of 24" in front of face of shower/tub. All blocking must be a minimum of 6" material.
- Blocking for future grab bars at toilet
- Knee space available under sink must be 30" wide, 8" deep and 29" high
- Install single lever mixing valve

All switches and control heights must be between 15" from bottom of the box and 46" from top of box to finished floor. This includes light switches and thermostat. This does not include receptacles. (CBC section 1136A)

VERIFICATION

Rater will verify that plans and specifications include applicable Universal Design strategies (such as blocking in walls, hallway widths and turning radius). Rater will conduct field compliance verifications to verify blocking in wall framing and to see final fixture selection and zero step entrances, etc.

B. Live/Work Units Include a Dedicated Commercial Entrance

APPLICATION

Typically applicable to market-rate developments.

CRITERIA FOR QUALIFICATION (1 point)

Live/Work units are defined as spaces serving as both commercial businesses and residences. Commercial spaces are usually at the ground level with living quarters above. To be eligible for this measure, all live/work units must include at least one dedicated entrance to the commercial zone that is not the entrance typically used for residential access.

VERIFICATION

Rater will verify that plans include live/work units with dedicated commercial entrance(s).

If the above verification method is not possible, a final field verification is acceptable, though not preferred.

11. AFFORDABILITY

A. A Percentage of Units are Dedicated to Households Making 80% or Less of AMI

APPLICATION

All multifamily projects that include units dedicated to residents making 80% or less of the Area Median Income (AMI).

CRITERIA FOR QUALIFICATION (up to 4 points)

Many cities and agencies now mandate a minimum number of units of residential housing be dedicated to households making less than the Area Median Income (AMI). To earn credit for this measure, the project includes a percentage of units for households making 80% or less of the AMI. See www.hcd.ca.gov/hpd/hrc/rep/state/incNote.html for this year's median income levels by county.

The following are the percentage thresholds:

- i. 10% of all units (1 point)**
- ii. 20% (2 points total)**
- iii. 30% (3 points total)**
- iv. 50% or more (4 points total)**

VERIFICATION

Submit an Accountability Form signed by the Owner or Developer stating this measure has been met.

B. Development Includes Multiple Bedroom Units (At least One Unit with 3 or More Bedrooms at or Less Than 80% AMI)

APPLICATION

All multifamily projects that include units dedicated to residents making less than 80% of the Area Median Income (AMI).

CRITERIA FOR QUALIFICATION (1 point)

At least one of the units dedicated for tenants at or below 80% of AMI has three or more bedrooms.

VERIFICATION

Rater will verify that multiple bedroom unit(s) are dedicated to 80% AMI tenants, if such information is available on the project plans or other documents. Submit an Accountability Form signed by the Owner, Developer or Architect stating this measure has been met.

B. SITE

1. CONSTRUCTION & DEMOLITION WASTE MANAGEMENT

A. Divert a Portion of All Construction & Demolition Waste (50% Required)

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (up to 4 points) (Required)

Identify the types and quantities of materials generated at the job site and reuse or recycle at least 50% of the non-hazardous construction debris, including green waste. Allocate space for recycling bins and containers on the job site and train workers. Establish and use a cut-pile to reduce waste from scrap pieces of wood, drywall, roofing and siding. Separate green waste from other materials. Contact the California Integrated Waste Management Board at www.ciwmb.ca.gov for more information on recycling facilities.

The following percentage thresholds includes green waste:

- Minimum 50% Waste Diversion by Weight (Recycling or Reuse) (Required)
- Minimum 65% Waste Diversion by Weight (Recycling or Reuse) (2 points)
- Minimum 80% Waste Diversion by Weight (Recycling or Reuse) (4 points total)

VERIFICATION

The builder will submit the Pre Construction Debris Recovery Plan in the planning stages of construction to the Rater. The Rater will submit this form to Build It Green with the project application. Builder will submit Post Construction Debris Recovery Plan and documentation of results (i.e. hauler load tags, builder's waste tabulation supplied by local waste authority and/or recycling rates for the local facility from local waste authority). Rater has the option of conducting field observations to get a sense waste diversion practices. However, field observation can not be used as a judgment or verification method of the documented results as some builders have waste separated and recycled off site and it is not evident on site. To facilitate this process occurring smoothly, plans should be submitted with the Build It Green Sample Debris Recovery Statement or equivalent form required by local jurisdictions or regularly used by the Builder.

2. CONSTRUCTION MATERIAL EFFICIENCIES

A. Lumber is Delivered Pre-Cut from Supplier

APPLICATION

All floor, wall and roof framing, excluding roof trusses.

CRITERIA FOR QUALIFICATION (1 point)

80% or more of framing materials are delivered to the job-site pre-cut or pre-assembled from supplier (determined by board-foot or as a percentage of total framing material cost). This includes interior and exterior studs, headers, joists, beams, posts/columns, and more (excluding roof trusses). Steel framing or other pre-assembled components can be included in this measure if the components do not include insulation.

Note: Pre-fabricated walls, floors or roofs that have insulation installed, such as SIPs or other pre-made building systems are not eligible for this measure, but are eligible for measure C7.

VERIFICATION

Rater will conduct field compliance verification and verify documentation showing that 80% of lumber is pre-cut when delivered.

B. Components of the Project Are Pre-Assembled Off-Site & Delivered to the Project

APPLICATION

All projects that include pre-fabricated building components like complete roofs, floors, walls, bathrooms, rooms or other systems. Any materials are eligible, including wood and steel framing.

CRITERIA FOR QUALIFICATION (up to 6 points)

At least 25% of the total building square footage comes from pre-manufactured and complete building units (complete rooms that are finished or very nearly finished), such as modular bathrooms, bedrooms, kitchens or other rooms.

The following are the percentage thresholds:

- i. 25% of the total building square footage (2 points)**
- ii. 50% of the total building square footage (4 points total)**
- iii. 75% of the total building square footage (6 points total)**

VERIFICATION

Rater will conduct field compliance verification to see delivery and/or installation of components or modules and verify documentation showing that building components are pre-assembled off-site and delivered to the project. Rater will also verify percentage of floor area calculations.

3. CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

A. An IAQ Management Plan is Written & Followed for the Project

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (2 points)

Include in the project specifications a Construction Indoor Air Quality Management plan that requires the following: a) protection of construction materials from water damage during construction; b) capping of ducts during construction; c) cleaning of ducts before end of construction; d) for rehabilitation projects, implementation of a dust control plan that prevents particulates from migrating into occupied areas; e) source control: reduce building air quality contamination from specific construction processes; and f) complete applications of wet and odorous materials such as paints, sealants and coatings before installing absorbent materials such as carpets and fabric covered furnishings.

VERIFICATION

The rater should review the IAQ Management Plan provided by the Builder or Developer and ensure that all minimum requirements for the measure are included. Conduct appropriate verifications at rough and final to ensure required practices are being implemented such as protection of ducts and on-site stored or installed absorptive materials. Documentation may include photographs of practices being implemented on site and Accountability Forms from responsible parties. The nature of this process based credit requires good communication between the builder and Rater as well as judgment calls by the Rater that the practice is being implemented. It is expected that this some of the process will be seen by the rater, as the rater should be verifying finish materials during this period. Rater will conduct field verification as necessary to verify measures.

C. STRUCTURE

1. RECYCLED AGGREGATE

A. Minimum 25% Recycled Aggregate (Crushed Concrete) for Fill, Backfill & Other Uses

APPLICATION

Use wherever California Department of Transportation's (CalTrans) Class 2 Aggregate Base is specified.

CRITERIA FOR QUALIFICATION (1 point)

Recycled aggregate consists mainly of crushed concrete and crushed asphalt pavement. Use a minimum of 25% recycled aggregate for the entire project, including: parking lots, walkways, landscape paving, and roadway base.

VERIFICATION

Rater may conduct field compliance verification to see crushed concrete aggregate in sitework and will verify documentation showing compliance with this measure. OR Accountability Form signed by the Owner, Developer, Architect or Contractor stating this measure has been met. This should include a calculation of the recycled aggregate percent based on vendor invoices.

2. RECYCLED FLYASH IN CONCRETE

A. Fly ash and/or Slag is Used to Displace a Portion of Portland Cement in Concrete

APPLICATION

All flatwork and poured-in-place concrete. Cement blocks or vertical shotcrete concrete systems can be excluded.

CRITERIA FOR QUALIFICATION (up to 2 points)

Portland cement is displaced in concrete mixes with recycled content materials (fly ash and/or slag):

i. Minimum 20% displacement of Portland Cement in Concrete. (1 point)

ii. Minimum 30% displacement of Portland Cement in Concrete. (1 additional point)

Note: Engineer should provide appropriate calculations for concrete mix.

VERIFICATION

Accountability Form signed by the Structural Engineer stating the amount of fly ash and/or slag incorporated in the mix as a displacement of Portland cement OR submit builder's documentation (concrete tags or receipts) showing fly ash and/or slag percentage in mix along with calculation of percentage for the entire project's concrete work.

3. FSC-CERTIFIED WOOD FOR FRAMING LUMBER

A. FSC-Certified Wood for a Percentage of All Dimensional Studs

APPLICATION

Wood framing on wood-framed buildings only.

CRITERIA FOR QUALIFICATION (up to 4 points)

Forest Stewardship Council (FSC) certified wood is used for at least 40% of all dimensional studs, calculated by board foot.

i. Minimum 40% (2 points)

ii. Minimum 70% (4 points total)

VERIFICATION

Builder documentation that substantiates FSC materials (via invoice documentation and unbroken chain of custody) and percentage calculations. Rater has the option of conducting field compliance verification. (Note: FSC lumber often does not carry FSC stamps on the material itself).

B. FSC-Certified Panel Products for a Percentage of All Sheathing (OSB & Plywood)

APPLICATION

Wood framing on wood-framed buildings only.

CRITERIA FOR QUALIFICATION (up to 2 points)

Forest Stewardship Council (FSC) certified wood is used for at least 40% of all panel products (OSB and/or plywood), calculated by square footage of sheet goods.

i. Minimum 40% (2 points)

ii. Minimum 70% (4 points total)

VERIFICATION

Builder documentation that substantiates FSC materials (via invoice documentation and unbroken chain of custody) and percentage calculations. Rater has the option of conducting field compliance verification. (Note: FSC lumber often does not carry FSC stamps on the material itself).

4. ENGINEERED LUMBER OR STEEL STUDS, JOISTS, HEADERS & BEAMS

A. 90% or More of All Floor & Ceiling Joists

APPLICATION

Wood framed buildings can use I-beams/ joists or web trusses for floors or for ceilings to replace large diameter solid-sawn lumber (typically 2x10 or greater). Steel framed buildings will use steel joists.

CRITERIA FOR QUALIFICATION (1 point)

At least 90% of all floor and ceiling joists are engineered lumber or steel, calculated by linear feet. Pre-assembled components (framing without insulation) are allowed to be included in this measure.

VERIFICATION

Rater will conduct field compliance verification during framing.

B. 90% or More of All Studs

APPLICATION

All wood finger-jointed studs, wood engineered studs, or steel studs.

CRITERIA FOR QUALIFICATION (2 points)

At least 90% of all interior and exterior wall studs are engineered wood or steel, calculated by board feet. Pre-assembled components (framing without insulation) are allowed to be included in this measure.

VERIFICATION

Rater will conduct field compliance verification during framing. Percentage is calculated in length or board feet for framing lumber.

C. 90% or More of All Headers & Beams

APPLICATION

Use engineered or insulated headers and engineered beams in place of solid wood. Steel structures use steel headers and beams.

CRITERIA FOR QUALIFICATION (2 points)

At least 90% of all headers and beams are engineered wood, insulated wood, or steel headers and beams, calculated by board feet. Pre-assembled components (framing without insulation) are allowed to be included in this measure.

VERIFICATION

Rater will conduct field compliance verification during framing.

5. OPTIMAL VALUE ENGINEERING FRAMING

A. Studs at 24" on Center on Top Floor Exterior Walls &/or All Interior Walls

APPLICATION

Most applicable to wood-framed buildings. Low-rise buildings may be able to locate ground-floor studs at 24-inch on center. Projects of three stories or more will likely only be able to space studs at 24-inch on center only on the top floor. All projects can place interior, non-load-bearing walls at 24-inch on center on all floors.

CRITERIA FOR QUALIFICATION (1 point)

At least the top floor walls are spaced at 24-inch on center. At least 50% of interior wall studs (non-load-bearing) are placed at 24-inch on center. SIPS or other solid wall assemblies do not achieve points under this measure. Pre-fabricated components (insulated or not) can achieve this measure if the OVE strategy is verifiable.

VERIFICATION

Rater will conduct field compliance verification during framing.

B. Door & Window Headers Sized for Load

APPLICATION

Most applicable to low-rise, wood-framed buildings.

CRITERIA FOR QUALIFICATION (1 point)

Header sizes in walls not supporting the structure can be reduced drastically. Ensure framing places appropriately-sized headers in each location. The Rater should be able to see distinctly different header sizes based on different placements within the building. SIPS or other solid wall assemblies do achieve points under this measure. Pre-fabricated components (insulated or not) can achieve this measure if the OVE strategy is verifiable. Headers in non-load-bearing walls should be 4"x4" or less.

Steel-framed buildings get this measure automatically if headers are steel.

VERIFICATION

Rater will conduct field compliance verification during framing.

C. Use Only Jack & Cripple Studs Required for Load

APPLICATION

Most applicable to low-rise, wood-framed buildings.

CRITERIA FOR QUALIFICATION (1 point)

Jack and cripple studs on walls not supporting the structure can be reduced beyond their standard use. Ensure framing shows that jack and cripple studs are placed only where necessary to carry loads or offer nailing surfaces for drywall, sheathing and siding. The Rater should be able to see distinctly different jack and cripple stud configurations based on different placements within the building. SIPS or other solid wall assemblies do achieve points under this measure. Pre-fabricated components (insulated or not) can achieve this measure if the OVE strategy is verifiable. Only use cripple studs to maintain stud layout. Using cripple studs to support the ends of the window sill does not qualify for this measure.

Steel-framed buildings will get this measure automatically if studs are steel.

VERIFICATION

Rater will conduct field compliance verification for selected measures.

6. STEEL FRAMING

A. Mitigate Thermal Bridging by Installing Exterior Insulation (At Least 1-Inch of Rigid Foam)

APPLICATION

Applicable on steel-framed buildings only.

CRITERIA FOR QUALIFICATION (2 points)

All exterior steel framing must be insulated by at least 1-inch of rigid foam.

VERIFICATION

Rater will conduct field compliance verification of installation and verify that exterior insulation is planned at exteriors.

7. STRUCTURAL INSULATED PANELS OR OTHER SOLID WALL SYSTEMS

A. Structural Insulated Panels Or Other Solid Wall Systems are Used for 80% of All Floors, Walls and Roofs

APPLICATION

Structural Insulated Panels (SIPs) and other solid wall systems are applicable as solid, insulated exterior walls, roofs or floors where one would typically use wood frame construction. Structural Insulated Panels (SIPs) consist of rigid expanded polystyrene foam sandwiched between two panels of sheathing (usually oriented strand board). Other solid-wall systems include insulated concrete forms, aerated autoclaved concrete, and more. They are most often used in low-rise applications.

CRITERIA FOR QUALIFICATION (up to 12 points)

Pre-fabricated building components (with or without insulation) and uninsulated solid wall systems are not applicable under this measure. SIPs or other solid-wall system must be used for at least 80% of all:

- i. Floors (4 points)
- ii. Walls (4 points)
- iii. Roofs (4 points)

VERIFICATION

Rater will conduct field compliance verification and verify that solid wall systems are used in the building in the indicated quantities.

8. RAISED HEEL ROOF TRUSSES

A. 75% of All Roof Trusses Have Raised Heels

APPLICATION

Mostly applicable to low-rise buildings with sloped roofs.

CRITERIA FOR QUALIFICATION (1 point)

Where installed, 75% of roof trusses have raised heels to accommodate increased insulation levels in the attic. Design and install roof truss with raised heel that allows for 75% of the attic insulation height at the outside edge of the exterior wall, while also allowing for attic ventilation. Trusses must insulate residences or non-residential tenant spaces; those that only serve aesthetic purposes (such as for architectural details) are not eligible for this measure.

VERIFICATION

Rater will verify framing plans show raised heel trusses and conduct field compliance verification during framing.

9. INSULATION

A. All Ceiling, Wall & Floor Insulation is 01350 Certified OR Contains No Added Formaldehyde

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Select a product that does not contain added formaldehyde OR has been tested for low emissions according to the California “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers.”

See www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350 for details.

a. Walls and Floors (1 point)**b. Ceilings (1 point)**

Note: As of 2007, all insulation passes the 01350 commercial building standard. This standard is designed for commercial buildings, but it is the only standard we have available to residential today. This will change when a more stringent residential standard is set in the future.

VERIFICATION

Rater will conduct field compliance verification to verify insulation brand and crosscheck to the CIWMB list above. Builder to provide documentation of either a) 01350 compliance, or b) no added formaldehyde in products, such as by means of a product cut-sheet or other manufacturer literature.

B. All Ceiling, Wall & Floor Insulation Has a Recycled Content of 75% or More**APPLICATION**

All projects.

Loose-fill cellulose insulation is usually spread flat in attics. Vertical applications use batts, damp-spray mixes, or netting. Fiberglass insulation typically contains 30% recycled glass, with a combination of post-industrial and post-consumer content. Materials such as recycled cotton or newspaper insulation (cellulose) contain up to 80% post-consumer recycled materials.

CRITERIA FOR QUALIFICATION (2 points)

To get credit for this measure, insulation must have at least 75% total recycled content (post-industrial and/or post-consumer) for all:

a. Walls and Floors (1 point)**b. Ceilings (1 point)**

Note: Concrete slab floors are not required to be insulated for this measure.

VERIFICATION

Rater will conduct field compliance verification to verify cellulose, cotton or other high-recycled content insulation. Builder to submit documentation of recycled content, such as by means of a product cut-sheet or other manufacturer literature.

10. DURABLE ROOFING OPTIONS**A. All Shingle Roofing Carries a 3-Year Subcontractor Guarantee & 20-Year Manufacturer Warranty (Required)****APPLICATION**

Applicable on shingle roofs only.

CRITERIA FOR QUALIFICATION (required)

a. Shingle roofing shall carry a 3-year subcontractor guarantee and at least a 20-year manufacturer’s warranty (required for all projects). This requirement is met if there are no

shingle roofs. This measure also includes a requirement for a “Class A” fire rating of the roofing material or roof assembly.

VERIFICATION

Builder or Developer to provide a copy of the manufacturer’s warranty and subcontractor guarantee (if shingle roofing is used).

B. All Sloped Roofing Materials Carry a 40-Year Manufacturer Warranty

APPLICATION

Applies to pitched roofs only. The additional requirement for a “Class A” fire rating is applicable anytime roofing materials are specified. The “Class A” fire rating is achieved through the roofing material itself or through the roof assembly as a whole.

CRITERIA FOR QUALIFICATION (1 point)

All roofing products installed over sloped roofs carry a 40-year manufacturer's warranty or longer. 40-year warranties are most common on sloped applications such as metal, tile, or high quality shingle roofing products. This measure also includes a requirement for a “Class A” fire rating of the roofing material or roof assembly.

Sloped roof must be at least 50% of entire roof area.

VERIFICATION

Rater will conduct field compliance verification. Builder to provide a copy of the manufacturer’s warranty and subcontractor guarantee (if shingle roofing is used).

11. MOISTURE SHEDDING & MOLD AVOIDANCE

A. Building(s) Include a Definitive Drainage Plane Under Siding

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (4 points)

Install a deliberate, ventilated drainage plane at all exterior wall surfaces. A drainage plane allows moisture to run down walls by placing a gap or rain screen assembly between siding and exterior sheathing. Wall finishes applied directly onto building paper (or vapor barrier) do not count for this measure. Install a definitive, ventilated, drainage plane, such as a true rain screen wall system (i.e. curtain wall) that physically isolates the siding from the vapor barrier/building paper. A 3/8” minimum air space must be created by spacer strips or a specifically designed rain screen system that allows for effective ventilation of the wall (includes provisions for ventilating around wall penetrations such as windows and doors). Flash all wall openings correctly to ensure drainage plane continuity and create adequately sized vent strips at the top and bottom of the wall.

VERIFICATION

Rater will verify that the plans show a definitive, ventilated drainage plane under siding. Rater will conduct field compliance verification prior to siding.

B. ENERGY STAR® Bathroom Fans in All Bathrooms, Exhausted to the Outdoors & Equipped with Controls

APPLICATION

All bathrooms including residences and those located in non-residential parts of the building(s).

CRITERIA FOR QUALIFICATION (1 point)

All bathrooms have a fan that is vented to the exterior and have controls that exhaust moist air automatically. Strategies include: a timer connected to the light switch that runs for a pre-set minimum time after being turned on (independent of being turned off); a continuously running common draft ventilation shaft and fan that draws equally from lower floors as well as upper floors; or humidistat sensor that automatically runs when moisture is present. All bathroom fans must also be ENERGY STAR® qualified (roof fan does not need to meet the ENERGY STAR® requirement). See www.energystar.gov for product lists.

VERIFICATION

Rater will conduct field compliance verification to verify that all criteria are met. Builder or Developer to provide proof of ENERGY STAR fans.

C. A Minimum of 80% of Kitchen Range Hoods Are Vented to the Exterior

APPLICATION

All residential kitchens.

CRITERIA FOR QUALIFICATION (1 point)

At least 80% of all kitchen range hoods located in individual residences are vented to the exterior. It is recommended but not required to use range manufacturers (or ASHRAE 62.2) recommendations for sizing, but verification is not required.

VERIFICATION

Rater to verify that the plans show kitchen hoods vented to the outside for 80% of all resident kitchens. Rater will conduct field compliance verification during framing.

12. GREEN ROOF

A. A Portion of the Roof Area is a Vegetated Roof

APPLICATION

Applicable on low-slope applications.

CRITERIA FOR QUALIFICATION (up to 4 points)

A portion of the total roof surface area is covered by a vegetated roof.

i. 25% (2 points)

ii. 50% (4 points total)

Intensive or extensive roofs receive equal credit.

VERIFICATION

Rater will verify that the roof/landscape plan shows a vegetated roof as percentage of total roof surface area. Rater will conduct field compliance verification.

D. SYSTEMS

1. PASSIVE SOLAR HEATING

A. Orientation: At Least 40% of the Units Face Directly South

APPLICATION

All projects where buildings can be appropriately oriented on a site.

CRITERIA FOR QUALIFICATION (2 points)

Count the number of housing units in the project. 40% of these units must have one wall that faces south (within 15-degrees east or west of true south). This same wall must accommodate at least 50% of all window or door glazing for each unit.

VERIFICATION

Rater will verify the orientation of units on the project plans. Rater will conduct field compliance verification and verify the orientation of the units. Builder, Developer, or Architect to provide a narrative describing the passive solar strategies designed into the project as it relates to this measure.

B. Shading On All South-Facing Windows Allow Sunlight to Penetrate in Winter, not in Summer

APPLICATION

All projects where buildings can be appropriately oriented on a site.

CRITERIA FOR QUALIFICATION (1 point)

Some form of overhang, trellis, landscape or awning is provided to shade all south-facing windows (within 15-degrees east or west of true south) during summer. The passive design must address the greatest need of the climate either heating or cooling. For heating dominant climates, the overhangs should provide full exposure at winter solstice. For cooling dominant climates, the overhangs should provide full cover at the summer solstice. Overhangs must be designed for the time of year that walls or windows need to be shaded (cut-off). This depends on climate conditions and location; in general, the hottest days should coincide with shading of south windows and walls. On the shortest days of winter, sunlight should be allowed to penetrate into the space. Check weather data for your site to determine dates for sunlight control.

VERIFICATION

Rater will verify the shading type designed for the project in the plans and will conduct field compliance verification of the sun control devices. Builder, Developer, or Architect to provide a narrative describing the passive solar strategies designed into the project.

C. Thermal Mass: At Least 50% of the Floor Area Directly Behind South-Facing Windows is Massive

APPLICATION

Typically low-rise projects. Multistory developments face challenges with incorporating thermal mass, especially on floors above the first habitable level. Thermal mass includes using hard floor coverings such as tile, stone, and concrete.

CRITERIA FOR QUALIFICATION (2 points)

South-facing windows are those placed within 15-degrees east or west of true south. The first 15 feet of a room from the perimeter glazing measured to the inside of the unit is considered the passive solar collection zone. Add up all of the floor area up to 15 feet directly behind south-facing, passive solar glazing. Of that total, at least 50% of the floor must be made of:

- Exposed concrete floor
- Tile/stone over concrete, cement backerboard, or cement/gypsum mix

The assembly must be at least 1" thick (includes concrete or concrete/gypsum slab or cementitious backerboard, thin set, and tile).

VERIFICATION

Rater will review plans and conduct field compliance verification and verify the flooring types and square footage areas and thickness of thermal mass floor assembly. Builder, Developer, or Architect to provide a narrative describing the passive solar strategies designed into the project.

2. RADIANT HYDRONIC SPACE HEATING

A. Install Radiant Hydronic Space Heating for IAQ Purposes (No Forced Air) In All Residences

APPLICATION

All residential portions of projects.

CRITERIA FOR QUALIFICATION (2 points)

In-slab, subfloor, baseboard, or wall-mounted radiant hydronic heating is installed in all units. Forced-air hydronic heating is not eligible for this measure.

VERIFICATION

Rater will verify that plans and specifications include radiant hydronic heating system. Rater will conduct field compliance verification and verify radiant hydronic system piping.

3. SOLAR WATER HEATING

A. Pre-plumb for Solar Hot Water

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Provide the following provisions for pre-plumbing solar hot water:

- a. Two insulated plumbing pipes shall be installed from the roof/attic area to the buildings' main water heater area.
- b. Electrical conduit (1/2"-1") shall be installed from the roof/attic area to a junction box next to the water heater in preparation for pump power and controller wiring.
- c. Roof trusses shall be engineered to handle an addition load per square foot beyond that of the anticipated load for the roofing material, based on manufacturer and structural recommendations.
- d. Provide at least an 8 ft. by 8 ft. clear section of south-facing roof per 5 units for future installation of solar panels.

Solar hot water system must be dedicated to domestic hot water heating. Swimming pool heaters do not count.

This measure is mutually exclusive with D3B.

VERIFICATION

Rater will review plans for adequate preparations for a solar water heating to system in the future and will conduct field compliance verification

B. Install Solar Hot Water System for Preheating DHW

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (4 points)

A solar hot water heating system is installed. The system must serve at least 40% of domestic hot water load, as calculated using F-Chart or other CEC-approved software (see www.fchart.com). A swimming pool solar water system does not count for this measure.

This measure is mutually exclusive with D3A.

VERIFICATION

Rater will verify plans (must be finalized construction set) show solar DHW system to be installed and documentation of percentage. Rater will conduct field compliance.

4. AIR CONDITIONING WITH ADVANCED REFRIDGERANTS

A. Install Air Conditioning with Non-HCFC Refrigerants

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Air conditioning systems, where used, do not use CFC- or HCFC-based refrigerants (commonly R-22 and R-142b). Advanced refrigerants such as R-410a (R-410), R-134a, or R-407C are specified instead. Common trade names for these refrigerants are Puron[®], SUV-410A[®], GENETRON AZ20[®], DuraCool[®], and more. Points are not available to projects that have no air conditioning.

VERIFICATION

Builder's documentation of refrigerant (or visual verification of label on outside compressor unit) and efficiency rating complying with this measure. Rater has the option of conducting field observation.

5. ADVANCED VENTILATION PRACTICES

A. Infiltration Testing by a HERS Rater for Envelope Sealing & Reduced Infiltration

APPLICATION

Residential portions of all projects.

CRITERIA FOR QUALIFICATION (2 points)

A HERS rater must perform tests for envelope sealing and reduced infiltration. Testing requires a blower door test to be performed on the project. Sampling may be available. Test must show blower door test results of less than or equal to 0.35 Air Changes per Hour (ACH). Be sure to consider building tightness in the context of ventilation and refer to CEC Residential Compliance Manual.

VERIFICATION

Provide a copy of the HERS report showing air infiltration leakage of 0.35 ACH or lower.

B. Operable Windows Or Skylights Are Placed To Induce Cross Ventilation In At Least One Room In 80% Of Units**APPLICATION**

Usually found on projects where a majority of units have two or more exterior walls (double-loaded corridors will make it difficult to earn this measure).

CRITERIA FOR QUALIFICATION (2 points)

For residential portions of the project only. For 80% of all units, operable windows and/or operable skylights are installed on two or more adjacent or opposing walls (or the ceiling for skylights) of major living areas (living rooms, family rooms, recreation rooms), kitchen, or master bedroom to induce cross-ventilation in the unit. Inlet and outlet window operational areas must each be a minimum of 2% of the floor area of that ventilation area. Windows on adjacent walls cannot be in a direct corner window format. There must be a minimum of 4 feet between window openings (measured directly between windows, not along wall) to allow for a breeze. The following configurations would qualify:

- one operable window and operable skylight
- two operable windows with a minimum of 4 feet between closest edges
- operable windows and skylights in various locations of the unit with no doors or other obstructions in between

VERIFICATION

Rater will verify cross-ventilation strategies in plan review and conduct field compliance verification.

C. Ceiling Fans in Every Bedroom & Living Room OR Whole House Fan is Used**APPLICATION**

Residential portions of all projects.

CRITERIA FOR QUALIFICATION (1 point)

For residential portions of the project only. An Energy Star ceiling fan is installed in all bedrooms and living rooms, or a whole house fan with insulated cover is installed in each unit.

VERIFICATION

Rater will conduct field compliance verification.

6. GARAGE VENTILATION**A. Garage Ventilation Fans Are Controlled by Carbon Monoxide Sensors (Passive Ventilation Does Not Count)****APPLICATION**

Applies to underground or enclosed parking.

CRITERIA FOR QUALIFICATION (1 point)

Naturally ventilated parking areas do not apply and cannot earn points in this rating system

Where demand-controlled ventilation of garages is required, fans must be controlled by carbon monoxide sensors. For projects with dedicated garages for each unit, refer to Single Family Rating System measures D5a and b.

VERIFICATION

Rater will review mechanical plans and/or specifications to verify if demand-controlled ventilation is used in enclosed parking. Rater will conduct field compliance verification.

7. LOW-MERCURY LAMPS**A. Low-Mercury Products Are Installed Wherever Linear Fluorescent Lamps Are Used****B. Low-Mercury Products Are Installed Wherever Compact Fluorescent Lamps Are Used****APPLICATION**

All projects in both residences and non-residential areas.

CRITERIA FOR QUALIFICATION (up to 3 points)

Fluorescent lamps supplied on the project pass the EPA TCLP test.

a. Low-mercury products are installed wherever linear fluorescent lamps are used (1 point)

b. Low-mercury products are installed wherever compact fluorescent lamps are used (2 points)

Some manufacturers now offer fluorescent lamps (linear and CFL) that contain only a fraction of the mercury used in standard fluorescent lamps (such as Philips ALTO® & ALTO II®, Osram Sylvania EcoLogic®, or GE Ecolux®). The EPA has devised a test for mercury called the Toxicity Characteristic Leach Performance (TCLP) test that classifies standard fluorescent lamps as hazardous waste and must be regulated for disposal. Low-mercury lamps that pass the TCLP test are not considered hazardous, but should still be recycled at the end of their life. All fluorescent lamps and tubes are considered hazardous waste in California when they are discarded because they contain mercury. (Title 22, division 4.5, chapter 11, section 66261.50) This includes:

- Fluorescent tubes, including low mercury tubes.
- Compact fluorescents, including low mercury lamps.
- Metal halide lamps, such as floodlights for large indoor and outdoor areas and gymnasiums.
- Sodium lamps, such as those sometimes used as security lighting and outdoor floodlights.
- Mercury vapor lamps, such as those sometimes used for street lighting.

All fluorescent lamps and tubes must be recycled, or taken to a household hazardous waste disposal facility, a universal waste handler (e.g., storage facility or broker), or an authorized recycling facility. (Title 22, division 4.5, chapter 23, section 66273.8) (This law has been in effect since February 9, 2006.)

Also, Follow the USGBC's LEED-EB requirements for mercury content as follows:

Maintain mercury content of all mercury-containing light bulbs below 100 picograms per lumen hour, on weighted average, for all mercury-containing light bulbs acquired for the existing building and associated grounds.

The weighted average mercury content of these mercury-containing light bulbs is calculated by: 1) adding up the total weight of mercury in all the mercury-containing light bulbs acquired during the performance period (picograms of Hg); and then,

2) dividing total mercury content (picograms of Hg) by the sum of the lumen hour output of all the light bulbs (lumen hours: calculated by multiplying the rated hours (life) of each light bulb by the mean light output in lumens).

Rated hours of life are defined as stated by the manufacturer based on consistent testing (three hours on/20 minutes off for linear fluorescents and compact fluorescents; 11 hours on for HID light bulbs) and are based on the design or mean light output of the light bulbs (in lumens, fluorescent light bulbs measured with a ballast having a ballast factor of 1.0 and measured using instant-start ballasts except for T-5s, which are measured using program start ballasts).

The mean light output in lumens is the light output at 40% of light bulb life.

These calculations need to show for all acquired mercury containing light bulbs:

- The total mercury content in the light bulbs.
- The total lumen hours of light output for all the light bulbs.
- The number of light bulbs of each type.
- The overall weighted average mercury content in picograms/lumen hour.
- If the mercury content documentation shows a range of mercury contents in milligrams, use the highest value in the range in these calculations.

VERIFICATION

Builder or Developer to submit manufacturer data showing compliance with TCLP for all applicable lamp types. Rater will conduct field compliance verification. Field verification is likely only feasible for linear fluorescent lamps that have either green end-caps (Philips ALTO[®]) or green print on the lamps (GE Ecolux[®]). Compact fluorescent lamps are much more difficult to visually identify.

8. LIGHT POLLUTION REDUCTION

A. Exterior Luminaires Emit No Light Above Horizontal OR Are Dark Sky certified

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Light pollution occurs when outdoor light fixtures let excess light escape into the night sky. To earn credit for this measure, full cut-off luminaires (no light is emitted above horizontal at the fixture height) are used for all exterior lighting installed by the builder. Landscape lighting that points upward shall not be allowed. Exception to this include lighting placed in areas where shielding is unnecessary to control light pollution (such as fixtures placed under overhangs) or where the builder does not install the lighting. Another exception is to use fixtures that are certified to emit no light above horizontal by Dark Sky International.

VERIFICATION

Builder, Architect, or Developer to submit site plans showing lighting fixtures or schedules, and/or other documentation supporting this measure (such as cut-sheets of Dark Sky certified luminaires or an Accountability Form signed by the lighting designer). Rater will conduct field compliance verification.

B. Control Light Trespass Onto Neighboring Areas Through Appropriate Fixture Selection & Placement

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Light trespass occurs when fixtures let light spill onto neighboring properties. For areas more than 15 feet away from the property line, the following values are not exceeded:

- For residential-only areas: 0.2 average footcandles (FC).
- For mixed use areas: 0.6 average FC.

Alternatively, exterior lights shall not substantially spill onto neighboring properties (light trespass). Lamp must not be visible at the property line when viewed at a maximum elevation of 5 feet; OR more than fourteen feet (14') into adjacent property when viewed at ground level.

VERIFICATION

Architect, Builder, or Developer to provide a photometric site plan with analysis showing average footcandles have not been exceeded, OR submit a signed Accountability Form signed by the Lighting Designer. Rater will conduct field compliance verification.

9. ONSITE ELECTRICITY GENERATION**A. Pre-Wire & Plan for Space (Clear Areas on Roof & in Mechanical Room)****APPLICATION**

All projects with decent, unshaded and clear roof area.

CRITERIA FOR QUALIFICATION (1 point)

Allow adequate space on plans for the generation system. For PVs, this requires a clear roof area (without penetrations) of roughly 100 to 150 square feet for each kilowatt of power. Reserve space in mechanical rooms for system components. Plan for adequate infrastructure (conduit runs and space in mechanical rooms) to supply a system in the future. Install 3/4-inch or larger conduit with pull boxes as needed to run wire from the roof to junction boxes near the main panel and meter. Consider adding hose bibs on the roof for easy washing of the panels.

This measure is mutually exclusive with D9B.

VERIFICATION

Rater will check plans and specifications for pre-wiring and space requirements and/or rater will conduct field compliance verification to verify clear roof area, junction box locations and mechanical room space.

B. Install PVs to Offset a Percent of the Project's Total Estimated Electricity Demand**APPLICATION**

All projects with decent, unshaded and clear roof area. Applies to the entire project.

CRITERIA FOR QUALIFICATION (up to 12 points)

Provide a portion of the estimated annual electric energy demand with solar photovoltaics. Include all areas of the project built by the developer in the estimated demand. Develop an estimate of the solar potential for the system (output) that is supplied by a C-46 licensed solar contractor. The estimate must include system size, expected output of the system, and an estimate of the amount of total electrical load the PV system will offset.

- i. 10% (4 points)**
- ii. 20% (8 points total)**
- iii. 30% or more. (12 points total)**

This measure is mutually exclusive with D9A

VERIFICATION

Contractor to supply a copy of the CF-6R-PV solar report (or other appropriate forms) based on what was actually built (system size, output, and percentage of load for served by the PV system. The HERS Rater to supply the CF-4R-PV verifying the installation.

C. Educational Display is Provided in a Viewable Public Area

APPLICATION

All projects that include on-site electricity generation systems.

CRITERIA FOR QUALIFICATION (1 point)

Educational display is provided in a viewable public area for residents to view output of on-site generation system(s). Display must provide real-time feedback (at least once daily) to residents about how much electricity is generated by the system.

VERIFICATION

Rater will conduct field verification of the display.

10. ELEVATORS

A. Gearless Elevators are Installed

APPLICATION

All projects, especially those more than two stories.

CRITERIA FOR QUALIFICATION (1 point)

Gearless (or gearless traction) elevators are used instead of hydraulic or geared traction systems in all locations.

VERIFICATION

Architect, Builder, or Developer to submit manufacturer data showing gearless elevators are to be used exclusively. Rater will conduct field compliance verification.

11. INSTALL ENERGY STAR® APPLIANCES

A. Install ENERGY STAR Refrigerators in All Locations

APPLICATION

Applicable wherever refrigerators are installed (residences and non-residential areas). Offering appliances as an option to residents or businesses does not count toward this measure.

CRITERIA FOR QUALIFICATION (up to 2 points)

Install refrigerators that are ENERGY STAR-qualified. Lists of qualifying residential and commercial products are found at www.energystar.gov.

For all refrigerators (in residences or commercial spaces):

a. Install ENERGY STAR®-qualified and <25 cubic Feet Capacity (based on the actual volume; not adjusted volume) (1 point)

b. Install ENERGY STAR®-qualified and <20 cubic Feet Capacity (based on the actual volume; not the adjusted volume) (2 points total)

Multiple refrigerators, and separate refrigerator and freezer units combined must still meet all requirements.

For solid door commercial refrigerators and freezers, choose models listed on the Food Service Appliances section of the www.energystar.gov website.

VERIFICATION

Architect, Builder, or Developer to submit documentation of installed refrigerator model(s) showing ENERGY STAR® rating and volume. Rater will conduct field compliance verification and verify model numbers.

B. Install ENERGY STAR Dishwashers in All Locations

APPLICATION

Applicable wherever dishwashers are installed (residences and non-residential areas). Offering appliances as an option to residents does not count toward this credit.

CRITERIA FOR QUALIFICATION (up to 3 points)

For all residential-grade dishwashers:

or

a. ENERGY STAR® (www.energystar.gov) (1 point)

Install ENERGY STAR-qualified dishwashers (have an ENERGY STAR logo on the unit)

b. Dishwasher Uses No More than 6.5 Gallons/Cycle (24.6 L/cycle) on normal setting (2 additional points)

Install models that use 6.5 gallons per cycle or less. To find models that use less than 6.5 gallons (24.6 liters) of water per cycle in their normal setting, the Energy Star Canada website provides water factor values for Energy Star qualified dishwashers (water factor is listed as L/cycle):

www.cee.nrcan.gc.ca/energystar/english/consumers/index.cfm

For all commercial-grade models (such as in commercial kitchens):

Install ENERGY STAR-qualified dishwashers in all commercial kitchen areas. Verify based on the www.energystar.gov product lists for commercial equipment.

VERIFICATION

Architect, Builder, or Developer submit documentation of installed dishwasher model(s) showing ENERGY STAR® rating or listing. Rater will conduct field compliance verification to verify model numbers for listed dishwashers.

C. Install ENERGY STAR Clothes Washers in All Locations

APPLICATION

Applicable wherever clothes washers are installed, including in residences or central laundry facilities with commercial-grade appliances.

CRITERIA FOR QUALIFICATION (3 points)

Offering appliances as an option to residents does not count toward this measure. For commercial models, ENERGY STAR models must be installed regardless of whether the appliances are purchased or leased.

For all residential-grade and commercial-grade clothes washers:

Meets ENERGY STAR® and CEE Tier 2 Requirements (Modified Energy Factor 2.0 or more, Water Factor 6.0 or less). See www.cee1.org or www.energystar.gov for qualifying models

VERIFICATION

Architect, Builder, or Developer submit documentation showing that installed washing machines are ENERGY STAR® labeled and have a water factor of 6.0 or less or MEF of 2.0 or greater. Rater will conduct field compliance verification to verify model numbers for ENERGY STAR® label and water factor.

D. Install Ventless Natural Gas Clothes Dryers in Residences

APPLICATION

Residential areas only.

CRITERIA FOR QUALIFICATION (1 point)

Dryers must be installed at time of project completion to be eligible. Offering dryers does not count toward this measure.

All installed clothes dryers in residences are natural gas fueled. Additionally, clothes dryers are ventless (require no exhaust).

VERIFICATION

Architect, Builder, or Developer submit documentation showing that installed dryers are gas-fueled and ventless. Rater will conduct field compliance verification.

12. CENTRAL LAUNDRY

A. Common Laundry Facilities Are Provided for All Occupants

APPLICATION

Applicable everywhere central laundry facilities are provided.

CRITERIA FOR QUALIFICATION (1 point)

Clothes washers and dryers are provided for resident use in common area(s).

VERIFICATION

Rater will verify from project plans that central laundry facilities are provided and/or conduct field compliance verification.

13. WATER EFFICIENT FIXTURES

A. All Showerheads Use 2.0 Gallons Per Minute (gpm) or Less

APPLICATION

Applicable in all residential units and in commercial applications wherever showers are installed at time of project completion.

CRITERIA FOR QUALIFICATION (2 points)

Showerheads use 2.0 gallons per minute (gpm) or less wherever showerheads are installed at time of project completion. If multiple showerheads or jets are installed in a single shower enclosure intended for one occupant or one living unit (i.e. an attached shower to a master bedroom), the combined water use for the entire shower assembly must be 2.0 gallons per minute or less.

Note: US EPA's WaterSense program will soon develop standards for ultra-low showerheads. This standard will be used as guidance for this measure in the future.

VERIFICATION

Rater will conduct field compliance verification and verify documentation showing flow rates.

B. High-Efficiency Toilets (HETs) that Use 1.28 gpf or Less OR Are Dual Flush (For Residences and Non-Residential Areas)

APPLICATION

Applicable in all areas where toilets are installed (residences and non-residential areas).

CRITERIA FOR QUALIFICATION (up to 6 points)

At time of project completion, all toilets installed are High Efficiency or Dual Flush (≤ 1.28 gallons per minute). Install HETs qualified as meeting the rigorous performance requirements of North American water agencies. These fixtures are identified as meeting or exceeding a 250 gram waste removal threshold as defined in the Maximum Performance (MaP) testing report or passing the Uniform North American Requirements (UNAR) standard.

A complete listing of HETs and the MaP and UNAR reports can be downloaded from the product webpage of the California Urban Water Conservation Council:

www.cuwcc.org/products_tech.lasso.

Toilets that qualify for this measure should be certified by the EPA Water Sense Program or be on the qualified list of the appropriate local water utility high efficiency toilet rebate program.

VERIFICATION

Rater will conduct field compliance verification and verify showing flush rate and MaP or UNAR testing report for each model.

C. Install High Efficiency Urinals (0.5 gpf or less) or No-Water Urinals Wherever Urinals are Specified

APPLICATION

Applicable in all common area or commercial/non-residential tenant bathrooms.

CRITERIA FOR QUALIFICATION (up to 2 points)

The average flush rate of all urinals in common areas or commercial/non-residential tenant bathrooms is:

i. 0.5 gallons per flush or less (1 point)

ii. 0.1 gallons per flush or less (2 points total)

To calculate average flush rate, add up all the urinals installed in the building at time of project completion, including non-residential tenants. Add up the flow rates of each urinal and divide that total by number of units. Note: Code issues may arise for projects considering the use of waterless urinals. Check with city building department.

VERIFICATION

Rater will conduct field compliance verification and verify documentation of average flow rate for all urinals. Assume flow rates for flush urinals are the flow rate stamped on each urinal unit or found in manufacturer literature. For urinals without flush valves (zero-water urinals), assume the flush rate is zero gallons per minute. A narrative or worksheet must be supplied that calculates the average flow rate for all urinals (has number of urinals, flow rate for each type, and average flush rate calculation) unless all urinals are zero-water models at which point only the final verification is required.

D. Flow Limiters Or Flow Control Valves are Installed on All Faucets (In Residences &/or Non-Residential Areas)**APPLICATION**

All projects.

CRITERIA FOR QUALIFICATION (up to 4 points)

Install flow limiters or flow control valves in all kitchens and bathrooms that limit flow rates to 2.0 gpm or less for kitchens and 1.5 gpm or less for bathrooms. Flow limiters are built into the faucet or are screwed on. Aerators or laminar flow devices are considered flow limiters. Permanent flow control valves are installed underneath the sink/faucet and restrict the amount of water entering the faucet. Commercial kitchens can install the federal standard low-flow pre-rinse spray valves with flow rates of 1.6 gpm or less.

Note: US EPA's WaterSense program is finalizing its standards for high-efficiency bathroom sink faucets. This standard will be used as guidance for this measure in the future.

VERIFICATION

Rater will conduct field compliance verification and verify flow control devices are installed.

Rater will review backup documentation of flow rates for each fixture type. Document flow limiters (aerators or other flow restrictor built into the faucet) with manufacturer data showing flow rates of faucets (cut sheet). Permanent flow control valves are independent of faucet model, but must be verified by: a) observation under sink for installation of reducer, and b) manufacturer information stating flow rate of flow control valve installed. Pre-rinse spray valves need documentation from manufacturer showing flow rate.

14. SOURCE WATER EFFICIENCY**A. Use Recycled Water for Landscape Irrigation or for Flushing Toilets/Urinals****APPLICATION**

Wherever recycled water (or reclaimed water) is available, usually from a municipal source.

CRITERIA FOR QUALIFICATION (2 points)

Use Captured Rainwater for Landscape Irrigation or to Flush 5% of Toilets and/or Urinals.

Any portion of water serving the site is from treated and recycled water. This water can be used either for irrigation or to flush a portion of toilets/urinals in the development (typically for common areas or non-residential tenants). Refer to requirements and codes of local jurisdictions.

VERIFICATION

Architect, Builder, or Developer to provide documentation of the use of recycled water on-site.

Rater will conduct field compliance verification and verify purple-colored pipe at the water supply hookups to the building indicating recycled water and the allocation of water for Landscape Irrigation or to Flush 5% of Toilets and/or Urinals

B. Use Captured Rainwater for Landscape Irrigation or for Flushing Toilets/Urinals**APPLICATION**

All projects.

CRITERIA FOR QUALIFICATION (4 points)

Capture rainwater and plumb it to either provide landscape irrigation or flush toilets. Captured water must irrigate at least 10% of site landscaping or must flush at least 5% of all toilets.

VERIFICATION

Accountability form and/or documentation signed by the Builder, Developer or Architect stating compliance with the building code and with this measure. Rater has the option of conducting field compliance verification.

C. Water is Submetered for Each Residential Unit and Non-Residential Tenant

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (4 points)

Submeter water use for all residences and non-residential tenants, if any. Only true submetering (with a separate meter for each unit/tenant) is eligible for points. Ratio billing is not eligible.

VERIFICATION

Rater will conduct field compliance verification.

E. FURNISHINGS & FINISHES

1. CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT

A. Perform a 2-Week Building Flush-Out Prior to Occupancy

APPLICATION

All new construction and renovation projects.

CRITERIA FOR QUALIFICATION (1 point)

Measure B.3 (Construction IAQ Plan) is a prerequisite for this measure.

Follow a Construction Indoor Air Quality Management Plan, and:

FOR RESIDENCES:

- Open windows and doors for a period of 2 weeks prior to occupancy (at least 8 hours per day). Finishes or materials that offgas VOC's must be installed before the official flushout period begins.
- Use 100% outside air during flush-out

FOR COMMON AREAS/NON-RESIDENTIAL TENANTS

- Run mechanical systems with 100% outside air for two weeks in common areas or non-residential tenant areas. Finishes that offgas VOCs must be installed before the official flushout period begins.
- Use temporary HVAC filtration media if the HVAC system is used to conduct the flush-out. The filtration media shall have at least a Minimum Efficiency Reporting Value (MERV) of 8 as determined by ASHRAE 52.2-1999.
- After building flush-out, replace all of HVAC filtration media immediately prior to occupancy with appropriate filtration media. (As a reference ASHRAE Standard 52.2-1999 calls for a MERV 13 for replacement filter).

VERIFICATION

Measure B.3 (Construction IAQ Plan) is a prerequisite for this measure. Obtain an Accountability Form signed by the Owner or Contractor stating that a 2-week flush-out has been performed to the criteria. Review and verify required measures are described in the IAQ Management Plan. Rater will conduct field verifications to verify practices are complying with requirements of measure. This field verification should coincide with final verifications.

2. ENTRYWAYS

A. Provide Permanent Walk-Off Mats & Shoe Storage at Home Entrances

APPLICATION

Applicable for every residential unit.

CRITERIA FOR QUALIFICATION (1 point)

Design and build a deliberate and obvious hard surface area at the home's main entrance that offers room for visitors to comfortably take off shoes. This area must also include permanently installed space for shoe storage. A bench and permanent walk-off mat or grille are recommended but not required.

VERIFICATION

Rater will conduct field compliance verification.

B. Permanent Walk-Off Systems Are Provided at All Main Entrances & in Common Areas

APPLICATION

Applicable at every common area or non-residential tenant entrance.

CRITERIA FOR QUALIFICATION (1 point)

A deliberate and obvious hard surface area is included at every entrance to the building(s). A built-in, permanent walkoff mat or grill (for a minimum of 6 feet of continuous travel) is provided at the entrance to the building.

VERIFICATION

Rater will conduct field compliance verification.

3. RECYCLING & WASTE COLLECTION

A. Provide Built-In Recycling Center in Each Unit

DESCRIPTION

Built-in recycling centers provide bins for separating recyclables and trash. These must, at a minimum, allow for the collection of glass, paper, metal, plastic and corrugated cardboard.

APPLICATION (2 points)

All residences.

CRITERIA FOR QUALIFICATION

Built-in receptacles are provided for recycling in every unit. This is done by co-locating trash & recycling into a two bin minimum (1 trash, 1 recycling) assembly built into kitchen cabinets. The number of recycling bins necessary will vary based on the waste and recycling haulers in the area. Single-stream recycling vendors allow most recyclable items to be included in one mixed bin. Other haulers may require separate bins for each type of recyclable material.

VERIFICATION

Rater will conduct field compliance verification.

4. LOW/NO-VOC PAINTS & COATINGS

A. Low-VOC Interior Paints (<50 gpl VOCs (flat) & <150 gpl VOCs (non-flat))

B. Zero-VOC Interior Paints (<5 gpl VOCs (flat))

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (up to 2 points)

Low- volatile organic compounds (VOCs) paints contain less than 150 grams per liter (gpl) of VOCs for non-flat finishes, and 50 gpl or less for flat finishes. Paints that contain less than 5 gpl of VOCs are classified as zero-VOC.

To earn credit for this measure, 90% or more of all interior painted areas must comply with these VOC limits:

i. Low-VOC interior paints (<50 gpl VOCs (flat) and <150 gpl VOCs (non-flat)) (1 point)

ii. Zero-VOC interior paints (<5 gpl VOCs (flat)) (2 points total)

VERIFICATION

Builder's documentation of paint VOC levels, coverage, and invoice. Rater has the option of conducting field observations.

C. Low-VOC Wood Coatings (<250 gpl VOCs)

Coatings include varnish, urethane, and other coatings that protect wood surfaces.

D. Low-VOC Wood Stains (<250 gpl VOCs)

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (up to 4 points)

All wood finishes and stains used inside the homes must be less than 250 grams per liter of Volatile Organic Compounds. If wood coatings or stains are not used, then no points can be claimed.

i. Low-VOC wood coatings (<250 gpl VOCs) (2 points)

ii. Low-VOC wood stains (<250 gpl VOCs) (2 points)

VERIFICATION

Builder's documentation of paint VOC levels, coverage, and invoice. Rater has the option of conducting field observations.

5. RECYCLED-CONTENT EXTERIOR PAINT

A. Use Recycled Content Paint on 50% of All Exteriors

APPLICATION

All projects. Recycled paints may not be suitable for all exterior surfaces. Look for products that are certified by Green Seal to meet quality, performance, safety and environmental standards.

CRITERIA FOR QUALIFICATION (1 point)

Use a minimum 50% recycled-content paint (post-industrial or post-consumer) on at least half of all exterior walls. Recycled-content can be post-industrial, post-consumer, or some combination thereof.

VERIFICATION

Builder's documentation of paint recycled content, coverage, and invoice. Rater has the option of conducting field observations.

6. LOW-VOC CONSTRUCTION ADHESIVES

A. Use Low-VOC Construction Adhesives (<70 gpl VOCs) for All Adhesives

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (1 point)

Use low-VOC products (70 gpl or less) in place of standard adhesives and caulks for all interior applications such as installation of flooring, subflooring, countertops, trim, wall coverings,

paneling and tub/shower enclosures. 90% of adhesives must comply with this measure to receive credit for this measure.

VERIFICATION

Builder's documentation of adhesive VOC levels and invoice. Rater has the option of conducting field observations.

7. ENVIRONMENTALLY PREFERABLE MATERIALS FOR INTERIOR FINISHES

A. Use Environmentally Preferable Materials for Interior Finish: A) FSC-Certified Wood, B) Reclaimed Lumber, C) Rapidly Renewable D) Recycled-Content or E) Finger-Jointed

APPLICATION

Applicable to interior trim and finish materials of residences and non-residential areas.

CRITERIA FOR QUALIFICATION (up to 5 points)

Environmentally preferable materials include:

- a. Forest Stewardship Council (FSC)–Certified wood and plywood/MDF
- b. Reclaimed Materials for Nonstructural Applications.
- c. Rapidly Renewable Trim Materials – alternatives to plywood/MDF (which are not rapidly renewable), such as wheatboard or bamboo (which are rapidly renewable; 10 year maximum cycle rate).
- d. Recycled-Content Materials - Some recycled-content trim is made from recycled polystyrene or other plastics. Recycled-content countertops include recycled glass tiles, terrazzo-like materials that blend recycled glass and concrete, and natural fiber composites derived from rapidly renewable or recycled resources. Recycled content must be 50% post-consumer recycled content. MDF and particleboard does not count as recycled-content. Post-industrial (pre-consumer) recycled content is counted at half the rate of post-consumer recycled content.
- e. Finger-Jointed Trim - manufactured from short pieces of solid wood glued together to create a finished material.

Note: Local Materials qualify equally to the previously mentioned environmentally preferable criteria. Local materials are those materials extracted, processed, and manufactured within 500 miles of the home. These materials offer many environmental, economic and social benefits such as reduced transportation efforts (and associated fuel use and pollution), local economic development, and heightened community awareness of the links between materials sourcing and the associated environmental impacts

At least 50% of each of the following finish materials are environmentally preferable:

- i. Cabinets (includes box, face frame, toe kick, and door; does not include countertop substrate) (1 Point)** (50% Minimum; measured in square foot area of all cabinet materials)
- ii. Interior Trim (includes all casing and trim for floors, doors, walls, ceilings, windows, wainscot, fireplaces, non-structural beams, etc.) (1 Point)** (50% Minimum; measured in total square foot area of trim/casing)
- iii. Shelving (includes shelves and support structure or encasement) (1 Point)** (50% Minimum; measured in total square foot area of shelving and encasement or structure)
- iv. Doors (includes door and frame; not trim or hardware) (1 Point)** (50% Minimum; measured in board foot area of door and frame materials)

Note: Steel doors do not qualify as recycled materials for this measure

v. Countertops (includes substrate) (1 Point) (50% Minimum; measured in square feet or volume of qualifying countertop and substrate assembly)

Note: Substrate adhesives need to be less than 70 g/L VOC.

VERIFICATION

Builder's documentation of material specifications and use. Rater will conduct a field compliance verification.

8. REDUCE FORMALDEHYDE IN INTERIOR FINISH MATERIALS

A. Reduce Formaldehyde in Interior Finish (Section 01350) for At Least 90% of Cabinets, Interior Trim, Shelving, and Subfloor

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (up to 4 points)

Materials have been tested for low emissions according to the California "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers," otherwise known as Specification Section 01350 (see www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350). At least 90% of the following materials meet the above criteria:

- i. Subfloor (does not include joists) (1 point)** (90% Minimum; measured in square foot area)
- ii. Cabinets (includes box, face frame, toe kick and door) (1 Point)** (90% Minimum; measured in square foot area)
- iii. Interior Trim (includes all casing and trim for floors, doors, walls, ceilings, windows, wainscot, fireplaces, non-structural beams, etc.) (1 Point)** (90% Minimum; measured in 1 square foot area) (1 point)
- iv. Shelving (includes shelves and support structure or encasement) (1 Point)** (90% Minimum; measured in square foot area)

VERIFICATION

Builder's documentation of material specifications (a copy of manufacturer literature or CIWMB web site citation stating compliance with Section 01350, or proof that the product(s) do not contain added formaldehyde) and use. Rater has the option of conducting field observations.

9. ENVIRONMENTALLY PREFERABLE FLOORING

A. Use Environmentally Preferable Flooring: A) FSC-Certified or Reclaimed Wood, B) Rapidly Renewable Flooring Materials, C) Recycled-Content Ceramic Tiles, D) Exposed Concrete as Finished Floor or E) Recycled-Content Carpet. Note: Flooring Adhesives Must Have <70 gpl VOCs.

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (up to 4 points)

Any adhesives used in installing flooring materials must be under 70g/L VOCs. Floor area includes stairs. The final % of flooring can include any combination of environmentally preferable flooring materials. Subfloor does not need to meet the standard of this measure. Percentage is measured in total square feet of flooring. Recycled content must be 50% post-consumer

recycled content. Post-industrial (pre-consumer) recycled content is counted at half the rate of post-consumer recycled content.

Note: Local Materials qualify equally to the previously mentioned environmentally preferable criteria. Local materials are those materials extracted, processed, and manufactured within 500 miles of the home. These materials offer many environmental, economic and social benefits such as reduced transportation efforts (and associated fuel use and pollution), local economic development, and heightened community awareness of the links between materials sourcing and the associated environmental impacts

Floors, in aggregate, must contain the following amounts of environmentally preferable materials:

- i. Minimum 15% of Floor Area is Environmentally Preferable (1 point)**
- ii. Minimum 30% of Floor Area is Environmentally Preferable (2 points total)**
- iii. Minimum 50% of Floor Area is Environmentally Preferable (3 points total)**
- iv. Minimum 75% of Floor Area is Environmentally Preferable (4 points total)**

VERIFICATION

Builder's documentation of material specifications and floor area % coverage. Rater will conduct a field compliance verification.

10. LOW-EMITTING FLOORING

A. Flooring Meets Section 01350 or CRI Green Label Plus Requirements (50% Minimum)

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (1 point)

Flooring products may emit formaldehyde and other volatile organic compounds. Look for products that have been tested for low emissions by a reputable third-party or government organization. Materials that meet the requirement are listed at:

- Floorscore from Scientific Certification Systems and the Resilient Floor Covering Institute: www.scscertified.com and www.rfci.com/int_FS-ProdCert.htm
- Carpet Rug Institute: <http://www.carpet-rug.org/> and <http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/index.cfm>
- California Section 01350: <http://www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350/>
- Indoor Advantage Gold: www.scscertified.com
- GREENGUARD Children & Schools Certification Program: www.greenguard.org

Or another flooring product that has been tested for low emissions according to the California "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers." (For information, go to www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350.)

Tile or exposed concrete floor meets the intent of this measure (even if not certified via 01350 testing) provided the finish (i.e. tile or concrete sealer or wax) does not exceed 100 g/L VOCs (SCAQMD Rule 1113).

VERIFICATION

Builder's documentation of material specifications and percent of floor area coverage. Rater will conduct a field compliance verification.

11. DURABLE CABINETS

A. Install Durable Cabinets

APPLICATION

Applicable to interiors of residences and non-residential tenant areas.

CRITERIA FOR QUALIFICATION (1 point)

Build durable cabinets with the following minimum standards:

- All casework is built with plywood, assembled with adhesives, screws and bolts.
- Doors are hardwood.
- Full extension drawer slides have ball bearings.
- Cabinet joints are dovetail, Mortise and tenon, or other methods substantially beyond typical construction.
- Hinges are stainless steel and attach to doors from two directions.

VERIFICATION

Rater will review cabinet plans and specifications to ensure compliance with this measure and conduct field compliance verification.

12. FURNITURE & OUTDOOR PLAY STRUCTURES

A. Play Structures & Surfaces Have an Overall Average Recycled Content Greater Than 20%

APPLICATION

All projects that have outdoor play structures.

CRITERIA FOR QUALIFICATION (1 point)

Many outdoor play structures and surfaces contain recycled materials. Play structures and surfaces have an overall average recycled content greater than 20%, based on volume or weight. Surface area includes all surface area in the immediate play area not just within the fall zone surrounding the structure itself.

Note: Post-industrial (pre-consumer) recycled content is counted at half the rate of post-consumer recycled content

VERIFICATION

Rater will review manufacturer data on recycled content and documentation of the recycled content materials as calculated by volume or weight to ensure compliance with this measure and conduct field compliance verification to see play areas and surfaces.

B. Environmentally Preferable Exterior Site Furnishings

APPLICATION

All projects that include site furnishings.

CRITERIA FOR QUALIFICATION (1 point)

50% based on volume or weight of exterior site furnishing meet criteria for environmentally preferable. Exterior site furnishings are made of metal, salvaged materials, FSC certified or a minimum 50% post-consumer recycled-content material. Some site furnishings contain a combination of these elements, such as a metal framed bench with recycled plastic composite lumber slats. Plastic and composite lumber must be made from recycled plastic.

VERIFICATION

Builder to provide a copy of manufacturer literature showing recycled content of plastic and composite lumber, or that furnishings have reclaimed lumber and/or metal components. Rater will conduct a field compliance verification.

C. At Least 25% of All Newly Supplied Interior Furniture has Environmentally Preferable Attributes

APPLICATION

All projects that include interior furnishings as part of the project.

CRITERIA FOR QUALIFICATION (1 point)

In aggregate, at least 25% of all newly supplied interior furniture in all non residential areas (hallways, offices, maintenance room, recreation room, etc.) (estimated by volume) have one or more of these attributes:

- Reclaimed, refurbished, rapidly renewable or made from minimum 50% post-consumer recycled-content materials
- Sourced and fabricated locally (within 500 miles)
- Made with FSC-certified wood or FSC-certified composite wood
- New furniture is Cradle-To-Cradle certified (www.cradletocradle.org).

VERIFICATION

Builder to provide product data that shows compliance with the above environmentally preferable attributes of furniture. Rater will conduct a field compliance verification to verify installation of furniture.

13. VANDALISM DETERRENCE

A. Project Includes Vandalism Resistant Finishes and Strategies

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point; mutually exclusive to F.5)

Use durable and vandal-proof materials. The most vital points are walls, windows, doors and entryways. At least three of the following scenarios must be in place:

WALLS:

- Use easily repaired and repainted siding materials at ground level to allow for easy cleanup and defense against graffiti.
- Avoid large, clear wall areas along streets and public walkways that invite graffiti. Design staggered surfaces instead of smooth and flat ones. Alternatively, encourage children or local artists to paint murals in these areas.
- Use darker paint on ground-floor walls. Darker paint, especially at ground level, helps discourage vandalism. Also, it is easier to paint over graffiti on dark surfaces (graffiti may show through light-colored paint).
- Use anti-graffiti coating. On surfaces likely to attract graffiti, apply an anti-graffiti coating, which is usually a water- or oil-based clear coat that can be easily cleaned.

WINDOWS:

- All windows are placed in visible locations (can be seen by another window within the development).
- The height of ground-floor windows is out of easy reach (on the exterior facades of the building(s)).

DOORS/ENTRIES:

- High-quality metal or solid-core doors with durable hardware and locksets are installed in all exterior entrances.

VERIFICATION

Rater will conduct a field compliance verification to verify physical strategies that can be seen. Builder or Architect to provide a narrative written by the design team describing vandalism-resistant materials and design considerations.

F. OTHER

1. INCORPORATE GreenPoint Rated CHECKLIST IN BLUEPRINTS

A. Incorporate GreenPoint Checklist in Blueprints (Required)

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (required)

Incorporate on the introductory pages of the blueprints, the GreenPoint Checklist with the applicable measures checked off. If the plans have been printed, the GreenPoint Checklist may be incorporated into the design documents by distributing an ASI or Addendum to project team and all sub-contractors. During the time of the project, include any relevant addendums to the checklist to project team and all sub-contractors.

VERIFICATION

Rater will verify building plans with GreenPoint Rating System checklist as described above.

2. OPERATIONS & MAINTENANCE MANUALS

A. Provide O&M Manual to Building Maintenance Staff

APPLICATION

All projects with maintenance staff that operate and clean portions of the building(s).

CRITERIA FOR QUALIFICATION (1 point)

The building maintenance staff is furnished with a green building maintenance manual. This manual can be part of the standard operators manual if necessary. The O&M manual includes the following information at a minimum:

- A copy of the Local Initiatives Support Corporation (LISC) Operations and Maintenance manual (found at www.bayarealisc.org)
- A description of the development's green building features
- An explanation of the O&M procedures necessary to achieve ongoing green building benefits
- Warranty, operation and maintenance instructions for all equipment and appliances, including HVAC systems, water heating and conveyance systems, replacement part numbers and ordering info for toilets, faucets, sinks, etc., and more
- Recycling opportunities and procedures for residents and non-residential areas
- Ways to optimize water and energy use
- Clear labeling of safety valves and controls for major house systems
- Information about periodically checking for pests and termites
- Information on organic pest control, fertilizers, and environmental cleaning products
- Information on proper turf, shrub, and tree irrigation and maintenance
- Instructions for proper handling and disposal of hazardous chemicals
- Instructions on how to reapply organic mulch to a minimum depth of 2 inches in landscaping areas

VERIFICATION

Rater will approve maintenance manual that meets criteria and Builder Accountability Form stating that the manual will be given to all maintenance personnel.

B. Provide O&M Manual to Occupants

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Develop a separate green homeowner manual or include a green section in the standard homeowner manual. A comprehensive manual must include the following information at a minimum:

- A copy of the Local Initiatives Support Corporation (LISC) Operations and Maintenance manual (found at www.bayarealisc.org)
- A description of the home's green building features
- An explanation of importance of maintenance and operations to achieve ongoing green building benefits
- Warranty, operation and maintenance instructions for equipment and appliances
- Household recycling opportunities
- Ways to optimize water and energy use
- Clear labeling of safety valves and controls for major house systems
- Information on organic pest control, fertilizers, and environmental cleaning products
- Instructions for proper handling and disposal of hazardous chemicals

VERIFICATION

Rater's approval of homeowner manual that meets criteria and Builder Accountability Form stating that the manual will be given to all homeowners.

3. TRANSIT OPTIONS

A. Residents Are Offered Free or Discounted Transit Passes

APPLICATION

All projects located near public transit.

CRITERIA FOR QUALIFICATION (2 points)

Provide heavily discounted or free or transit passes to all residents for a minimum of one year's time for transit options that are most valuable to residents.

VERIFICATION

Submit an Accountability Form signed by the Architect or Owner/Developer stating this measure has been met OR submit a copy of the policy describing the transit pass/discount program offered to residents.

4. EDUCATIONAL SIGNAGE

A. Educational Signage Highlighting & Explaining the Project's Green Features is Included

APPLICATION

All projects.

CRITERIA FOR QUALIFICATION (1 point)

Permanent and informative signage is included in the building that highlights the project's green features. A prominent display must be located in the lobby (or other high-use area) and must include the Multifamily Green Points scorecard awarded to the project.

VERIFICATION

Rater will conduct field compliance verification upon installation of the signage.

5. VANDALISM MANAGEMENT PLAN

A. Project Includes a Vandalism Management Plan for Dealing with Disturbances Post-Occupancy APPLICATION

All projects, especially in crime-prone areas.

CRITERIA FOR QUALIFICATION (1 point; mutually exclusive to E.13.A)

A vandalism management plan can discourage vandalism by dealing with disturbances quickly and efficiently. Include a Vandalism Management Plan that is followed and includes, at a minimum:

Instructions on maintaining landscaping to deter vandalism.

- A plan for removing graffiti and blight quickly (within 3 days of occurrence).
- General good housekeeping practices to deter vandalism, such as regular litter cleanup (at least once a week).

VERIFICATION

Submit a copy of the Vandalism Management plan.

BUILD IT GREEN

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