LEED Rating System
4th Public Comment Draft

HOMES

Includes
Homes (Single Family and Low-Rise Multifamily)
Midrise (Multifamily)

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INTEGRATIVE PROCESS

3 points
This credit applies to
- Homes (1-2 points)
- Midrise (1-2 points)

Intent

To maximize opportunities for cost-effective adoption of integrative green design and construction strategies.

Requirements

HOMES, MIDRISE

Meet any of the following requirements for a maximum of 2 points.

Option 1. Integrative Project Team (1 point)

Assemble and involve a project team to meet the three criteria below:

a) Include team members, in addition to the builder and verification team, whose capabilities include at least three of the following skill sets:

- architecture or residential building design;
- mechanical or energy engineering;
- building science or performance testing;
- green building or sustainable design; and
- civil engineering, landscape architecture, habitat restoration, or land-use planning.

b) Involve all team members referenced above in at least three of the following phases of the home design and construction process:
- conceptual or schematic design;
- LEED planning;
- preliminary design;
- energy and envelope systems analysis or design;
- design development;
- final design, working drawings or specifications; and
- construction.

c) Conduct meetings with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems, formulate solutions, review responsibilities, and identify next steps.

AND/OR

Option 2. Design Charrette (1 point)

No later than the design development phase and preferably during schematic design, conduct at least one full-day workshop (or two half-day workshops) with the project team, as defined in Option 1. Use the workshop to integrate green strategies across all aspects of the building design, drawing on the expertise of all participants.

AND/OR

Option 3. Trades Training (1 point)

Before construction but after trades have been hired for the project, conduct at least eight hours of training (extending a full day or over several days) on the green aspects of the project and how the trades can contribute to achieving each LEED for Homes prerequisite and attempted credit. Focus on areas where trades have traditionally struggled to meet green building standards. Include at least the following trades in the training:

- plumbing;
- mechanical systems;
- insulation;
- framing; and
- air sealing.

Each trade may be present only for the relevant segment, but the builder's site supervisor must be present throughout so that he or she understands the quality control duties on LEED and green building best practices.

LOCATION AND TRANSPORTATION (LT)

Point floor: Earn a~~A~~t least ~~15%~~8 ~~of total~~ points ~~available~~ in the combined LT and EA sections ~~must be earned~~.

LT PREREQUISITE: FLOODPLAIN AVOIDANCE~~SENSITIVE LAND PROTECTION~~

This credit applies to

- Homes
- Midrise

Intent

To reduce the environmental impact of the development footprint.

Requirements

HOMES, MIDRISE

Do not develop buildings on ~~on portions of sites that meet any of the following criteria:~~
~~L~~land that lies within a flood hazard area shown on a legally adopted flood hazard map (such as ~~whose elevation is at or below the elevation of the 100-year flood as defined by~~ the Federal Emergency Management Agency (FEMA)~~, unless the building is elevated so all finished areas and mechanical equipment are above the~~ 100 year flood plain) or otherwise legally designated by the local jurisdiction or the state, unless the building is designed and built in accordance with the flood provisions of applicable building code, the local floodplain management regulations, or, at a minimum, the National Flood Insurance Program Requirements~~.~~
~~Land that prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (park authority projects are exempt)~~.

Previously developed buildings and *hardscapes* are exempt from the above requirements.

LT CREDIT: LEED FOR NEIGHBORHOOD DEVELOPMENT

15 points
This credit applies to

- Homes (15 points)
- Midrise (15 points)

Intent

To m~~M~~inimize the environmental ~~impact~~ damage of land development practices by building homes in LEED for Neighborhood Development ~~-~~ –certified ~~developments~~communities.

Requirements
HOMES, MIDRISE

Locate the project within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the 2012 rating system).~~LEED for Neighborhood Development Plan or a LEED for Neighborhood Development Certified Project.~~

LT CREDIT: SITE SELECTION

~~3~~ 8 points

This credit applies to

- Homes (1-8~~3~~ points)
- Midrise (1-8~~3~~ points)

Intent

To ~~promote~~ encourage~~the~~ ~~development of buildings~~ construction in environmentally ~~preferred~~ preferable locations and avoid~~reduce the impact on~~ development of sensitive lands.

Requirements

HOMES, MIDRISE

Meet any combination of the following five options for a maximum of eight points.

Option 1. ~~Enhanced Site Selection~~Sensitive Land Protection (3-4 points)

Path 1. Previously Developed (4 points)

Select a lot such that at least 75% of the total *buildable land* is *previously developed*.

OR

Path 2. Avoidance of Sensitive Land (3 points)

Do not develop new buildings, *hardscapes*, roads or parking areas on portions of sites that meet any of the following criteria~~.~~: ~~Previously developed buildings and hardscapes are exempt:~~

- *Prime farmland.* The development footprint does not consist of *prime farmland, unique farmland*, or farmland of statewide or local importance as defined by the U.S. Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5
- ~~Prime farmland as defined by the U.S. Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5);~~
- ~~Prime or unique soils, or soils of state significance, as identified in a Natural Resources Conservation Service state soils survey;~~
- *Parkland.* Land that prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (park authority projects are exempt);
- Land whose elevation is at or below the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA);
- *Habitat*. Land specifically identified as habitat for the following:
  - species listed as threatened or endangered under the U.S. Endangered Species Act or the state's endangered species act, or
  - species or ecological communities classified by NatureServe as GH (possibly extinct), G1 (critically imperiled), or G2 (imperiled), or

- species listed as threatened or endangered specifies under local equivalent standards (in areas outside of the United States) that are not covered by NatureServe data.

- ~~Land specifically identified as habitat for any species or ecological communities on federal or state threatened or endangered lists;~~

- *Wetlands.* Land that is either (1) within 50 feet of any wetlands as defined by the U.S. Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, ~~OR~~ or (2) within the setback distances from wetlands prescribed in state or local regulations, as defined by ~~local or state~~state or local rule~~ or law~~, whichever is more stringent; or

- *Water bodies.* Land that is within 100 feet of a water body, defined as seas, lakes, rivers, streams, and tributaries that support or could support fish, recreation, or industrial use, consistent with the terminology of the Clean Water Act 40 CFR 122.2~~;~~.

~~Project Location~~	~~*Rural*~~	~~*Suburban*~~	~~*Urban*~~
~~Points~~	~~3~~	~~2~~	~~0~~

AND/OR

Option 2. Infill Development (2 points)

Select a lot such that at least 75% of the land within ½ mile from the project boundary is *previously developed* land. Water bodies and publicly owned parks are excluded from the calculation.

For projects within city limits or towns with populations of less than 20,000, select a lot where at least 75% of the land immediately adjacent to the project boundary is *previously developed* land. A bordering street itself does not constitute previously developed land; instead, it is the status of the property on the other side of the segment of the street that matters. Any fraction of the boundary that borders a water body is excluded from the calculation.

AND/OR

Option ~~2~~3. Open Space (1 point)

Select a location within ½ mile of a publicly accessible or community-based *open space* that is at least ¾ acre~~ in size~~, or create public~~al~~ly available open space on the project site. The open space requirement can be met ~~by~~ with either one large open space or two smaller spaces totaling ¾ acre.

~~Project Location~~	~~Rural~~	~~Suburban~~	~~Urban~~
~~Points~~	~~0~~	~~0~~	~~1~~

AND/OR

Option ~~3~~4. Street Network (1 point)

Locate the project in an area of high intersection density~~. High intersection density is~~, defined as an area ~~with~~ whose existing streets and sidewalks ~~with a density of~~create at least 90 intersections per square mile. When determining the number of intersections, include the following:

- intersections within a ¼ mile radius of project boundary;

~~Water bodies and publicly owned parks are not included in the calculation.~~

- ~~All~~ streets and sidewalks that are ~~counted as an intersection must be~~ available for general public use and not gated~~.~~; ~~Gated areas are not considered available for public use, with the exception of education and health care campuses and military bases where gates are used for security purposes.~~

- ~~S~~sidewalk intersections ~~may be counted only if~~provided they are a unique right of way (i.e., a sidewalk through a city park)~~.~~; and

- ~~P~~publicly accessible *alleys* ~~may be counted~~.

Exclude the following:

- intersections in gated areas, which are not considered available for public use, with the exception of education and health care campuses and military bases where gates are used for security purposes;

- water bodies and public parks; and

- ~~T~~the closest intersection to a dead end or cul-de-sac ~~is not counted~~.

~~Count intersections within a ¼ mile radius of project boundary.~~

~~Project Location~~	~~Rural~~	~~Suburban~~	~~Urban~~
~~Points~~	~~0~~	~~1~~	~~1~~

AND/OR

Option ~~4~~5. Bicycle Network and Storage (1 point)

Meet both of the following requirements:

BICYCLE NETWORK

Design or locate the *project* such that a *primary entry* and/or bicycle storage is within a 200-yard (180 meters) *walking distance* or *bicycling distance* from a *bicycle network* that connects to at least one of the following. All choices must be within 3 miles (4 800 meters) bicycling distance of the project boundary.

a. At least 10 uses (see LT Community Resources)
b. A school or *employment center*
c. *Bus rapid transit* stops, light or heavy rail stations, commuter rail stations and/or ferry terminals

If the network borders the project boundary, a safe, *all-weather route* must exist between the bicycle network and the project's bicycle storage and/or main entrance.

Planned bicycle trails or lanes may be counted if they are fully funded at the certificate of occupancy date and are scheduled for completion within one year of that date.

AND

BICYCLE STORAGE

Provide *short-term bicycle storage* capacity equal to 2.5% or more of all building occupants but no fewer than four storage spaces per building. *Short-term bicycle storage* must be within 100 feet (30 meters) of a *primary entry*.

Provide *long-term bicycle storage* capacity equal to 30% of all building occupants, but no less than one storage space per residential unit. *Long-term bicycle storage* must be within 100 feet (30 meters) of a *primary entry*.

Bicycle storage capacity may not be double counted; storage that is fully allocated to the occupants of non-project facilities cannot also serve project occupants.

A single family dwelling unit with enclosed garage meets the bicycle storage requirement.

~~**BICYCLE NETWORK**~~

~~Design or locate the *project* such that the building entrance and/or bicycle storage is within a 200-yard walk distance from at least one of the following:~~

- ~~An existing bicycle network that connects to a school or employment center within 3 miles bicycling distance from the project boundary; or~~
- ~~An existing bicycle network that connects to at least 10 community resources within 2 miles bicycling distance from the project boundary.~~

~~If the requirements border the project boundary, a safe, all-weather route must exist between the bicycle network and the project's bicycle storage and/or main entrance.Planned and funded bicycle trails or lanes may be counted if they are funded and designated for completion within the fiscal year that the constructing organization finalizes the plans.~~

~~AND~~

~~**BICYCLE STORAGE**~~

~~Provide at least one secure, enclosed bicycle storage space per occupant for 25% of all building occupants. Expect 2 persons for a studio or 1-bedroom apartment with one additional person per additional bedroom.~~

~~Bicycle storage areas must be locked, located under roof and easily accessible to residents. For multifamily buildings with more than 10 units, provide informational signage on using the storage facilities. Bicycle storage capacity may not be double counted; storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.~~

A single family dwelling unit with enclosed garage meets the bicycle storage requirement~~.~~

~~Project Location~~	~~Rural~~	~~Suburban~~	~~Urban~~
~~Points~~	~~0~~	~~0~~	~~1~~

~~LT CREDIT: PREFERRED LOCATIONS~~

~~4 points~~
~~This credit applies to~~

- ~~Homes (0.5–4 points)~~
- ~~Midrise (0.5–4 points)~~

~~Intent~~

~~To encourage development within *existing* cities, suburbs, and towns to reduce adverse environmental and public health effects associated with sprawl.~~

~~Requirements~~

~~HOMES, MIDRISE~~

~~Option 1. Adjacent Development~~

~~Select a lot such at least 25% of the perimeter immediately borders previously developed land.~~

~~Project Location~~	~~Rural~~	~~Suburban~~	~~Urban~~
~~Points~~	~~0.5~~	~~0~~	~~0~~

~~OR~~

~~Option 2. Infill (2 points)~~
~~Select a lot where at least 75% of the land ½ mile from the project boundary is *previously developed* land. Water bodies and publicly owned parks are excluded from the calculation.~~

~~For projects within city limits of towns with populations of less than 20,000, select a lot where at least 75% of the land immediately surrounding the project boundary is previously developed land.~~

~~AND/OR~~

~~Option 3. Previously Developed (2 points)~~
~~Select a lot where at least 75% of the total *buildable land* is previously developed.~~

LT Credit: Compact Development

3 points
This credit applies to

- Homes (1–3 points)
- Midrise (1–3 points)

Intent

To conserve land and promote livability, transportation efficiency, and walkability by creating compact communities.

Requirements

Homes, Midrise

Construct or renovate a building that meets the dwelling unit per acre of *buildable land* area *density* defined in Table 1.

Table 1. Points for housing density

Single-family and low-rise multifamily projects	Midrise multifamily projects	Points
≥ 7 DU/acre of buildable land	≥ 30 DU/acre of buildable land	1
≥ 12 DU/acre of buildable land	≥ 55 DU/acre of buildable land	2
≥ 20 DU/acres of buildable land	≥ 80 DU/acre of buildable land	3

DU = dwelling units

LT CREDIT: COMMUNITY RESOURCES

2 points
This credit applies to

- Homes (1–2 points)
- Midrise (1–2 points)

Intent

~~Encourage the building of LEED homes in development patterns that~~ To encourage daily walking and ~~biking~~bicycling and to reduce *vehicle miles traveled* (VMT) and automobile dependence.

Requirements

HOMES, MIDRISE

Construct or renovate a project s~~o~~uch that the building's main entrance is ~~within~~ within a 1/2~~-~~-mile *walking distance* from the building entrance of the following number of ~~diverse~~ uses ~~(see below for list of diverse uses)~~, as listed below.

Table 1. Points for proximity to uses

~~Diverse~~ Uses	Points
4~~-~~–7	1
8~~-~~–11	1.5
≥ 12~~+~~	2

The following restrictions apply:

- A single establishment ~~may not be counted in two categories~~ counts as only one type of use (e.g., a retail store may be counted only once even if it sells products in several categories).
- ~~For buildings with multiple diverse uses under a common roof (e.g., shopping malls), n~~No more than half of the minimum number of ~~diverse~~ uses can be in a single building (e.g., a shopping mall).
- ~~Only two establishments of a single type~~No more than two establishments in each use type may be counted (e.g., if five restaurants are within the required distance, only two may be counted).
- ~~One of the establishments must be in the Food Retail category.~~
- ~~Diverse~~ The uses must ~~include at least one use from two separate use category groups~~represent at least two categories, exclusive of the building's primary use.
- ~~The diverse u~~Uses outside the project boundary must be in place upon occupation of the project.

~~Diverse~~ Uses and Use Categories:

Food Retail
Supermarket
Other food store with produce

Community-Serving Retail

Clothing store or department store selling clothes
Convenience store
Farmer's market
Hardware store
Pharmacy
Other retail

Services
Bank
Gym, health club, exercise studio
Hair care
Laundry, dry cleaner
Restaurant, café, diner (excluding establishments with only drive-throughs)

Civic and Community Facilities
Adult or senior care (licensed)
Child care (licensed)
Community or recreation center
Cultural arts facility (museum, performing arts)
Educational facility (including K–12 school, university, adult education center, vocational school, community college)
Family entertainment venue (theater, sports)
Government office that serves public on-site
Place of worship
Medical clinic or office that treats patients
Police or fire station
Post office
Public library
Public park
Social services center

Adapted from Criterion Planners, INDEX neighborhood completeness indicator, 2005.

LT CREDIT: ACCESS TO TRANSIT

2 points
This credit applies to

- Homes (~~0.5~~1–2 points)
- Midrise (~~0.5~~1–2 points)

Intent

To reduce pollution and land development ~~impacts~~ effects from automobile use.

Requirements

HOMES, MIDRISE

Locate the project within a ¼-mile *walking distance* of bus or streetcar stops, or within a ½-mile walking distance of *bus rapid transit* stops, light or heavy rail stations, or ferry terminals. The transit service at those stops in aggregate must meet~~s~~ the minimums listed in Table 1 or Table 2.

- A bus or streetcar stop ~~cannot be counted unless it is a part of a pair that~~must serve~~s~~ a route that extends in opposite directions; the ~~and has~~walking distance can be the average distance ~~walk distance of ¼-mile~~to the two stops.
- A single stop that serves as the terminal for a transit route can ~~also~~ be counted.
- Trips in opposite directions are counted separately.
- Only one stop per route in a given direction can be counted.

Table 1. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry)~~.~~

Weekday trips	Weekend trips	Points
~~60~~72	40	~~0.5~~1
~~110~~144	~~70~~108	1.5
~~170~~360	~~110~~216	~~1.5~~2
~~260~~	~~150~~	~~2.0~~

Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday trips	Points
24	~~.5~~1
40	1.5
60	~~1.5~~2

SUSTAINABLE SITES (SS)

SS PREREQUISITE: CONSTRUCTION ACTIVITY POLLUTION PREVENTION

This prerequisite applies to

- Homes
- Midrise

Intent

To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation, and airborne dust.

Requirements

HOMES, MIDRISE

Stockpile and protect disturbed topsoil from erosion (for reuse).

Control the path and velocity of runoff with silt fencing or comparable measures.

Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.

Provide swales to divert surface water from hillsides.

Use tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that is disturbed during construction.

Prevent air pollution from dust and particulate matter.

Construction sites larger than 1 acre must conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit or local equivalent, whichever are more stringent.

SS PREREQUISITE: NO INVASIVE PLANTS

This prerequisite applies to

- Homes
- Midrise

Intent

To prevent the introduction of invasive species through landscaping.

Requirements

HOMES, MIDRISE

Introduce no *invasive plant species* into the landscape.

Invasive plant species vary by region. Consult the U.S. Department of Agriculture's GRIN Taxonomy for Plants database, the National Association of Exotic Pest Plant Councils, or local cooperative extension service or state exotic pest lists for plants in natural areas and wildlands. Not all nonnative species are considered invasive.

SS CREDIT: HEAT ISLAND REDUCTION

2 points
This credit applies to

- Homes (1–2 points)
- Midrise (1–2 points)

Intent

To ~~reduce heat islands to~~ minimize ~~impacts~~ effects on microclimates and human and wildlife habitats~~.~~ by reducing heat islands.

Requirements

HOMES, MIDRISE

Ensure that at least 50% of *hardscapes* and roofs~~(e.g., sidewalks, patios, driveways, parking lots, and roofs~~, but not including common roads that serve multiple buildings,~~)~~ on the project site meet one or more of the following requirements~~ (see Table 2 for points):~~. Points are awarded according to Table 1.

Table 1. Points for percentage area with shading or nonabsorptive material

Percentage of hardscape area	Points
50–75%	1
≥ 75%	2

Option 1. Shading (1–2 points)

Locate trees or other plantings to provide shading of *hardscapes*. Shading should be calculated for noon on June 21, when the sun is directly overhead, based on five years' growth after installation.

AND/OR

Option 2. Nona~~A~~bsorptive Materials (1–2 points)
Install light-colored, high-albedo materials or vegetation~~-~~-covered hardscapes. Acceptable strategies include the following:

- ~~Nonroof surfaces that have a solar reflectance (SR) of greater than 29 at installation;~~
- using ENERGY STAR qualified roof products~~ used~~ in appropriately sloped applications;
- installing ~~V~~vegetated roofing;
- using ~~O~~open pavers (counting only the vegetation, not the pavers)~~,~~ or ~~an~~ engineered grass pavers; and
- Use paving materials with a *solar reflectance (SR)* of at least 0.33 at installation or a three-year aged SR of at least 0.28;
- ~~Roofing material with a solar reflectance index (SRI) meeting the following criteria in Table 1~~

~~**Table 1. SRI value for roofs**~~

~~Application~~	~~Slope~~	~~Initial SRI~~	~~3-Year Aged SRI~~
~~Low slope~~	~~≤ 2:12~~	~~82~~	~~64~~

~~Steep slope~~	~~> 2:12~~	~~39~~	~~32~~

~~Reflective materials having a lower SRI value than those listed above may be used if the weighted SRI average meets the following criteria:~~

$$\frac{\text{Hardscape area meeting minimum SRI}}{\text{Total Hardscape Area}} \times \frac{\text{SRI of installed hardscape}}{\text{Required SRI}} \geq 50\%$$

~~Table 2: Points for shading and nonabsorptive materials~~

~~% Hardscapes Shaded or Nonabsorptive~~	~~Points~~
~~50-75%~~	~~1~~
~~75%+~~	~~2~~

SS CREDIT: RAINWATER MANAGEMENT

~~1–~~3 points
This credit applies to

- Homes (1–3 points)
- Midrise (1–3 points)

Intent

To reduce rainwater runoff volume from the site.~~To restore or maintain the natural hydrology and water balance of the site based on historical conditions and undeveloped ecosystems in the region.~~

Requirements

HOMES, MIDRISE

Projects that ~~are required to~~must comply with local requirements of the National Pollutant Discharge Elimination System (NPDES) ~~post-construction stormwater management requirements may~~must follow Case 2.

Case 1. Low Impact Development

Use ~~L~~low~~-~~-~~l~~impact ~~D~~development (LID) techniques to minimize the amount of stormwater that leaves the site. ~~Use Table 1 or Table 2 to determine points. Multifamily project must use Table 1.~~ Examples of ~~A~~acceptable techniques include~~, but are not limited to,~~ the following:

- planting ~~A~~areas ~~of~~ with *native* or *adapted* plant material (e.g. trees~~,~~ shrubs);
- installing a ~~V~~vegetated roof;
- using ~~P~~permeable paving~~. A Permeable paving system must include~~, consisting of porous above-ground materials (e.g., open pavers, engineered products), ~~and~~ a~~n appropriate sub-base. This~~ base layer ~~must be~~ designed to ~~ensure proper~~ drain~~age~~ water away from the home~~. Many systems require a 6-inch~~, and (often) a 6-inch-deep sub~~-~~base; and
- installing ~~P~~permanent infiltration or collection features (e.g., vegetated swale, rain garden, ~~or~~ rainwater cistern) that can handle 100% of the runoff from ~~the area for~~ a ~~2~~two-~~-~~year, 24~~-~~-hour storm.

Single-family home projects may use Table 1 or Table 2 to determine points; *multifamily* projects must use Table 1.

To determine compliance for single-family and multifamily homes, calculate the percentage of the lot area, including the area under roof, that is permeable or can direct water to an on-site catchment or infiltration feature.

Table 1. ~~Percentage of Permeable Area~~Points for permeable area, as percentage of total lot area

Percentage ~~of lot(including area under roof) that is permeable or directed to onsite catchment or~~	Points

~~infiltration feature~~	
~~35 – 49%~~	~~1~~
50–64%	~~2~~1
65~~%~~ –79%	~~3~~2
≥ 80~~%+~~%	~~4~~3

As an alternative approach to determining compliance for single-family homes only, credit is given for reducing the total impermeable area compared to the ENERGY STAR reference home, as listed in Table 2.

Table 2. Conditioned floor area of reference home, by number of bedrooms

	1	2	3	4	5	6	7	8 or more
Floor area (square feet)	1,000	1,600	2,200	2,800	3,400	4,000	4,600	+ 600 ft^2 per additional bedroom

Thresholds for total impermeable area are then calculated according to the values in Table 3, column 1.

Table ~~2~~3. Points for reducing t~~T~~otal ~~I~~impermeable ~~A~~area

~~Square Feet of~~ Impermeable ~~A~~area (square feet) ~~that does not direct water to onsite catchment or infiltration feature~~	Points
~~Reference Hhome Ssize * 1.33~~	~~1~~
Reference ~~H~~home ~~S~~size * 1	~~2~~1
Reference ~~H~~home ~~S~~size * 0.66	~~3~~2
Reference ~~H~~home ~~S~~size * 0.33	~~4~~3

Case 2. NPDES Projects

~~In a manner best replicating~~Using low-impact development and green infrastructure to replicate *natural site hydrology*,[1] ~~processes,~~ *manage on-site*[2] the runoff from the developed site for the percentile ~~of~~ regional or local rainfall events listed in Table 4 ~~below using Low Impact Development (LID)[3] and green infrastructure~~[4].

Use daily rainfall data and the methodology in the ~~United States~~U.S. Environmental Protection Agency's Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal

~~[1] **Natural Site Hydrology** is defined as the pre-Columbian function of water occurrence, distribution, movement, and balance.~~
~~[2] **"Manage Onsite"** refers to capturing and retaining the specified volume of rainfall to mimic natural hydrologic runoff characteristics. This includes, but is not limited to, strategies that manage volume through evapotranspiration, infiltration, or capture and reuse.~~
~~[3] **Low Impact Development** (LID) is defined as an approach to managing stormwater runoff that emphasizes on-site natural features to protect water quality by replicating the pre-development hydrologic regime of watersheds and addressing runoff close to its source. Examples include better site design principles such as minimizing land disturbance, preserving vegetation, minimizing impervious cover, and design practices like rain gardens, vegetated swales and buffers, permeable pavement, and soil amendments. These are engineered practices that may require specialized design assistance.~~
~~[4] **Green infrastructure** is a soil and vegetation-based approach to wet weather management that is cost-effective, sustainable, and environmentally friendly (US EPA).~~

Projects, under Section 438 of the Energy Independence and Security Act, to determine the percentile amount.

~~Alternatively, U.S. projects may use the Stormwater Calculator developed by the United States Environmental Protection Agency to determine the natural land cover hydrology.~~

Table 4. Points for on-site management of water from ~~Percentile R~~rainfall ~~E~~events

Percentile ~~R~~rainfall ~~E~~event~~s~~	Points
~~90th~~	~~2~~
95th	~~3~~2
98th	~~4~~3

SS CREDIT: NON~~T~~TOXIC PEST CONTROL

~~0.5~~ 2 points
This credit applies to

- Homes (0.5–2 points)
  Midrise (0.5–2 points)

Intent

~~Design home features t~~To minimize pest problems and risk of exposure to pesticides.
Requirements

HOMES, MIDRISE

Implement one or more of the measures below for a maximum of 2 points. Each measure is worth ~~(~~½ point ~~each~~, except ~~where~~ as noted ~~below), maximum 1 point)~~.

~~In addition, for multifamily buildings, develop an integrated pest management (IPM) policy including resident guidance related to pesticide use, housekeeping, and prompt reporting of pest problems to be included in the Homeowner Education manual.~~

- Install a steel mesh barrier termite control system~~.~~ (1 point).
- Install a physical termite barrier system ~~approved by code~~ (e.g., basaltic rock) approved by code~~.~~ (1 point).
- For below~~-~~-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block.
- Install post-tension slabs ~~and top -feed utilities~~.
- Treat all cellulosic structural material (e.g., wood framing)~~,~~ with a registered pesticide containing borates, following the manufacturer's directions for pre~~-~~construction treatment.
- Use noncellulosic material for all structural elements.
- Install ~~inspection~~ ports or openings for all plumbing elements that penetrate the slab, ~~which~~ to allow access for inspection and treatment of pest infestations.
- Install a registered termite bait system and provide for ongoing maintenance as required by the manufacturer.
- Design a minimum ~~six~~ 6-inch inspection space between the surface of the planned landscape grade and nonmasonry siding.
- Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh)~~,~~ on all openings greater than ¼ inch, except where code prohibits their installation (e.g., dryer vents).
- Design discharge points for rain gutters, air~~-~~-conditioning condensation lines, steam vent lines, or any other moisture source s~~o~~uch that discharge is at least 24 inches from the foundation.
  ~~Design landscape features to~~
- ~~provide~~Leave a minimum 18~~-~~-inch~~es~~ space between the exterior wall and any landscape plantings.

In addition, multifamily building projects must develop an integrated pest management policy that includes guidance for residents on pesticide use, housekeeping, and prompt reporting of pest problems; incorporate the policy in the Homeowner Education Manual.

WATER EFFICIENCY (WE)

Point ~~F~~floor: Earn a~~A~~t least 3 points ~~available~~ in the WE section ~~must be earned~~.

WE PREREQUISITE: WATER METERING

This prerequisite applies to

- Homes
- Midrise

Intent

To ~~provide~~ support water efficiency efforts by monitoring and benchmarking ~~of~~ water use over time.

Requirements

HOMES, MIDRISE

Case 1. Single Family

~~Complete both of the following:~~
Install a whole-house water meter ~~(unless the building is on well water and not on a municipal water system)~~. Single-family attached homes may share a whole-building water meter if landscaping is commonly managed and any units that will not achieve LEED certification are separately metered.

Commit to ~~informing and~~ encouraging homeowners or tenants to participate in the USGBC Building Performance Partnership ~~(BPP)~~.

Homes that use only well water and are not connected to a municipal water system are exempt from this prerequisite.~~Note: Single family attached homes may share a whole building water meter if:~~
~~Landscaping is commonly managed~~
~~There is a separate meter for any group of homes that will not achieve LEED certification~~

Case 2. Multifamily

~~Complete both of the following:~~
Install a water meter or sub-meter for each unit or the entire building ~~(if applicable).~~

Commit to ~~informing and~~ encouraging homeowners or tenants to participate in the USGBC Building Performance Partnership ~~(BPP)~~ by ~~including~~ describing the benefits of participation in the Homeowner Education Manual.

PERFORMANCE PATH

WE CREDIT: TOTAL WATER USE

12 points
This credit applies to

- Homes (1–12 points)
- Midrise (1–12 points)

Intent

To reduce demand for water through high-efficiency fixtures and efficient landscaping practices.

Requirements

Reduce total indoor and outdoor water consumption by at least 10% over standard practices.

For indoor water savings, use the Water Reduction Calculator to determine the average flush or flow rate for each fixture type and the estimated daily usage. The baselines for indoor water consumption are shown in Table 1.

Table 1. Indoor water baseline consumption (per person per day)

Fixture	Baseline flush or flow rate[5]	Estimated fixture usage	Estimated water usage
Shower (per compartment)	2.5 gpm	6.15 minutes	15.4 gallons
Lavatory, kitchen faucet	2.2 gpm	5.0 minutes	11 gallons
Toilet	1.6 gpf	5.05 flushes	8 gallons
Clothes washer	9.5 WF	0.37 cycles @ 3.5 ft^3	15.1 gallons
Dishwasher	6.5 gpc	0.1 cycles	0.7 gallons

gpm = gallons per minute
gpf = gallons per flush
WF = water factor
gpc = gallons per cycle

Each toilet, showerhead, and faucet or faucet aerator must be WaterSense labeled. The water pressure in single-family buildings must not exceed 60 psi, with no detectable water leaks. Any installed water softeners must be demand initiated.

For outdoor water savings, use the EPA WaterSense Water Budget Tool to calculate the baseline landscape water consumption and the design landscape water consumption.

Implement the following measures to further reduce landscape water consumption. Add the savings associated with each of the following strategies to the reduction from the landscape water requirement, as calculated in the Water Budget Tool:

- Install smart scheduling technology. This strategy counts for a maximum reduction of 30% provided all landscape water use is controlled by a soil moisture sensor control system or a weather-based irrigation control system.
- Use captured rainwater.

- Use reclaimed water.
- Use water treated on site or conveyed by a public agency specifically for nonpotable uses (water from naturally occurring surface water bodies, such as streams and rivers, and groundwater, such as well water, does not count).

Points are awarded according to Table 2.

Table 2. Points for reducing indoor and outdoor water use

Percentage reduction	Points
10%	1
15%	2
20%	3
25%	4
30%	5
35%	6
40%	7
45%	8
50%	9
55%	10
60%	11
65%	12

PRESCRIPTIVE PATH

WE CREDIT: INDOOR WATER USE

6 points
This credit applies to

- Homes (1-6 points)
- Midrise (1-6 points)

Intent

To minimize indoor demand for water through high-efficiency fixtures and fittings.

Requirements

HOMES

Case 1. Single Family
Projects that install fixtures consuming more than 2.5 gallons per minute per *shower compartment* must use WE Credit Total Water Reduction.

Each lavatory faucet or faucet aerator must be WaterSense labeled. The average rated flow volume across all lavatory faucets must not exceed 1.5 (1 point) or 1.0 (2 points) gallons per minute.

Each showerhead fixture and fitting must be WaterSense labeled. The average rated flow volume per shower compartment must not exceed 1.75 (1 point) or 1.5 (2 points) gallons per minute.

Each toilet fixture and fitting must be WaterSense labeled. The average rated flush volume across all toilets must not exceed 1.1 gallons per flush (1 point).

Each clothes washer must be ENERGY STAR qualified. (1 point)

The water pressure in the house must not exceed 60 pounds per square inch, with no detectable water leaks.

Case 2. Multifamily and Midrise
Meet the above requirements for all *in-unit spaces* and *non-unit* (*residential-associated* and *nonresidential*) spaces. *Multifamily* and *midrise* projects are exempt from the water pressure testing criterion. No additional credit is awarded if the fixtures and fittings in nonunit spaces are more efficient than those of in-unit spaces.

WE CREDIT: OUTDOOR WATER USE

4 points
This credit applies to

- Homes (1-4 points)
- Midrise (1-4 points)

Intent

To reduce outdoor water consumption through efficient landscaping practices.

Requirements

HOMES, MIDRISE

Reduce the landscape area planted to *turf grass* by landscaping with plants that are *native* or *adapted* to the region. Points are awarded according to Table 1.

Table 1. Points for reducing turf grass and increasing native plantings, as percentage of total landscape area

< 60%	> 25%	1
< 40%	> 50%	2
< 20%	> 75%	3
< 5%	> 75%	4

Lists of native plants are maintained by the Lady Bird Johnson Wildflower Center, the North American Native Plant Society, state agencies, and local cooperative extension service offices.

Project with pools and other *outdoor water features* must use WE Credit Total Water Reduction.

ENERGY AND ATMOSPHERE (EA)

Point floor: Earn a~~A~~t least 8 ~~15% of total~~ points ~~available~~ in the combined LT and EA sections ~~must be earned~~.

EA PREREQUISITE: PERFORMANCE OF ENERGY STAR FOR HOMES

This prerequisite applies to

- Homes
- Midrise

Intent

To improve the building's overall energy performance ~~of a home to lower the building's~~ and reduce its greenhouse gas emissions.

Requirements

HOMES

~~**Option 1. Performance Pathway**~~

Meet all of the following requirements:

1. Meet the ~~performance~~ requirements of ENERGY STAR for Homes, version 3~~, including all of the following:~~

~~S~~Complete~~uccessful completion of~~ the thermal enclosure system rater checklist, the HVAC system quality installation rater and contractor checklists, and the water management system builder checklist. Certified passive house projects automatically meet the thermal enclosure system rater checklist requirement.

~~;~~

~~A~~Achieve a HERS ~~I~~index rating at or below the ~~ENERGY STAR for Homes version 3~~ HERS ~~I~~index ~~T~~target or~~.~~ meet the requirements of the ENERGY STAR for Homes version 3 Prescriptive Pathway, which includes meeting or exceeding all components of the ENERGY STAR Reference Design.

2. At least one of the following appliances must be ENERGY STAR qualified and installed in each dwelling unit:

   - refrigerator;
   - dishwasher; or
   - clothes washer.

3. All ~~plenums and~~ duct runs must be fully ducted~~,~~ (i.e., building cavities may not be used as ducts).

~~Projects with any of the following characteristics must use the LEED Energy and Atmosphere Performance Pathway:~~

- ~~Projects with pools, heated garages, heated driveways or other major energy users not included in the HERS Index.~~

- ~~Projects that are not installing heating systems or not installing cooling systems, unless a professional HVAC contractor signs off that there is no significant heating/cooling load to necessitate a heating or cooling system.~~

~~Certified Passive House projects automatically meet the ENERGY STAR v3 thermal enclosure system rater checklist requirement.~~

~~Any e~~Existing portions of an existing building ~~is~~ are given the following allowances:

Thermal Enclosure System Rater Checklist

2.1. ~~—~~Slab insulation is strongly encouraged~~,~~ but not required to meet or exceed 2009 IECC levels.

4.1. ~~R-value of ceiling insulation at existing exterior walls/existing roof intersection is not required~~Attic insulation at the intersection of existing roof and existing exterior walls does not have to meet R-value requirements.

4.4.5e. ~~—~~Advanced framing is not required on existing framed walls.

5.2.1. ~~—~~Existing sill plates on top of concrete ~~is~~ are not required to be placed on a foam gasket.

Water-Managed Site and Foundation

1.3. A ~~—C~~capillary break under an existing slab is not required ~~for existing slabs,~~ unless there are visible signs of moisture damage on the slab floor.

1.5. ~~—~~Exterior below-grade walls are not required to be damp-proofed on the exterior surface~~,~~ unless there are visible signs of moisture damage on the interior of the wall.

1.8 - Drain tiles surrounded with clean gravel and fabric filter are not required for existing slabs, unless there are visible signs of moisture damage on the slab floor

2, ~~and~~ 3. ~~—~~Water-~~M~~managed ~~W~~wall and ~~R~~roof ~~A~~assembly requirements are not required for existing walls~~/~~ or roofing~~,~~ unless there are signs of moisture damage related to vulnerabilities in the walls or roof.

~~OR~~

~~**Option 2. Prescriptive Pathway**~~

~~Meet all of the following requirements:~~

~~Meet the prescriptive requirements of ENERGY STAR for Homes, version 3, including all of the following:.~~

~~Successful completion of the thermal enclosure system rater checklist, the HVAC system quality installation rater and contractor checklists, and the water management system builder checklist;~~

~~Meet the requirements of the ENERGY STAR for Homes version 3 Prescriptive Pathway, which includes meeting or exceeding all components of the ENERGY STAR Reference Design.~~

~~All pipes used for space heating must be insulated to at least R-3 in unconditioned spaces.~~

~~At least one of the following appliances must be ENERGY STAR qualified and installed in each dwelling unit:~~

- ~~refrigerator~~
- ~~dishwasher~~
- ~~clothes washer~~

~~Any existing portion of an existing home are given the following allowances:~~

~~Thermal Enclosure System Rater Checklist~~

~~2.1 – slab insulation is strongly encouraged, but not required to meet or exceed 2009 IECC levels~~

~~4.1 – attic insulation at the intersection of existing roof to existing exterior walls is not required to meet r-value requirements~~

~~4.4.5e – advanced framing is not required on existing framed walls~~

~~5.2.1 – existing sill plates on top of concrete is not required to be placed on foam gasket~~

~~Water-Managed Site and Foundation~~

~~1.3 – capillary break under slab is not required for existing slabs, unless there are visible signs of moisture damage on the slab floor~~

~~1.5 – exterior below grade walls are not required to be damp-proofed on the exterior surface, unless there are visible signs of moisture damage on the interior of the wall~~

~~2 and 3 – Water Managed Wall and Roof Assembly requirements are not required for existing walls/roofing, unless there are visible signs of moisture damage on the wall or roof~~

MIDRISE

Meet both the whole-building energy simulation and commissioning requirements:

Whole-Building Energy Simulation

Demonstrate a ~~10~~5% ~~percentage~~ improvement ~~of 10% compared with~~over the baseline building performance rating.

~~**Energy Cost Savings.** Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating.~~ Calculate the baseline ~~building performance~~ according to the building performance rating method of USGBC's residential midrise simulation guidelines ~~building performance rating method~~, which is ~~modeled off of~~based on ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G (with errata but without addenda), using a computer simulation model for the whole-building project.

~~The proposed design must meet the following criteria:~~

Comply with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010 (with errata but without addenda)~~;~~.

Comply with USGBC's residential midrise simulation guidelines~~;~~.

Include all ~~the~~ energy consumption and energy costs ~~within and~~ associated with the building project~~;~~.

~~and~~

Compare ~~against~~ the design case with a baseline building that complies with Standard 90.1–2010, Appendix G (with errata but without addenda).

~~OR~~AND

Commissioning

Option 1. Commissioning using ENERGY STAR Protocols. Meet the ENERGY STAR Qualified Multifamily High Rise Buildings Testing and Verification (T&V) Protocols~~multifamily midrise testing and verification protocols~~.

OR

Option 2. Commissioning using Prescriptive Path.

Meet all of the following:

1. Reduced Heating and Cooling Distribution System Losses for ~~i~~In-unit HVAC~~.~~
Limit the duct air leakage rate, ~~using either~~testing for ~~a~~ leakage to outside the unit ~~test,~~ or conducting a total duct leakage test~~.~~. The tested ~~duct~~ leakage ~~-~~ to ~~-~~ outside rate must be ~~<~~ less than 4.0 cfm25 per 100 square feet of conditioned floor area (for each installed system) (or 6.0 cfm25 for units ~~less~~ smaller than 1,200 ~~ft2~~square feet), verified by a qualified energy rater. Total duct leakage for in-unit systems ~~shall be ≤~~must not exceed 8 ~~CFM25~~ cfm25 per 100 ~~ft2~~ square feet of conditioned floor area. Testing is waived if the air-handler unit and all ductwork are visibly within the unit's envelope (i.e., no duct~~work~~s are hidden in walls, chases, floors, or ceilings).

2. Fundamental Commissioning of Central HVAC Systems~~.~~
Meet the performance testing and ongoing maintenance requirements of EA Prerequisite Fundamental Commissioning and Verification of 2012 LEED for New Construction for central commercial heating, cooling, water heating and ventilation systems~~,~~. The requirements include the following: ~~which include:~~

- ~~d~~Develop a system test procedure.
- ~~v~~Verify system test execution.
- ~~m~~Maintain an issues and benefits log throughout the commissioning process.
- ~~d~~Document all findings and recommendations and report directly to the owner throughout the process.
- ~~p~~Prepare and maintain a current facilities requirements and operations and maintenance plan documenting information necessary for efficient building operations.

3. Construction Document Specifications~~.~~
Include the following details in construction and bid documents:

- ~~Include a list of e~~Elements to be sealed ~~in~~ (construction and bid documents). ~~This list should include~~List all elements identified in ASHRAE 90.1–2007, Section 5.4.3.1, or applicable state codes, in addition to any site-specific elements identified during plan review, and ~~must~~ include the items in the LEED for Homes multifamily midrise thermal enclosure inspection checklist (see below). ~~Bid documents must include~~Show locations to be sealed as well as acceptable methods and materials.

- ~~Include an a~~Air barrier sheet ~~in the~~ (bid documents). ~~that s~~Show~~s~~ the air barrier continuity through the various conditions of the exterior enclosure~~, and~~; this information can serve as an index to ~~relevant~~ details.
- ~~Include a "~~C~~c~~ompartmentalization~~"~~ sheet ~~in the~~ (bid documents). ~~that s~~Show~~s~~ the continuity of fire and smoke barriers around each apartment and between ~~various areas (~~corridors, stairs, and common areas~~),~~; this ~~and~~ information can serve as an index to ~~relevant~~ details.

4. LEED for Homes Multifamily Midrise Thermal Enclosure Inspection Checklist~~.~~

Have a third party ~~–~~qualified energy rater verify each item ~~is met from~~on the checklist~~,~~. The LEED checklist is based on ~~which is taken from~~ the ENERGY STAR ~~Qualified~~ for Homes,~~,~~ ~~V~~version 3 (Rev. 02) thermal enclosure rater checklist, ~~s~~Sections 2, 3, and 5.

Certified Passive House projects automatically meet the ~~LEED for Home Multifamily Midrise~~ thermal enclosure inspection checklist requirement.

EA Prerequisite: Energy Metering

This prerequisite applies to

- Homes
- Midrise

Intent

To support energy efficiency efforts by monitoring and benchmarking energy use over time.

Requirements

Homes, Midrise

Case 1. Single Family

Install whole-house electric and gas meters, as applicable.

Commit to encouraging homeowners or tenants to participate in the USGBC Building Performance Partnership.

Case 2. Multifamily

Install an electricity meter or submeter for each residential unit and a gas meter for the entire building, or a gas meter or sub-meter for each unit. Single room–occupancy units, transitional and temporary housing, and designated supportive housing buildings do not need an energy meter in each unit but must have a whole-building energy meter.

Commit to encouraging homeowners or tenants to participate in the USGBC Building Performance Partnership by describing the benefits of participation in the Homeowner Education Manual.

EA Prerequisite: Education of Homeowner, Tenant, or Building Manager

This prerequisite applies to

- Homes
- Midrise

Intent

To sustain the performance of the home by training its occupants in the operation and maintenance of LEED features and equipment.

Requirements

Homes, Midrise

Provide to all individuals or organizations responsible for ongoing maintenance of the home (e.g., occupants, building managers, maintenance contractors) an operations and maintenance manual, binder, or CD that includes all the following items:

- the completed checklist of LEED for Homes features;
- a copy of each signed accountability form;
- copies of all ENERGY STAR for Home, version 3, checklists;
- product manufacturers' manuals for all installed equipment, fixtures, and appliances;
- general information on efficient use of energy, water, and natural resources;
- operations and maintenance guidance for any installed equipment, including space heating and cooling, mechanical ventilation, humidity control, radon protection, renewable energy, and irrigation, rainwater harvesting, or graywater systems (following 2009 EPA WaterSense Single-Family New Home Specifications, item 5.0, Homeowner Education);
- guidance on occupants' activities and choices, including cleaning materials and methods, water-efficient landscaping, integrated pest management, effects of chemical fertilizers and pesticides, irrigation, lighting selection, and appliance selection;
- information on local green power options; and
- information on enrolling in USGBC's Building Performance Partnership.

In addition, conduct a minimum one-hour walkthrough of the home with the occupants. For buildings with building managers, include the building manager. The walkthrough must feature the following:

- identification of all installed equipment;
- instruction in how to use and operate the equipment; and
- information on its maintenance.

EA PREREQUISITE: HOME SIZE

Required - Bonus points

This prerequisite applies to:

- Homes – Prescriptive Path Only
- Mid-Rise

Intent

Reduce energy consumption and greenhouse gas emissions by designing more compact living spaces.

Requirements

HOMES, MID-RISE

Earn 1 point for every 4% decrease in *conditioned floor area* compared with the ENERGY STAR for Homes, version 3, reference home (Table 1). Buildings that are larger than the reference home lose 1 point for every 4% increase in *conditioned floor area*.

Projects cannot exceed the maximum number of points in the EA section.

Table 1. Conditioned floor area of reference home, by number of bedrooms

Bedrooms	1	2	3	4	5	6	7	8 or more
Floor area (square feet)	1,000	1,600	2,200	2,800	3,400	4,000	4,600	+ 600 ft^2 per additional bedroom

For multifamily buildings, home size includes only *in-unit space*.

EA CREDIT: ~~MINIMIZE~~ ANNUAL ENERGY USE

~~29~~1-30 points

This credit applies to

- Homes (1–29 points)
- Midrise (1–30 points)

Intent

~~Improve the overall energy performance of a home to lower the building's greenhouse gas emissions.~~ To improve the home's overall energy performance and reduce its greenhouse gas emissions ~~through enhanced conservation measures.~~ .

Requirement

HOMES

~~Follow one of the two modeling pathways:~~

Projects with *major energy users not included in the HERS Index*, including pools, spas, heated driveways, and heated garages, or other major energy users not included in the HERS ~~I~~index must use Option 1.

Option 1. LEED Energy Budget

Design and construct a ~~home~~ building ~~that reduces the~~whose modeled annual energy usage ~~compared to~~is lower than the LEED ~~E~~energy ~~B~~budget~~.~~

The LEED Energy Budget~~-~~ ~~uses a LEED Reference Home which modifies the following from~~ is based on the ENERGY STAR ~~Qualified~~ for Homes, HERS Index Target Procedure ~~F~~for National Program Requirements, ~~V~~version 3~~.0.~~, with the following modifications:

- The ~~S~~size ~~A~~adjustment ~~F~~factor is always 1.
- ~~Foundation: The LEED Reference Home~~The building is a slab-on-grade ranch~~, with~~ whose floor area is equal to the ENERGY STAR ~~R~~reference ~~H~~home's conditioned floor area.
- There are no f~~F~~loors over unconditioned spaces~~: none~~.
- The g~~G~~ross exterior wall area~~:~~ is ~~equal to square footage~~as shown in Table 1 ~~below:~~.
-

There are two ~~*For homes with more than 7 bedrooms, add 150 ft² to the exterior wall area of the reference home.*~~

- ~~E~~exterior ~~doors: 2~~ half-lite doors, unshaded, one on the ~~S~~south wall, one on the ~~W~~west wall.
- Glazing~~:~~ is 15% of the floor area ~~of the LEED Reference Home~~.
- The c~~C~~eiling ~~area:~~is ~~I~~insulated, and its gross area equals ~~to the LEED Reference Home~~ the conditioned floor area.
- ~~Service water heating equipment efficiency:~~ The ~~S~~storage water heater ~~with~~ has an energy factor of 0.59 ~~EF~~ for gas, 0.92 ~~EF~~ for electric.
- The t~~T~~hermal distribution system~~:~~ is 100% in the attic, above insulation.

- The LEED Energy Budget shall be displayed in MBtu/year, and is based on source energy.
- Any ~~permanently installed plug loads~~major energy users not covered by the energy model, including heated driveways, pools, spas, and heated garages, must be added to the annual energy consumption of the Rated Home.

Table 1. Exterior ~~W~~wall ~~A~~area of LEED ~~R~~reference ~~H~~home, by number of bedrooms

~~Bedrooms in LEED Reference Home~~	1	2	3	4	5	6	7	8 or more
~~Exterior wall area of LEED Reference Home~~Area (square feet)	1,300	1,667	1,957	2,200	2,411	2,600	2,773	+ 150 ft^2 per additional bedroom

Individual units in multifamily buildings are compared to the LEED Reference Homes.

Points are awarded according to Table 2.

Table 2. Points ~~can be earned as follows:~~ for reducing energy usage below LEED energy budget

~~Energy Savings Compared to LEED Energy Budget~~Percentage reduction	Points
1%	1
2%	2
3%	3
4%	4
5%	5
6%	6
7%	7
8%	8
9%	9
10%	10
12%	11
14%	12
16%	13
18%	14
20%	15
22%	16

24%	17
26%	18
28%	19
30%	20
32%	21
34%	22
37%	23
40%	24
50%	25
60%	26
70%	27
80%	28
90%	29

Option 2. HERS Index with Home Size Adjuster

Design and construct a home ~~that reduces the~~whose modeled annual energy usage ~~using the~~achieves a HERS ~~I~~index rating of 74 or better. Points are awarded according to Table 3.

Table 3. Points ~~can be earned as follows:~~for achieving HERS index ratings

HERS ~~I~~index	~~EA~~ Points
74	1
73	2
72	3
71	4
70	5
69	6
68	7
67	8
66	9
65	10
64	11
63	12
62	13
60	14
58	15
56	16
54	17
52	18
50	19
45	20
40	21

35	22
30	23
25	24
20	25
15	26
10	27
5	28
0	29

AND

Earn 1 point for every 4% decrease in *conditioned floor area* ~~based on~~compared with the ENERGY STAR ~~Qualified~~ for Homes, ~~V~~version 3,~~.0~~ ~~R~~reference ~~H~~home~~, summarized in~~ (Table 1)~~ below~~. Buildings that are larger than the reference home lose 1 point for every 4% increase in *conditioned floor area*.

Projects cannot exceed the maximum number of points in the EA section.

Table 1. ~~Reference Home Size~~Conditioned floor area of reference home, by number of bedrooms

~~Bedrooms in Home to be Built~~	1	2	3	4	5	6	7	8 or more
~~Conditioned f~~Floor area ~~of reference home~~(square feet)	1,000	1,600	2,200	2,800	3,400	4,000	4,600	+ 600 ft^2 per additional bedroom

~~*For homes with more than 7 bedrooms, add 600 ft^2 to the condition floor area of the reference home.*~~

For multifamily buildings, home size includes only *in-unit space*.

MIDRISE

Follow the criteria ~~detailed~~ in ~~the~~ EA Prerequisite~~:~~ Performance for Energy Star Homes to demonstrate a percentage improvement in the proposed building's performance ~~rating~~ compared with the baseline building performance ~~rating~~ of ASHRAE 90.1–2010. Points are awarded according to Table 4.

Table 4. Points for reducing energy usage below ASHRAE baseline

~~Energy Savings Above ASHRAE 90.1–2010~~Percentage reduction	~~LEED for Homes Midrise~~ Points
	-
6%~~10%~~	1
7%~~12%~~	2
8%~~14%~~	3

9%~~16%~~	4
10%~~18%~~	5
11%~~20%~~	6
12%~~22%~~	7
13%~~24%~~	8
14%~~26%~~	9
15%~~28%~~	10
16%~~30%~~	11
17%~~32%~~	12
18%~~34%~~	13
19%~~36%~~	14
20%~~38%~~	15
22%~~40%~~	16
24%~~42%~~	17
26%~~44%~~	18
28%~~46%~~	19
30%~~48%~~	20
33%~~50%~~	21
36%~~52%~~	22
39%	23
42%~~54%~~	24
45%	25
48%~~56%~~	26
51%	27
54%~~58%~~	28
57%	29
60%	30

AND

Earn 1 point for every 4% decrease in conditioned floor area ~~based on~~compared with the ENERGY STAR ~~Qualified~~ for Homes, ~~V~~version 3,~~.0~~ ~~R~~reference ~~H~~home~~, summarized in~~ (Table 1) ~~below~~. Buildings that are larger than the reference home lose 1 point for every 4% increase in conditioned floor area.

Projects cannot exceed the maximum number of points in the EA section.

Table 1. ~~Reference Home Size~~Conditioned floor area of reference home, by number of bedrooms

~~Bedrooms in Home to be Built~~	1	2	3	4	5	6	7	8 or more

~~Conditioned f~~Floor area ~~of reference home~~(square feet)	1,000	1,600	2,200	2,800	3,400	4,000	4,600	+ 600 ft^2 per additional bedroom

~~*For homes with more than 7 bedrooms, add 600 ft^2 to the condition floor area of the reference home.*~~

For multifamily buildings, home size includes only *in-unit space*.

EA CREDIT: EFFICIENT HOT WATER DISTRIBUTION SYSTEM

5 points
This credit applies to

- Homes (2-5 points)
- Midrise (2-5 points)

Intent

To reduce energy consumption and the burden on water supply and wastewater systems ~~and on energy consumption~~ by increasing the efficiency of hot water distribution.

Requirements

HOMES, MIDRISE

Option 1. Efficient Hot Water Distribution (~~1~~ 2 points)
Design and install an energy-efficient hot water distribution system~~.~~, based on either maximum pipe length requirements (Path 1) or maximum pipe volume limits (Path 2). ~~Branch length requirements below do not apply to cold water demand loads (e.g., toilets), washing machines, tubs without showerheads, or stovetop pot-fillers.~~

The source of hot water ~~shall be considered~~is assumed to be a water heater, boiler, circulation loop piping, or electric~~ally~~ heat-traced piping. Multiple water heaters and multiple distribution systems may be used ~~in order~~ to comply with this credit. Heat traces are only allowed in situations to prevent freezing.

~~Hot water distribution shall comply with either the maximum pipe length or maximum pipe volume limits in this section.~~

~~PATH~~ Path 1. Maximum Allowable Pipe Length ~~Method.~~

Do not exceed t~~T~~he maximum allowable pipe length from the source of hot water to the termination of the fixture supply pipe ~~shall be in accordance with the maximum pipe length columns~~, as listed in Table 1. ~~Where the length contains~~If a branch consists of more than one size of pipe, use the largest size ~~of pipe shall be used for~~ when determining the maximum allowable length ~~of the pipe in Table 1~~.

Branch length requirements do not apply to cold water demand loads (e.g., toilets), tubs without showerheads, or stovetop pot-fillers.

Table 1. Maximum ~~L~~length of ~~P~~pipe

Nominal pipe size (inch)	Liquid ounces per foot of length	Maximum pipe or tube length	
		System without ~~a~~ circulation loop or heat traced line (feet)	System with ~~a~~ circulation loop or heat traced line (feet)
1/4[a]	0.33	50	16
5/16[a]	0.5	50	16

3/8[a]	0.75	50	16
~~1/2~~½	1.5	43	16
5/8	2	32	12
~~3/4~~¾	3	21	8
7/8	4	16	6
1	5	13	5
1 ~~1/4~~¼	8	8	3
1 ~~1/2~~½	11	6	2
2 or larger	18	4	1

OR

Path 2. Maximum Allowable Pipe Volume

Do not exceed a maximum volume of hot or tempered water of 64 ounces (1.89 L) for hot water from a water heater or boiler to the fixture, and ~~16~~24 ounces (0.71~~5~~ L) for hot water from a circulation loop pipe or an electric heat-traced pipe to the fixture.

Pipe volume is the sum of the internal volumes of pipe, fittings, valves, meters, and manifolds between the source of hot water and the termination of the fixture supply pipe. To determine the volume, refer to the liquid ounces per foot column in Table 1, or use Table 2, which lists the volumes for specific types of tubing.

Branch volume requirements do not apply to cold water demand loads (e.g., toilets), tubs without showerheads, or stovetop pot-fillers.

Table 2. ~~Internal v~~Volume of ~~various~~ water distribution ~~tubing~~pipes, by tubing type

Internal Volume of Various Water Distribution Tubing

Ounces of Water Per Foot Length of Hot Water Tubing								
Nominal Size (Inches)	Copper M	Copper L	Copper K	CPVC CTS SDR 11	CPVC SCH 40	PEX-Al-PEX ASTM F 1281	PE-AL-PE	PEX CTS SDR 9
⅜	1.06	0.97	0.84	N/A	1.17	0.63	0.63	0.64
½	1.69	1.55	1.45	1.25	1.89	1.31	1.31	1.18
¾	3.43	3.22	2.90	2.67	3.38	3.39	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	5.56	5.56	3.91
1 ¼	8.70	8.36	8.09	6.61	9.66	8.49	8.49	5.81
1 ½	12.18	11.83	11.45	9.22	13.20	13.88	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	21.48	21.48	13.86

Source: Modified from *2009 International Plumbing Code Table E202.1. International Code Council. January*

Conversions: 1 gallon (3.8 liters) = 128 ounces
1 ounce = 0.00781 gallons (0.0296 liters)
0.5 gallons (1.9 liters) = 64 ounces
0.6 gallons (2.3 liters) = 76.8 ounces

Paths 1 and 2, Pumps and Controls for ~~Circulating~~ Hot Water Circulation Loops~~Systems~~

Circulating systems must meet the following requirements.

1. Circulating pump may not operate continuously, on a timer control, or on a water temperature (aquastat) sensors. Gravity and thermo-syphon circulation systems are prohibited.

2. Circulating pump must be demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.

3. After the pump starts, the controls shall allow the pump to operate until the water temperature in the return pipe rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe. Controls shall further limit the water temperature to a maximum of 105ºF (40 ºC). Controls shall limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.

5. Circulating hot water systems must be provided with an *automatic* or readily accessible *manual* switch to turn off the hot water circulating pump when not in use. ~~Pumps on circulating hot water systems be activated on demand by either a hard-wired or wireless activation control of one of the following types:~~

- ~~1. A normally-open, momentary contact switch.~~
- ~~2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.~~
- ~~3. A flow switch.~~
- ~~4. A door switch.~~

~~Circulating hot water systems must be provided with an *automatic* or readily accessible *manual* switch to turn off the hot water circulating pump when not in use. Controls that allow continuous, timer, or water temperature-initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosyphon circulation loops are prohibited.~~

~~The controls for the pump must be electronic and operate on the principal of shutting off the pump with a rise in temperature. Electronic controls must have a lock-out to prevent operation exceeding 105°F in the~~

~~event of failure of the device that senses temperature rise. The electronic controls must have a lock out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.~~

AND/OR

Option 2. Performance Test (~~2~~ 3 points)

Case 1. Hot water source is a water heater or boiler with no circulation loop or heat traced pipe; or in multifamily buildings a central circulation loop or heat traced pipe.

To minimize wasted water before hot water is delivered, using EPA WaterSense testing procedures, verify that no more than 0.5 gallon of water is stored in any piping between the hot water source and any fixture, and that no more than 0.6 gallons of water is collected from the hot water fixture before hot water is delivered. Heat traces are only allowed in situations to prevent freezing. ~~Diagnostically verify that no more than 0.5 gallons of water are stored in any piping/manifold between the hot water source and any hot water fixture. Follow EPA WaterSense testing procedures, which state that no more than 0.6 gallons of water can be collected from the hot water fixture before hot water is delivered.~~

Projects that meet WaterSense Labeled New Homes requirements automatically achieve this credit.

Case 2. Hot water source is a circulation loop or heat traced pipe serving a single unit or house

To minimize wasted water before hot water is delivered, using EPA WaterSense testing procedures, verify that no more than 0.25 gallons of water can be collected from the hot water fixture furthest from the recirculation loop,

AND/OR

Option 3. Pipe Insulation (~~1~~ 2 points)
Install at least R-4 insulation on a~~A~~ll domestic hot water piping, including sub-slab pipes~~, shall have R-4 insulation~~. Insulation ~~shall be properly installed~~ on all piping elbows and tees ~~to~~ must adequately insulate changes in direction ~~the 90-degree bend~~.

Run buried p~~Buried piping. P~~iping ~~installed with~~in a slab or below grade ~~shall be placed within~~ through a ~~physically~~ protective, waterproof raceway, channel, sleeve, or path~~way having~~ whose internal dimensions and changes of direction are large enough ~~such~~ that the piping and insulation can be removed and replaced~~, and maintain its~~ without damaging the piping's dimensional integrity ~~during and after construction~~.

~~Exception: Where~~The waterproof sleeve is not required for below-grade piping if the insulation manufacturer~~'s specifications~~ stipulates that the pipe insulation will maintain its insulating value in underground applications in damp soil when installed according to the manufacturer's instructions. This exception does not apply to piping that runs through or under building slabs.

EA Credit: Active Solar-Ready Design

1 point
This credit applies to

- Homes (1 point)

Intent

To reduce energy consumption and greenhouse gas emissions by designing to maximize opportunities for solar design.

Requirements

Homes

Option 1. Photovoltaic-Ready Design (1 point)

A project team that installs a photovoltaic (PV) system that meets the requirements of EA Credit Renewable Energy is not eligible for this credit.

Meet EPA's solar photovoltaic specifications for a renewable energy–ready home. Provide detailed information about such systems in the homeowner education manual so that future occupants can install an active PV system.

AND/OR

Option 2. Solar Direct Hot Water–Ready Design (1 point)

A project team that installs a solar direct hot water (DHW) system that meets the requirements of EA Credit Efficient Domestic Hot Water Equipment is not eligible for this credit.

MeetEPA's solar water heating specifications for a renewable energy–ready home. Provide detailed information about such systems in the homeowner education manual so that future occupants can install an active solar DHW system.

EA CREDIT: HVAC START-UP CREDENTIALING

1 point
This credit applies to

- Homes (1 point)

Intent

To rReduce energy consumption by ensuring that the heating and cooling systems is operating at itsoperate at peak efficiency.

Requirements

HOMES

Have all heating, cooling, and ventilation systems commissioned by a NATE certified technician with North American Technician Excellence certification, HVAC contractor credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO) (or equivalent as defined by USGBC), commission all heating, cooling and ventilation systems by completing. The technician must complete the ENERGY STAR for Homes, version 3, HVAC system quality installation contractor checklist, or the ACCA Standard 9 HVAC quality installation verification protocols, or equivalent as defined by USGBCsimilar.

EA Credit: Advanced Utility Tracking

2 points
This credit applies to

- Homes (1–2 points)
- Midrise (1–2 points)

Intent

To support energy efficiency efforts through real-time monitoring of energy and water use.

Requirements

Homes, Midrise

Case 1. Single Family

Option 1. Electric and Water (1 point)

Meet one of the following:
Install a permanent energy-monitoring system that records at intervals of one hour or less and is equipped with the ability to transmits data to the homeowner or occupant at a remote location (e.g., computer, in-house display).
OR

If the project has an automatic in-ground irrigation system and the landscape irrigated area is larger than 1,000 square feet, install a submeter to monitor all irrigation system components.

AND/OR

Option 2. Building Performance Partnership (1 point)

The homeowner must enroll in the USGBC Building Performance Partnership for all applicable utility accounts before the project team submits its application for certification.

Case 2. Multifamily

Option 1. Energy and Water (1 point)

In each unit, install a permanent energy-monitoring system that records at intervals of one hour or less and is equipped with the ability to transmit data to the homeowner or occupant at a remote location (e.g., computer, in-house display).

OR

If the project has an automatic in-ground irrigation system and the landscape irrigated area is larger than 1,000 square feet, install a submeter to monitor all irrigation system components.

AND/OR

Option 2. Building Performance Partnership (1 point)

Path 1. Whole-Building Master Meter
The building owner must enroll in the USGBC Building Performance Partnership for all applicable utility accounts before the project team submits its application for certification.

OR

Path 2. Individual Unit Meters
At least 50% of unit owners or occupants must enroll in the USGBC Building Performance Partnership for all applicable utility accounts before the project team submits its application for certification.

PRESCRIPTIVE PATH~~WAY~~

EA CREDIT: EFFICIENT HOT WATER DISTRIBUTION SYSTEM

HOMES

See performance path.

EA CREDIT: SOLAR-READY DESIGN

HOMES

See performance path.

EA CREDIT: HVAC START-UP CREDENTIALING

HOMES

See performance path.

EA CREDIT: ADVANCED UTILITY TRACKING

HOMES

See performance path.

EA Credit: Building Orientation for Passive Solar

3 points
This credit applies to
- Homes (3 points)

Intent

To reduce energy consumption and greenhouse gas emissions by designing to maximize opportunities for solar design.

Requirements

Homes

Meet all of the following requirements:
- The south-facing glazing area is at least 50% greater than the sum of the glazing area on the east- and west-facing walls.
- The east-west axis of the building is within 15 degrees of due east-west.
- At least 90% of the south-facing glazing is completely shaded (by awnings, overhangs, plantings) at solar noon on June 21 and unshaded at noon on December 21.

In areas south of 25 degrees of latitude or where topography significantly impacts insolation, orientation may be adjusted to meet local conditions provided the team provides documentation to demonstrate that its building orientation decision is based on solar and meteorological data for the site.

EA CREDIT: AIR INFILTRATION

2 points
This credit applies to
- Homes (1–2 points)

Intent

To minimize waste of energy caused by uncontrolled air leakage into and from conditioned spaces.

Requirements

HOMES

Case 1. Single Family
Meet the air leakage requirements shown in Table 1 or Table 2. The rate of air leakage to outside must be tested and verified by a qualified energy rater.

Case 2. Multifamily
Meet the air leakage requirements shown in Table 1 or Table 2. The rate of air leakage to outside must be tested and verified by a qualified energy rater.

Meet the requirements for leakage to outside the conditioned envelope for each dwelling unit, unless the whole building can be entirely and sufficiently depressurized by a blower door(s).

Table 1. Points for reducing air leakage, in ACH50

IECC climate zone				
1–2	*3–4*	*5–7*	*8*	*Points*
4.25	3.5	2.75	2.0	1
3.0	2.5	2.0	1.5	2

Table 2. Points for reducing air leakage, in cfm50 per sf envelope area

Performance requirements IECC climate zone				
1–2	*3–4*	*5–7*	*8*	*Points*
.195	.16	.125	.925	1
.1375	.115	.925	.675	2

ACH = Air changes per hour
cfm = cubic feet per minute
ELR = envelope leakage ratio
IECC = International Energy Conservation Code
sf = square feet

EA CREDIT: ENVELOPE INSULATION

2 points
This credit applies to

- Homes (1–2 points)

Intent

To conserve energy by selecting~~Design~~ and installing insulation to minimize heat transfer and thermal bridging.

Requirements

HOMES

~~Meet the following requirements:~~
~~Install~~ Select insulation ~~that exceeds the~~whose R-value exceeds the requirements listed in ~~Chapter 4 of~~ the ~~2009~~ 2012 International Energy Conservation Code (IECC), Chapter 4, or local code, whichever is more stringent~~, by the percentages shown in the table below:~~. Do not include thermal mass or infiltration effects in the R-value calculation. Points are awarded according to Table 1.

Table 1. Points for exceeding code requirements for R-value

~~% I~~Percentage improvement ~~from IECC 2009 or local code~~	Points
10%	1
20%	2

~~thermal mass or infiltration effects cannot be included in the R-value calculation.~~

Install the insulation to meet the Grade I specifications set by the RESNET Home Energy Rating Standard ~~(Table 1)~~. Installation must be verified by a qualified energy rater conducting a pre-drywall thermal enclosure inspection.

~~**Table 1. Summary of HERS Installation Grades**~~

~~*Please refer to "Adopted Enhancements to the Mortgage Industry National Home Energy Rating Standards," available from RESNET, for a more detailed description*~~

~~*Grade*~~	~~*Description*~~
~~I~~	~~Meet the requirements of Grade II (below), but allow only very small gaps, and compression or incomplete fill amounts to 2% or less.~~
~~II~~	~~Moderate to frequent installation defects, gaps around wiring, electric outlets, etc. and incomplete fill amounts to 10% of less. Gaps running clear through the insulation amount to no more than 2% of the total surface area covered by the insulation. Wall insulation is enclosed on all six sides and in substantial contact with the sheathing material on at least one side (interior or exterior) of the cavity.~~

EA CREDIT: WINDOWS

3 points
This credit applies to
- Homes (1.5–3 points)

Intent

To maximize the energy performance of windows.

Requirements

HOMES

Design and install windows, skylights, and glass doors whose ratings from the National Fenestration Rating Council exceed the requirements in the ENERGY STAR for Homes, version 3, prescriptive pathway, as shown in Tables 1–3. Use the average window ratings, average skylight ratings, and average exterior door ratings.

Determine the window-to-floor-area (WFA) ratio by calculating the total window area in the above-grade conditioned floor area. All skylight window areas count toward the WFA ratio. For decorative glass, the project team may exclude up to 0.75% of the WFA ratio from the calculations. If the WFA ratio is 15% or more, the following additional requirements apply:

- In climate zones 4–8, homes with a WFA ratio of 15% or more must meet a more stringent U-factor requirement:

  U-factor = (0.15 / WFA) * (U-factor from Table 1)

- In climate zones 1–3, homes with a WFA ratio of 15% or more must meet a more stringent solar heat gain coefficient (SHGC) requirement:

  SHGC = (0.15 / WFA) * (SHGC from Table 1)

Project teams that achieve EA Credit Building Orientation for Solar Design are exempt from the requirements for window SHGC.

Table 1. Points for exceeding baseline window ratings

	Climate zone					
	1, 2	*3*	*4*	*5–8*		*Points*
U-factor	≤ 0.45	≤ 0.30	≤ 0.26	≤ 0.26		1.5
SHGC	≤ 0.25	≤ 0.25	≤ 0.40	Any		
U-factor	≤ 0.30	≤ 0.26	≤ 0.22	≤ 0.22		3
SHGC	≤ 0.25	≤ 0.25	≤ 0.40	Any		

SHGC = solar heat gain coefficient

Table 2. Points for exceeding baseline skylight ratings

	Climate zone					*Points*
	1, 2	*3*	*4*	*5–8*		
U-factor	≤ 0.70	≤ 0.57	≤ 0.47	≤ 0.47		1.5
SHGC	≤ 0.25	≤ 0.25	≤ 0.40	Any		
U-factor	≤ 0.47	≤ 0.47	≤ 0.40	≤ 0.40		3
SHGC	≤ 0.25	≤ 0.25	≤ 0.40	Any		

SHGC = solar heat gain coefficient

Table 3. Points for exceeding baseline door ratings

	Opaque	*≤ 1/2 lite*	*> 1/2 lite*
U-factor	0.21	0.27	0.32
SHGC	N/A	0.30	0.30

SHGC = solar heat gain coefficient

EA CREDIT: SPACE HEATING AND COOLING EQUIPMENT

4 points
This credit applies to
- Homes (1–4 points)

Intent

To reduce energy consumption associated with the heating and cooling system.

Requirements

HOMES

Design and install HVAC equipment that is more efficient than the equipment required by the ENERGY STAR for Homes, version 3, prescriptive pathway. Points are awarded according to Table 1.

Any piping designed as part of a heat pump system to carry water that is well above (or below) the thermostatic temperature settings in the home must have R-4 or better insulation. Refrigerant piping must be insulated to R-6 or better on the air-conditioning mode suction line or the heat-pump mode discharge line.

Table 1. Points for HVAC equipment that exceeds Energy Star requirements

Climate zones 4–8

	Central AC, air source heat pump	*Gas furnace*	*Boiler, oil furnace (gas, oil, diesel, propane)*	*Ground-source heat pump*			*Points*
				Open loop	*Closed loop*	*Direct expansion*	
Cooling	≥ 14 SEER			≥ 17.8 EER	≥ 15.5 EER	≥ 16.5 EER	1
Heating	≥ 10 HSPF	≥ 92 AFUE	≥ 87 AFUE	≥ 4.0 COP	≥ 3.6 COP	≥ 3.9 COP	1
Cooling	≥ 15 SEER			≥ 19.4 EER	≥ 17 EER	≥ 18 EER	2
Heating	≥ 10.5 HSPF	≥ 94 AFUE	≥ 90 AFUE	≥ 4.3 COP	≥ 4.0 COP	≥ 4.2 COP	2

Climate zones 1–3

	Central AC, air source heat pump	*Gas furnace*	*Boiler, oil furnace (gas, oil, diesel, propane)*	*Ground-source heat pump*			*Points*
				Open loop	*Closed loop*	*Direct expansion*	
Cooling	≥ 15.5 SEER			≥ 17.8 EER	≥ 15.5 EER	≥ 16.5 EER	1
Heating	≥ 8.6 HSPF	≥ 90 AFUE	≥ 85 AFUE	≥ 4.0 COP	≥ 3.6 COP	≥ 3.9 COP	1
Cooling	≥ 16.5 SEER			≥ 19.4 EER	≥ 17 EER	≥ 18 EER	2
Heating	≥ 9.0 HSPF	≥ 92 AFUE	≥ 87 AFUE	≥ 4.3 COP	≥ 4.0 COP	≥ 4.2 COP	2

AC = air-conditioning
AFUE = annual fuel utilization efficiency
COP = coefficient of performance
EER = energy efficiency ratio
HSPF = heating seasonal performance factor
SEER = seasonal energy efficiency ratio

EA Credit: Heating and Cooling Distribution Systems

3 points
This credit applies to
- Homes (2–3 points)

Intent

To minimize energy loss to thermal bridges and leaks in the heating and cooling distribution system.

Requirements

Homes

Single Family, Multifamily?

Option 1. Forced-Air System

Case 1. Large Homes (2 points)
For homes of 1,200 square feet or more, limit the rate of duct air leakage to outside the conditioned envelope. For each installed system, the tested duct leakage rate must not exceed 3.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system), verified by the qualified energy rater.

Case 2. Small Homes (2 points)
For homes smaller than 1,200 square feet, limit the rate of duct air leakage to outside the conditioned envelope. For each installed system, the tested duct leakage rate must not exceed 4.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system), verified by the qualified energy rater.

Case 3. Ductwork in Conditioned Space (3 points)
Duct leakage testing is waived if the following conditions are met:
- The air-handler unit and all ductwork are located entirely within conditioned spaces (i.e., no ductwork hidden in walls, chases, floors, or ceilings).
- The envelope is airtight; 2 points are earned in EA Credit: Air Infiltration.

Ductless systems with air circulation blowers qualify. This case is not available for multifamily projects whose ductwork runs through spaces between units: interstitial space is considered outside the thermal envelope of the unit.

OR

Option 2. Hydronic System (2–3 points)

Keep the system (including boiler and distribution pipes) entirely within the conditioned envelope (2 points).

For an additional point, install an outdoor reset control that modulates distribution water temperature based on the outdoor air temperature (1 point).

EA CREDIT: EFFICIENT DOMESTIC HOT WATER EQUIPMENT

3 points
This credit applies to

- Homes (1–3 points)

Intent

To r~~R~~educe the energy consumption associated with ~~the~~ domestic hot water ~~system~~ by improving the efficiency of the ~~hot water system~~water heater.

Requirements

HOMES

Install an ENERGY STAR ~~–~~qualified water heater~~s,~~ (1 point), or install a solar water heater that, in combination with an ENERGY STAR water heater, meets at least 40% (2 points) or 60% (3 points) of the annual domestic hot water (DHW) load ~~in combination with an ENERGY STAR qualified water heate~~ (Table 1).~~r.~~

~~Select one measure from Table 1 below.~~

Table 1. Points for high-efficiency water ~~heating~~ heater~~equipment~~

~~*Water heater type and efficiency requirement*~~	*Points*
ENERGY STAR ~~Qualified~~water heater	1
	1.5
EF or thermal efficiency greater than 0.90	2
EF or thermal efficiency greater than 1.8	
Solar water heaters	
Solar water heater: ≥ 40% of annual DHW load	2
Solar water heater: ≥ 60% of annual DHW load	3

EA CREDIT: LIGHTING

2 points
This credit applies to
- Homes (0.5–2 points)

Intent

To reduce the energy consumption associated with interior and exterior lighting.

Requirements

HOMES

Option 1. Indoor Lighting (1.5 points)

Single family

Install high-efficacy lighting. Meet or exceed the requirements for lighting power density, measured in watts per square foot, for hard-wired fixtures, as listed in Table 1.

Table 1. Points for reducing lighting power density

Maximum lighting power density (W/sf)	*Points*
0.72	0.5
0.60	1
0.48	1.5

The proposed fixtures used to calculate energy savings must be capable of meeting the recommended light levels (weighted average footcandles) in the Illuminating Engineering Society Lighting Handbook, 9th edition, for the given space type. Either calculate the needs for each space type, or use 16 as the weighted average footcandles for the home.

In calculating lighting power density, follow these guidelines:
- Use a lighting power density of 1.1 W per square foot for rooms or portions of any rooms with less than the required hardwired lighting.
- Account for all hard-wired fixtures in the home, including the garage and exterior lights (whether affixed to the home or freestanding).
- Do not include portable table and floor lamps, appliance lights, or landscape lights.
- Include step lights and undercabinet and cabinet lights.
- For standard incandescent (a-line medium screw base) bulbs, assume 64 watts per socket.
- For LED and Xenon lights, use actual wattages.
- For fluorescent lighting, calculate wattage based on the assumptions in Table 2 or use the actual wattages installed.

Table 2. Assumptions for fluorescent bulb wattage

	Watts
CFL twist	14
Covered	14
Candelabra	9

Incandescent	64
Candelabra	40
MR16	40

AND/OR

Option 2. Exterior Lighting (0.5 point)
All exterior lighting must be Dark Sky qualified and have motion sensor controls, integrative photovoltaic cells, photosensors, or astronomic time-clock operation.

The following lighting is exempt: emergency lighting, lighting required by code for health and safety purposes, and lighting used for eye adaptation near covered vehicle entrances or exits.

Multifamily

Option 1. Indoor Lighting (1.5 points)

Install high-efficacy lighting and/or lighting controls that achieve a reduction from the ENERGY STAR baseline. Complete the ENERGY STAR multifamily midrise worksheet for interior lighting.

Table 1. Points for reducing interior lighting from baseline

Percentage reduction	*Points*
35%	0.5
45%	1
55%	1.5

Option 2. Exterior Lighting (0.5 point)

Complete the ENERGY STAR multifamily midrise worksheet for exterior lighting. Reduce exterior lighting wattage by at least 50%.

All exterior lighting must be Dark Sky qualified.

EA Credit: High-Efficiency Appliances

2 points
This credit applies to

- Homes (0.5–2 points)

Intent

To reduce energy consumption through installation of efficient appliances.

Requirements

Homes

Install appliances from the list below. To receive credit for one type (e.g., refrigerator), every appliance of that type must meet the requirement.

- ENERGY STAR–labeled refrigerator(s) (1 point);
- ENERGY STAR–labeled ceiling fans (at least one in the living or family room and one per bedroom) (0.5 point);
- ENERGY STAR–labeled dishwasher(s) (0.5 point).

EA Credit: Renewable Energy

4 points
This credit applies to
- Homes (1–4 points)

Intent

To encourage the installation and operation of renewable electricity generation systems.

Requirements

Homes

Design and install a renewable electricity generation system. Receive 1 point for every 500 kWh produced per year by the system. For every point earned in the rest of the EA category, 1 point is available in this credit. Renewable energy credits (RECs) must be retained by the building owner.

Table 1. Points for electricity generation from renewable sources

Annual kWh	Required points in rest of EA	Points
500	1	1
1,000	2	2
1,500	3	3
2,000	4	4

MATERIALS AND RESOURCES (MR)

~~Point floor: At least 10% of total points available in the MR section must be earned.~~

MR PREREQUISITE: CERTIFIED TROPICAL WOOD

This prerequisite applies to

- Homes
- Midrise

Intent

To encourage environmentally responsible forest management.

Requirements

HOMES, MIDRISE

All wood in the building must be nontropical, reused or reclaimed, or certified by the Forest Sustainability Council, or equivalent as defined by USGBC.

For the purposes of this prerequisite, a tree species is considered *tropical* if it is grown in a location that lies between the Tropic of Cancer and the Tropic of Capricorn.

MR Prerequisite: Durability Management

This prerequisite applies to
- Homes
- Midrise

Intent

To promote durability and performance of the building enclosure and its components and systems through appropriate design, materials selection, and construction practices.

Requirements

Homes

Meet the requirements of the ENERGY STAR for Homes, version 3, water management system builder checklist (with the exceptions for existing homes listed in EA Prerequisite ENERGY STAR for Homes Performance).
Midrise projects are exempt from this requirement.

Install all the applicable indoor moisture control measures listed in Table 1.

Table 1. Required interior moisture control measures for homes

Location or equipment	*Required measure*
Area directly above bathtub, spa, or shower (extending to ceiling), exposed wall or area behind fiberglass enclosure if wallboard is installed	Use nonpaper-faced backer board or paper-faced product or coating over wallboard that meets standard ASTM D 3273 standard
Kitchen, bathroom, laundry room, spa area	Use water-resistant flooring; do not install carpet
Entryway within 3 feet of exterior door accessible from ground	Use water-resistant flooring; do not install carpet (carpet tiles are permitted)
Tank water heater in or over living space	Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, or floor drain with floor sloped to drain
Clothes washer in or over living space	Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, or floor drain with floor sloped to drain
Conventional clothes dryer	Exhaust directly to outdoors

MR Credit: Durability Management Verification

1 point
This credit applies to
- Homes (1 point)
- Midrise (1 point)

Intent

To promote enhanced durability and high performance of the building enclosure and its components and systems through appropriate design, materials selection, and construction practices.

Requirements

HOMES

Have the verification team inspect and verify each measure listed in the ENERGY STAR for Homes, version 3, water management system builder checklist.

MR Credit: Material-Efficient Framing

1-2 points
This credit applies to
- Homes (0.5–2 points)
- Midrise (0.5–1 point)

Intent

To conserve resources by reducing the use of unnecessary framing materials.

Requirements

Homes, Midrise

Implement any of the following advanced framing techniques for at least 90% of each component.

- Implement one of the following optimum value engineering measures in exterior walls and common walls (1 point):
    - Install no more than one horizontal 2x top plate on walls by aligning studs with joists and roof rafters.
    - Place window and door headers in the rim joist.
    - Install raised (directly beneath the top plate), single-ply headers not more than 2 inches nominal thickness in a 2x4 wall or 4 inches nominal thickness in a 2x6 wall, in accordance with International Residential Code 2012.
    - Install structural insulated panels (SIPs) for walls.

- Implement any two of the following for all interior and exterior walls (0.5 point):
    - Size headers for actual loads.
    - Use ladder blocking or drywall clips.
    - Use two-stud corners or California corners.

- Space interior wall studs greater than 16 inches o.c. (0.5 point).

- Space floor joists greater than 16 inches o.c. or SIPs (0.5 point).

- Space roof rafters greater than 16 inches o.c. or SIPs (0.5 point).

For renovation projects, existing components may be excluded from the calculation.

Modular, panelized, or other prefabricated wall or structural systems must comply with the requirements.

MR CREDIT: ENVIRONMENTALLY PREFERABLE PRODUCTS

~~0.5~~ 4–points
This credit applies to

- Homes (0.5–4 points)
- Midrise (0.5–4 points)

Intent

To ~~I~~increase demand for products or building components that minimize material consumption through recycled and recyclable content, reclamation, or overall reduced life-cycle impacts.

Requirements
HOMES, MIDRISE

Use building component materials that meet one or more of the criteria below. A material must make up 90% of the component~~,~~ by weight or volume, except as ~~specifically~~ noted. A single component that meets Option 1 and Option 2 can earn points for each ~~(½~~ (0.5 point per item ~~is earned~~).

Option 1. Local ~~p~~Production
Use products that were extracted, processed, and manufactured ~~within~~ either locally or regionally ~~50 miles of the building, OR or use products reclaimed within 50 miles of the building for at least 50% of~~ for the following components. Meet the thresholds in Table 1 ~~(0.5 points per component).~~:

- framing (0.5 point);
- ~~concrete/cement and~~ aggregate for concrete and foundation (0.5 point);
- drywall~~/~~ or interior sheathing (0.5 point).

Table 1: Percentage of component to meet Local or Regional credit

Maximum distance from extraction, processing and manufacturing to project site:	% of building component required to meet criteria (0.5 points per component)
Regionally: 500 miles or within the state, province or territory	90%
Locally: 100 miles	50%

For renovation projects, existing components meet the requirement for local production.

AND/OR

Option 2. Environmentally ~~p~~Preferable ~~p~~Products
Use products that meet ~~at least~~ one or more of the following criteria (0.5 points each). ~~(points will not be awarded for meeting more than one of the criteria with a single component):~~ At least 90% of each component, by weight or volume, must meet one of the requirements below. A single component that meets more than one criterion does not earn additional credit.

- The product contains ~~Composed of~~ at least 25% reclaimed material, including salvaged, refurbished, or reused materials~~;~~. For renovation projects, existing components are considered reclaimed. Wood by-products can be counted as reclaimed material. These include items from secondary manufacturers; felled, diseased, or dead trees from urban or suburban areas; orchard trees that are unproductive and cut for replacement; and wood recovered from landfills or water bodies.

- The product contains ~~Composed of~~ at least 25% *postconsumer* or 50% *preconsumer* ~~(postindustrial) products~~content~~;~~.
- ~~Composed of at least 50% rapidly renewable material (bamboo, cork, or other a material that regenerates within 10 years such as bamboo, cork, etc.);~~
- New wood products must be Forest Stewardship Council (FSC) Certified, or ~~better~~equivalent as defined by USGBC.
- Other bio-based products meet ASTM Test Method D6866 ~~must meet~~and the Sustainable Agriculture Network's Sustainable Agriculture Standard.
- Concrete that consists of at least 30% fly ash or slag used as a cement substitute and 50% recycled content or reclaimed aggregate OR 90% recycled content or reclaimed aggregate.~~,~~ ~~Bio based products are those that meet ASTM Test Method D6866~~
- Products~~-~~ purchased from a manufacturer (producer) that has a *closed-loop product-recycling program* for that product. A closed-loop program (aka Product Take Back) is run by a producer that accepts its own and sometimes other manufacturers' products at the end of their useful life and recover and recycle the materials. To count toward credit compliance, a program must be widely available.

Table 1. Maximum points for compliant building components

Component	Max~~.~~imum ~~P~~points ~~Available~~
Flooring - Base floor only (i.e., sealed concrete, no floor covering)	~~maximum credit for no floor covering material above base floor (i.e. sealed concrete)~~1
Floor covering	0.5~~?~~
~~All i~~Insulation*	0.5
Sheathing	0.5
Framing	0.5
Drywall~~/~~, interior finish	0.5
Concrete:~~/ or~~ cement and / or aggregate~~**~~	0.5
Roofing	0.5
Siding	0.5
Additional components (install at least 3 of the following): • Doors (not including insulated doors or garage door) • Cabinets • Counters (kitchens and bathrooms) • Interior trim • Decking or patio material	0.5

* ~~e~~Excluding HVAC and pipe insulation.

~~Wood by-products – including items from secondary manufacturers; felled, diseased, or dead trees from urban or suburban areas; orchard trees that are un-productive and cut for replacement; and wood recovered from landfills or water bodies can be counted as reclaimed material.~~

~~Note: For renovation projects, existing components are considered both Local for Option 1 AND Reclaimed for Option 2.~~

~~AND~~

~~Any material that meets the above requirements must also meet the Raw Material Sourcing Disclosure.~~

~~**Raw Material Sourcing Disclosure:**~~
~~Manufacturers and their raw materials suppliers must annually report data to a publically available database maintained by a third party.~~

~~*Data to be reported by the Manufacturer*~~

- ~~Governance~~
- ~~Environmental impact (Energy, Water, Waste, Materials, Biodiversity, Air Quality)~~
- ~~Labor Practices~~
- ~~Financial reporting~~
- ~~Product responsibility~~

MR CREDIT: ~~MATERIALS RESOURCE~~CONSTRUCTION WASTE MANAGEMENT

3 points
This credit applies to

- Homes (0.5–3 points)
- Midrise (0.5–3 points)

Intent

To r~~R~~educe construction waste generation and ~~then~~ to reuse and recycle debris ~~that is produced~~.

Requirements

HOMES, MID-RISE

Reduce total construction waste or divert from landfills and incinerators a large proportion of the waste generated from new construction ~~activities~~. ~~from landfills and incinerators.~~ Use the tables below to calculate the percentage of waste avoided or *recycled*. ~~Credit is awarded for reducing the total waste, or by diverting a large percentage, according to the point allocation equation in Table 1.~~

Excavated soil, land-clearing debris, and alternative daily cover (ADC) do not qualify for this credit. Any waste-to-energy is not considered recycling for this credit. ~~Note: Land clearing and demolition waste (e.g., from removal of preexisting structures on the site) should not be counted in this calculation.~~ An ID point is available for projects that divert at least 50% of their demolition waste. ~~An ID point is available for exemplary performance in demolition waste diversion.~~

Table 1. Baseline w~~W~~aste ~~Generated~~ for ~~by~~ LEED ~~R~~reference ~~H~~home

Bedrooms	*Conditioned ~~F~~floor a~~A~~rea (sf) ~~of LEED Reference Home~~*	*Waste ~~Generated by LEED Reference Home~~ (lbs)*
1	1,000	4,200
2	1,600	6,720
3	2,200	9,240
4	2,800	11,760
5	3,400	14,280
6	4,000	16,800
7	4,600	19,320
8 or more	—	Area (sf) * 4.2

~~For buildings with more than 7 bedrooms, Waste Generated by LEED Reference Home (lbs) = Conditioned Floor Area of LEED Reference Home * 4.2~~

For multifamily buildings, use the project's floor area for any *non-unit spaces*, and add it to the floor area of the LEED reference home calculated for each unit.

~~Step 1:~~ Calculate the ~~W~~ waste (in pounds) ~~G~~generated by the p~~P~~roject according to the following equation:

Project construction waste ~~(lbs)~~ = Total ~~W~~waste ~~to landfill (lbs)~~ ~~+~~ - (~~W~~Recycled waste ~~diverted (lbs)~~ * 0.25~~75~~)

To convert ~~from~~ volume ~~of waste~~ to weight, ~~projects may use a generic~~assume 500 pounds ~~/~~ per cubic yard of ~~waste factor for~~ mixed construction waste~~. Projects may~~, or ~~elect to~~ use Table 2 to calculate the~~a more detailed waste calculation based on specific~~ weights of specific waste products~~ using the conversion table below:~~.

Table 2. Volume-to-weight conversion for construction and demolition debris

Construction & Demolition Debris Weight Conversion Table			
MATERIAL	LBS/CY	TONS/CY	CY/TON
Aluminum (scrap, whole)	175 lbs/cy	0.09 tons/cy	11.1 cy/ton
Asphalt	1,380 lbs/cy	0.69 tons/cy	1.4 cy/ton
Brass (scrap)	906 lbs/cy	0.45 tons/cy	2.2 cy/ton
Brick (common hard)	3,024 lbs/cy	1.50 tons/cy	0.67 cy/ton
Cardboard (uncompacted)	100 lbs/cy	0.05 tons/cy	20 cy/ton
Carpet & Padding (loose)	84.4 lbs/cy	0.04 tons/cy	25 cy/ton
Concrete	1,855 lbs/cy	0.92 tons/cy	1.4 cy/ton
Copper (scrap)	1,094 lbs/cy	0.56 tons/cy	1.8 cy/ton
Dirt (loose, dry)	1,890 lbs/cy	0.94 tons/cy	1.1 cy/ton
Drywall	500 lbs/cy	0.25 tons/cy	4 cy/ton
Glass (broken)	2,160 lbs/cy	1.10 tons/cy	0.91 cy/ton
Metal (scrap)	906 lbs/cy	0.45 tons/cy	2.2 cy/ton
Mixed C&D Debris	900 lbs/cy	0.45 tons/cy	2.2 cy/ton
Mixed Waste/Trash	350 lbs/cy	0.17 tons/cy	5.9 cy/ton
Rock (loose)	2,570 lbs/cy	1.28 tons/cy	0.78 cy/ton
Roofing (wood shake, shingle)	435 lbs/cy	0.22 tons/cy	4.5 cy/ton
Tree Limbs & Stumps	1,080 lbs/cy	0.54 tons/cy	1.9 cy/ton
Wood (scrap, loose)	330 lbs/cy	0.17 tons/cy	5.9 cy/ton
Yard Trimmings (mixed)	108 lbs/cy	0.05 tons/cy	20 cy/ton

Source: Contra Costa Waste Authority

~~Step 2: Calculate % Construction Waste Reduced from LEED Reference Home~~

~~Construction Waste Reduction (%) = [Waste Generated by LEED Reference Home (lbs) – Project Construction waste (lbs)] / Waste Generated by LEED Reference Home (lbs)~~

~~Step 2. Calculate the percentage of construction waste reduced from the baseline (the LEED reference home):~~

~~Waste reduction (%) = (LEED reference home~~Baseline ~~waste – Project waste) / LEED reference home~~Baseline ~~waste~~

Table 3. ~~Point Allocation Equation:~~Points for reducing construction waste below baseline

~~*% Construction Waste Reduced from LEED Reference Home*~~*Percentage*	*Points*

reduction	
2510.0%	0.5
2037.5%	1.0
3050.0%	1.5
4062.5%	2.0
5075.0%	2.5
6087.5%	3.0

MIDRISE

Reduce or divert waste generated from construction activities from landfills and incinerators to a level below the industry norm using one of the following options:

Case 1. Project scope includes demolition

Recycled, reused, or salvaged at least 75% of the deconstruction and construction waste as shown in the table below:

Heavy materials, defined as ABC (asphalt, brick and concrete) reused or recycled can be counted in this calculation up to but no more than 75% of the diverted total.

Table 1.

Percentage Diverted	Points
75%	2
95%	3

OR

Case 2. Project scope is only New Construction

Minimize new construction waste to landfills or incinerators by recycling, reusing, or salvaging material to meet the requirements in Table below:

Heavy materials, defined as ABC (asphalt, brick and concrete) reused or recycled can be counted in this calculation up to but no more than 75% of the diverted total.

Table 2 .

Total Construction Waste to Landfill or Incinerator	Percentage Diverted	Points
2.5 lbs/ft^2	50%	2
1.5 lbs/ft^3	75%	3

INDOOR ENVIRONMENTAL QUALITY (EQ)

Point floor: Earn a~~A~~t least 3~~20% of total~~ points ~~available~~ in the EQ section~~ must be earned~~.

EQ PREREQUISITE: VENTILATION

This prerequisite applies to

- Homes
- Midrise

Intent

To ~~R~~reduce moisture problems and occupants' exposure to indoor pollutants from kitchens, ~~and~~ bathrooms and other sources by exhausting pollutants to outside and ventilating with outdoor air.

Requirements

HOMES, MIDRISE

Case 1. Single Family

Meet all of the following requirements for local exhaust and outdoor air ventilation including the requirements of ASHRAE 62.2 – 2010, sections 4, 5 and 7 and Section 1504.4 of the 2009 International Residential Code (IRC), including:~~.~~

1. **Local Exhaust**. Meet all the following requirements:

Design and install local exhaust systems in all bathrooms (including half-baths) and the kitchen to meet the requirements of ~~Sections 5 and 7 of~~ ASHRAE Standard 62.2~~-~~–2010, Sections 5 and 7. Sample requirements that relate to minimum intermittent local exhaust flow rates are shown in Table 1~~, below~~.

Exhaust air to the outdoors. ~~(~~Do not r~~R~~out~~ing~~e exhaust ducts to terminate in attics or interstitial spaces. ~~is not permitted, nor is the use of r~~Re~~-~~circulating range hoods or re~~-~~circulating over-the-range microwaves ~~to~~ do not satisfy the kitchen exhaust requirements.

Use ENERGY STAR~~-~~–labeled bathroom exhaust fans in all bathrooms (including half~~-~~-baths). A HRV or ERV can be used to exhaust single or multiple bathrooms if it has an efficacy level of greater than or equal to 2.8 cfm/watt as certified by HVI.~~Exhaust fans serving multiple bathrooms and bathrooms with an HRV or ERV must meet the applicable ENERGY STAR ventilation fan requirements for efficacy level (cfm/Watt).~~

For e~~E~~xhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 m3/s), ~~shall be provided with~~provide makeup air at a rate approximately equal to the exhaust air rate. ~~Such m~~Makeup air systems ~~shall be equipped with~~must have a means of closure and ~~shall~~ be automatically controlled to start and operate simultaneously with the exhaust system.

Table 1. Minimum air~~-~~-flow requirements ~~-~~for intermittent local exhaust

~~Location~~	*Minimum air flow*
Kitchen	100 cfm; vented range hood required if continuous exhaust fan flow rate is less than 5 kitchen air changes per hour~~.~~

Bathroom, half-bath	50 cfm

AND

2. **Whole House Mechanical Ventilation.** Design and install a whole-~~building~~-house mechanical ventilation system that complies with ASHRAE Standard 62.2-~~–~~2010, Sections 4 and 7. ~~A summary of alternatives is provided below, but the HVAC contractor should review and follow the requirements of ASHRAE Standard 62.2-2010, Sections 4 and 7.~~ Whole house ventilation fans must be rated for sound at a maximum of 1.0 sone per ASHRAE 62.2–2010, Section 7.2.1. Remote mounted fans need not meet these sound requirements.

   The ASHRAE options can be summarized as follows:

   - Continuous ventilation. Meet the ventilation requirements. Simplified minimum air-~~-~~flow requirements are shown in Table 2 ~~below~~.
   - Intermittent ventilation. Use ~~Equation 4.2 of~~ ASHRAE Standard 62.2-~~–~~2010, Equation 4.2, to demonstrate adequate ventilation air flow.
   - ~~Exception for~~Any passive ventilation~~. Have a passive ventilation~~ system must be approved and verified by a licensed HVAC engineer as providing ventilation equivalent to that achieved by continuous ventilation systems.

Table 2. Simplified minimum air-~~-~~flow requirements (cfm) for continuous ventilation systems~~, in cfm~~

Conditioned floor area (ft^2)	Bedrooms				
	0, 1	2, 3	4, 5	6, 7	> 7
≤ 1,500	30	45	60	75	90
1,501–3,000	45	60	75	90	105
3,001–4,500	60	75	90	105	120
4,501–6,000	75	90	105	120	135
6,001–7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of this prerequisite.

Case 2. Multifamily

Design and install a whole-unit ventilation system for each individual dwelling unit that complies with the requirements of ASHRAE Standard 62.2-~~–~~2010 (with errata but without addenda), and all l~~L~~ocal ~~E~~exhaust ~~Items A, B, C and D~~ requirements ~~from the~~for Single Family section, above. Major components of the standard are summarized below.

- Provide o~~O~~utdoor air ~~must be provided~~ to each unit directly from the outdoors. Project teams using exhaust ventilation systems must specify how outside air is delivered at the flow rate required by ASHRAE 62.2-~~–~~2010. Do not use s~~S~~ystems that rely on transfer air from pressurized hallways or corridors, adjacent dwelling units, attics, etc. ~~are prohibited.~~
- For continuous ventilation systems, meet the requirements of ASHRAE 62.2–2010 shown in Table 2, ~~which is summarized in Table 16-1 or Equation 16-1 below.~~ Continuous in-~~-~~unit

ventilation fans must be rated for sound at a maximum of 1.0 sone, per ASHRAE 62.2–2010, Section 7.2.1. Remote mounted fans need not meet these sound requirements.

- For intermittent ventilation systems, install fans to meet ASHRAE Standard 62.2–2010. The requirement states that the fan flow rate is must be equal to the outdoor air flow requirements (provided in Table 16-1 or Equation 16-1) below multiplied by the fan flow rate multiplier shown in Table 16-2. The system must be designed so such that it can operate automatically based on a timer. Fans must be rated for sound at a maximum of 1.0 sone. Remote mounted fans need not meet these sound requirements.

- As applicable, follow the restrictions on system types for hot, humid climates and very cold climates. In hot, humid climates, whole-house mechanical net exhaust flow shall must not exceed 7.5 cfm per 100ft^2 of 100 square feet of conditioned floor area. In very cold climates, mMechanical supply-only systems must not exceeding 7.5 cfm per 100ft^2 100 square feetshall not be used in very cold climates. See ASHRAE 62.2–2010, Sections 4.5 and Section 8, for more details and a list of applicable climate scategories.

- Locate aAir inlets that are part of the ventilation design shall be located a minimum ofat least 10 feet from known sources of contamination, such as a stack, vent, exhaust hood, or vehicle exhaust. Place tThe intake shall be placed so such that entering air is not obstructed by snow, plantings, or other material. Forced air inlets shall must be provided withcovered by rodent/insect screens to exclude rodents and insects (mesh not larger than ½ inch). See ASHRAE 62.2–2010, Section 6.8, for more details and a list of exceptions.

AND

For all non-unit spaces, meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata but without addenda), and:.

Mechanically Vventilated Sspaces must be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent. Ventilation fans that penetrate rated assembles may require radiation and fire dampers to meet local building and fire codes.

Naturally Vventilated Sspaces must comply with ASHRAE Standard 62.1–2010, Paragraph 5.1 (with errata but without addenda[1]).

Note: Ventilation fans may require radiation/fire dampers when fans penetrate rated assemblies to meet local building/fire codes.

EQ Prerequisite: Combustion Venting

This prerequisite applies to

- Homes
- Midrise

Intent

To limit the leakage of combustion gases into the occupied space of the home.

Requirements

Homes, Midrise

Do not install any unvented combustion appliances (ovens and ranges excluded).

Install a carbon monoxide (CO) monitor on each floor, hard-wired with a battery backup. In multifamily buildings, install a CO monitor on each floor of each unit.

For all fireplaces and woodstoves inside the building, provide doors that close or a solid glass enclosure. Interior fireplaces and woodstoves that are not closed-combustion or power-vented must pass BPI or RESNET combustion safety testing protocols to ensure that depressurization of the combustion appliance zone is less than 5 Pa.

Space- and water-heating equipment that involves combustion must meet one of the following:

- it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting);
- it must be designed and installed with power-vented exhaust; or
- it must be located in a detached utility building or open-air facility.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of this prerequisite.

EQ Prerequisite: Garage Pollutant Protection

This prerequisite applies to

- Homes
- Midrise

Intent

To reduce occupants' exposure to indoor pollutants originating from an adjacent garage.

Requirements

Homes, Midrise

Place all air-handling equipment and ductwork outside the fire-rated envelope of the garage.

Tightly seal shared surfaces between the garage and conditioned spaces, including all of the following:

- In conditioned spaces above the garage, seal all penetrations and all connecting floor and ceiling joist bays.
- In conditioned spaces next to the garage, weather-strip all doors, install carbon monoxide detectors in rooms that share a door with the garage, seal all penetrations, and seal all cracks at the base of the walls.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of this prerequisite.

EQ Prerequisite: Radon-Resistant Construction

This prerequisite applies to

- Homes
- Midrise

Intent

To reduce occupants' exposure to radon gas and other soil gas contaminants.

Requirements

Homes, Midrise

Case 1. New Construction

If the building is in EPA radon zone 1 (high risk), design and build with radon-resistant construction techniques, as prescribed by American Association of Radon Scientist and Technologists (AARST), Reducing Radon in New Construction of 1 & 2 Family (RRNC 2.0); EPA Building Radon Out; NFPA 5000, Chapter 49; International Residential Code, Appendix F; CABO, Appendix F; ASTM E1465; or an equivalent code or standard as defined by USGBC. Follow all the requirements listed in Indoor airPLUS, 2.1:

- Provide a capillary break per the Indoor airPLUS specifications.
- Provide an electrical outlet near vent piping in the attic to facilitate future fan installation.
- Install a 3- or 4-inch-diameter gas-tight vertical vent pipe with no bends greater than 45 degrees, connected to an open T-fitting in the aggregate layer, extending up through the conditioned spaces and terminating at least 12 inches above the roof opening.

The requirements for radon protection are automatically satisfied if the building is elevated by at least 2 feet, with open air space between the building and ground. An enclosed vented crawlspace does not qualify. A garage under a building is an acceptable alternative.

For mixed-use buildings, nonresidential space is exempted.

Case 2. Renovation of Existing Building

If the building is in EPA radon zone 1 (high risk), and if no slab work is being performed (i.e., an existing slab is not being demolished, and no new slab floor is being built), test the building for radon. If the results are greater than 4 pCi/L, install an active ventilation system. If the results are less than 4 pCi/L, no radon-resistant construction techniques are required.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of this prerequisite.

EQ Prerequisite: Air Filtering

This prerequisite applies to

- Homes
- Midrise

Intent

To protect occupants' health by reducing particulate matter from the air supply system.

Requirements

Homes, Midrise

Install air filters with a minimum efficiency reporting value (MERV) of 8 or higher on all recirculating space conditioning systems, per ASHRAE 62.2–2010. Design ductwork and specify the central blower to account for the pressure drop across the filter. Air filter housings must be airtight to prevent bypass or leakage.

Nonducted systems are exempt from the minimum MERV 8 requirements but must have an internal air filter in the air-handling unit.

Install air filters rated MERV 6 or higher for mechanically supplied outdoor air for systems with 10 feet of ductwork or more, per ASHRAE 62.2–2010, Section 6.7.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of this prerequisite.

EQ Prerequisite: Environmental Tobacco Smoke

This prerequisite applies to

- Homes
- Midrise

Intent

To limit exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke.

Requirements

Homes, Midrise

Multifamily projects only

Prohibit smoking in all common areas of the building. The prohibition must be communicated in building rental or lease agreements or in condo or co-op association covenants and restrictions, and provisions for enforcement must be included.

Locate any exterior designated smoking areas, including balconies where smoking is permitted, at least 25 feet from entries, outdoor air intakes, and operable windows opening to common areas.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes, and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas, or prohibit smoking on the entire property.

EQ Prerequisite: Compartmentalization

This prerequisite applies to

- Homes
- Midrise

Intent

To limit occupants' exposure to indoor air pollutants by minimizing the transfer of air between units.

Requirements

Homes, Midrise

Multifamily and Attached Single-Family Projects Only

Compartmentalize each residential unit to minimize leakage between units. Minimize uncontrolled pathways for environmental tobacco smoke and other indoor air pollutants between units by sealing penetrations in walls, ceilings, and floors and by sealing vertical chases (including utility chases, garbage chutes, mail drops, and elevator shafts) adjacent to the units.

Weather-strip all doors in the residential units leading to common hallways to minimize air leakage into the hallway. Weather-strip all exterior doors and operable windows to minimize leakage from outdoors.

Demonstrate acceptable sealing of residential units by a blower door test. Follow the procedure described by RESNET or the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, with an allowable maximum leakage of 0.23 cfm50 per square foot of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceiling).

EQ Credit: Enhanced Ventilation

3 points
This credit applies to

- Homes (1–3 points)
- Midrise (1–3 points)

Intent

To minimize moisture problems and occupants' exposure to indoor pollutants through enhanced exhaust and ventilation systems.

Requirements

Homes, Midrise

Case 1. Single Family

Option 1. Enhanced Local Exhaust (1 point)
Use one of the following strategies in every bathroom with a shower, bathtub, or spa (i.e., half-baths are exempt) to control the use of the local exhaust fan:

- an occupancy sensor;
- an automatic humidistat controller;
- a continuously operating exhaust fan; or
- a delay timer that operates the fan for at least 20 minutes.

AND/OR

Option 2. Enhanced Whole-House Ventilation (2 points)
Install a balanced whole-house ventilation system (not just exhaust only or supply only) that meets the minimum ventilation requirements of ASHRAE Standard 62.2–2010, Sections 4 and 7. Program the system such that it does not exceed the standard's requirements by more than 10%.

Case 2. Multifamily

Meet the above requirements for all in-unit residential spaces.

EQ Credit: Contaminant Control

2 points
This credit applies to

- Homes (0.5–2 points)
- Midrise (0.5–2 points)

Intent

To reduce occupants' exposure to indoor airborne contaminants through source control and removal.

Requirements

Homes

Option 1. Walk-off Mats (0.5 point)
At each *primary entryway* from the outdoors, design and install a permanent walk-off mat that is at least 4 feet long and allows access for cleaning (e.g., grating with catch basin). Permanent walk-off mats are required only for primary exterior entryways, but nonpermanent walk-off mats are strongly recommended for other entryways.

For regularly used common exterior entryways in multifamily buildings, install permanent systems that are at least 10 feet long in the primary direction of travel to capture dirt and particulates.

Acceptable entryway systems include permanently installed grates, grilles, and slotted surfaces that allow for cleaning underneath. Roll-out mats are acceptable only if maintained on a weekly basis by a contracted service organization.

AND/OR

Option 2. Shoe Removal and Storage (0.5 point)
Design a shoe removal and storage space near the primary entryway, separated from living areas. This space must be a permanent architectural feature, it may not have wall-to-wall carpeting, and it must be large enough to accommodate a bench and at least two pairs of shoes per bedroom.

For multifamily buildings, design a shoe removal and storage space at each residential unit's primary entrance.

AND/OR

Option 3. Preoccupancy Flush (0.5 points)

At installation, seal all permanent ducts and vents to minimize contamination from construction. Remove seals after all phases of construction are completed.

After construction ends and before occupancy, flush the home with fresh air, according to the following guidelines:

- Remove any dust and debris from ducts.

- Flush the entire home for 48 hours, keeping all windows and interior doors open; the 48 hours may be nonconsecutive if necessary.
- Keep all windows open and run a fan (e.g., HVAC system fan) continuously, or flush the home with all HVAC fans and exhaust fans operating continuously at the highest flow rate.

For multifamily buildings, the requirements apply only to all in-unit spaces.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of Option 3.

AND/OR

Option 4. Air Testing (1 point)

After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline indoor air quality testing using protocols consistent with the methods listed in Table 1. Project teams must follow either the Use current versions of ASTM standard methods, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile organic compounds must be accredited under ISO/IEC 17025 for the test methods they use.

Demonstrate that contaminants do not exceed concentration levels listed in Table 1.

Table 1. Maximum concentration levels, by contaminant and testing method

Contaminant	*Maximum concentration*	*Maximum concentration (Healthcare only)*	*ASTM and U.S. EPA methods*	*ISO method*
Formaldehyde	27 ppb	16.3 ppb	ASTM D5197; EPA TO-11 or EPA Compendium Method IP-6	ISO 16000-3
Particulates (PM10 for all buildings; PM2.5 for buildings in EPA nonattainment areas)	PM10: 50 micrograms per cubic meter PM2.5: 15 micrograms per cubic meter	20 micrograms per cubic meter	EPA Compendium Method IP-10	ISO 7708
Ozone (for buildings in EPA nonattainment areas)	0.075 ppm	0.075 ppm	ASTM D5149 - 02	ISO 13964
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter	200 micrograms per cubic meter	EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1	ISO 16000-6

Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except formaldehyde	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	ASTM D5197; EPA TO-1, TO-15, TO-17, or EPA Compendium Method	ISO 16000-3, 16000-6
Carbon monoxide (CO)	9 ppm; no more than 2 ppm above outdoor levels	9 ppm; no more than 2 ppm above outdoor levels	EPA Compendium Method IP-3	ISO 4224

ppb = parts per billion; ppm = parts per million; µg/cm = micrograms per cubic meter

Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.

The number of sampling locations depends on the size of the building and number of ventilation systems but must include the entire building and all representative situations. Include areas with the least ventilation and greatest presumed source strength.

Collect air samples between 3 and 6 feet (90 and 180 centimeters) from the floor to represent the breathing zone of occupants over a minimum four-hour period.

Measure particulate concentrations by a gravimetric method. Hand-held or real-time instruments are not acceptable unless they are calibrated on site against the standard gravimetric method.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.

Refer to CA Section 01350, Appendix B, New Single-Family Residence Scenario, for air-testing guidance.

MIDRISE

Option 1. Walk-off Mats (0.5 point)

At each unit's primary entryway from the outdoors, design and install a permanent walk-off mat that is at least 4 feet long and allows access for cleaning (e.g., grating with catch basin).

For regularly used common exterior entryways in multifamily buildings, install permanent systems that are at least 10 feet long in the primary direction of travel to capture dirt and particulates. Acceptable entryway systems include permanently installed grates, grilles, and slotted surfaces that allow for cleaning underneath. Roll-out mats are acceptable only if maintained on a weekly basis by a contracted service organization.

AND/OR

Option 2. Shoe Removal and Storage (0.5 point)

In each unit, design a shoe removal and storage space near the entryway, separated from living areas. This space must be a permanent architectural feature, it may not have wall-to-wall carpeting, and it must be large enough to accommodate a bench and at least two pairs of shoes per bedroom.

AND/OR

Option 3. Preoccupancy flush (0.5 point)

The Preoccupancy Flush can be awarded if the requirements are only met for all in-unit spaces.

At installation, seal all permanent ducts and vents to minimize contamination from construction. Remove seals after all phases of construction are completed.

After construction ends and before occupancy, flush the home with fresh air, according to the following guidelines:

- Remove any dust and debris from ducts.
- Flush the entire home, keeping all interior doors open for 48 hours; the hours may be nonconsecutive if necessary.
- Keep all windows open and run a fan (e.g., HVAC system fan) continuously, or flush the home with all HVAC fans and exhaust fans operating continuously at the highest flow rate.

For multifamily buildings, the requirements apply only to all in-unit spaces.

AND/OR

Option 4. Air Testing (1 point)

After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline indoor air quality testing using protocols consistent with the methods listed in Table 1. Project teams must follow either the Use current versions of ASTM standard methods, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile organic compounds must be accredited under ISO/IEC 17025 for the test methods they use.

Demonstrate that contaminants do not exceed concentration levels listed in Table 1.

Table 1. Maximum concentration levels, by contaminant and testing method

Contaminant	*Maximum concentration*	*Maximum concentration (Healthcare only)*	*ASTM and U.S. EPA methods*	*ISO method*
Formaldehyde	27 ppb	16.3 ppb	ASTM D5197; EPA TO-11 or EPA Compendium	ISO 16000-3

			Method IP-6	
Particulates (PM10 for all buildings; PM2.5 for buildings in EPA nonattainment areas)	PM10: 50 micrograms per cubic meter PM2.5: 15 micrograms per cubic meter	20 micrograms per cubic meter	EPA Compendium Method IP-10	ISO 7708
Ozone (for buildings in EPA nonattainment areas)	0.075 ppm	0.075 ppm	ASTM D5149 - 02	ISO 13964
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter	200 micrograms per cubic meter	EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1	ISO 16000-6
Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except formaldehyde	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	ASTM D5197; EPA TO-1, TO-15, TO-17, or EPA Compendium Method	ISO 16000-3, 16000-6
Carbon monoxide (CO)	9 ppm; no more than 2 ppm above outdoor levels	9 ppm; no more than 2 ppm above outdoor levels	EPA Compendium Method IP-3	ISO 4224

ppb = parts per billion; ppm = parts per million; µg/cm = micrograms per cubic meter

Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.

The number of sampling locations depends on the size of the building and number of ventilation systems but must include the entire building and all representative situations. Include areas with the least ventilation and greatest presumed source strength.

Collect air samples between 3 and 6 feet (90 and 180 centimeters) from the floor to represent the breathing zone of occupants over a minimum four-hour period.

Measure particulate concentrations by a gravimetric method. Hand-held or real-time instruments are not acceptable unless they are calibrated on site against the standard gravimetric method.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.

Refer to CA Section 01350, Appendix B, New Single-Family Residence Scenario, for air-testing guidance.

EQ Credit: Balancing of Heating and Cooling Distribution Systems

3 points
This credit applies to

- Homes (1–3 points)
- Midrise (1–3 points)

Intent

To improve thermal comfort and energy performance by ensuring appropriate distribution of space heating and cooling in the home.

Requirements

Homes, Midrise

Case 1. Forced-Air Systems

Option 1. Multiple Zones (1 point)

Install a system with at least two space-conditioning zones with independent thermostatic controls. In houses with both a heating system and a cooling system, each must have at least two zones.

Single-family houses with less than 800 square feet of conditioned floor area and multifamily buildings whose average unit size is less than 1,200 square feet automatically meet the requirements of this credit.

AND/OR

Option 2. Supply Air-Flow Testing (1 point)
Have the total supply air-flow rates in each room tested by a qualified energy rater using a flow hood with doors closed, or another acceptable method, per RESNET or ACCA Quality Installation Specifications.

Supply air-flow rates must be within +/- 20% (or +/- 25 cfm) of calculated values from ACCA Manual J.

Test multirate or multispeed HVAC systems at the rate for which they were designed. Supply air-flow requirements must meet the higher of the cooling or heating designed air flow for each room.

Ductless systems qualify for this credit.

AND/OR

Option 3. Pressure Balancing (1 point)

For each bedroom, demonstrate a pressure difference of more than 3 Pa (0.012 inch w.c.) with respect to the main body of the house when doors are closed and the air handler is operating on highest speed. The testing must be verified by a qualified energy rater.

Case 2. Radiative Systems

Radiative systems include radiators, hot water baseboard systems, and other non-forced air heating and cooling systems.

Option 1. Multiple Zones (1 point)

Install an HVAC system with at least two zones with independent thermostat controls. Each zone must have a separate loop and separate pump controlled automatically by a thermostat control. For HVAC systems with radiators, see Option 2.

Houses with less than 800 square feet of conditioned floor area and multifamily buildings whose average unit size is less than 1,200 square feet automatically meet the requirements of this credit.

AND/OR

Option 2. Room-by-Room Controls (2 points)
Design the HVAC system with room-by-room thermostatic controls, such as flow-control valves on every radiator.

EQ Credit: No Environmental Tobacco Smoke

1 point
This credit applies to

- Midrise (1 point)

Intent

To minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke.

Requirements

Midrise

Prohibit smoking throughout the building, including within living units. The prohibition must be communicated in building rental or lease agreements or in condo or co-op association covenants and restrictions, and provisions for enforcement must be included.

EQ Credit: Enhanced Compartmentalization

1–3 points
This credit applies to

- Homes (1 point)
- Midrise (3 points)

Intent

To minimize the exposure of building occupants to indoor air pollutants by preventing the transfer of air between units.

Requirements

Homes, Midrise

Perform a compartmentalization blower door test according to RESNET or the ENERGY STAR testing and verification protocols for multifamily midrise buildings, with an allowable maximum leakage of 0.15 cfm50 per square foot of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceiling).

EQ Credit: Combustion Venting

2 points
This credit applies to

- Homes (1–2 points)
- Midrise (1–2 points)

Intent

To minimize the leakage of combustion gases into the occupied space of the home.

Requirements

Homes, Midrise

Option 1. (2 points)
Do not install any fireplaces or woodstoves.

OR

Option 2. (1 point)
For any wood- or pellet-burning fireplaces and stoves, install equipment that is EPA qualified. Provide power or direct venting.

For any natural gas, propane, or alcohol stoves, install equipment listed by an approved safety testing facility. The stove must have a permanently fixed glass front or gasketed door and an electronic pilot. Provide power or direct venting.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of Option 2.

EQ CREDIT: ENHANCED GARAGE POLLUTANT PROTECTION

1-2 points
This credit applies to

- Homes (1–2 points)
- Midrise (1 point)

Intent

To ~~Reduce~~ minimize occupants' exposure to indoor pollutants originating from an adjacent garage.

Requirements

HOMES

Case 1. Single Family

Option 1. Exhaust Fan in Garage (1 point)
Install in the garage an exhaust fan that is ~~in the garage~~rated at least 75 cfm ~~that~~ and meets ENERGY STAR cfm/w performance requirements.

The f~~F~~an must vent directly to the outdoors~~, be designed~~ and have ~~with~~ an automatic timer control linked to an occupant sensor, a light switch, a garage door opening-closing mechanism, a carbon monoxide sensor ~~which~~ that turns on the ~~exhaust~~ fan when ambient CO levels ~~are no greater than~~reach 35 ppm, or equivalent. ~~Exhaust fans must be 70 cfm or greater.~~ The timer must be set to provide at least three air changes each time the fan is turned on.

Projects that earn the EPA Indoor airPLUS label automatically meet the requirements of Option 1.

OR

Option 2. ~~Detached Garage or~~ No Garage, ~~or Carport~~ or Detached Garage, or Carport (2 points)

~~If a garage is constructed, it may not share a wall with the home. A carport is defined as an open-air space with only one complete wall, which is shared with the home.~~
Select one of the following strategies:

- Do not construct a garage.
- Install a detached garage, defined as a structure that does not share a wall with the home.
- Install a carport, defined as an open-air space with one complete wall, which may be shared with the home.

Case 2. Multifamily

~~Case 2a~~Option 1. Exhaust Fan in ~~MULTICAR~~ Multicar Garage (1 point)
For a garage that accommodates more than three cars, ~~F~~follow the requirements ~~laid out~~ in ASHRAE 62.1–2010 ~~for projects with garages that hold more than 3 cars~~. Exhaust the garage sufficiently to create negative pressure with respect to adjacent spaces with the doors to the ~~room~~ garage closed. Provide self-closing doors and deck~~-~~-to~~-~~-deck partitions or a hard lid ceiling. The pressure differential with the surrounding spaces must be at least 5 Pascals (Pa) (0.02 inches of water gauge) when all doors are closed. The exhaust fan may either run continuously, or on a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm.

~~The exhaust rate shall be at least 0.75 cfm/ ft2, with no air recirculation, provided continuously.~~

OR

~~Case 2b~~Option 2. Exhaust Fan in Small Garage (1 point)
For a garage~~s~~ that~~ hold 3 or fewer cars~~ accommodates one, two, or three cars, install an ENERGY STAR exhaust fan, rated for continuous use~~, in the garage~~. ~~The fan must v~~Vent the fan directly to the outdoors; ~~, and meet one of requirements listed below. D~~direct-exhaust fans must be 100 cfm or greater, and ducted exhaust fans must be 130 cfm or greater.

The f~~F~~an must either run continuously~~,~~ or have an automatic timer control linked to an occupant sensor, a light switch, a garage door opening-closing mechanism, a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm, or equivalent. Any timer must be set to provide at least three air changes each time the fan is turned on.

~~a.~~

~~b. Fan must be designed with an automatic timer control linked to an occupant sensor, light switch, garage door opening-closing mechanism, carbon monoxide sensor which turns on the exhaust fan when ambient CO levels are no greater than 35 ppm, or equivalent. The timer must be set to provide at least three air changes each time the fan is turned on.~~

OR

Option 3. No Garage, or Detached Garage (2 points)
Select one of the following strategies:

- Do not construct a garage.
- Install a detached garage, defined as a structure that does not share a wall with the building.

~~**Case 2c. Detached Garage or No Garage or Carport (2 points)**~~
~~If a garage is constructed, it may not share a wall with the home. A carport is defined as an open-air space with only one complete wall, which is shared with the home.~~

MIDRISE

Option 1. Exhaust Fan on Controls in Garage (~~0.5~~1 point)
For a garage that accommodates more than three cars, follow the requirements in ASHRAE 62.1–2010. Exhaust the garage sufficiently to create negative pressure with respect to adjacent spaces with the doors to the garage closed. Provide self-closing doors and deck-to-deck partitions or a hard lid ceiling. The pressure differential with the surrounding spaces must be at least 5 Pascals (Pa) (0.02 inches of water gauge) when all doors are closed. The exhaust fan may either run continuously, or on a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm.

OR

Option 2. Detached Garage or No Garage or Carport (1 point)
If a garage is constructed, it may not share a wall with the ~~home~~building. ~~A carport is defined as an open-air space with only one complete wall, which is shared with the home.~~

EQ CREDIT: LOW-EMITTING PRODUCTS

3 points
This credit applies to

- Homes (0.5-3 points)
- Midrise (0.5-3 points)

Intent

To reduce occupants' exposure to airborne chemical contaminants through product selection.

Requirements

HOMES, MIDRISE

In the interior of the home, use products that have been tested and found compliant with the California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, New Single-Family Residence Scenario, for emissions testing guidance. At least 90% of a component must meet the requirements to earn credit.

For site-applied interior paints and coatings, meet the requirements of CA Section 01350 (0.5 point).

For flooring, meet the requirements of CA Section 01350 (0.5 point).

For insulation, meet the requirements of CA Section 01350 (0.5 point).

For site-applied adhesives and sealants, meet the requirements of CA Section 01350 (0.5 point).

For composite wood products, be constructed from materials documented to have low formaldehyde emissions that meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde based resins. Salvaged and re-used architectural millwork more than one year old at the time of occupancy is considered compliant provided any site-applied paints, coatings, adhesives, and sealants meet the requirements. Wood structural panels conforming to DOC PS-1 or PS-2 and manufactured with moisture-resistant adhesive for "Exposure 1" or "Exterior" application as indicated on the panel by the trademark of an approved testing and grading agency are exempt. (1 point)

INNOVATION (IN)

IN PREREQUISITE: PRELIMINARY RATING

This prerequisite applies to

- Homes
- Midrise

Intent

To maximize opportunities for integrative, cost-effective adoption of green design and construction strategies.

Requirements

HOMES, MIDRISE

As early as practicable, conduct a preliminary LEED for Homes meeting, with the participation of the principal members of the verification and project teams. As part of the meeting, create an action plan that identifies the following:

- the targeted LEED award level (Certified, Silver, Gold, or Platinum);
- the credits that have been selected to meet the targeted award level; and
- the party accountable for meeting the requirements for each selected credit.

IN CREDIT: INNOVATION

5 points
This credit applies to
- Homes (1–5 points)
- Midrise (1–5 points)

Intent

To encourage exceptional performance for current credits and promote innovative performance in pioneering areas.

Requirements

HOMES, MIDRISE

Credit can be achieved through a combination of Innovation, Pilot, and Exemplary Performance strategies, as described below.

Option 1. Innovation (1 point)
Achieve significant, measurable environmental performance using a strategy not addressed in the LEED Green Building Rating System.

Identify the following in writing:

- the intent of the proposed innovation credit;
- the proposed requirement for compliance;
- the proposed submittals to demonstrate compliance; and
- the design approach (strategies) used to meet the requirements.

AND/OR

Option 2. Pilot (1 point)
Attempt and achieve one pilot credit from the USGBC's LEED Pilot Credit Library.

AND/OR

Option 3. Additional Strategies (1–4 points)
- Innovation (1–4 points)
  Defined in Option 1 above.
- Pilot (1–4 points)
  Defined in Option 2 above.
- Exemplary Performance (1–2 points)
  Achieve exemplary performance in an existing LEED 2012 prerequisite or credit that allows exemplary performance, as specified in the LEED Reference Guide, 2012 edition. An exemplary performance point is typically earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit.

IN CREDIT: LEED AP FOR HOMES

1 point
This credit applies to

- Homes (1 point)
- Midrise (1 point)

Intent

To support and encourage the project team integration required by a LEED project and to streamline the application and certification process.

Requirements

HOMES, MIDRISE

LEED AP Homes

Include in the project team at least one principal participant who is a LEED Homes Accredited Professional (AP). This team member must have earned the credential before the preliminary rating meeting. A principal participant is defined as the builder, architect, or green building consultant who has design and/or product specifying responsibilities. The Green Rater is not considered a principal participant.

REGIONAL PRIORITY (RP)

RP CREDIT: REGIONAL PRIORITY

4 points
This credit applies to

- Homes (1–4 points)
- Midrise (1–4 points)

Intent

To address geographically specific environmental, social equity, and public health priorities.

Requirements

HOMES, MIDRISE

Six Regional Priority credits have been identified by the USGBC regional councils and chapters as having special importance for the project's region. A database of these credits and their geographic applicability is available on the USGBC website, at http://www.usgbc.org.

One point is awarded for each Regional Priority credit achieved, up to a maximum of four.