

# 2020 National Green Building Standard ANSI Standard Revision Process

## Public Comment Draft

**September 28, 2018**

### Forward

This draft is provided for the purpose of soliciting public comments on the changes to the 2015 National Green Building Standard. Only the changes to the 2015 Standard (shown in underline and ~~strikethrough~~) are open for public comment. Any comments on any other provisions of the Standard that have not changed from the 2015 Standard will not be accepted as part of the 2020 revision cycle, they will be addressed in the next revision cycle.

Public comments are accepted through **November 12, 2018** via a web-based form at [www.homeinnovation.com/ngbs](http://www.homeinnovation.com/ngbs).

The Draft Standard shows all changes in underline / strikethrough format. The existing language that has not been changed is shown only for the purpose of providing context for review of the changes.

The final draft of the revised Standard will be editorially reviewed for spelling, grammar, and format after all substantive changes have been approved by the Consensus Committee.



Title Page with Disclaimer



## CHAPTER 1

# SCOPE AND ADMINISTRATION

### 101 GENERAL

**101.1 Title.** The title of this document is the *National Green Building Standard™*, hereinafter referred to as “this Standard.”

**101.2 Scope.** The provisions of this Standard shall apply to the design, and construction, alteration, enlargement, and renovation of (1) all residential buildings, (2) residential portions of mixed-use buildings, or (3) mixed-use buildings where the residential portion is greater than 50 percent of the gross floor area~~the residential portion(s) of any building, not classified as an institutional use, in all climate zones.~~ This Standard shall also apply to subdivisions, building sites, building lots, and accessory structures,~~and the residential portions of alterations, additions, renovations, mixed-use buildings, and historic buildings.~~

**101.2.1 Residential Designation.** For the purpose of this standard, all Group R occupancies as defined by the International Building Code and all buildings within the scope of the International Residential Code shall be considered residential. Assisted living facilities, residential board and care facilities, and group homes classified as an I-1 occupancy as defined by the International Building Code shall also be considered residential.

**101.3 Intent.** The purpose of this Standard is to establish criteria for rating the environmental impact of design and construction practices to achieve conformance with specified performance levels for green residential buildings, renovation thereof, accessory structures, building sites, and subdivisions. This Standard is intended to provide flexibility to permit the use of innovative approaches and techniques. This Standard is not intended to abridge safety, health, or environmental requirements contained in other applicable laws, codes, or ordinances.

**101.4 Referenced documents.** The codes, standards, and other documents referenced in this Standard shall be considered part of the requirements of this Standard to the prescribed extent of each such reference. The edition of the code, standard, or other referenced document shall be the edition referenced in Chapter 13.

**101.5 Appendices.** Where specifically required by a provision in this Standard, that appendix shall apply. Appendices not specifically required by a provision of this Standard shall not apply unless specifically adopted.

### 102 CONFORMANCE

**102.1 Mandatory practices.** This Standard does not require compliance with any specific practice except those noted as mandatory.

**102.2 Conformance language.** The green building provisions are written in mandatory language by way of using the verbs “to be,” “is,” “are,” etc. The intent of the language is to require the user to conform to a particular practice in order to qualify for the number of points assigned to that practice. Where the term “shall” is used, or the points are designated as “mandatory,” the provision or practice is mandatory.

**102.3 Documentation.** Verification of conformance to green building practices shall be the appropriate construction documents, architectural plans, site plans, specifications, builder certification and sign-off, inspection reports, or other data that demonstrates conformance as determined by the Adopting Entity. Where specific documentation is required by a provision of the Standard, that documentation is noted with that provision.

**102.4 Alternative compliance methods.** Alternative compliance methods shall be acceptable where the Adopting Entity finds that the proposed green building practice meets the intent of this Standard.

## SCOPE AND ADMINISTRATION

### SECTION 103 ADMINISTRATION

**103.1 Administration.** The Adopting Entity shall specify performance level(s) to be achieved as identified in Chapter 3 and shall provide a verification process to ensure compliance with this Standard.

## CHAPTER 2

# DEFINITIONS

### 201 GENERAL

**201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this Standard, have the meanings shown in this chapter.

**201.2 Interchangeability.** Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

**201.3 Terms defined in other documents.** Where terms are not defined in this Standard, and such terms are used in relation to the reference of another document, those terms shall have the definition in that document.

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

### SECTION 202 DEFINITIONS

**ACCESSORY STRUCTURE.** A structure, the use of which is customarily accessory to and incidental to that of the residential building; the structure is located on the same lot or site as the residential building; the structure does not contain a dwelling unit [or a sleeping unit](#); and (1) is classified as Group U – Utility and Miscellaneous in accordance with the ICC International Building Code, or (2) is classified as accessory in accordance with the ICC International Residential Code, or (3) is classified as accessory to the residential use by a determination of the Adopting Entity.

**ADDITION.** An extension or increase in the conditioned space floor area or height of a building or structure.

**ADOPTING ENTITY.** The governmental jurisdiction, green building program, or any other third-party compliance assurance body that adopts this Standard, and is responsible for implementation and administration of the practices herein.

**ADVANCED FRAMING.** Code compliant layout, framing and engineering techniques that minimize the amount of framing products used and waste generated to construct a building while maintaining the structural integrity of the building.

**AFUE (Annual Fuel Utilization Efficiency).** The ratio of annual output energy to annual input energy which includes any non-heating season pilot input loss, and for gas or oil-fired furnaces or boilers, does not include electrical energy.

**AIR BARRIER.** Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

**AIR HANDLER.** A blower or fan used for the purpose of distributing supply air to a room, space, or area.

**AIR INFILTRATION.** The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

**AIR, MAKE-UP.** Air that is provided to replace air being exhausted.

**ARCHITECTURAL COATINGS.** A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, primers, paints, varnishes,

## DEFINITIONS

sealers, and stains. An architectural coating is a material applied to stationary structures or their appurtenances at the site of installation. Coatings applied in shop applications, sealants, and adhesives are not considered architectural coatings.

**AREA OF HIGH INTERSECTION DENSITY.** An area whose existing streets and sidewalks create at least 90 intersections per square mile (35 intersections per square kilometer).

**BIOBASED PRODUCT.** A commercial or industrial material or product that is composed of, or derived from, in whole or in significant part, biological products or renewable agricultural materials, including plant, animal, and marine materials, or forestry materials

**BROWNFIELD (also EPA-Recognized Brownfield).** A site in which the expansion, redevelopment or reuse of would be required to address the presence or potential presence of a hazardous substance, pollutant or contaminant. Brownfield sites include:

- EPA-recognized brownfield sites as defined in Public Law 107-118 (H.R. 2869) “Small Business Liability Relief and Brownfields Revitalization Act,” 40 CFR, Part 300; and
- Sites determined to be contaminated according to local or state regulation.

*(i.e.: Pub.L. 107-118, § 1, Jan. 11, 2002, 115 Stat. 2356, provided that: “This Act [enacting 42 U.S.C.A. § 9628, amending this section, 42 U.S.C.A. § 9604, 42 U.S.C.A. § 9605, 42 U.S.C.A. § 9607, and 42 U.S.C.A. § 9622, and enacting provisions set out as notes under this section and 42 U.S.C.A. § 9607] may be cited as the ‘Small Business Liability Relief and Brownfields Revitalization Act’.”)*

**CERTIFIED GEOTHERMAL SERVICE CONTRACTOR.** A person who has a current certification from the International Ground Source Heat Pump Association as an installer of ground source heat pump systems or as otherwise approved by the Adopting Entity.

**CLIMATE ZONE.** Climate zones are determined based on Figure 6(1).

**CLUSTER DEVELOPMENT.** A design technique that concentrates residential buildings and related infrastructure at a higher density within specified areas on a site. The remaining land on the site can then be used for low intensity uses such as recreation, common open space, farmland, or the preservation of historical sites and environmentally sensitive areas.

### **COMMON AREA(S).**

1. Areas within a site or lot that are predominantly open spaces and consist of non-residential structures, landscaping, recreational facilities, roadways and walkways, which are owned and maintained by an incorporated or chartered entity such as a homeowner’s association or governmental jurisdiction; or
2. Areas of a multifamily building that are outside the boundaries of a dwelling unit or sleeping unit and are shared among or serve the dwelling units or sleeping units; including, but not limited to, hallways, amenity and resident services areas, parking areas, property management offices, mechanical rooms, and laundry rooms.

**COMPONENT.** See “Major Component” and/or “Minor Component”.

**COMPOST FACILITY.** An outdoor bin or similar structure designed for the decomposition of organic material such as leaves, twigs, grass clippings, and vegetative food waste.

**COMPRESSED NATURAL GAS (CNG) VEHICLE RESIDENTIAL FUELING APPLIANCE.** A residential appliance that supplies compressed natural gas into a CNG vehicle.

**CONDITIONED SPACE.** An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate thru openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings or where they contain uninsulated ducts, piping or other sources of heating or cooling.



**CONSTRUCTED WETLAND.** An artificial wetland system (such as a marsh or swamp) created as new and/or restored habitat for native wetland plant and wildlife communities as well as to provide and/or restore wetland functions to the area. Constructed wetlands are often created as compensatory mitigation for ecological disturbances that result in a loss of natural wetlands from (1) anthropogenic discharge for wastewater, stormwater runoff, or sewage treatment; (2) mines or refineries; or (3) the development.

**CONSTRUCTION WASTE MANAGEMENT PLAN.** A system of measures designed to reduce, reuse, and recycle the waste generated during construction and to properly dispose of the remaining waste.

**CONTINUOUS PHYSICAL FOUNDATION TERMITE BARRIER.** An uninterrupted, non-chemical method of preventing ground termite infestation (e.g., aggregate barriers, stainless steel mesh, flashing, or plastic barriers).

**COEFFICIENT OF PERFORMANCE (COP) – COOLING.** The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system of some specific portion of the system under designated operating conditions.

**COEFFICIENT OF PERFORMANCE (COP) – HEATING.** The ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor, and, if applicable, auxiliary heat, under designated operating conditions.

**DAYLIGHT CONTROL.** A device or system that provides automatic control of electric light levels based on the amount of daylight.

**DEMAND CONTROLLED HOT WATER LOOP.** A hot water circulation (supply and return) loop with a pump that runs "on demand" when triggered by a user-activated switch or motion-activated sensor.

**DESUPERHEATER.** An auxiliary heat exchanger that uses superheated gases from an air conditioner's or heat pump's vapor-compression cycle to heat water.

**DIRECT-VENT APPLIANCE.** A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

**DRAIN-WATER HEAT RECOVERY.** A system to recapture the heat energy in drain water and use it to preheat cold water entering the water heater or other water fixtures.

**DURABILITY.** The ability of a building or any of its components to perform its required functions in its service environment over a period of time without unforeseen cost for maintenance or repair.

**DWELLING UNIT.** A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.

**DYNAMIC GLAZING.** Any fenestration product that has the fully reversible ability to change its performance properties, including U-factor, SHGC, or VT.

**EER (Energy Efficiency Ratio).** A measure of the instantaneous energy efficiency of electric air conditioning defined as the ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions. When consistent units are used, this ratio becomes equal to COP. (See also Coefficient of Performance.)

**ENERGY MANAGEMENT CONTROL SYSTEM.** An integrated computerized control system that is intended to operate the heating, cooling, ventilation, lighting, water heating, and/or other energy-consuming appliances and/or devices for a building in order to reduce energy consumption. Also known as Building Automation Control (BAC) or Building Management Control System (BMCS).

**ENERGY MONITORING DEVICE.** A device installed within a building or dwelling unit that can provide near real-time data on whole building ~~or~~ dwelling unit [or sleeping unit](#) energy consumption.

## DEFINITIONS

**ENGINEERED WOOD PRODUCTS.** Products that are made by combining wood strand, veneers, lumber or other wood fiber with adhesive or connectors to make a larger composite structure.

**ENVIRONMENTAL IMPACT.** See **LCA (Life Cycle Analysis/Assessment)**.

### **ENVIRONMENTALLY SENSITIVE AREAS.**

1. Areas within wetlands as defined by federal, state, or local regulations;
2. Areas of steep slopes;
3. "Prime Farmland" as defined by the U.S. Department of Agriculture;
4. Areas of "critical habitat" for any federal or state threatened or endangered species;
5. Areas defined by state or local jurisdiction as environmentally sensitive; or,
6. Shoreline buffers that have important environmental functions as identified by the state or local jurisdiction, e.g., shoreline stability, pollutant removal, streamside shading, ecological flow protection.

**EROSION CONTROLS.** Measures that prevent soil from being removed by wind, water, ice, or other disturbance.

**EXISTING BUILDING.** A building erected prior to the date of the current adopted building code, or one for which a legal building occupancy permit has been issued.

**EXISTING SUBDIVISION.** An area of land, defined as "Site" in this Chapter, that has received all development approvals and has been platted and all infrastructure is complete at time of application to this Standard.

**FENESTRATION.** Products classified as either vertical fenestration or skylights.

**Skylight.** Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.

**Vertical fenestration.** Windows (fixed or movable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of at least 60 degrees (1.05 rad) from horizontal.

**FENESTRATION PRODUCT, FIELD-FABRICATED.** A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration.

**FENESTRATION PRODUCT, SITE-BUILT.** A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

**FLOOR AREA, GROSS.** The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, ramps, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the useable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no opening or interior courts.

**FROST-PROTECTED SHALLOW FOUNDATION.** A foundation that does not extend below the design frost depth and is protected against the effects of frost in compliance with SEI/ASCE 32-01 or the provisions for frost-protected shallow foundations of the ICC IBC or IRC, as applicable.

**GRADE PLANE.** A reference plane representing the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1830 mm) from the building, between the structure and a point 6 feet (1830 mm) from the building.

**GRAY WATER.** Untreated waste water that has not come into contact with waste water from water closets, urinals, kitchen sinks, or dishwashers. Gray water includes, but is not limited to, waste water from bathtubs, showers, lavatories, clothes washers, and laundry trays.

**GREYFIELD SITE.** A previously developed site with little or no contamination or perceived contamination.

**GRID-INTERACTIVE ELECTRIC THERMAL STORAGE (GETS).** An energy storage system that provides electric system grid operators such as utilities, independent system operators (ISOs) and regional transmission organizations (RTOs), with variable control of a building's space heating and service water heating end uses.

**GROUND SOURCE HEAT PUMP.** [A system that uses the earth or subsurface water as a heat sink for air conditioning and as a heat source for heating](#)~~Where the earth is used as a heat sink in air conditioning or heat source in heating systems. This also applies to systems utilizing subsurface water.~~

**HARDSCAPE.** Asphalt, concrete, masonry, stone, wood, and other non-plant elements external to the building shell on a landscape.

**HEAT PUMP.** An appliance having heating or heating/cooling capability and which uses refrigerants to extract heat from air, liquid, or other sources.

**HIGH-EFFICACY LAMPS.** Compact fluorescent lamps (CFL); light emitting diode (LED); T-8 or smaller diameter linear fluorescent lamps; or lamps with a minimum efficacy of 1) 60 lumens per watt for lamps over 40 watts, 2) 50 lumens per watt for lamps over 15 watts to 40 watts, or 3) 40 lumens per watt for lamps 15 watts or less.

**HISTORIC BUILDINGS.** Buildings that are listed in or eligible for listing in the National Register of Historic Places (NRHP) or designated as being of historic or architectural significance under an appropriate state or local law.

**HSPF (Heating Seasonal Performance Factor).** The total seasonal heating output of a heat pump, in Btu, divided by the total electric energy input during the same period, in watt-hours using a defined test methodology.

**HYDROZONING.** A landscape practice that groups plants with similar watering needs together in an effort to conserve water.

**ICF (INSULATING CONCRETE FORMS).** A concrete forming system using stay-in-place forms of rigid foam plastic insulation, a hybrid of cement and foam insulation, a hybrid of cement and wood chips, or other insulating material for constructing cast-in-place concrete walls.

**IMPERVIOUS SURFACE.** Hard-covered ground area that prevents/retards the entry of water into the soil at that location, resulting in water flowing to another location. (Also see HARDSCAPE)

**INDIRECT-FIRED WATER HEATER.** A water storage tank, typically with no internal heating elements, that is connected by piping to an external heating source such as a gas or oil-fired boiler.

**INFILL.** A location including vacant or underutilized land that may apply to either a site or a lot and is located in an area served by existing infrastructure such as centralized water and sewer connections, roads, drainage, etc., and the site boundaries are adjacent to existing development on at least one side.

**INTEGRATED PEST MANAGEMENT.** A sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

**INVASIVE PLANTS.** Plants for which the species are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health. For the purposes of compliance with this standard, invasive plants are those that are included on local, state, or regional lists of plants determined to cause environmental harm and shall not be limited to those plants covered by law or regulation.

## DEFINITIONS

**JALOUSIE WINDOW.** A window consisting of a series of overlapping horizontal frameless louvers which pivot simultaneously in a common frame and are actuated by one or more operating devices so that the bottom edge of each louver swings outward and the top edge swings inward during operation.

**LANDSCAPE PRACTICE (LANDSCAPING).** Any activity that modifies the visible features of an area of land. It may include:

1. Living elements, such as flora or fauna;
2. Natural elements such as terrain shape, elevation, or bodies of water;
3. Created or installed elements such as fences or other material objects;
4. Abstract elements such as the weather and lighting conditions.

**LAVATORY FAUCET.** A valve for dispensing hot and/or cold water to a basin used for washing hands and face, but not for food preparation.

**LCA (Life Cycle Analysis/Assessment).** An accounting and evaluation of the environmental aspects and potential impacts of materials, products, assemblies, or buildings throughout their life (from raw material acquisition through manufacturing, construction, use, operation, demolition, and disposal).

**Level 2 Electric Vehicle Charging Station.** A device that is used to supply electricity to a plug-in hybrid electric vehicle or a plug-in electric vehicle and is rated for use with 208 to 240 Volts AC input.

**Level 3 Electric Vehicle Charging Station.** A device that is used to supply electricity to a plug-in hybrid electric vehicle or a plug-in electric vehicle and is rated for use with 208 to 500 Volts, 3 phase electric AC input.

**LOT.** A portion or parcel of land considered as a unit.

**LOW-IMPACT DEVELOPMENT.** A storm water management approach that attempts to recreate the predevelopment hydrology of a site by using lot level topography and landscape to deter storm water runoff and promote soil infiltration and recharge.

**LOW-VOC (PRODUCTS).** Products or materials with volatile organic compound (VOC) emissions equal to or below the established thresholds as defined in the referenced VOC emissions requirements for each applicable section in this document. (Also see VOC.)

### MAJOR COMPONENT.

1. All structural members and structural systems.
2. Building materials or systems that are typically applied as a part of over 50% of the surface area of the foundation, wall, floor, ceiling, or roof assemblies.

**MANUFACTURED HOME CONSTRUCTION.** Three-dimensional sections of the complete building, ~~or~~ dwelling unit, or sleeping unit built in a factory in conformance with the HUD Manufactured Home Construction and Safety Standards (24 CFR, Part 3280) and transported to the jobsite to be joined together on a foundation.

**MASS WALLS.** Above-grade masonry or concrete walls having a mass greater than or equal to 30 pounds per square foot (146 kg/m<sup>2</sup>), solid wood walls having a mass greater than or equal to 20 pounds per square foot (98 kg/m<sup>2</sup>), and any other walls having a heat capacity greater than or equal to 6 Btu/ft<sup>2</sup>•°F [266 J/(m<sup>2</sup> • K)] with a minimum of 50 percent of the required R-value on the exterior side of the wall's centerline.

**MERV (Minimum Efficiency Reporting Value).** Minimum efficiency-rated value for the effectiveness of air filters.

**MINOR COMPONENT.** Building materials or systems that are not considered a major component. (Also see Major Component.)

**MIXED-USE BUILDING.** A building that incorporates more than one use (e.g., residential, retail, commercial) in a single structure.

**MIXED-USE DEVELOPMENT.** A project that incorporates more than one use (e.g., residential, retail, commercial) on the same site.

**MODULAR CONSTRUCTION.** Three-dimensional sections of the complete building or dwelling unit built in a factory and transported to the jobsite to be joined together on a permanent foundation.

**MULTIFAMILY BUILDING.** A building containing multiple dwelling units [or sleeping units](#) and classified as R-2 under the ICC IBC.

**NET DEVELOPABLE AREA.** The land on which buildings may be constructed. Any land where buildings cannot be constructed due to environmental restrictors, or that is used for infrastructure or public purposes such as parks, schools, etc., is not considered net developable area.

**NEW CONSTRUCTION.** Construction of a new building.

**NON-RESIDENTIAL SPACES.** [Spaces not designated as residential in Section 101.2.1.](#)

**OCCUPANCY SENSOR.** Devices that generally use passive infrared and/or ultrasonic technology or a combination of multiple sensing technologies to automatically turn lights on and off or from one preset light level to another based on whether or not the sensor detects that a space is occupied.

**ON-SITE RENEWABLE ENERGY SYSTEM.** An energy generation system located on the building or building site that derives its energy from a renewable energy source.

**OPEN SPACE.** An area of land or water that (1) remains in its natural state, (2) is used for agriculture, or (3) is free from intensive development.

**PANELIZED ASSEMBLIES.** Factory-assembled wall panels, roof trusses, and/or other components installed on-site.

**PERFORMANCE PATH.** An alternative set of standards (to the Prescriptive Path) with defined performance metrics, as specified in Chapter 7 of this Standard.

**PERMEABLE MATERIAL.** A material that permits the passage of water vapor and/or liquid.

**PLUMBING FIXTURE.** A receptor or device that requires both a water-supply connection and a discharge to the drainage system, such as water closets, lavatories, bathtubs, and sinks.

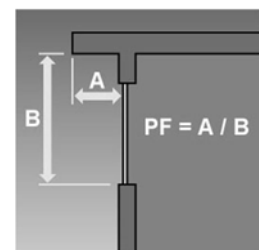
**PRECUT.** Materials cut to final size prior to delivery to site and ready for assembly.

**PRESCRIPTIVE PATH.** A set of provisions in a code or standard that must be adhered to for compliance.

**PRESERVATION.** The process of applying measures to maintain and sustain the existing materials, integrity, and/or form of a building, including its structure and building artifacts.

**PROGRAMMABLE COMMUNICATING THERMOSTAT.** A whole building or whole dwelling unit [/sleeping unit](#) thermostat that can be monitored and controlled remotely.

**PROJECTION FACTOR.** The ratio of the overhang width to the overhang height above the door threshold or window sill ( $PF = A/B$ ).



**Projection Factor**

**R-VALUE (THERMAL RESISTANCE).** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ( $\text{h}\cdot\text{ft}^2\cdot\text{°F}/\text{Btu}$ )[ $(\text{m}^2\cdot\text{K})/\text{W}$ ].

**READILY ACCESSIBLE.** Capable of being quickly and easily reached for operation, maintenance, and inspection.

**RECLAIMED WATER.** Non-potable water provided by a wastewater utility, treated to meet the requirements of the Authority Having Jurisdiction (AHJ) for the intended uses. The water may be sanitized to allow for above ground landscape irrigation or flush sanitary fixtures. May also be known as Recycled Water in some areas.

**RECYCLE.** To recover and reprocess manufactured goods into new products.

**RECYCLED CONTENT.** Resources containing post-consumer or pre-consumer (post-industrial) recycled content.

**POST-CONSUMER RECYCLED CONTENT.** Proportion of recycled material in a product generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product that can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

**PRE-CONSUMER (POST-INDUSTRIAL) RECYCLED CONTENT.** Proportion of recycled material in a product diverted from the waste stream during the manufacturing process. Pre-consumer recycled content does not include reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

**REGIONAL MATERIAL.** Material that originates, is produced, grows naturally, or occurs naturally within: (1) 500 miles (804.7 km) of the construction site if transported by truck, or (2) 1,500 miles (2,414 km) of the construction site if transported for not less than 80 percent of the total transport distance by rail or water. Products that are assembled or produced from multiple raw materials are considered regional materials if the weighted average (by weight or volume) of the distance the raw materials have been transported meet the distance criteria.

**REMODELING.** The process of restoring or improving an existing building, dwelling unit, [sleeping unit](#), or property.

**RENEWABLE ENERGY.** Energy derived from renewable energy sources.

**RENEWABLE ENERGY SOURCE.** Energy derived from solar radiation, wind, hydropower, waves, tides, biogas, biomass, or geothermal energy.

**REPLACEMENT.** The act or process of replacing material or systems.

**REUSE.** To divert a construction material, product, component, module, or a building from the construction and demolition waste stream, without recycling the material, in order to use it again.

**SEDIMENT CONTROLS.** Practices used on building sites to minimize the movement of sand, soil, and particulates or dust from construction from reaching waterways.

**SEER (Seasonal Energy Efficiency Ratio).** The total cooling output of an electric air conditioner (or heat pump) during its normal annual usage period for cooling, in Btu, divided by the total electric energy input during the same period, in watt-hours (Wh), expressed as Btu/Wh. SEER is the cooling performance equivalent measurement of HSPF.

**SHGC (Solar Heat Gain Coefficient).** The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted, or convected into the space.



**SIP (Structural Insulated Panel).** A structural sandwich panel that consists of a light-weight foam plastic core securely laminated between two thin, rigid wood structural panel facings; a structural panel that consists of lightweight foam plastic and cold-formed steel sheet or structural cold-formed steel members; or other similar non-interrupted structural panels.

**SITE.** Any area of land that is or will be developed into two or more parcels of land intended for multiple ownership, uses, or structures and designed to be part of an integrated whole such as a residential subdivision, mixed-use development, or master-planned community. Site, as defined, generally contains multiple lots. (Also see LOT)

**SLEEPING UNIT.** A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

**SMART APPLIANCE.** A product that has the capability to receive, interpret, and act on a signal transmitted by a utility, third-party energy service provider, or home energy management device, and automatically adjust its operation depending on both the signal's contents and settings by the consumer. The product has this capability either built-in or added through an external device that easily connects to the appliance.

**SOLID FUEL-BURNING APPLIANCE.** A chimney connected device designed for purposes of heating, cooking, or both that burns solid fuel.

**STEEP SLOPES.** Slopes equal to or greater than 25 percent ( $\geq 25\%$ ).

**STORY.** That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.

**STORY ABOVE GRADE.** Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:

- More than 6 feet (1829mm) above grade plane; or
- More than 12 feet (3658 mm) above the finished ground level at any point.

**STRUCTURAL SYSTEMS.** Load-bearing elements and systems that transfer lateral and vertical loads to the foundation and may include, but are not limited to load-bearing walls (interior or exterior), roofs, and other structural elements.

**SUBDIVISION.** A tract, lot, or parcel of land divided into two or more lots, plats, sites, or other divisions of land.

**SWPPP (Stormwater Pollution Prevention Plan).** A site-specific, written document or report that identifies required features specifically represented in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP).

**TERRAIN ADAPTIVE ARCHITECTURE.** Architecture or landscape architecture where the design of the building or site has been specifically adapted to preserve unique features of the terrain.

**UA.** The total U-factor times area for a component or building.

**URBAN.** Areas within a designated census tract of 1,000 people per square mile or located within a Metropolitan Statistical Area primary city, as designated by the U.S. Census Bureau.

**U-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building envelope component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ( $\text{Btu/h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$ ) [ $\text{W}/(\text{m}^2 \cdot \text{K})$ ].

## DEFINITIONS

**VAPOR RETARDER CLASS.** A measure of the ability of a material or assembly to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method with Procedure A of ASTM E 96 as follows:

- Class I: 0.1 perm or less
- Class II:  $0.1 < \text{perm} = 1.0$  perm
- Class III:  $1.0 < \text{perm} = 10$  perm

**VENTILATION.** The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

**VOC (VOLATILE ORGANIC COMPOUNDS).** A class of carbon-based molecules in substances and organic compounds that readily release gaseous vapors at room temperature as indoor pollutants and when reacting with other exterior pollutants can produce ground-level ozone.

**WASTE HEAT.** Heat discharged as a byproduct of one process to provide heat needed by a second process.

**WATER FACTOR.** The quantity of water, in gallons per cycle (Q), divided by a clothes washing machine clothes container capacity in cubic feet (C). The equation is  $WF=Q/C$ .

**WATER-RESISTIVE BARRIER.** A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

**WETLANDS.** Areas that are inundated or saturated by the surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

**WILDLIFE HABITAT/CORRIDOR.** An ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives or the physical environment that surrounds (influences and is utilized by) a species population.

**WOOD-BASED PRODUCT.** Any material that consists of a majority of wood or constituents derived from wood (e.g., wood fiber) as measured by either weight or volume.



THIS PAGE INTENTIONALLY LEFT BLANK

## CHAPTER 3

# COMPLIANCE METHOD

### 301 GENERAL

**301.1 Environmental rating levels.** The building, project, site, and/or development environmental rating level shall consist of all mandatory requirements plus points assessed using the point system specified within this chapter. The rating level shall be in accordance with Section 302, 303, 304, or 305.3, as applicable. The designation for remodeled functional areas shall be in accordance with Section 305.4. The designation for accessory structures shall be in accordance with Section 306.

[301.1.1 Non-residential spaces. Non-residential spaces in mixed-use buildings shall comply with Chapter 13 \(Commercial Spaces/Mix Use Chapter\) of this Standard or Chapters 6-10 of the ICC International Green Construction Code \(IgCC\), excluding §6.3.1.](#)

**301.2 Awarding of points.** Points shall be awarded as follows:

- (1) The maximum number of points that can be awarded for each practice is noted with that practice.
- (2) Point allocation for multifamily buildings shall be as prescribed in Section 304.
- (3) The Adopting Entity shall allow the use of new and innovative products and practices deemed to meet the intent of this Standard. Points assigned for any new product or practice shall be determined by the Adopting Entity. A maximum of 20 points may be awarded at the discretion of the Adopting Entity. Innovative practices and products shall fall under Chapters 5-10 (Categories 1-6 in Table 303); ~~however, these points shall only be assigned under Category 7.~~ Point values shall be determined by comparing the innovative product or practice to a practice or product already described in the Standard. The applicant shall supply demonstrable, quantified data to support the innovative product or practice and to determine the practice's functional equivalent in the Standard for the points to be awarded.

### 302 GREEN SUBDIVISIONS

**302.1 Site design and development.** The threshold points required for the environmental rating levels to qualify a new or existing subdivision as green under this Standard shall be in accordance with Table 302 and based on points in Chapter 4.

[302.1.1 Site design and development obtaining thresholds in table 302 are permitted to be verified, certified, and marketed as such prior to the verification of green buildings.](#)

[302.1.2 Developments are permitted to be marketed as a green subdivision. Developer shall provide clear explanation that the rating only applies to the development and not the buildings.](#)

**Table 302**  
**Threshold Point Ratings for Site Design and Development**

Green Subdivision Category		Rating Level Points			
		One Star	Two Stars	Three Stars	Four Stars
Chapter 4	Site Design and Development	95	122	149	176

**303 GREEN BUILDINGS**

**303.1 Compliance options.** The criteria for new buildings shall be in accordance with Section 303.2 for residential buildings, the residential portion of mixed use buildings, or mixed-use buildings or Section 303.3 for compliance for single family homes, townhomes, and duplexes

**303.24 Green buildings.** The threshold points required for the environmental rating levels for a green building shall be in accordance with Table 303. To qualify for one of these rating levels, all of the following shall be satisfied:

- (1) The threshold number of points, in accordance with Table 303, shall be achieved as prescribed in Categories 1 through 6. The lowest level achieved in any category shall determine the overall rating level achieved for the building.
- (2) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.
- (3) In addition to the threshold number of points prescribed in Categories 1 through 6 (which corresponds to Chapters 5-10), the additional points prescribed in Category 7 shall be achieved from any of the categories. Where deemed appropriate by the Adopting Entity based on regional conditions, additional points from Category 7 may be assigned to another category (or categories) to increase the threshold points required for that category (or categories). Points shall not be reduced by the Adopting Entity in any of the six other categories.

Exception: Where the builder is unable to control a majority of items in Chapter 5 due to timing and lack of relationship to the Lot Design, Preparation, and Development, green ratings on the home are permitted to be obtained by eliminating rating requirements and points from Chapter 5. Rating thresholds requirements are permitted to be adjusted accordingly. Builder shall provide evidence of this impossibility to the Adopting Entity and provide disclaimer statement on marketing materials when this occurs.

**Table 303  
Threshold Point Ratings for Green Buildings**

Green Building Categories			Rating Level Points <sup>(a) (b)</sup>			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	50	64	93	121
2.	Chapter 6	Resource Efficiency	43	59	89	119
3.	Chapter 7	Energy Efficiency	30	45	60	70
4.	Chapter 8	Water Efficiency	25	39	67	92
5.	Chapter 9	Indoor Environmental Quality	25	42	69	97
6.	Chapter 10	Operation, Maintenance, and Building Owner Education	8	10	11	12
7.		Additional Points from Any Category	50	75	100	100
<b>Total Points:</b>			<b>231</b>	<b>334</b>	<b>489</b>	<b>611</b>

(a) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.

(b) For dwelling units greater than 4,000 square feet (372 m<sup>2</sup>), the number of points in Category 7 (Additional Points from Any Category) shall be increased in accordance with Section 601.1. The "Total Points" shall be increased by the same number of points.

**303.3 Green single-family homes, townhomes, and duplexes.** Single-family homes, townhomes, and duplexes that meet all applicable requirements of Chapter 12 shall be deemed Certified.

### 304 GREEN MULTIFAMILY BUILDINGS

**304.1 Multifamily buildings.** All residential portions of a building shall meet the requirements of this Standard. Partial compliance shall not be allowed. Unless specifically addressed in other portions of this standard, all [dwelling and sleeping](#) units and residential common areas within a multifamily building shall meet all mandatory requirements. Where features similar to dwelling unit/[sleeping unit](#) features are installed in the common area, those features shall meet the standard of the dwelling [and sleeping](#) units. Green building practices for residential common areas may differ from requirements for dwelling units/[sleeping units](#). Points for the green building practices that apply to multiple units shall be credited once for the entire building. Where points are credited, including where a weighted average is used, practices shall be implemented in all [dwelling and sleeping](#) units, as applicable. Where application of a prescribed practice allows for a different number of points for different [dwelling and sleeping](#) units in a multifamily building, the fewer number of points shall be awarded, unless noted that a weighted average is used.

**304.2 Alternative IgCC compliance.** [As an alternative, any multifamily or mixed-use building that complies with the ICC International Green Construction Code \(IgCC\) shall be designated as achieving the gold rating level. Additionally, acceptable air tightness of individual residential units shall be demonstrated by a blower door test. The testing and sampling procedure shall be in accordance with the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, Revision 03 - 2015, with an allowable maximum leakage of 0.3 cfm/sf of enclosure bounding the apartment at an induced pressure difference of 50 pascals.](#)

### 305 GREEN REMODELING

**305.1 Compliance.** Compliance with Section 305 shall be voluntary unless specifically adopted as mandatory by the Adopting Entity.

~~**305.2 Compliance options.** The criteria for existing buildings shall be in accordance with Section 305.3 for whole-building ratings or Section 305.4 for compliance designations of building functional areas.~~

#### **305.23 Whole-building rating criteria**

**305.23.1 Applicability.** The provisions of Section 305.3 shall apply to remodeling of existing buildings. In addition to the foundation, at least 50 percent of the structural systems of the existing building shall remain in place after the remodel for the building to be eligible for compliance under Section 305.3. [Recent new construction projects are not eligible for verification under the remodel path. The Certificate of Occupancy date must be at least five years prior to the registration of a remodel project.](#)

**305.23.1.1 Additions.** For a remodeled building that includes an addition, the entire building including the addition shall comply with the criteria of Section 305.3. The total above-grade conditioned area added during a remodel shall not exceed 75% of the existing building's above-grade conditioned area. For multifamily buildings, the above-grade conditioned area shall be based on the entire building including all dwelling units/[sleeping units](#) and common areas.

**305.23.2 Rating scope.** The building rating achieved under Section 305.3 and the associated compliance criteria apply to the entire building after the remodel including any additions.

~~**305.23.3 Mandatory practices.** The building, including any additions and common areas, shall satisfy all practices designated as mandatory in Chapter 11. Additions, alterations or repairs to an existing building, building system or portion thereof shall comply with the Mandatory requirements of Chapter 11. Unaltered portions of the existing building or building supply system shall not be required to meet Mandatory requirements except when life safety or apartment moisture issues exist.~~

**305.23.4 Rating level.** A minimum rating level of Bronze shall be achieved in each of the following categories: Energy efficiency (Sections 305.3.5), Water efficiency (Section 305.3.6), and Prescriptive practices

(Section 305.3.7). The building rating level shall be the lowest rating level achieved in Sections 305.3.5, 305.3.6, and 305.3.7.

**305.23.5 Energy efficiency.** The ~~energy efficiency rating level shall be based on the reduction in energy consumption resulting from the remodel in accordance with Table 305.3.5~~ building shall comply with Section ~~11.305.3.5.1 or 11.305.3.5.2.~~

**Table 305.23.5.1**  
**Energy Rating ~~Reduction~~ Level Thresholds**

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in energy consumption	15%	25%	35%	45%

**305.23.5.1 Energy consumption reduction path.** ~~The energy efficiency rating level shall be based on the reduction in energy consumption resulting from the remodel in accordance with Table 205.3.5.1.~~

The reduction in energy consumption resulting from the remodel shall be based on the estimated annual energy cost savings or site energy savings or source energy savings as determined by a third-party energy audit and analysis or utility consumption data. The reduction shall be the percentage difference between the consumption per square foot before and after the remodel calculated as follows:

$$[(\text{consumption per square foot before remodel} - \text{consumption per square foot after remodel}) / \text{consumption per square foot before remodel}] * 100$$

The occupancy and lifestyle assumed and the method of making the energy consumption estimates shall be the same for estimates before and after the remodel. The building configuration for the after-remodel estimate shall include any additions to the building or other changes to the configuration of the conditioned space. For multifamily buildings, the energy consumption shall be based on the entire building including all dwelling units/sleeping units and common areas.

If a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the energy baseline (consumption per square foot before remodel) can be calculated based on data and building systems that existing in the building up to 3 years prior project registration.

**305.2.5.2 Prescriptive path.** ~~The building shall comply with Table 305.3.5.2 (Energy Rating Prescriptive Point Thresholds). Any practice listed in Section.11.703 shall be eligible for contributing points toward Table 305.3.5.2 (Energy Rating Prescriptive Point Thresholds). The attributes of the existing building that were in compliance with the prescriptive practices of in Section.11.703 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing points to this section.~~

**Table 305.2.5.2**  
**Energy Rating Prescriptive Point Thresholds**

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
<u>Section 11.703 prescriptive thresholds</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>70</u>

Points from Section 11.703. and 11.705 do not count towards the total points for section 11.305.3.7.

**305.23.6 Water efficiency.** ~~The water efficiency rating level shall be based on the reduction in water consumption resulting from the remodel in accordance with Table 305.3.6~~ building shall comply with Section ~~11.305.3.6.1 or 11.305.3.6.2.~~

**Table 305.23.6.1**  
**Water Rating Reduction Level Thresholds**

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in water consumption	20%	30%	40%	50%

**305.23.6.1 Water consumption reduction path.** The water efficiency rating level shall be based on the reduction in water consumption resulting from the remodel in accordance with Table 305.3.6.1.

Water consumption shall be based on the estimated annual use as determined by a third-party audit and analysis or use of utility consumption data. The reduction shall be the percentage difference between the consumption before and after the remodel calculated as follows:

$$[(\text{consumption before remodel} - \text{consumption after remodel}) / \text{consumption before remodel}] * 100\%$$

The occupancy and lifestyle assumed and the method of making the water consumption estimates shall be the same for estimates before and after the remodel. The building configuration for the after-remodel estimate shall include any changes to the configuration of the building such as additions or new points of water use. For multifamily buildings, the water consumption shall be based on the entire building including all dwelling units and common areas.

If a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the water baseline (consumption before remodel) can be calculated based on data and building systems that existed in the building up to 3 years prior project registration.

**305.2.6.2. Prescriptive path.** The building shall comply with Table 305.3.6.2 (Water Rating Prescriptive Point Thresholds). Any practice listed in Section.11.801 shall be eligible for contributing points toward Table 305.3.6.2 (Water Rating Prescriptive Point Thresholds). The attributes of the existing building that were in compliance with the prescriptive practices of in Section.11.801 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing points to this section

**Table 305.2.6.2**  
**Water Rating Prescriptive Point Thresholds**

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
<u>Section 11.800 prescriptive thresholds</u>	<u>25</u>	<u>39</u>	<u>67</u>	<u>92</u>

**305.23.7 Prescriptive practices.** The point thresholds for the environmental rating levels based on compliance with the Chapter 11 prescriptive practices shall be in accordance with Table 305.3.7. Any practice listed in Chapter 11, except for 11.700 and 11.800 shall be eligible for contributing points to the prescriptive threshold ratings. The attributes of the existing building that were in compliance with the prescriptive practices of Chapter 11 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing points to the prescriptive threshold ratings.

**Table 305.23.7**  
**Prescriptive Threshold Point Ratings**

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Chapter 11 prescriptive thresholds	88	125	181	225

### ~~305.4 Criteria for remodeled functional areas of buildings~~

~~305.4.1 Applicability.~~ The provisions of Section 305.4 shall apply to remodeling of one or more of the following functional areas of the existing building as follows:

- ~~1. Addition, kitchen, bathroom, or basement in buildings other than multifamily buildings.~~
- ~~2. Kitchen or bathroom of an individual dwelling unit in a multifamily building.~~

~~305.4.1.1 Additions.~~ The total above-grade conditioned area added during a remodel shall not exceed 400 square feet.

~~305.4.2 Compliant.~~ Projects that meet all applicable requirements of Chapter 12 for that functional area shall be designated as *compliant*.

~~305.4.3 Designation.~~ The designation achieved under Section 305.4 applies only to the specific functional area of the existing building. The existing building may have more than one *compliant* functional area.

~~305.4.4 Additions.~~ A bathroom(s), kitchen, or finished basement included in an addition shall comply with all criteria specifically applicable to those functional areas in accordance with the provisions of Chapter 12.

~~305.4.5 Mandatory.~~ Projects shall satisfy all applicable practices designated as mandatory in Chapter 12.

~~305.4.6 Existing attributes.~~ The attributes of the existing building that were in compliance with the applicable provisions of Chapter 12 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing to demonstration of compliance under Section 305.4.

## **306 GREEN ACCESSORY STRUCTURES**

**306.1 Applicability.** The designation criteria for accessory structures shall be in accordance with Appendix E.

**306.2 Compliance.** Compliance with Appendix E shall be voluntary unless specifically adopted as mandatory. If specifically adopted, the adopting entity shall establish rules for compliance with Appendix E.

## CHAPTER 4

# SITE DESIGN AND DEVELOPMENT

GREEN BUILDING PRACTICES	POINTS
<b>400 SITE DESIGN AND DEVELOPMENT</b>	
<b>400.0 Intent.</b> This section applies to land development for the eventual construction of buildings or additions thereto that contain dwelling units/ <a href="#">sleeping units</a> . The rating earned under Section 302 based on practices herein, applies only to the site as defined in Chapter 2. The buildings on the site achieve a separate rating level or designation by complying with the provisions of Section 303, 304, 305, or 306, as applicable.	
<b>401 SITE SELECTION</b>	
<b>401.0 Intent.</b> The site is selected to minimize environmental impact by one or more of the following:	
<b>401.1 Infill site.</b> An infill site is selected.	<b>7</b>
<b>401.2 Greyfield site.</b> A greyfield site is selected.	<b>7</b>
<b>401.3 Brownfield site.</b> A brownfield site is selected.	<b>8</b>
<b>402 PROJECT TEAM, MISSION STATEMENT, AND GOALS</b>	
<b>402.0 Intent.</b> The site is designed and constructed by a team of qualified professionals trained in green development practices.	
<b>402.1 Team.</b> A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project's green goals and objectives are written into a mission statement.	<b>4</b>
<b>402.2 Training.</b> Training is provided to on-site supervisors and team members regarding the green development practices to be used on the project.	<b>3</b>
<b>402.3 Project checklist.</b> A checklist of green development practices to be used on the project is created, followed, and completed by the project team regarding the site.	<b>Mandatory 4</b>
<b>402.4 Development agreements.</b> Through a developer agreement or equivalent, the developer requires purchasers of lots to construct the buildings in compliance with this Standard (or equivalent) certified to a minimum bronze rating level.	<b>6</b>



GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>403 SITE DESIGN</b>
----------------------------

<p><b>403.0 Intent.</b> The project is designed to avoid detrimental environmental impacts, minimize any unavoidable impacts, and mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the site.</p> <p style="text-align: center;"><b>(To acquire points allocated for the design, the intent of the design is implemented.)</b></p>
---

<b>403.1 Natural resources.</b> Natural resources are conserved by one or more of the following:	
(1) A natural resources inventory is used to create the site plan.	<b>Mandatory 5</b>
(2) A plan to protect and maintain priority natural resources/areas during construction is created. (Also see Section 404 for guidance in forming the plan.)	<b>Mandatory 5</b>
(3) Member of builder’s project team participates in a natural resources conservation program.	<b>4</b>
(4) Streets, buildings, and other built features are located to conserve high priority vegetation.	<b>5</b>
(5) Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, from the disturbed areas of the site.	<b>3</b>
(6) Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, on the undisturbed areas of the site.	<b>6</b>

<b>403.2 Building orientation.</b> A minimum of 75 percent of the building sites are designed with the longer dimension of the structure to face within 20 degrees of south.	<b>6</b>
--	----------

<b>403.3 Slope disturbance.</b> Slope disturbance is minimized by one or more of the following:	
(1) Hydrological/soil stability study is completed and used to guide the design of all buildings on the site.	<b>5</b>
(2) All or a percentage of roads are aligned with natural topography to reduce cut and fill.	
(a) 10 percent to 25 percent	<b>1</b>
(b) 25 percent to 75 percent	<b>4</b>
(c) greater than 75 percent	<b>6</b>
(3) Long-term erosion effects are reduced by the use of clustering, terracing, retaining walls, landscaping, and restabilization techniques.	<b>6</b>

<b>403.4 Soil disturbance and erosion.</b> A site Stormwater Pollution Prevention Plan (SWPPP) is developed in accordance with applicable stormwater Construction General Permits. The plan includes one or more of the following:	
(1) Construction activities are scheduled to minimize length of time that soils are exposed.	<b>4</b>
(2) Utilities are installed by alternate means such as directional boring in lieu of open-cut trenching. Shared easements or common utility trenches are utilized to minimize earth disturbance. Low ground pressure equipment or temporary matting is used to minimize excessive soil consolidation.	<b>5</b>

GREEN BUILDING PRACTICES		POINTS
(3)	Limits of clearing and grading are demarcated.	4
<p><b>403.5 Stormwater management.</b> The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:</p>		
(1)	A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.	7
(2)	A hydrologic analysis is conducted that results in the design and installation of a stormwater management system that maintains the predevelopment (stable, natural) runoff hydrology of the site through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume and duration.	10
(3)	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:	
	(a) 80th percentile storm event	5
	(b) 90th percentile storm event	8
	(c) 95th percentile storm event	10
(4)	Permeable materials are used for driveways, parking areas, walkways and patios according to the following percentages:	
<p style="text-align: center;"><u>(Points for vegetative paving systems are only awarded for location receiving more than 20 inches per year of annual average precipitation)</u></p>		
	(a) <u>10 percent to less than 25 percent</u> <u>(add 2 points for use of vegetative paving system)</u>	2
	(b) 25-50 percent <u>(add 4 points for use of vegetative paving system)</u>	5
	(c) greater than 50 percent <u>(add 6 points for use of vegetative paving system)</u>	10
<p><b>403.6 Landscape plan.</b> A landscape plan is developed to limit water and energy use in common areas while preserving or enhancing the natural environment utilizing one or more of the following:</p>		
(1)	A plan is formulated to restore or enhance natural vegetation that is cleared during construction. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated.	6
(2)	On-site native or regionally appropriate trees and shrubs are conserved, maintained, and reused for landscaping to the greatest extent possible.	6
(3)	Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity.	7
(4)	EPA WaterSense Water Budget Tool or equivalent is used when implementing <u>up to</u> the maximum percentage of turf areas.	<u>210</u>

<a href="#">(5)</a>	<a href="#">Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent third party qualified water efficient grasses are used</a>	<a href="#">6</a>
<a href="#">(56)</a>	For landscaped vegetated areas, the maximum percentage of all turf areas is:	
	<a href="#">(a)</a> 0 percent	<a href="#">510</a>
	<a href="#">(b)</a> Greater than 0 percent to less than 20 percent	<a href="#">48</a>
	<a href="#">(c)</a> 20 percent to less than 40 percent	<a href="#">36</a>
	<a href="#">(d)</a> 40 percent to 60 percent	<a href="#">24</a>
<a href="#">(67)</a>	To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	<a href="#">36</a>
<a href="#">(78)</a>	Non-potable irrigation water is available to common areas	<a href="#">2</a>
<a href="#">(89)</a>	Non-potable irrigation water is available to lots.	<a href="#">4</a>
<a href="#">(910)</a>	Plants with similar watering needs are grouped (hydrozoning).	<a href="#">4</a>
<a href="#">(4011)</a>	Species and locations for tree planting are identified and utilized to increase summer shading of streets, parking areas, and buildings and to moderate temperatures.	<a href="#">5</a>
<a href="#">(4112)</a>	Vegetative wind breaks or channels are designed as appropriate to local conditions.	<a href="#">4</a>
<a href="#">(4213)</a>	On-site tree trimmings or stump grinding of regionally appropriate trees are used to provide protective mulch during construction or as base for walking trails, and cleared trees are recycled as sawn lumber or pulp wood.	<a href="#">4</a>
<a href="#">(4314)</a>	An integrated common area pest management plan to minimize chemical use in pesticides and fertilizers is developed.	<a href="#">4</a>
<a href="#">(4415)</a>	Plans for the common area landscape watering system include a weather-based or soil moisture-based controller. Required irrigation systems are designed in accordance with the IA Landscape Irrigation Best Management Practices.	<a href="#">6</a>
<a href="#">(4516)</a>	Trees that might otherwise be lost due to site construction are transplanted to other areas on-site or off-site using tree-transplanting techniques to ensure a high rate of survival.	<a href="#">4</a>
<a href="#">(4617)</a>	Gray water irrigation systems are used to water common areas. Gray water used for irrigation conforms to all criteria of Section 802.1.	<a href="#">7</a>
<a href="#">(4718)</a>	Cisterns, rain barrels, and similar tanks are designed to intercept and store runoff. These systems may be above or below ground, and they may drain by gravity or be pumped. Stored water may be slowly released to a pervious area, and/or used for irrigation of lawn, trees, and gardens located in common areas.	<a href="#">6</a>
<a href="#">(19)</a>	<a href="#">Spray irrigation</a>	
	<a href="#">(a) Is not present on slopes steeper than 25% (i.e. where the land rises more than a foot vertically for every 4 feet horizontally).</a>	<a href="#">2</a>
	<a href="#">(b) Has been tested in accordance with the ASABE/ICC 802, "Landscape Irrigation Sprinkler and Emitter Standard" and there is documentation of the sprinklers achieving a lower quarter distribution uniformity of at least 0.65.</a>	<a href="#">2</a>
	<a href="#">(c) Is installed to eliminate low head/point drainage and runoff.</a>	<a href="#">2</a>
	<a href="#">(d) Spray irrigation is not used</a>	<a href="#">6</a>
<b>403.7 Wildlife habitat. Measures are planned that will support wildlife habitat.</b>		<a href="#">6</a>
<a href="#">(1)</a>	<a href="#">Measures are planned that will support wildlife habitat.</a>	<a href="#">6</a>

SITE DESIGN AND DEVELOPMENT

<b>(2)</b>	<a href="#">The site is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship.</a>	<b><u>3</u></b>
<b>(3)</b>	<a href="#">Outdoor lighting techniques are utilized with regard for wildlife.</a>	<b><u>3</u></b>

<b>403.8 Operation and maintenance plan.</b> An operation and maintenance plan (manual) is prepared and outlines ongoing service of common open area, utilities (storm water, waste water), and environmental management activities.	<b>6</b>
--	----------

<b>403.9 Existing buildings.</b> <del>Existing</del> <a href="#">Following mitigation of any harmful materials, existing</a> building(s) and structure(s) is/are preserved <del>and</del> <a href="#">re-used, modified/adapted</a> , or disassembled for reuse or recycling of building materials.	<b>8</b>
<b>(1)</b> <a href="#">Building reuse or adaptation</a>	<b><u>12</u></b>
<b>(2)</b> <a href="#">Disassemble for reuse or recycling of building materials.</a>	<b><u>10</u></b>

<b>403.10 Existing and recycled materials.</b> Existing pavements, curbs, and aggregates are salvaged and reincorporated into the development or recycled asphalt or concrete materials are used as follows.  <b>(Points awarded for every 10 percent of total materials used for pavement, curb, and aggregate that meet the criteria of this practice. The percentage is consistently calculated on a weight, volume, or cost basis.)</b>	<b>15 Max</b>
<b>(1)</b> Existing pavements, curbs, and aggregates are reincorporated into the development.	<b>3</b>
<b>(2)</b> Recycled asphalt or concrete with at least 50 percent recycled content is utilized in the project.	<b>2</b>

<b>403.11 Demolition of existing building.</b> A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous demolition waste.  <b>(One additional point awarded for every 10 percent of nonhazardous demolition waste recycled and/or salvaged beyond 50 percent).</b>	<b>5 10 max</b>
---	---------------------

<b>403.12 Environmentally sensitive areas.</b> Environmentally sensitive areas are as follows:		
<b>(1)</b>	Environmentally sensitive areas are avoided as follows:	
	<b>(a)</b> <25 percent of environmentally sensitive areas left undeveloped	<b>2</b>
	<b>(b)</b> 25 percent – 75 percent of environmentally sensitive areas left undeveloped	<b>4</b>
	<b>(c)</b> >75 percent of environmentally sensitive areas left undeveloped	<b>7</b>
<b>(2)</b>	Environmentally sensitive areas are permanently protected by a conservation easement or similar mechanism.	<b>10</b>

**404  
SITE DEVELOPMENT AND CONSTRUCTION**

**404.0 Intent.** Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized, and any significant impacts are mitigated.

<b>404.1 On-site supervision and coordination.</b> On-site supervision and coordination is provided during clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 403.4)	<b>5</b>
---	----------

<b>404.2 Trees and vegetation.</b> Designated trees and vegetation are preserved by one or more of the following:	
(1) Fencing or equivalent is installed to protect trees and other vegetation.	<b>4</b>
(2) Trenching, significant changes in grade, compaction of soil, and other activities are avoided in critical root zones (canopy drip line) in “tree save” areas.	<b>5</b>
(3) Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	<b>4</b>

<b>404.3 Soil disturbance and erosion.</b> On-site soil disturbance and erosion are minimized by implementation of one or more of the following:	
(1) Limits of clearing and grading are staked out prior to construction.	<b>5</b>
(2) “No disturbance” zones are created using fencing or flagging to protect vegetation and sensitive areas from construction vehicles, material storage, and washout.	<b>4</b>
(3) Sediment and erosion controls are installed and maintained.	<b>5</b>
(4) Topsoil is stockpiled and covered with tarps, straw, mulch, chipped wood, vegetative cover, or other means capable of protecting it from erosion for later use to establish landscape plantings.	<b>5</b>
(5) Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area by laying lightweight geogrids, mulch, chipped wood, plywood, OSB (oriented strand board), metal plates, or other materials capable of weight distribution in the pathway of the equipment.	<b>4</b>
(6) Disturbed areas are stabilized within the EPA-recommended 14-day period.	<b>4</b>
(7) Soil is improved with organic amendments and mulch.	<b>4</b>

<b>404.4 Wildlife habitat.</b> Measures are implemented to support wildlife habitat.	
(1) Wildlife habitat is maintained.	<b>5</b>
(2) Measures are instituted to establish or promote wildlife habitat.	<b>5</b>
(3) Open space is preserved as part of a wildlife corridor.	<b>6</b>
(4) Builder or member of builder’s project team participates in a wildlife conservation program.	<b>5</b>

**405  
INNOVATIVE PRACTICES**

**405.0 Intent.** Innovative site design, preparation, and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained, and innovative zoning practices are used to implement such practices, as applicable.

**405.1 Driveways and parking areas.** Driveways and parking areas are minimized or mitigated by one or more of the following:

(1)	Off-street parking areas are shared or driveways are shared; on-street parking is utilized; and alleys (shared common area driveways) are used for rear-loaded garages.	5
(2)	In multifamily projects, parking capacity is not to exceed the local minimum requirements.	5
(3)	Structured parking is utilized to reduce the footprint of surface parking areas.	
	(a) 25 percent to less than 50 percent	3
	(b) 50 percent to 75 percent	5
	(c) greater than 75 percent	8
(4)	<del>Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.</del>	
	<del>(a) 10% to less than 25%</del>	<del>2</del>
	<del>(b) 25% to 75%</del>	<del>4</del>
	<del>(c) greater than 75%</del>	<del>6</del>

**405.2 Street widths.**

(1)	Street pavement widths are minimized per local code and are in accordance with Table 405.2.	6														
<p><b>Table 405.2</b> <b>Maximum Street Widths</b></p> <table border="1"> <thead> <tr> <th>Facility Type</th> <th>Maximum Width</th> </tr> </thead> <tbody> <tr> <td>Collector street with parking (one side only)</td> <td>31 feet</td> </tr> <tr> <td>Collector street without parking</td> <td>26 feet</td> </tr> <tr> <td>Local access with parking (one side only)</td> <td>27 feet</td> </tr> <tr> <td>Local access street without parking</td> <td>20 feet</td> </tr> <tr> <td>Queuing (one-lane) streets with parking</td> <td>24 feet</td> </tr> <tr> <td>Alleys and queuing (one-lane) streets without parking</td> <td>17 feet</td> </tr> </tbody> </table> <p>For SI: 1 foot = 304.8 mm</p>			Facility Type	Maximum Width	Collector street with parking (one side only)	31 feet	Collector street without parking	26 feet	Local access with parking (one side only)	27 feet	Local access street without parking	20 feet	Queuing (one-lane) streets with parking	24 feet	Alleys and queuing (one-lane) streets without parking	17 feet
Facility Type	Maximum Width															
Collector street with parking (one side only)	31 feet															
Collector street without parking	26 feet															
Local access with parking (one side only)	27 feet															
Local access street without parking	20 feet															
Queuing (one-lane) streets with parking	24 feet															
Alleys and queuing (one-lane) streets without parking	17 feet															
(2)	A waiver was secured by the developer from the local jurisdiction to allow for construction of streets below minimum width requirement.	8														

**405.3 Cluster development.** Cluster development enables and encourages flexibility of design and development of land in such a manner as to preserve the natural and scenic qualities of the site by utilizing an alternative method for the layout, configuration and design of lots, buildings and structures, roads, utility lines and other infrastructure, parks, and landscaping.

<b>405.4 Planning.</b> Innovative planning techniques are implemented in accordance with the following:		
<b>(1)</b>	Innovative planning techniques are used or developed for permissible adjustments to population density, area, height, open space, mixed-use, or other provisions for the specific purpose of open space, natural resource preservation or protection and/or mass transit usage. Other innovative planning techniques may be considered on a case-by-case basis.	<b>10</b>
<b>(2)</b>	Provide common or public spaces of a minimum of 1/6 acre that are within ¼ mile walk to 80 percent of planned and existing units and entrances to non-residential buildings. Both existing and newly constructed squares, parks, paseos, plazas, and similar uses qualify under this criterion.	<b>10</b>
<b>405.5 Wetlands.</b> Constructed wetlands or other natural innovative wastewater or stormwater treatment technologies are used.		<b>8</b>
<b>405.6 Multi-modal transportation.</b> Multi-modal transportation access is provided in accordance with one or more of the following:		
<b>(1)</b>	A site is selected with a boundary within one-half mile (805 m) of pedestrian access to a mass transit system or within five miles of a mass transit station with available parking.	<b>5</b>
<b>(2)</b>	A site is selected where all lots within the site are located within one-half mile (805 m) of pedestrian access to a mass transit system.	<b>7</b>
<b>(3)</b>	A system of walkways, bikeways, street crossings, or pathways designed to promote connectivity to existing and planned community amenities are provided.	
	<b>(a)</b> Create a network of sidewalks and paths that provide a minimum level of connectivity of at least 90 bikeway or pathway intersections per square mile.	<b>5</b>
	<b>(b)</b> Create a network of sidewalks and paths that provide a minimum level of connectivity of at least 140 bikeway or pathway intersections per square mile.	<b>10</b>
<b>(4)</b>	Dedicated bicycle parking and racks are indicated on the site plan and a minimum of six spaces are constructed for, multifamily buildings, and/or each developed common area.	<b>1 point for each 6 spaces 6 max</b>
<b>(5)</b>	Bike sharing programs participate with the developer and facilities for bike sharing are planned for and constructed.	<b>5</b>
<b>(6)</b>	Car sharing programs participate with the developer and facilities for car sharing are planned for and constructed.	<b>5</b>
<b>(7)</b>	<u>A site is selected within a census block group that, compared to its region, has above-average transit access to employment as calculated using the Transit Access Measures within the USEPA's Smart Location Database:</u>	
	<u><b>(a)</b> Access is within the top quartile for the region</u>	<u><b>10</b></u>
	<u><b>(b)</b> Access is within the second quartile for the region</u>	<u><b>4</b></u>
<b>(8)</b>	<u>A site is selected within a census block group that, compared to its region, has above-average access to employment within a 45-minute drive as calculated using USEPA's Smart Location Database:</u>	
	<u><b>(a)</b> Access is within the top quartile for the region</u>	<u><b>6</b></u>
	<u><b>(b)</b> Access is within the second quartile for the region</u>	<u><b>2</b></u>

<b>405.7 Density.</b> The average density on a net developable area basis is:		
(1)	7 to less than 14 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>5</b>
(2)	14 to less than 21 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>7</b>
(3)	21 or greater dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>10</b>

<b>405.8 Mixed-use development.</b> (1) Mixed-use development is incorporated, or (2) for single-use sites 20 acres or less in size, 80% of the units are within ½ mile walk of 5 non-residential uses and where a system of walkways, bikeways, street crossings or pathways is designed to promote connectivity to those uses.	<b>9</b>
--	----------

<b>405.9 Open space.</b> <del>A</del> <u>The community is saturated within 1/2 mile of an area of open space available to the public or a</u> portion of the gross area of the community is set aside as open space. <b>(Points awarded for every 10 percent of the community set aside as open space. <u>If open space outside of the community is included, a maximum of 3 points are awarded</u>)</b>	<b><u>12</u></b>
---	------------------

<b>405.10 Community garden(s).</b> <del>A portion of the site is established as a community garden(s) for the residents of the site to provide</del> <u>l</u> ocal food production for residents or area consumers.	<b>3</b>
<u>(a) A portion of the site of at least 250 sq ft is established as a community garden(s) for the residents of the site</u>	<b><u>1 point per 250 sq ft max 3 points</u></b>
<u>(b) Areas and physical provisions are provided for composting</u>	<b><u>1</u></b>
<u>(c) Signs designating the garden are posted</u>	<b><u>1</u></b>

<b>406.1</b> The site is designed to mitigate hazards from insect born disease. <b><u>(To acquire points the site must be documented to be at risk by an epidemiologist or qualified professional)</u></b>	
<u>(a) Dense plant beds, shrubbery and woody plants are not planted within 5 feet (1.5 m) of occupied buildings</u>	<b><u>6</u></b>
<u>(b) A minimum of a 5 foot (1.5 m) border of paving, mulch, bare earth, or turfgrass is provided between woods or weedy areas and people trafficked or occupied areas, including playgrounds and dog parks</u>	<b><u>5</u></b>
<u>(c) Vegetation that is attractive to deer, as documented by a qualified professional, is not planted within 20 feet (6 m) of buildings</u>	<b><u>3</u></b>
<u>(d) Paths or trails maintained through natural or non-maintained areas are a minimum of 5 feet wide (1.5 m)</u>	<b><u>3</u></b>
<u>(e) Conditions that are favorable to mosquito breeding, such as standing water, are not present on site</u>	<b><u>2</u></b>

<b>406.2 Smoking prohibitions.</b> Signs are provided prohibiting smoking at the following locations:	
<u>(a) Smoking is prohibited within 25 feet (7.5 m) of all building exterior doors and operable windows or building air intakes within 15 (4.5 m) vertical feet of grade or a walking surface</u>	<b><u>3</u></b>
<u>(b) Smoking is prohibited in common areas unless otherwise designated as smoking areas</u>	<b><u>3</u></b>





## CHAPTER 5

# LOT DESIGN, PREPARATION, AND DEVELOPMENT

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

### 500 LOT DESIGN, PREPARATION, AND DEVELOPMENT

**500.0 Intent.** This section applies to lot development for the eventual construction of residential buildings, multifamily buildings, or additions thereto that contain dwelling units [or sleeping units](#).

### 501 LOT SELECTION

<b>501.1 Lot.</b> Lot is selected in accordance with Section 501.1(1) or Section 501.1(2).	
<b>(1)</b> A lot is selected within a site certified to this Standard or equivalent;	<b>15</b>
<b>(2)</b> A lot is selected to minimize environmental impact by one or more of the following:	
<b>(a)</b> An infill lot is selected.	<b>10</b>
<b>(b)</b> A lot is selected that is a greyfield.	<b>10</b>
<b>(c)</b> An EPA-recognized brownfield lot is selected.	<b>15</b>

<b>501.2 Multi-modal transportation.</b> A range of multi-modal transportation choices are promoted by one or more of the following:	
<b>(1)</b> A lot is selected within one-half mile (805 m) of pedestrian access to a mass transit system	<b>6</b>
<b>(2)</b> A lot is selected within five miles (8,046 m) of a mass transit station with provisions for parking.	<b>3</b>
<b>(3)</b> Walkways, street crossings, and entrances designed to promote pedestrian activity are provided. New buildings are connected to existing sidewalks and areas of development.	<b>5</b>
<b>(4)</b> A lot is selected within one-half mile (805 m) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following: <i>Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks.</i> <i>Retail: grocery store, restaurant, retail store.</i> <i>Civic: post office, place of worship, community center.</i> <i>Services: bank, daycare center, school, medical/dental office, laundromat/dry cleaners.</i> <a href="#">OR</a> <a href="#">A lot is selected within a census block group that, compared to its region, has above-average neighborhood walkability using an index within the USEPA's Smart Location Database:</a>	<b>4</b>
<a href="#">(a) Walkability is within the top quartile for the region</a>	<b>5</b>
<a href="#">(b) Walkability is within the second quartile for the region</a>	<b>2</b>

GREEN BUILDING PRACTICES		POINTS
(5)	Bicycle use is promoted by building on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or on an infill lot located within 1/2 mile of a bicycle lane designated by the jurisdiction.	5
(6)	Dedicated bicycle parking and racks are indicated on the site plan and constructed for mixed-use and multifamily buildings:	
(a)	Minimum of 1 bicycle parking space per 3 residential units	2
(b)	Minimum of 1 bicycle parking space per 2 residential units	4
(c)	Minimum of 1 bicycle parking space per 1 residential unit.	6
(d)	<u>Bicycle enclosed storage is provided or parking spaces are covered or otherwise protected from the elements.</u>	<u>2 points per (a) – (c)</u>
(7)	<u>Select a lot in a community where there is access to shared vehicle usage such as carpool drop-off areas, car-share services, and shuttle services to mass transit</u>	<u>5</u>
(8)	<u>Lot is within 1/2 mile walking distance of where a bike sharing program is provided</u>	<u>5</u>

**502  
PROJECT TEAM, MISSION STATEMENT, AND GOALS**

<b>502.1 Project team, mission statement, and goals.</b> A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project’s green goals and objectives are written into a mission statement.	4
--	---

**503  
LOT DESIGN**

<b>503.0 Intent.</b> The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot. <b>(Points awarded only if the intent of the design is implemented.)</b>	
--	--

<b>503.1 Natural resources.</b> Natural resources are conserved by one or more of the following:	
(1) A natural resources inventory is completed under the direction of a qualified professional.	5
(2) A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources.	6
(3) Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional.	4
(4) Basic training in tree or other natural resource protection is provided for the on-site supervisor.	4
(5) All tree pruning on-site is conducted by a certified arborist or other qualified professional.	3
(6) Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices.	4
(7) Where a lot adjoins a landscaped common area, a protection plan from construction activities next to the common area is implemented.	5

<p><b>(8)</b> <a href="#">Developer has a plan to design and construct the lot in accordance with the International Wildland-Urban Interface Code (IWUIC).</a></p> <p><a href="#">(Only applicable where the AHJ has not declared a wildland-urban interface area, but a fire protection engineer, certified fire marshal, or other qualified party has determined and documented the site as hazarded per the IWUIC).</a></p>	<p><b>6</b></p>
--	-----------------

<p><b>503.2 Slope disturbance.</b> Slope disturbance is minimized by one or more of the following:</p>	
<p><b>(1)</b> The use of terrain adaptive architecture.</p>	<p><b>5</b></p>
<p><b>(2)</b> Hydrological/soil stability study is completed and used to guide the design of all buildings on the lot.</p>	<p><b>5</b></p>
<p><b>(3)</b> All or a percentage of driveways and parking are aligned with natural topography to reduce cut and fill.</p>	
<p><b>(a)</b> 10 percent to 25 percent</p>	<p><b>1</b></p>
<p><b>(b)</b> 25 percent to 75 percent</p>	<p><b>4</b></p>
<p><b>(c)</b> greater than 75 percent</p>	<p><b>6</b></p>
<p><b>(4)</b> Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques.</p>	<p><b>6</b></p>
<p><b>(5)</b> Underground parking uses the natural slope for parking entrances.</p>	<p><b>5</b></p>
<p><b>503.3 Soil disturbance and erosion.</b> Soil disturbance and erosion are minimized by one or more of the following: (also see Section 504.3)</p>	
<p><b>(1)</b> Construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days.</p>	<p><b>5</b></p>
<p><b>(2)</b> At least 75% of total length of the utilities on the lot are designed to use one or more alternative means:</p>	<p><b>5</b></p>
<p><b>(a)</b> tunneling instead of trenching</p>	
<p><b>(b)</b> use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment</p>	
<p><b>(c)</b> shared utility trenches or easements</p>	
<p><b>(d)</b> placement of utilities under paved surfaces instead of yards</p>	
<p><b>(3)</b> Limits of clearing and grading are demarcated on the lot plan.</p>	<p><b>5</b></p>

<p><b>503.4 Stormwater management.</b> The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:</p>	
<p><b>(1)</b> A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.</p>	<p><b>7</b></p>
<p><b>(2)</b> A hydrologic analysis is conducted that results in the design of a stormwater management system that maintains the pre-development (stable, natural) runoff hydrology of the site through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume and duration.</p>	<p><b>10</b></p>

<b>(3)</b>	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:	
<b>(a)</b>	80th percentile storm event	<b>5</b>
<b>(b)</b>	90th percentile storm event	<b>8</b>
<b>(c)</b>	95th percentile storm event	<b>10</b>
<b>(4)</b>	Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:	
<b>(a)</b>	<u>10 percent to less than 25 percent</u> <u>(add 2 points for use of vegetative paving system)</u>	<u>52</u>
<b>(b)</b>	25-50 percent <u>(add 4 points for use of vegetative paving system)</u>	<u>85</u>
<b>(c)</b>	Greater than 50 percent <u>(add 6 points for use of vegetative paving system)</u>	<b>10</b>
<u>(Points for vegetative paving systems are only awarded for locations receiving more than 20 inches per year of annual average precipitation)</u>		
<b>(5)</b>	<u>Complete gutter and downspout system directs storm water away from foundation to landscaping or catchment system</u>	<u>3</u>

<b>503.5 Landscape plan.</b> A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment.  <b>(Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8))</b>		
<b>(1)</b>	A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.	
<b>(a)</b>	100 percent of the natural area	<b>4</b>
<b>(b)</b>	50 percent of the natural area	<b>3</b>
<b>(c)</b>	25 percent of the natural area	<b>2</b>
<b>(d)</b>	12 percent of the natural area	<b>1</b>
<b>(2)</b>	Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity.	<b>7</b>
<b>(3)</b>	To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	<b>3</b>
<b>(4)</b>	EPA WaterSense Water Budget Tool or equivalent is used when implementing <u>up to</u> the maximum percentage of turf areas.	<u>25</u>
<b>(5)</b>	<u>Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent third party qualified water efficient grasses are used</u>	<u>3</u>
<b>(5<del>6</del>)</b>	For landscaped vegetated areas, the maximum percentage of turf area is:	
<b>(a)</b>	0 percent	<b>5</b>
<b>(b)</b>	Greater than 0 percent to less than 20 percent	<b>4</b>
<b>(c)</b>	20 percent to less than 40 percent	<b>3</b>

**LOT DESIGN, PREPARATION, AND DEVELOPMENT**

(d) 40 percent to 60 percent	2
(67) Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan.	5
(78) Summer shading by planting installed to shade a minimum of 30 percent of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice.	5
(89) Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions.	5
(910) Site or community generated tree trimmings or stump grinding of regionally appropriate trees are used on the lot to provide protective mulch during construction or for landscaping.	3
(4011) An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	4
(4412) Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site.	3
(4213) Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site.	6

<b>503.6 Wildlife habitat.</b> Measures are planned to support wildlife habitat and include at least two of the following:	
(1) Plants and gardens that encourage wildlife, such as bird and butterfly gardens.	3
(2) <a href="#">To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.</a>	3
(32) Inclusion of a certified “backyard wildlife” program.	3
(43) The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship.	3
(54) Outdoor lighting techniques are utilized with regard for wildlife.	3

<b>503.7 Environmentally sensitive areas.</b> The lot is in accordance with one or both of the following:	
(1) The lot does not contain any environmentally sensitive areas that are disturbed by the construction.	4
(2) On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through development and construction activities.	4

<b>503.8 Demolition of existing building.</b> A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage with a goal of recycling or salvaging a minimum of 50 percent of the nonhazardous demolition waste.  <b>(One additional point awarded for every 10 percent of nonhazardous demolition waste recycled and/or salvaged beyond 50 percent).</b>	5
--	---

**504 LOT CONSTRUCTION**

**504.0 Intent.** Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized and any significant impacts are mitigated.

<b>504.1 On-site supervision and coordination.</b> On-site supervision and coordination is provided during on-the-lot clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 503.3)	<b>4</b>
--	----------

**504.2 Trees and vegetation.** Designated trees and vegetation are preserved by one or more of the following:

- |   |          |
|---|----------|
| <b>(1)</b> Fencing or equivalent is installed to protect trees and other vegetation.  | <b>3</b> |
| <b>(2)</b> Trenching, significant changes in grade, and compaction of soil and critical root zones in all “tree save” areas as shown on the lot plan are avoided. | <b>5</b> |
| <b>(3)</b> Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.          | <b>4</b> |

**504.3 Soil disturbance and erosion implementation.** On-site soil disturbance and erosion are minimized by one or more of the following in accordance with the SWPPP or applicable plan: (also see Section 503.3)

- |   |          |
|---|----------|
| <b>(1)</b> Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required.   | <b>5</b> |
| <b>(2)</b> Limits of clearing and grading are staked out on the lot.  | <b>5</b> |
| <b>(3)</b> “No disturbance” zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity.  | <b>5</b> |
| <b>(4)</b> Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot.   | <b>5</b> |
| <b>(5)</b> Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment). | <b>4</b> |
| <b>(6)</b> Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA or in the approved SWPPP, where required.  | <b>3</b> |
| <b>(7)</b> Soil is improved with organic amendments or mulch.   | <b>3</b> |
| <b>(8)</b> Utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements).   | <b>5</b> |
| <b>(9)</b> Inspection reports of stormwater best management practices are available.  | <b>3</b> |

**505  
INNOVATIVE PRACTICES**

**505.0 Intent.** Innovative lot design, preparation, and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained and innovative zoning is used to implement such practices.

**505.1 Driveways and parking areas.** Driveways and parking areas are minimized or mitigated by one or more of the following:

LOT DESIGN, PREPARATION, AND DEVELOPMENT

(1)	Off-street parking areas are shared or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, if required.	5
(2)	In a multifamily project, parking capacity does not exceed the local minimum requirements.	5
(3)	Structured parking is utilized to reduce the footprint of surface parking areas.	
(a)	25 percent to less than 50 percent	4
(b)	50 percent to 75 percent	5
(c)	greater than 75 percent	6
(4)	<del>Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.</del>	
(a)	<del>10 percent to less than 25 percent</del>	<del>1</del>
(b)	<del>25 percent to 75 percent</del>	<del>2</del>
(c)	<del>greater than 75 percent</del>	<del>3</del>

<b>505.2 Heat island mitigation.</b> Heat island effect is mitigated by the following.		
(1)	Hardscape: Not less than 50 percent of the surface area of the hardscape on the lot meets one or a combination of the following methods.	5
(a)	Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.	
(b)	Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.	
(c)	Permeable hardscaping: Permeable hardscaping materials are installed.	
(2)	Roofs: Not less than 75 percent of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate conditions of the building lot. Invasive plant species are not permitted.	5

<b>505.3 Density.</b> The average density on the lot on a net developable area basis is:		
(1)	7 to less than 14 dwelling units/ <del>sleeping units</del> per acre (per 4,047 m <sup>2</sup> )	4
(2)	14 to less than 21 dwelling units/ <del>sleeping units</del> per acre (per 4,047 m <sup>2</sup> )	5
(3)	21 to less than 35 dwelling units/ <del>sleeping units</del> per acre (per 4,047 m <sup>2</sup> )	6
(4)	35 to less than 70 dwelling units/ <del>sleeping units</del> per acre (per 4,047 m <sup>2</sup> )	7
(5)	70 or greater dwelling units/ <del>sleeping units</del> per acre (per 4,047 m <sup>2</sup> )	8

<b>505.4 Mixed-use development.</b> <del>The lot contains a mixed-use building.</del>		<del>8</del>
(1)	<del>The lot contains a mixed-use building.</del>	<del>8</del>
(2)	<del>Lot is within ½ mile of a mixed-use building(s).</del>	<del>4</del>

<b>505.5 <del>C</del>Multifamily or mixed-use community garden(s).</b> <del>A portion of the lot is established as a community garden(s), available to residents of the lot, to provide for local food production to residents or area consumers.</del>		<del>3</del>
---	--	--------------



<b>(a)</b>	<u>A portion of the lot of at least 250 sq ft is established as community garden(s) for the residents of the site.</u>	<b><u>3 per 250 sq ft maximum</u></b> <b><u>9 points</u></b>
<b>(b)</b>	<u>Locate the project within a 0.5-mile walking distance of an existing or planned farmers market/farm stand that is open or will operate at least once a week for at least five months of the year.</u>	<b><u>3</u></b>
<b>(c)</b>	<u>Areas and physical provisions are provided for composting.</u>	<b><u>1</u></b>
<b>(d)</b>	<u>Signs designating the garden area are posted.</u>	<b><u>1</u></b>

<p><b>505.6 Multi-unit plug-in electric vehicle charging.</b> Plug-in electric vehicle charging capability is provided for <del>at least 4</del><u>not fewer than 2</u> percent of parking stalls.  <b><u>(An additional 2 points can be earned for each percentage point above 2% for a maximum of 10 points.)</u></b></p> <p><u>Fractional values shall be rounded up to the nearest whole number.</u> Electrical capacity in main electric panels supports Level 2 charging (<u>208/240V- up to 80 amps or in accordance with SAE J1772/208/240V-40 amp</u>). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (<u>208/240V- up to 80 amps or in accordance with SAE J1772/208/240V-40 amp</u>) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (<u>208/240V- up to 480 amps or in accordance with SAE J1772</u>) or Level 2 charging stations (<u>208/240V- up to 80 amps or in accordance with SAE J1772/240V/40A</u>) by a third party charging station.</p>	<p><b><u>4</u></b> <b><u>10 max</u></b></p>
--	---

<p><b>505.7 Multi-unit residential CNG vehicle fueling.</b> CNG vehicle residential fueling appliances are provided for at least 1 percent of the parking stalls. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance with the appliance manufacturer's installation instructions.</p>	<p><b><u>4</u></b></p>
---	------------------------

<p><b>505.8 Street Network.</b> <u>Locate the project in an area of high intersection density.</u></p>	<p><b><u>5</u></b></p>
--	------------------------

<p><b>505.9 Smoking prohibitions.</b> Signs are provided on multifamily and mixed-use lots prohibiting smoking at the following locations.</p>		
<b>(a)</b>	<u>Smoking is prohibited within 25 feet (7.5 m) of all building exterior doors and operable windows or building air intakes within 15 (4.5 m) vertical feet of grade or a walking surface.</u>	<b><u>3</u></b>
<b>(b)</b>	<u>Smoking is prohibited on decks, balconies, patios and other occupied exterior spaces.</u>	<b><u>3</u></b>
<b>(c)</b>	<u>Smoking is prohibited at all parks, playgrounds, and community activity or recreational spaces.</u>	<b><u>3</u></b>

<p><b>505.10</b> <u>For multifamily buildings, on-site dedicated recreation space for exercise or play opportunities for adults and/or children open and accessible to residents is provided.</u></p>		
<b>(a)</b>	<u>A dedicated area of at least 400 square feet is provided inside the building with adult exercise and/or children's play equipment.</u>	<b><u>3</u></b>
<b>(b)</b>	<u>A courtyard, garden, terrace, or roof space at least 10% of the lot area that can serve as outdoor space for children's play and /or adult activities is provided.</u>	<b><u>3</u></b>
<b>(c)</b>	<u>Active play/recreation areas are illuminated at night to extend opportunities for physical activity into the evening.</u>	<b><u>3</u></b>



THIS PAGE INTENTIONALLY LEFT BLANK

## CHAPTER 6

# RESOURCE EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
<b>601 QUALITY OF CONSTRUCTION MATERIALS AND WASTE</b>	
<b>601.0 Intent.</b> Design and construction practices that minimize the environmental impact of the building materials are incorporated, environmentally efficient building systems and materials are incorporated, and waste generated during construction is reduced.	
<b>601.1 Conditioned floor area.</b> Finished floor area of a dwelling unit <u>or sleeping unit</u> is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily buildings. Only the finished floor area for stories above grade plane is included in the calculation.	
(1) less than or equal to 700 square feet (65 m <sup>2</sup> )	<b>14</b>
(2) less than or equal to 1,000 square feet (93 m <sup>2</sup> )	<b>12</b>
(3) less than or equal to 1,500 square feet (139 m <sup>2</sup> )	<b>9</b>
(4) less than or equal to 2,000 square feet (186 m <sup>2</sup> )	<b>6</b>
(5) less than or equal to 2,500 square feet (232 m <sup>2</sup> )	<b>3</b>
(6) greater than 4,000 square feet (372 m <sup>2</sup> ) <b>(For every 100 square feet (9.29 m<sup>2</sup>) over 4,000 square feet (372 m<sup>2</sup>), one point is to be added to rating level points shown in Table 303, Category 7 for each rating level.)</b>	<b>Mandatory</b>
<b>Multifamily Building Note:</b> For a multifamily building, a weighted average of the individual unit sizes is used for this practice.	
<b>601.2 Material usage.</b> Structural systems are designed or construction techniques are implemented that reduce and optimize material usage.	<b>9 Max</b>
(1) Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.	<b>3</b>
(2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.	<b>3</b>
(3) Performance-based structural design is used to optimize lateral force-resisting systems.	<b>3</b>
<b>601.3 Building dimensions and layouts.</b> Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for a minimum of 80 percent of the following areas:	
(1) floor area	<b>3</b>
(2) wall area	<b>3</b>
(3) roof area	<b>3</b>
(4) cladding or siding area	<b>3</b>

GREEN BUILDING PRACTICES	POINTS
(5) penetrations or trim area	1
<b>601.4 Framing and structural plans.</b> Detailed framing or structural plans, material quantity lists and on-site cut lists for framing, structural materials, and sheathing materials are provided.	4
<b>601.5 Prefabricated components.</b> Precut or preassembled components, or panelized or precast assemblies are utilized for a minimum of 90 percent for the following system or building:	13 Max
(1) floor system	4
(2) wall system	4
(3) roof system	4
(4) modular construction for the entire building located above grade	13
(5) manufactured home construction for the entire building located above grade	13
<b>601.6 Stacked stories.</b> Stories above grade are stacked, such as in 1½-story, 2-story, or greater structures. The area of the upper story is a minimum of 50 percent of the area of the story below based on areas with a minimum ceiling height of 7 feet (2,134 mm).	8 Max
(1) first stacked story	4
(2) for each additional stacked story	2
<b>601.7 Prefinished materials.</b> Prefinished building materials or assemblies listed below have no additional site-applied finishing material are installed.	12 Max
(a) interior trim not requiring paint or stain	
(b) exterior trim not requiring paint or stain	
(c) window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces: i. exterior surfaces ii. interior surfaces	
(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(e) exterior wall coverings or systems, floor system, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(1) 90 percent or more of the installed building materials or assemblies listed above: <b>(Points awarded for each type of material or assembly.)</b>	5
(2) 50 percent to less than 90 percent of the installed building material or assembly listed above: <b>(Points awarded for each type of material or assembly.)</b>	2
(3) 35 percent to less than 50 percent of the installed building material or assembly listed above: <b>(Points awarded for each type of material or assembly.)</b>	1
<b>601.8 Foundations.</b> A foundation system that minimizes soil disturbance, excavation quantities, and material usage, such as frost-protected shallow foundations, isolated pier and pad	3

GREEN BUILDING PRACTICES	POINTS
foundations, deep foundations, post foundations, or helical piles is selected, designed, and constructed. The foundation is used on 50 percent or more of the building footprint.	
<del>601.9 Above-grade wall systems. Above-grade wall systems that, at a minimum, provide the structural and thermal characteristics of mass walls and are used for a minimum of 75 percent of the gross exterior wall area of the building.</del>	4

**602  
ENHANCED DURABILITY AND REDUCED MAINTENANCE**

**602.0 Intent.** Design and construction practices are implemented that enhance the durability of materials and reduce in-service maintenance.

**602.1 Moisture management – building envelope**

**602.1.1 Capillary breaks**

**602.1.1.1** A capillary break and vapor retarder are installed at concrete slabs in accordance with ICC IRC Sections R506.2.2 and R506.2.3 or ICC IBC Sections 1907 and 1805.4.1. **Mandatory**

**602.1.1.2** A capillary break between the footing and the foundation wall is provided to prevent moisture migration into foundation wall. **3**

**602.1.2 Foundation waterproofing.** Enhanced foundation waterproofing is installed using one or both of the following: **4**

- (1) rubberized coating, or
- (2) drainage mat

**602.1.3 Foundation drainage**

**602.1.3.1** Where required by the ICC IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed. **Mandatory**

**602.1.3.2** Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit. **4**

**602.1.4 Crawlspace**

**602.1.4.1** Vapor retarder in unconditioned vented crawlspace is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.

- (1) Floors. Minimum 6-mil vapor retarder installed on the crawlspace floor and extended at least 6 inches up the wall and is attached and sealed to the wall. **6**
- (2) Walls. Dampproof walls are provided below finished grade. **Mandatory**

GREEN BUILDING PRACTICES	POINTS
<p><b>602.1.4.2</b> Crawlspace that is built as a conditioned area is sealed to prevent outside air infiltration and provided with conditioned air at a rate not less than 0.02 cfm (.009 L/s) per square foot of horizontal area and one of the following is implemented:</p>	
<p>(1) a concrete slab over 6-mil polyethylene sheeting, or other Class I vapor retarder installed in accordance with Section 408.3 or Section 506 of the International Residential Code.</p>	<b>8</b>
<p>(2) 6-mil polyethylene sheeting, or other Class I vapor retarder installed in accordance with Section 408.3 or Section 506 of the International Residential Code.</p>	<b>Mandatory</b>
<p><b>602.1.5 Termite barrier.</b> Continuous physical foundation termite barrier provided:</p>	
<p>(1) In geographic areas that have moderate to heavy infestation potential in accordance with figure 6(3), a no or low toxicity treatment is also installed.</p>	<b>4</b>
<p>(2) In geographic areas that have a very heavy infestation potential in accordance with figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented.</p>	<b>4</b>
<p><b>602.1.6 Termite-resistant materials.</b> In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:</p>	
<p>(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 feet (610 mm) above the top of the foundation.</p>	<b>2</b>
<p>(2) In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 feet (914 mm) above the top of the foundation.</p>	<b>4</b>
<p>(3) In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings.</p>	<b>6</b>
<p><b>602.1.7 Moisture control measures</b></p>	
<p><b>602.1.7.1</b> Moisture control measures are in accordance with the following:</p>	
<p>(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.</p>	<b>2</b>
<p>(2) Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall).</p>	<b>Mandatory 2</b>
<p>(3) The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or cavity enclosure.</p>	<b>4</b>
<p><b>602.1.7.2</b> Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied.</p>	<b>2</b>
<p><b>602.1.7.3</b> Building envelope assemblies are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis is required to incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation.</p>	<b>4</b>
<p><b>602.1.8 Water-resistive barrier.</b> Where required by the ICC, IRC, or IBC, a water-resistive barrier and/or drainage plane system is installed behind exterior veneer and/or siding.</p>	<b>Mandatory</b>

GREEN BUILDING PRACTICES		POINTS
<p><b>602.1.9 Flashing.</b> Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer’s instructions, the flashing manufacturer’s instructions, or as detailed by a registered design professional.</p>		
<p>(1) Flashing is installed at all of the following locations, as applicable:</p> <ul style="list-style-type: none"> <li>(a) around exterior fenestrations, skylights, and doors</li> <li>(b) at roof valleys</li> <li>(c) at all building-to-deck, -balcony, -porch, and -stair intersections</li> <li>(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets</li> <li>(e) at ends of and under masonry, wood, or metal copings and sills</li> <li>(f) above projecting wood trim</li> <li>(g) at built-in roof gutters, and</li> <li>(h) drip edge is installed at eave and rake edges.</li> </ul>	<b>Mandatory</b>	
(2) All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 or liquid applied flashing complying with AAMA 714-15 and installed in accordance with fenestration or flashing manufacturer’s installation instructions.	<b>2</b>	
(3) Pan flashing is installed at sills of all exterior windows and doors.	<b>3</b>	
(4) Seamless, preformed kickout flashing or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material.	<b>3</b>	
(5) A rainscreen wall design as follows is used for exterior wall assemblies.	<b>4 Max</b>	
<ul style="list-style-type: none"> <li>(a) A system designed with minimum 1/4-inch air space exterior to the water-resistive barrier, vented to the exterior at top and bottom of the wall, and integrated with flashing details; or,</li> <li>(b) A cladding material or a water-resistive barrier with enhanced drainage, meeting 75 percent drainage efficiency determined in accordance with ASTM E2273.</li> </ul>	<b>4</b>	
(6) Through-wall flashing is installed at transitions between wall cladding materials or wall construction types.	<b>2</b>	
(7) Flashing is installed at expansion joints in stucco walls.	<b>2</b>	
<p><b>602.1.10 Exterior doors.</b> Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have either a storm door or a projection factor of 1.0 minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).</p>		<b>2 per exterior door</b>
<ul style="list-style-type: none"> <li>(a) installing a porch roof or awning</li> <li>(b) extending the roof overhang</li> <li>(c) recessing the exterior door</li> <li>(d) Installing a storm door</li> </ul>	<b>6 Max</b>	



GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>602.1.11 Tile backing materials.</b> Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.	<b>Mandatory</b>
---	------------------

<b>602.1.12 Roof overhangs.</b> Roof overhangs, in accordance with Table 602.1.12, are provided over a minimum of 90 percent of exterior walls to protect the building envelope.	<b>4</b>												
<p><b>Table 602.1.12</b> <b>Minimum Roof Overhang for One- &amp; Two-Story Buildings</b></p> <table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">Inches of Rainfall <sup>(1)</sup></th> <th style="padding: 5px;">Eave Overhang (Inches)</th> <th style="padding: 5px;">Rake Overhang (Inches)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">≤40</td> <td style="text-align: center; padding: 5px;">12</td> <td style="text-align: center; padding: 5px;">12</td> </tr> <tr> <td style="text-align: center; padding: 5px;">&gt;41 and ≤70</td> <td style="text-align: center; padding: 5px;">18</td> <td style="text-align: center; padding: 5px;">12</td> </tr> <tr> <td style="text-align: center; padding: 5px;">&gt;70</td> <td style="text-align: center; padding: 5px;">24</td> <td style="text-align: center; padding: 5px;">12</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">(1) Annual mean total rainfall in inches is in accordance with Figure 6(2). For SI: 12 inches = 304.8 mm</p>		Inches of Rainfall <sup>(1)</sup>	Eave Overhang (Inches)	Rake Overhang (Inches)	≤40	12	12	>41 and ≤70	18	12	>70	24	12
Inches of Rainfall <sup>(1)</sup>	Eave Overhang (Inches)	Rake Overhang (Inches)											
≤40	12	12											
>41 and ≤70	18	12											
>70	24	12											

<b>602.1.13 Ice barrier.</b> In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier is installed in accordance with the ICC IRC or IBC at roof eaves of pitched roofs and extends a minimum of 24 inches (610 mm) inside the exterior wall line of the building.	<b>Mandatory</b>
--	------------------

<b>602.1.14 Architectural features.</b> Architectural features that increase the potential for water intrusion are avoided:	
(1) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.	<b>Mandatory 1</b>
(2) No roof configurations that create horizontal valleys in roof design.	<b>2</b>
(3) No recessed windows and architectural features that trap water on horizontal surfaces.	<b>2</b>

<a href="#"><u>602.1.15 Kitchen and vanity cabinets.</u></a> All kitchen and vanity cabinets are certified in accordance with the ANSI/KCMA A161.1 performance standard or equivalent.	<b>2</b>
--	----------

<b>602.2 Roof surfaces.</b> A minimum of 90 percent of roof surfaces, not used for roof penetrations and associated equipment, on-site renewable energy systems such as photovoltaics or solar thermal energy collectors, or rooftop decks, amenities and walkways, are constructed of one or more of the following:	<b>3</b>
(1) products that are in accordance with the ENERGY STAR® cool roof certification or equivalent	
(2) a vegetated roof system	
(3) Minimum initial SRI of 78 for low-sloped roof (a slope less than 2:12) and a minimum initial SRI of 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980. Roof products are certified and labeled.	

<b>602.3 Roof water discharge.</b> A gutter and downspout system or splash blocks and effective grading are provided to carry water a minimum of 5 feet (1524 mm) away from perimeter foundation walls.	<b>4</b>
---	----------

**602.4 Finished grade**

**602.4.1** Finished grade at all sides of a building is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent. **Mandatory**

**602.4.2** The final grade is sloped away from the edge of the building at a minimum slope of 5 percent. **1**

**602.4.3** Water is directed to drains or swales to ensure drainage away from the structure. **1**

**603 REUSED OR SALVAGED MATERIALS**

**603.0 Intent.** Practices that reuse or modify existing structures, salvage materials for other uses, or use salvaged materials in the building’s construction are implemented.

**603.1 Reuse of existing building.** Major elements or components of existing buildings and structures are reused, modified, or deconstructed for later use. **1  
12 Max**  
**(Points awarded for every 200 square feet (18.5 m<sup>2</sup>) of floor area.)**

**603.2 Salvaged materials.** Reclaimed and/or salvaged materials and components are used. The total material value and labor cost of salvaged materials is equal to or exceeds 1 percent of the total construction cost. **1  
9 Max**  
**(Points awarded per 1% of salvaged materials used based on the total construction cost.)**  
**(Materials, elements, or components awarded points under Section 603.1 shall not be awarded points under Section 603.2.)**

**603.3 Scrap materials.** Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided). **4**

**604 RECYCLED-CONTENT BUILDING MATERIALS**

**604.1 Recycled content.** Building materials with recycled content are used for two minor and/or two major components of the building. **per Table 604.1**

**Table 604.1  
Recycled Content**

<b>Material Percentage Recycled Content</b>	<b>Points For 2 Minor</b>	<b>Points For 2 Major</b>
25% to less than 50%	<b>1</b>	<b>2</b>
50% to less than 75%	<b>2</b>	<b>4</b>
more than 75%	<b>3</b>	<b>6</b>

**605  
RECYCLED CONSTRUCTION WASTE**

**605.0 Intent.** Waste generated during construction is recycled. ~~All waste classified as hazardous is properly handled and disposed of.~~  
(Points not awarded for hazardous waste removal.)

<u>605.1 Hazardous waste. The construction and waste management plan shall include information on the proper handling and disposal of hazardous waste. All hazardous waste is properly handled and disposed.</u>	<b>Mandatory</b>
--	------------------

<p><b>605.24 Construction waste management plan.</b> A construction waste management plan is developed, posted at the jobsite, and implemented diverting, through reuse, salvage, recycling, or manufacturer reclamation, a minimum of 50 percent (by weight) of nonhazardous construction and demolition waste from disposal. For this practice, land clearing debris is not considered construction waste. Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging.</p> <p>For <del>remodeling projects or demolition of an existing facility</del> buildings following the new construction path that also have a renovation component, the waste management plan includes the recycling of 95 percent of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards) by an <del>EPA-certified</del> E-Waste recycling facility.</p> <p><b>Exceptions:</b></p> <p>(1) Waste materials generated from land clearing, soil and sub-grade excavation and <del>all manner of</del> vegetative debris shall not be in the calculations.</p> <p>(2) A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.</p>	<b>6</b>
---	----------

<p><b>605.32 On-site recycling.</b> On-site recycling measures following applicable regulations and codes are implemented, such as the following:</p> <p>(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. A minimum of 50 percent (by weight) of construction and land-clearing waste is diverted from landfill.</p> <p>(b) Alternative compliance methods approved by the Adopting Entity.</p> <p>(c) Compatible untreated biomass material (lumber, posts, beams, etc.) are set aside for combustion if a solid fuel-burning appliance per Section 901.2.1(2) will be available for on-site renewable energy.</p>	<b>7</b>
--	----------

<p><b>605.43 Recycled construction materials.</b> Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite.</p>	<b>6 Max</b>
(1) a minimum of two types of materials are recycled	<b>3</b>
(2) for each additional recycled material type	<b>1</b>

**606  
RENEWABLE MATERIALS**

**606.0 Intent.** Building materials derived from renewable resources are used.

<b>606.1 Biobased products.</b> The following biobased products are used:	<b>8 Max</b>
(a) certified solid wood in accordance with Section 606.2	
(b) engineered wood	
(c) bamboo	
(d) cotton	
(e) cork	
(f) straw	
(g) natural fiber products made from crops (soy-based, corn-based)	
(h) other biobased materials with a minimum of 50 percent biobased content (by weight or volume)	
(1) Two types of biobased materials are used, each for more than 0.5 percent of the project's projected building material cost.	<b>3</b>
(2) Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	<b>6</b>
(3) For each additional biobased material used for more than 0.5 percent of the project's projected building material cost.	<b>1 2 Max</b>

**606.2 Wood-based products.** Wood or wood-based products are certified to the requirements of one of the following ~~recognized product programs~~:

(a) American Forest Foundation's <i>American Tree Farm System</i> ® (ATFS)	
(b) Canadian Standards Association's <i>Sustainable Forest Management System Standards</i> (CSA Z809)	
(c) <i>Forest Stewardship Council</i> (FSC)	
(d) <i>Program for Endorsement of Forest Certification Systems</i> (PEFC)	
(e) <i>Sustainable Forestry Initiative</i> ® Program (SFI)	
(f) National Wood Flooring Association's <i>Responsible Procurement Program</i> (RPP)	
(g) other product programs mutually recognized by PEFC	
(h) <a href="#">A manufacturers' fiber procurement system that has been audited by an approved agency as compliant with the provisions of ASTM D7612 as a responsible or certified source. Government or tribal forestlands whose water protection programs have been evaluated by an approved agency as compliant with the responsible source designation of ASTM D7612 are exempt from auditing in the manufacturers' fiber procurement system.</a>	
(1) A minimum of two <a href="#">responsible or</a> certified wood-based products are used for minor components of the building.	<b>3</b>
(2) A minimum of two <a href="#">responsible or</a> certified wood-based products are used in major components of the building.	<b>4</b>

<p><b>606.3 Manufacturing energy.</b> Materials manufactured using a minimum of 33 percent of the primary manufacturing process energy derived from (1) renewable sources, (2) combustible waste sources, or (3) renewable energy credits (RECs) are used for major components of the building. <b>(2 points awarded per material.)</b></p>	<p><b>6 Max</b></p>
---	---------------------

**607  
RECYCLING AND WASTE REDUCTION**

<p><b>607.1 Recycling and composting.</b> Recycling and composting by the occupant are facilitated by one or more of the following methods:</p>		
<p><b>(1)</b></p>	<p><u>A readily accessible space(s) for recyclable and compostable material containers is provided and identified on the floorplan of the house. A readily accessible area(s) outside the living space is provided for recyclable and compostable material containers and identified on the site plan for the house or building.</u> <u>The area outside the living space shall</u><del>A built-in collection space in each kitchen and an aggregation/pick-up space in a garage, covered outdoor space, or other area for recycling containers is provided.</del></p>	<p><b>3</b></p>
<p>(a)</p>	<p><u>Accommodate recycling bin(s) for recyclable materials accepted in local recycling programs.</u></p>	
<p>(b)</p>	<p><u>Where a local composting program exists, accommodate composting container(s) for locally accepted materials OR where the lot has a space for gardening, accommodate a composting bin(s) for on-site composting.</u></p>	
<p><b>(2)</b></p>	<p><u>In multifamily building, management provides recycling container and has designated recycling dumpsters onsite and /or contract with offsite sorting Recycling Facility</u><del>Compost facility is provided on the site.</del></p>	<p><b>3</b></p>

<p><b>607.2 Food waste disposers.</b> A minimum of one food waste disposer is installed at the primary kitchen sink.</p>	<p><b>1</b></p>
--	-----------------

**608  
RESOURCE-EFFICIENT MATERIALS**

<p><b>608.1 Resource-efficient materials.</b> Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:</p>		<p><b>9 Max 3 per each material</b></p>
<p><b>(1)</b></p>	<p>lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more that 25 percent</p>	
<p><b>(2)</b></p>	<p>engineered wood or engineered steel products</p>	
<p><b>(3)</b></p>	<p>roof or floor trusses</p>	

**609  
REGIONAL MATERIALS**

<p><b>609.1 Regional materials.</b> Regional materials are used for major and/or minor components of the building.</p>	<p><b>10 Max</b></p>
--	----------------------

<p><b>For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category – 75 percent or more of the stone veneer on a project must be sources regionally.</b></p>	<p><b>2 per each major component and 1 per each minor component</b></p>
---	---

**610 LIFE CYCLE ASSESSMENT**

<p><b>610.1 Life cycle assessment.</b> A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or, entire building designs. Points are awarded in accordance with Section 610.1.1 or 610.1.2. Only one method of analysis or tool may be utilized. The reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in Section 1001.1 or 1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA.</p>	<p><b>15 Max</b></p>
<p><b>610.1.1 Whole-building life cycle assessment.</b> A whole-building LCA is performed in conformance with ASTM E2921 using ISO14044 compliant life cycle assessment.</p>	<p><b>15 max</b></p>
<p><b>(1)</b> Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:</p>	<p><b>8</b></p>
<p><b>(a)</b> Primary energy use</p>	
<p><b>(b)</b> Global warming potential</p>	
<p><b>(c)</b> Acidification potential</p>	
<p><b>(d)</b> Eutrophication potential</p>	
<p><b>(e)</b> Ozone depletion potential</p>	
<p><b>(f)</b> Smog potential</p>	
<p><b>(2)</b> Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located</p>	<p><b>5</b></p>
<p><b>(3)</b> Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA.</p>	<p><b>2</b></p>

<p><b>610.1.2 Life cycle assessment for a product or assembly.</b> An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.</p>	<p><b>10 Max</b></p>
--	----------------------

<p><b>610.1.2.1 Product LCA.</b> A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. The environmental impact measures used in the assessment are selected from the following:</p>	<p><b>per Table 610.1.2.1 10 Max</b></p>
--	--

- (a) Primary energy use
- (b) Global warming potential
- (c) Acidification potential
- (d) Eutrophication potential
- (e) Ozone depletion potential
- (f) Smog potential

**(Points are awarded for each product/system comparison where the selected product/system improved upon the environmental impact measures by an average of 15 percent.)**

**Table 610.1.2.1  
Product LCA**

<b>4 Impact Measures</b>	<b>5 Impact Measures</b>
<b>POINTS</b>	
<b>2</b>	<b>3</b>

<p><b>610.1.2.2 Building assembly LCA.</b> A building assembly with improved environmental impact measures compared to an alternative assembly of the same function is selected. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment includes all structural elements, insulation, and wall coverings of the assembly. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following types of building assemblies are eligible for points under this practice:</p>	<p><b>per Table 610.1.2.2 10 Max</b></p>
--	--

- (a) exterior walls
- (b) roof/ceiling
- (c) interior walls or ceilings
- (d) intermediate floors

The environmental impact measures used in the assessment are selected from the following:

- (a) Primary energy use
- (b) Global warming potential
- (c) Acidification potential
- (d) Eutrophication potential
- (e) Ozone depletion potential
- (f) Smog potential

**(Points are awarded based on the number of types of building assemblies that improve upon environmental impact measures by an average of 15 percent.)**

**Table 610.1.2.2  
Building Assembly LCA**

	<b>4 Impact Measures</b>	<b>5 Impact Measures</b>
--	--------------------------	--------------------------

Number of Types of Building Assemblies	POINTS	
2 types	3	6
3 types	4	8
4 types	5	10

**611**  
**PRODUCT DECLARATIONS**

**611.1 Product declarations.** A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer’s name, company name, contact information, and date of the review. **5**

**611.1.1 Industry-wide declaration.** A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope.  
**(Each product complying with Section 611.4.1 shall be counted as one product for compliance with Section 611.4.)**

**611.1.2 Product Specific Declaration.** A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930.  
**(Each product complying with Section 611.4.2 shall be counted as two products for compliance with Section 611.4.)**

**611-612**  
**INNOVATIVE PRACTICES**

**611-612.1 Manufacturer’s environmental management system concepts.** Product manufacturer’s operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent. The aggregate value of building products from registered ISO 14001 or equivalent production facilities is 1 percent or more of the estimated total building materials cost. **10 Max**  
**(1 point awarded per percent.)**

**611-612.2 Sustainable products.** One or more of the following products are used for at least 30% of the floor or wall area of the entire dwelling unit or the sleeping unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065. **9 Max**



(1)	50% or more of carpet installed (by square feet) is certified to NSF 140 <a href="#">or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</a>	3
(2)	50% or more of resilient flooring installed (by square feet) is certified to NSF 332 <a href="#">or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</a>	3
(3)	50% or more of the insulation installed (by square feet) is certified to <del>EcoLogo</del> <a href="#">CCD-016UL 2985 or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</a>	3
(4)	50% or more of interior wall coverings installed (by square feet) is certified to NSF 342 <a href="#">or applicable multi-attribute standards.</a>	3
(5)	50% or more of the gypsum board installed (by square feet) is certified to UL 100 <a href="#">or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</a>	3
(6)	50% or more of the door leafs installed (by number of door leafs) is certified to UL 102 <a href="#">or applicable multi-attribute standards.</a>	3
(7)	50% or more of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials <a href="#">or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</a>	3

<b>614612.3 Universal design elements.</b> Dwelling incorporates one or more of the following universal design elements. Conventional industry construction tolerances are permitted.		<b>12 Max</b>
(1)	Any no-step entrance into the dwelling which (1) is accessible from a substantially level parking or drop-off area (no more than 2%) via an accessible path which has no individual change in elevation or other obstruction of more than 1-1/2 inches in height with the pitch not exceeding 1 in 12 and (2) provides a minimum 32-inch wide clearance into the dwelling.	3
(2)	Minimum 36-inch wide accessible route from the no-step entrance into at least one visiting room in the dwelling and into at least one full or half bathroom which has a minimum 32-inch clear door width and a 30-inch by 48-inch clear area inside the bathroom outside the door swing.	3
(3)	Minimum 36-inch wide accessible route from the no-step entrance into at least one bedroom which has a minimum 32-inch clear door width.	3
(4)	Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, if applicable.	1
(5)	All interior and exterior door handles are levers rather than knobs.	1
(6)	All sink, <del>lavatory and showering controls that comply with ICC A117.1 faucet controls are single-handle controls of both volume and temperature.</del>	1
(7)	Interior convenience Power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15" and 48" above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired.	1
(8)	All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices). Toggle-type switches may not be used.	1
(9)	Any of the following <a href="#">systems are automated and</a> can be controlled with a <del>(wireless) mobile device or voice-activated device such as a smartphone, tablet or laptop computer:</del> HVAC, <a href="#">all permanently-installed</a> lighting, alarm system, <a href="#">window treatments</a> , or door locks	<b>1 per system, max 5</b>

**RESOURCE EFFICIENCY**

**613.1 Intent.** Design and construction practices developed by a licensed design professional or equivalent are implemented that enhance the resilience and durability of the structure (above building code minimum design loads) so the structure can better withstand forces generated by; flooding, snow, wind or seismic (as applicable) and reduce the potential for the loss of life and property.

**613.2 Minimum structural requirements (base design).** Design and construction practices developed by a licensed design professional or equivalent are implemented that enhance the resilience and durability of the structure (above building code minimum design loads) so the structure can better withstand forces generated by; flooding, snow, wind or seismic (as applicable) and reduce the potential for the loss of life and property.

**613.3 Enhanced resilience – 10% above base design.** Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 10% higher than the base design.

**3**

**613.4 Enhanced resilience – 20% above base design.** Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 20% higher than the base design.

**5**

**613.5 Enhanced resilience – 30% above base design.** Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 30% higher than the base design.

**10**

**613.6 Enhanced resilience – 40% above base design.** Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 40% higher than the base design.

**12**

**613.7 Enhanced resilience – 50% above base design.** Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 50% higher than the base design.

**15**

**611.4 Product declarations.** A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review.

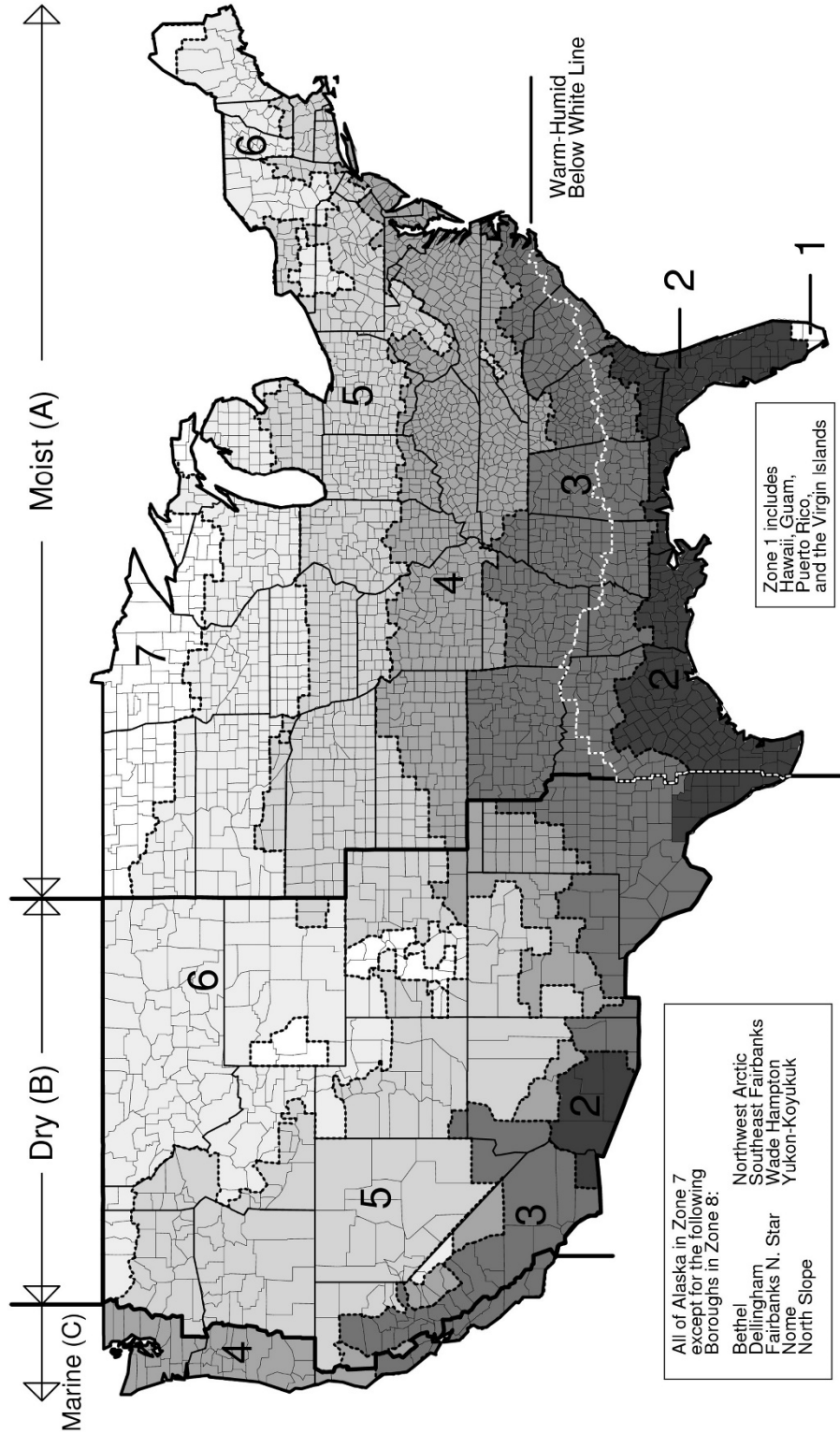
**5**

~~**611.4.1 Industry-wide declaration.** A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required to be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope.~~

~~**(Each product complying with Section 611.4.1 shall be counted as one product for compliance with Section 611.4.)**~~

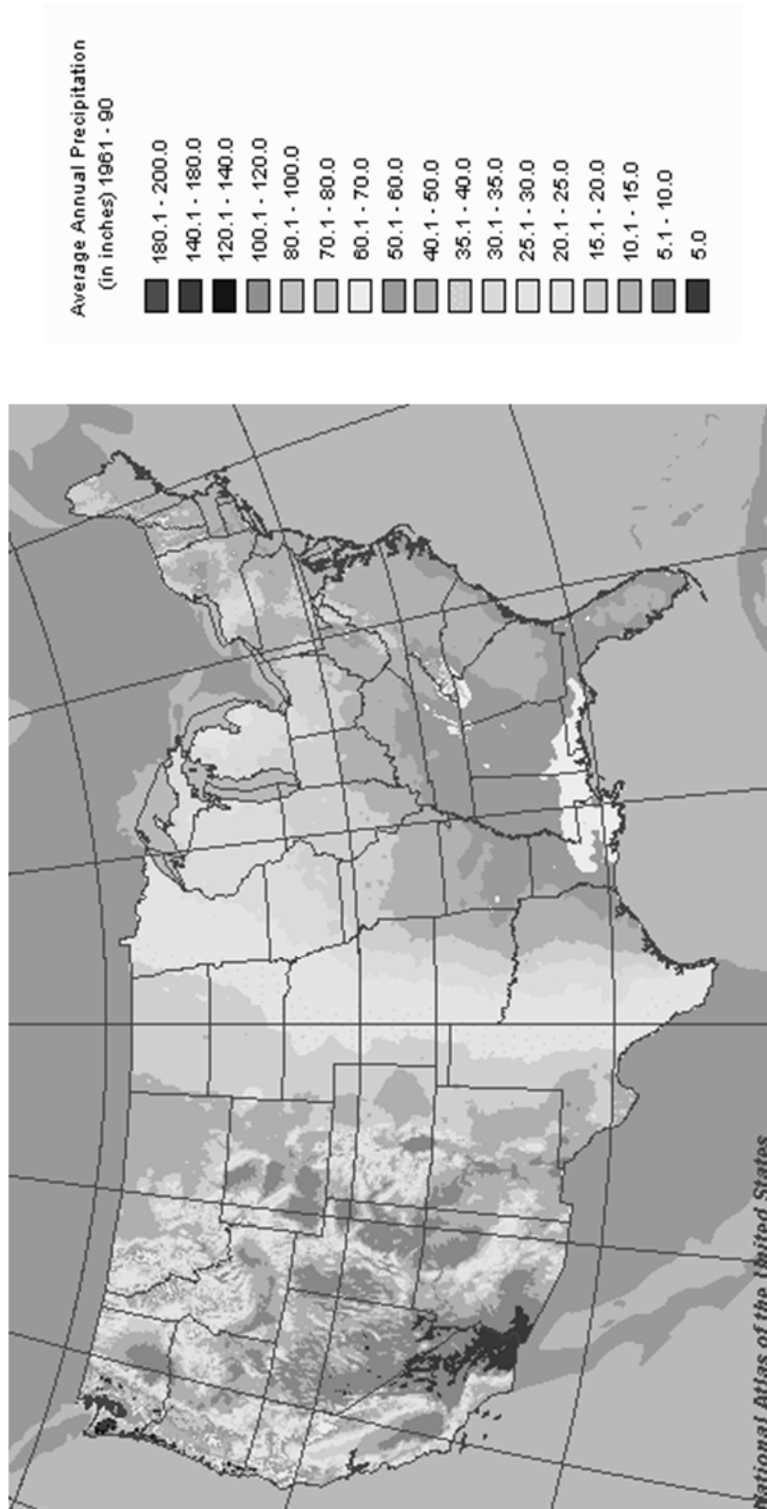
~~**611.4.2 Product Specific Declaration.** A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930.~~

~~**(Each product complying with Section 611.4.2 shall be counted as two products for compliance with Section 611.4.)**~~



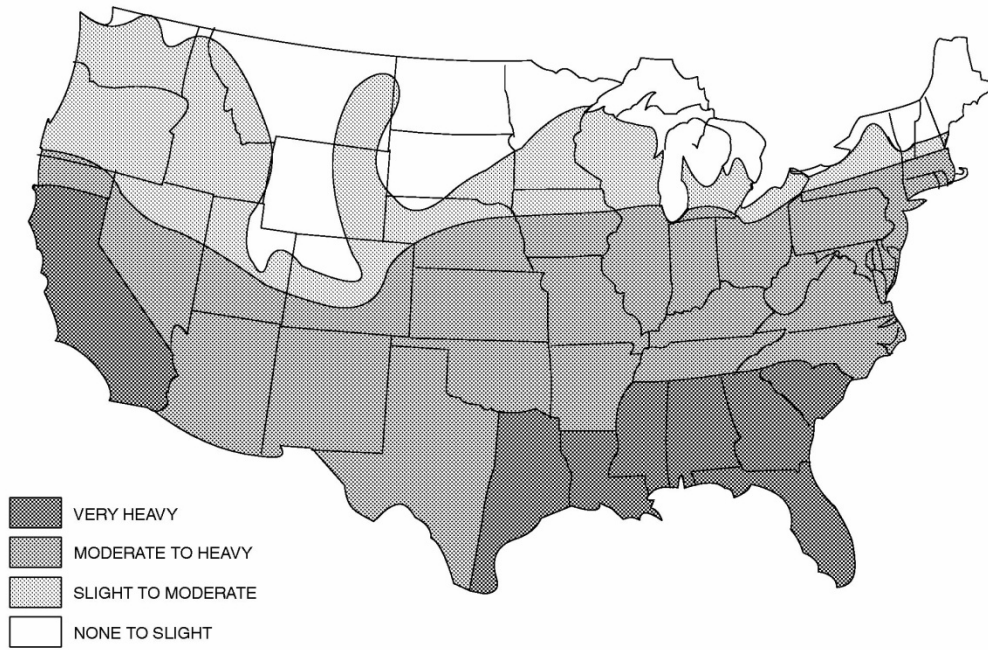
**FIGURE 6(1)  
CLIMATE ZONES**

Reprinted with permission from the 2015 International Residential Code, a copyrighted work of the International Code Council, [www.iccsafe.org](http://www.iccsafe.org).



**FIGURE 6(2)**  
**AVERAGE ANNUAL PRECIPITATION (inches)**

(Source: [www.nationalatlas.gov](http://www.nationalatlas.gov))



**FIGURE 6(3)**  
**TERMITE INFESTATION PROBABILITY MAP**

Reprinted with permission from the 2015 International Residential Code, a copyrighted work of the International Code Council, [www.iccsafe.org](http://www.iccsafe.org).

THIS PAGE INTENTIONALLY LEFT BLANK



# CHAPTER 7

## ENERGY EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

### 701 MINIMUM ENERGY EFFICIENCY REQUIREMENTS

**701.1 Mandatory requirements.** The building shall comply with Section 702 (Performance Path), Section 703 (Prescriptive Path), or Section 704 (HERS Index Target Path). Items listed as “mandatory” in Section 701.4 apply to all Paths. Unless otherwise noted, buildings in the Tropical Climate Zone shall comply with Climate Zone 1 requirements.

**701.1.1 Minimum Performance Path requirements.** A building complying with Section 702 shall include a minimum of two practices from Section 705, [or a minimum of one practice from Section 705 and a minimum of one practice from Section 706.](#)

**701.1.2 Minimum Prescriptive Path requirements.** A building complying with Section 703 shall obtain a minimum of 30 points from Section 703 and shall include a minimum of two practices from Section 705, [or a minimum of one practice from Section 705 and a minimum of one practice from Section 706.](#)

**701.1.3 HERS Index Target Path requirements.** A building complying with Section 704 shall obtain a minimum of 30 points from Section 704 and shall include a minimum of two practices from Section 705, [or a minimum of one practice from Section 705 and a minimum of one practice from Section 706.](#)

**701.1.4 Alternative bronze and silver level compliance.** As an alternative, any building that qualifies as an ENERGY STAR Version 3.0 Certified Home or ENERGY STAR Multifamily High Rise Version 1.0 Rev. 03 building [or demonstrates compliance with the 2018 IECC or Chapter 11 of the 2018 IRC](#) achieves the bronze level for Chapter 7. As an alternative, any building that qualifies as an ENERGY STAR Version 3.1 Certified Home or ENERGY STAR Multifamily High Rise Version 1.0 Rev. 03 (with the baseline at ASHRAE 90.1-2010) building achieves the silver level for Chapter 7. As an alternative in the Tropical Climate Zone, any building that meets all of the requirements in IECC Section R401.2.1 (Tropical Zone) achieves the silver level for Chapter 7. The buildings achieving compliance under Section 701.1.4 are not eligible for achieving a rating level above silver.

**701.1.5 Alternative gold level compliance.** [As an alternative, any building within the scope of the NGBS that complies with Chapter 7 of the ICC International Green Construction Code \(IgCC\) achieves the gold level for Chapter 7. Additionally, acceptable air tightness of individual residential units shall be demonstrated by a blower door test. The testing and sampling procedure shall be in accordance with the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, Revision 03 - 2015, with an allowable maximum leakage of 0.3 cfm/sf of enclosure bounding the apartment at an induced pressure difference of 50 pascals.](#)



GREEN BUILDING PRACTICES		POINTS
<b>701.1.6 Alternative gold level compliance for tropical zones.</b> One- or two-family dwelling in the tropical zone at an elevation less than 2,400 feet (731.5 m) above sea level that complies with the following shall achieve the gold level for chapter 7:		
(1)	The residence complies with IECC Tropical Zone than section R401.2.1	
(2)	The residence includes a minimum of 2 kW of PV and a minimum of 6 kWh of battery storage	
(3)	Any air conditioning has a minimum of 18 SEER	
(4)	Solar, wind or other renewable energy source supplies not less than 90 percent of the energy for service water heating	
(5)	Glazing in conditioned spaces has a solar heat gain coefficient of less than or equal to 0.25, or has an overhang with a projection factor equal to or greater than 0.30	
(6)	The exterior roof/ceiling complies with at least two of the following:	
	a. Minimum roof reflectance and emittance in IECC Table C402.3	
	b. Roof or ceiling has insulation with an R-value of R-15 or greater	
	c. Includes a radiant barrier	
(7)	Walls comply with at least one of the following:	
	a. Walls have an overhang with a projection factor equal to or greater than 0.30	
	b. Walls have insulation with an R-value of R-13 or greater	
	c. Walls have a solar reflectance of 0.64	
(8)	A ceiling fan is provided for bedrooms and the largest space that is not used as a bedroom; alternately a whole house fan is provided	
(9)	Wiring sufficient for a Level 2 (208/240V 40-80 amp) electric vehicle charging station is installed on the building site	
<b>701.2 Emerald level points.</b> The Performance Path (Section 702) or the HERS Index Target Path (Section 704) shall be used to achieve the emerald level.		
<b>701.3 Adopting entity review.</b> A review by the Adopting Entity or designated third party shall be conducted to verify design and compliance with Chapter 7.		
<b>701.4 Mandatory practices</b>		
<b>701.4.1 HVAC systems</b>		
<b>701.4.1.1 HVAC system sizing.</b> Space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. Equipment is selected using ACCA Manual S or equivalent.	<b>Mandatory</b>	
<b>701.4.1.2 Radiant and hydronic space heating.</b> Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ACCA 5 QI-2010, or an accredited design professional's and manufacturer's recommendations).	<b>Mandatory</b>	

GREEN BUILDING PRACTICES	POINTS
<b>701.4.2 Duct systems</b>	
<b>701.4.2.1 Duct air sealing.</b> Ducts are air sealed. All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer's instructions.	<b>Mandatory</b>
<b>701.4.2.2 Ducts and Plenums.</b> Building framing cavities are not used as ducts or plenums.	<b>Mandatory</b>
<b>701.4.2.3 Duct system sizing.</b> Duct system is sized and designed in accordance with ACCA Manual D or equivalent.	<b>Mandatory</b>
<b>701.4.3 Insulation and air sealing.</b>	
<b>701.4.3.1 Building Thermal Envelope Air Sealing.</b> The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material:	<b>Mandatory</b>
<ul style="list-style-type: none"> <li>(a) All joints, seams and penetrations.</li> <li>(b) Site-built windows, doors, and skylights.</li> <li>(c) Openings between window and door assemblies and their respective jambs and framing.</li> <li>(d) Utility penetrations.</li> <li>(e) Dropped ceilings or chases adjacent to the thermal envelope.</li> <li>(f) Knee walls.</li> <li>(g) Walls, <del>and ceilings, and floors</del> separating <del>a garage from</del> conditioned spaces <u>from unconditioned</u>.</li> <li>(h) Behind tubs and showers on exterior walls.</li> <li>(i) Common walls between dwelling units <u>or sleeping units</u>.</li> <li>(j) Attic access openings.</li> <li>(k) <del>Rim joist junction</del> <u>Joints of framing members at rim joists</u>.</li> <li>(l) <u>Top and bottom plates</u></li> <li>(m) Other sources of infiltration.</li> </ul>	
<b>701.4.3.2 Air <u>barrier, air sealing, building envelope testing, and insulation</u>.</b> <del>Grade II and III insulation installation is not permitted.</del> Building envelope air <u>barrier, air sealing envelope tightness,</u> and insulation installation is verified to be in accordance with <u>this Section 701.4.3.2(1) and 701.4.3.2(2) and Section 701.4.3.2.1. Insulation installation other than Grade 1 is not permitted.</u>	<b>Mandatory</b>
<b>(1) Testing.</b> Building envelope tightness is tested. Testing is conducted in accordance with ASTM E-779 using a blower door at a test pressure of 1.04 psf (50 Pa). Testing is conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. Testing is conducted under the following conditions:	

GREEN BUILDING PRACTICES	POINTS
<p>(a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;</p> <p>(b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;</p> <p>(c) Interior doors are open;</p> <p>(d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;</p> <p>(e) Heating and cooling systems are turned off;</p> <p>(f) HVAC duct terminations are not sealed; and</p> <p>(g) Supply and return registers are not sealed.</p>	
<p><b>Multifamily Building Note:</b> Testing by dwelling units, <a href="#">sleeping units</a>, groups of dwelling units, <a href="#">groups of sleeping units</a>, or the building as a whole is acceptable.</p>	
<p>(2) <b>Visual inspection.</b> The air barrier and insulation items listed in Table 701.4.3.2(2) are field verified by visual inspection.</p>	
<p><b>701.4.3.2.1</b> Grade I insulation installations. <a href="#">Field-installed insulation products to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements, and crawlspaces, except as specifically noted, are verified as Grade I by a third-party</a> are in accordance with the following:</p> <p><del>(1) Grading applies to field-installed insulation products.</del></p> <p><del>(2) Grading applies to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements and crawlspaces, except as specifically noted.</del></p> <p><del>(13)</del> Inspection is conducted before insulation is covered.</p> <p><del>(24)</del> Air-permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate.</p> <p><del>(35)</del> Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).</p> <p><del>(46)</del> Cavity insulation compression or incomplete fill amounts to 2 percent or less, presuming the compressed or incomplete areas are a minimum of 70 percent of the intended fill thickness; occasional small gaps are acceptable.</p> <p><del>(57)</del> Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.</p> <p><del>(68)</del> Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.</p> <p><del>(79)</del> Exterior sheathing is not visible from the interior through gaps in the cavity insulation.</p> <p><del>(81)</del> Faced batt insulation is permitted to have side-stapled tabs, provided the tabs are stapled neatly with no buckling, and provided the batt is compressed only at the edges of each cavity, to the depth of the tab itself.</p> <p><del>(91)</del> Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with <a href="#">the Grade 1 insulation installation requirements in this section.</a></p>	<p><b>Mandatory</b></p>

**Table 701.4.3.2(2)**  
**Air Barrier and Insulation Installation**

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjamb and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

GREEN BUILDING PRACTICES	POINTS
<p><b>701.4.3.3 Multifamily air leakage alternative.</b> Multifamily buildings four or more stories in height and in compliance with IECC section C402.5 (Air leakage-thermal envelope) are deemed to comply with Sections 701.4.3.1 and 701.4.3.2.</p>	
<p><b>701.4.3.4 Fenestration air leakage.</b> Windows, skylights and sliding glass doors have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m<sup>2</sup>), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m<sup>2</sup>), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. <a href="#">Site-built fenestration products have a certificate of compliance.</a> This practice does not apply to <a href="#">site-built windows, skylights, and doors/field-fabricated fenestration products.</a></p> <p><a href="#">Exception: For Tropical Zones Only, Jalousie windows are permitted to be used as a conditioned space boundary and shall have an air infiltration rate of not more than 1.3 cfm per square foot</a></p>	<b>Mandatory</b>
<p><b>701.4.3.5 Recessed lighting in building thermal envelope.</b> <del>Recessed</del> luminaires installed in the building thermal envelope <a href="#">which penetrate the air barrier</a> are sealed to limit air leakage between conditioned and unconditioned spaces. All <del>recessed</del> luminaires <a href="#">installed in the building thermal envelope which penetrate the air barrier</a> are IC-rated and labeled as meeting ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All <del>recessed</del> luminaires <a href="#">installed in the building thermal envelope which penetrate the air barrier</a> are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.</p>	<b>Mandatory</b>
<p><b>701.4.4 High-efficacy lighting.</b> Lighting efficacy in dwelling units <a href="#">or sleeping units</a> is in accordance with one of the following:</p> <p>(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent</p> <p>(2) Lighting power density, measured in watts/square foot, is 1.1 or less.</p>	<b>Mandatory</b>
<p><b>701.4.5 Boiler <del>supply</del> piping.</b> Boiler <del>supply</del> piping in unconditioned space <a href="#">supplying and returning heated water or steam</a> is insulated.</p>	<b>Mandatory</b>
<p><b>702 PERFORMANCE PATH</b></p>	
<p><b>702.1 Point allocation.</b> Points from Section 702 (Performance Path) shall not be combined with points from Section 703 (Prescriptive Path) or Section 704 (HERS Index Target Path).</p>	<b>Mandatory for Section 702</b>
<p><b>702.2 Energy performance levels</b></p>	
<p><b>702.2.1 ICC IECC analysis.</b> Energy efficiency features are implemented to achieve energy cost <a href="#">or site energy</a> or source energy performance that meets the ICC IECC. A documented analysis using software in accordance with ICC IECC, Section R405, or ICC IECC Section C407.2 through C407.5, applied as defined in the ICC IECC, is required.</p>	<b>Mandatory for Section 702</b>
<p><b>702.2.2 Energy performance analysis.</b> Energy savings levels above the ICC IECC are determined through an analysis that includes improvements in building envelope, air infiltration,</p>	

GREEN BUILDING PRACTICES	POINTS
<p>heating system efficiencies, cooling system efficiencies, duct sealing, water heating system efficiencies, lighting, <del>and</del> appliances, <u>and on-site renewable energy</u>. Points are assigned using the following formula:</p> $\text{Points} = 30 + (\text{percent above ICC IECC 2015}) * 2$	
<p><b>Multifamily Building Note:</b> Modeling is completed building-wide using one of the following methods: whole building energy modeling, a unit-by-unit approach, or a building average of a unit-by-unit approach.</p>	
<p><b>702.2.3 Tropical standard reference design.</b> For the Tropical Climate Zone, the standard reference design shall use the specifications in IECC Section R401.2.1 (Tropical Zone).</p>	
<p><b>703 PRESCRIPTIVE PATH</b></p>	
<p><b>703.1 Mandatory practices</b></p>	<p><b>30</b></p>
<p><b>703.1.1 UA-Building Thermal Envelope Compliance.</b> The building thermal envelope is in compliance with Section 703.1.1.1 or 703.1.1.2. <b>Exception:</b> Section 703.1.1 is not required for Tropical Climate Zone.</p>	<p><b>Mandatory for Section 703</b></p>
<p><b>703.1.1.1 Maximum UA and SHGC.</b> For IECC residential <u>buildings</u>, the total building UA is less than or equal to the total maximum UA as computed by <del>2015</del>IECC IECC Section R402.1.5. <u>The SHGC requirements for fenestration in Table R402.1.2 are also met.</u> For IECC commercial <u>buildings</u>, the total UA is less than or equal to the sum of the UA for <del>2015</del>IECC IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. <u>The SHGC requirements for fenestration in Table C402.4 are also met.</u> The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.</p>	
<p><b>703.1.1.2 Prescriptive R-values and fenestration requirements.</b> The building thermal envelope is in accordance with the insulation and fenestration requirements of <del>2015</del>IECC IECC Table R402.1.2<del>4</del> or Tables C402.1.3. <u>The fenestration U-factors and SHGC's are in accordance with Table 703.2.5.1 or ICC IECC Table and C402.4. The SHGC is in accordance with the 2015 IECC requirements.</u></p>	
<p><b>703.1.2 Building Envelope Leakage.</b> The building thermal envelope is in accordance with <del>2015</del>IECC IECC R402.4.1.2 or C402.5 as applicable. <b>Exception:</b> Section 703.1.2 is not required for Tropical Climate Zone.</p>	<p><b>Mandatory for Section 703</b></p>
<p><b>703.1.3 Duct Testing.</b> The duct system is in accordance with <del>2015</del>IECC IECC R403.3.2 through R403.3.5 as applicable.</p>	<p><b>Mandatory for Section 703</b></p>

<b>GREEN BUILDING PRACTICES</b>	<b>POINTS</b>
---------------------------------	---------------

**703.2 Building envelope**

**703.2.1 UA improvement.** The total building thermal envelope UA is less than or equal to the [baseline](#) total UA resulting from the U-factors provided in Table 703.2.1(a) or [ICC](#) IECC Tables C402.1.4 and C402.4, as applicable. Where insulation is used to achieve the UA improvement, the insulation installation is in accordance with Grade 1 [requirements as graded meeting Section 701.4.3.2.1 as verified](#) by a third-party. Total UA is documented using a RESCheck, COMCheck, or equivalent report to verify the baseline and the UA improvement.

**Per Table 703.2.1(b)**

**Table 703.2.1(a)**  
**Equivalent Baseline U-Factors<sup>a</sup>**

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor <sup>b</sup>	Floor U-Factor	Basement Wall U-Factor	Crawlspace Wall U-Factor <sup>c</sup>
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091 <sup>c</sup>	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

- a. Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.
- b. Where more the half the insulation is on the interior, the mass wall U-factors is a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except in Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
- c. Basement wall U-factor of 0.360 in warm-humid locations.

**Table 703.2.1(b)**  
**Points for Improvement in Total Building Thermal Envelope UA Compared to Baseline UA**

Minimum UA Improvement	Climate Zone							
	1 <sup>a</sup>	2	3	4	5	6	7	8
	<b>POINTS</b>							
0 to <5%	0	0	0	0	0	0	0	0
5% to <10%	2	3	3	3	3	3	3	3
10% to <15%	3	6	5	6	6	6	5	7
15% to <20%	5	9	8	9	9	9	8	10
20% to <25%	6	12	10	12	12	12	11	13
25% to <30%	8	15	13	16	14	15	14	17
30% to <35%	10	18	16	19	17	18	16	20
≥35%	11	21	18	22	20	21	19	23

- a. Tropical Climate Zone: Points are Climate Zone 1 points divided by 2 and rounded down
- Exception: [For the](#) Tropical Climate Zone, crawl space, basement, [and](#) floor u-factors are [not applicable](#) excluded from the total building thermal envelope UA improvement calculation.

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

**703.2.2 Mass walls.** More than 75 percent of the above-grade exterior opaque wall area of the building is mass walls.

**Per Table 703.2.2**

**Table 703.2.2  
Exterior Mass Walls**

Mass thickness	Climate Zone			
	1-4	5	6	7-8
<b>POINTS</b>				
≥3 inch to <6 inch	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
>6 inch	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>

**703.2.3** A radiant barrier with an emittance of 0.05 or less is used in the attic. The product is tested in accordance with ASTM C1371 and installed in accordance with the manufacturer's instructions.

**Per Table 703.2.3**

**Table 703.2.3  
Radiant Barriers**

Climate Zone	<b>POINTS</b>
<b>Tropical</b>	<b>3</b>
1	<b>2</b>
2-3	<b>3</b>
4-5	<b>1</b>
6-8	<b>0</b>

**(In climate zones 1-3, one point maximum for multifamily buildings four or more stories in height.)**

**703.2.4 Building envelope leakage.** The maximum building envelope leakage rate is in accordance with Table 703.2.4a or Table 703.2.4b and whole building ventilation is provided in accordance with Section 902.2.1.

**Per Table 703.2.4**

**Table 703.2.4a  
Building Envelope Leakage**

Max Envelope Leakage Rate (ACH50)	Climate Zone							
	1	2	3	4	5	6	7	8
<b>POINTS</b>								
4	<b>1</b>	<b>2</b>	-	-	-	-	-	-
3	<b>2</b>	<b>4</b>	-	-	-	-	-	-
2	<b>3</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>7</b>
1	<b>4</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>10</b>	<b>15</b>	<b>11</b>

**Table 703.2.4b  
Building Envelope Leakage**

Max Envelope Leakage Rate (ELR50)	Climate Zone							
	1	2	3	4	5	6	7	8
<b>POINTS</b>								
0.28	<b>1</b>	<b>2</b>	-	-	-	-	-	-
0.23	<b>2</b>	<b>4</b>	-	-	-	-	-	-
0.18	<b>3</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>7</b>
0.13	<b>4</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>10</b>	<b>15</b>	<b>11</b>

Where ELR50 = CFM50 / Shell Area  
CFM50 = cubic feet per minute at 50 Pa



<b>GREEN BUILDING PRACTICES</b>	<b>POINTS</b>
---------------------------------	---------------

**(Points not awarded if points are taken under Section 705.6.2.1)**

**703.2.5 Fenestration**

**703.2.5.1** NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) on an area-weighted average basis do not exceed the values in Table 703.2.5.1. Area weighted averages are calculated separately for the categories of 1) windows and exterior doors and 2) skylights and tubular daylighting devices (TDDs). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m<sup>2</sup>) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.

**Mandatory for Section 703**

~~**703.2.5.1.1 Dynamic glazing.** Dynamic glazing is permitted to satisfy the SHGC requirements of Table 703.2.5.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4 and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Table 703.2.5.1.~~

**Table 703.2.5.1  
Fenestration Specifications**

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1	0.50	0.25
2	0.40	0.25
3	<del>0.35</del> 0.32	0.25
4	<del>0.35</del> 0.32	0.40
5 to 8	<del>0.32</del> 0.30*	Any
	Skylights and TDDs (maximum certified ratings)	
1	0.75	0.30
2	0.65	0.30
3	0.55	0.30
4	0.55	0.40
5 to 8	0.55	Any

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

\*Exception: A maximum U-factor of 0.32 shall apply in climate zones 5 – 8 to vertical fenestration products installed in buildings located: (i) above 4000 feet in elevation above sea level or (ii) in windborne debris regions where protection of openings is provided by fenestration as required under IRC section R301.2.1.2.

Mandatory for Section 703

~~**703.2.5.1.1 Dynamic glazing.** Dynamic glazing is permitted to satisfy the SHGC requirements of Table 703.2.5.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4 and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically~~

GREEN BUILDING PRACTICES	POINTS
<p><a href="#">controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Table 703.2.5.1.</a></p>	
<p><b>703.2.5.2</b> The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.2.5.2(a), (b), or (c). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m<sup>2</sup>) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.</p>	<p><b>Per Table 703.2.5.2(a) or Table 703.2.5.2(b) or Table 703.2.5.2(c)</b></p>
<p><del><b>703.2.5.2.1 Dynamic glazing.</b> Dynamic glazing is permitted to satisfy the SHGC requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c) provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration, and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c).</del></p>	

## GREEN BUILDING PRACTICES

## POINTS

**Table 703.2.5.2(a)**  
**Enhanced Fenestration Specifications**

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
1	0.40	0.25	0.60	0.28	1
2	0.40	0.25	0.60	0.28	1
3	0.30	0.25	0.53	0.28	2
4	0.30	0.40	0.53	0.35	3
5	0.27 <sup>a</sup>	Any	0.50	Any	3
6	0.27 <sup>a</sup>	Any	0.50	Any	4
7	0.27 <sup>a</sup>	Any	0.50	Any	4
8	0.27 <sup>a</sup>	Any	0.50	Any	4

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

[a. An equivalent energy performance is permitted based on fenestration meeting the requirements of Section B. Equivalent Energy Performance in ENERGY STAR Product Specification Residential Windows, Doors, and Skylights, Eligibility Criteria Version 6.0.](#)

**Table 703.2.5.2(b)**  
**Enhanced Fenestration Specifications**

Climate Zone	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
1	0.38	0.25	0.55	0.28	2
2	0.38	0.25	0.53	0.28	3
3	0.30	0.25	0.50	0.28	4
4	0.28	0.40	0.50	0.35	4
5	0.25	Any	0.48	Any	4
6	0.25	Any	0.48	Any	5
7	0.25	Any	0.46	Any	5
8	0.25	Any	0.46	Any	4

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

**Table 703.2.5.2(c)**  
**Enhanced Fenestration Specifications**

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
4	0.25	0.40	0.45	0.40	6
5-8	0.22	Any	0.42	Any	6

**(Points for multifamily buildings four or more stories in height are awarded at 3 times the point value listed in Table 703.2.5.2(c))**

<b>GREEN BUILDING PRACTICES</b>	<b>POINTS</b>
---------------------------------	---------------

**703.2.5.2.1 Dynamic glazing.** Dynamic glazing is permitted to satisfy the SHGC requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c) provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration, and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c).

**703.3 HVAC equipment efficiency**

**703.3.0 Multiple heating and cooling systems.** For multiple heating or cooling systems in one home, practices 703.3.1 through 703.3.6 apply to the system that supplies 80% or more of the total installed heating or cooling capacity. Where multiple systems each serve less than 80% of the total installed heating or cooling capacity, points under Sections 703.3.1 through 703.3.6 are awarded either for the system eligible for the fewest points or the weighted average of the systems. The weighted average shall be calculated in accordance with the following equation and be based upon the efficiency and capacity of the equipment as selected in accordance with ACCA Manual S with its loads calculated in accordance with ACCA Manual J.

Weighted Average =  $[(E_{unit\ 1} * C_{unit\ 1}) + (E_{unit\ 2} * C_{unit\ 2}) + \dots + (E_{unit\ n} * C_{unit\ n})] / (C_{unit\ 1} + C_{unit\ 2} + \dots + C_{unit\ n})$   
 where:  
 E = Rated AHRI efficiency for unit  
 C = Rated heating or cooling capacity for unit  
 n = Unit count

<p><b>703.3.1</b> Combination space heating and water heating system (combo system) is installed using either a coil from the water heater connected to an air handler to provide heat for the building <del>or</del> dwelling unit <u>or sleeping unit</u>, or a space heating boiler using an indirect-fired water heater. Devices have a minimum combined annual efficiency of 0.80 and a minimum water heating recovery efficiency of 0.87.</p>	<b>4</b>
---	----------

**703.3.2** Furnace and/or boiler efficiency is in accordance with one of the following:

<p>(1) Gas and propane heaters:</p> <p style="text-align: center;"><b>Table 703.3.2(1)(a)</b> <b>Gas and Propane Heaters</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">AFUE</th> <th colspan="8">Climate Zone</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> <tr> <th colspan="9"><b>POINTS</b></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">≥90% AFUE</td> <td>0</td> <td>2</td> <td>3</td> <td>6</td> <td>6</td> <td>9</td> <td>10</td> <td>12</td> </tr> <tr> <td style="text-align: left;">≥92% AFUE</td> <td>0</td> <td>2</td> <td>4</td> <td>7</td> <td>8</td> <td>10</td> <td>12</td> <td>14</td> </tr> <tr> <td style="text-align: left;">≥94% AFUE</td> <td>0</td> <td>3</td> <td>4</td> <td>9</td> <td>9</td> <td>12</td> <td>14</td> <td>16</td> </tr> <tr> <td style="text-align: left;">≥96% AFUE</td> <td>1</td> <td>3</td> <td>5</td> <td>10</td> <td>10</td> <td>14</td> <td>16</td> <td>19</td> </tr> <tr> <td style="text-align: left;">≥98% AFUE</td> <td>1</td> <td>3</td> <td>6</td> <td>11</td> <td>12</td> <td>16</td> <td>18</td> <td>21</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Table 703.3.2(1)(b)</b> <b>Gas and Propane Heaters for Multifamily Buildings Four or More Stories in Height</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">AFUE</th> <th>Climate Zone</th> </tr> </thead> </table>	AFUE	Climate Zone								1	2	3	4	5	6	7	8	<b>POINTS</b>									≥90% AFUE	0	2	3	6	6	9	10	12	≥92% AFUE	0	2	4	7	8	10	12	14	≥94% AFUE	0	3	4	9	9	12	14	16	≥96% AFUE	1	3	5	10	10	14	16	19	≥98% AFUE	1	3	6	11	12	16	18	21	AFUE	Climate Zone	<p><b>Per Table 703.3.2(1)(a) or 703.3.2(1)(b)</b></p>
AFUE		Climate Zone																																																																								
	1	2	3	4	5	6	7	8																																																																		
<b>POINTS</b>																																																																										
≥90% AFUE	0	2	3	6	6	9	10	12																																																																		
≥92% AFUE	0	2	4	7	8	10	12	14																																																																		
≥94% AFUE	0	3	4	9	9	12	14	16																																																																		
≥96% AFUE	1	3	5	10	10	14	16	19																																																																		
≥98% AFUE	1	3	6	11	12	16	18	21																																																																		
AFUE	Climate Zone																																																																									

GREEN BUILDING PRACTICES								POINTS	
	1	2	3	4	5	6	7	8	
	<b>POINTS</b>								
≥90% AFUE	0	4	4	8	8	10	11	13	
≥92% AFUE	0	4	4	9	10	11	12	14	
≥94% AFUE	0	5	5	10	11	12	14	16	
≥96% AFUE	0	5	5	12	12	13	15	17	
≥98% AFUE	0	6	6	13	13	14	16	18	
<b>(2)</b> Oil furnace:	<b>Table 703.3.2(2)</b> <b>Oil Furnace</b>								Per Table 703.3.2(2)
	<b>Climate Zone</b>								
<b>AFUE</b>	1	2	3	4	5	6	7	8	
	<b>POINTS</b>								
≥85% AFUE	0	1	2	3	3	4	5	6	
≥90% AFUE	0	2	3	6	6	9	10	12	
<b>(3)</b> Gas boiler:	<b>Table 703.3.2(3)</b> <b>Gas Boiler</b>								Per Table 703.3.2(3)
	<b>Climate Zone</b>								
<b>AFUE</b>	1	2	3	4	5	6	7	8	
	<b>POINTS</b>								
≥85% AFUE	0	1	1	2	3	4	4	4	
≥90% AFUE	0	1	2	4	6	7	8	6	
≥94% AFUE	0	2	3	5	8	9	10	8	
≥96% AFUE	0	2	4	6	9	11	12	10	
<b>(4)</b> Oil boiler:	<b>Table 703.3.2(4)</b> <b>Oil Boiler</b>								Per Table 703.3.2(4)
	<b>Climate Zone</b>								
<b>AFUE</b>	1	2	3	4	5	6	7	8	
	<b>POINTS</b>								
≥85% AFUE	0	1	1	3	3	4	4	5	
≥90% AFUE	1	2	3	5	6	7	9	10	
<b>703.3.3</b> Heat pump heating efficiency is in accordance with Table 703.3.3(1) or Table 703.3.3(2) or Table 703.3.3(3). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.	<b>Table 703.3.3(1)</b> <b>Electric Heat Pump Heating</b>								Per Table 703.3.3(1) or Table 703.3.3(2) or Table 703.3.3(3)
	<b>Climate Zone</b>								
<b>Efficiency</b>	1	2	3	4	5	6-8 <sup>a</sup>			
	<b>POINTS</b>								
≥8.5 HSPF (11.5 EER)	0	1	1	2	2	2			
≥9.0 HSPF (12.5 EER)	0	2	4	5	6	10			

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

≥9.5 HSPF	0	3	7	7	11	18
≥10.0 HSPF	1	5	10	10	15	26
<u>≥12.0 HSPF</u>	<u>1</u>	<u>6</u>	<u>11</u>	<u>11</u>	<u>17</u>	<u>28</u>

a. Equipment designed to operate in cold climates is recommended to minimize use of resistance heat when installing a heat pump in Zones 6-8.

**Table 703.3.3(2)**  
**Electric Heat Pump Heating for Multifamily Buildings Four or More Stories in Height**

Efficiency	Climate Zone					
	1	2	3	4	5	6-8 <sup>a</sup>
<b>POINTS</b>						
≥8.5 HSPF (11.5 EER)	0	3	4	8	11	13

a. Equipment designed to operate in cold climates is recommended to minimize use of resistance heat when installing a heat pump in Zones 6-8.

**Table 703.3.3(3)**  
**Gas Engine-Driven Heat Pump Heating**

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
<b>POINTS</b>						
≥1.3 COP at 47°F	2	7	11	14	16	18

**703.3.4** Cooling efficiency is in accordance with Table 703.3.4(1) or Table 703.3.4(2). Refrigerant charge is verified for compliance with manufacturer’s instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

**Per Table 703.3.4(1) or Table 703.3.4(2)**

**Table 703.3.4(1)**  
**Electric Air Conditioner and Heat Pump Cooling<sup>a</sup>**

Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
<b>POINTS</b>								
≥15 SEER (12.5 EER)	<u>96</u>	<u>64</u>	<u>32</u>	1	1	1	1	0
≥17 SEER (12.5 EER)	11	9	7	3	3	2	2	0
≥19 SEER (12.5 EER)	19	12	10	6	4	4	4	0
≥21 SEER	26	15	14	8	6	6	5	0
<u>≥25 SEER</u>	<u>29</u>	<u>18</u>	<u>17</u>	<u>10</u>	<u>8</u>	<u>8</u>	<u>6</u>	<u>0</u>

a. Tropical Climate Zone: where none of the occupied space is air conditioned and where ceiling fans are provided for bedrooms and the largest space which is not used as a bedroom, 20 points is awarded.

**Table 703.3.4(2)**  
**Gas Engine-Driven Heat Pump Cooling**

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
<b>POINTS</b>						
>1.2 COP at 95°F	3	6	3	1	1	0

**703.3.5** Water source cooling and heating efficiency is in accordance with Table 703.3.5. Refrigerant charge is verified for compliance with manufacturer’s instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

**Per Table 703.3.5**

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>Table 703.3.5</b> <b>Water Source Cooling And Heating</b>						
<b>Efficiency</b>	<b>Climate Zone</b>					
	1	2	3	4	5	6-8
<b>POINTS</b>						
≥15 EER, ≥4.0 COP	14	18	22	30	37	37

<b>703.3.6</b> Ground source heat pump is installed by a Certified Geothermal Service Contractor in accordance with Table 703.2.5. Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.	<b>Per Table 703.3.6</b>
--	--------------------------

<b>Table 703.3.6</b> <b>Ground source heat pump<sup>a</sup></b>					
<b>Efficiency</b>	<b>Climate Zone</b>				
	1	2	3	4	5-68
<b>POINTS</b>					
≥16.0 EER, ≥3.6 COP	1	1	2	16	22
≥24.0 EER, ≥4.3 COP	24	29	22	31	35
≥28.0 EER, ≥4.8 COP	42	46	35	42	44

a. The ground loop is sized to account for the ground conductance and the expected minimum incoming water temperature to achieve rated performance.

<b>703.3.7</b> ENERGY STAR, or equivalent, ceiling fans are installed.  <div style="text-align: right;">(Points awarded per building.)</div>	<b>1</b>
--	----------

(For Tropical Climate Zone and Climate Zones 2B, 3B, and 4B: points awarded per fan where AC is not installed in the dwelling unit <a href="#">or sleeping unit</a> (Max 8 points), and where points awarded in Section 703.3.8 for these specific climate zones, points shall not be awarded in Section 703.3.7)	
---	--

<b>703.3.8</b> Whole-building or whole-dwelling unit <a href="#">or whole-sleeping unit</a> fan(s) with insulated louvers and a sealed enclosure is installed.  <div style="text-align: right;">(Points awarded per building.)</div>	<b>Per Table 703.3.8</b>
--	--------------------------

<b>Table 703.3.8</b> <b>Whole dwelling unit fan</b>		
<b>Climate Zone</b>		
1-3, Tropical	4-6	7-8
<b>POINTS</b>		
4	3	0

<b>703.4 Duct systems</b>
---------------------------

<b>703.4.1</b> All space heating is provided by a system(s) that does not include air ducts.	
--	--

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<p><b>Table 703.4.1</b> <b>Ductless heating system</b></p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">Climate Zone</th> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6-8</td> </tr> <tr> <th colspan="6" style="text-align: center;">POINTS</th> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">6</td> <td style="text-align: center;">8</td> <td style="text-align: center;">8</td> </tr> </table> <p><b>(No points awarded for multifamily buildings four or more stories in height.)</b></p>	Climate Zone						1	2	3	4	5	6-8	POINTS						0	2	4	6	8	8	<p>Per Table 703.4.1</p>
Climate Zone																									
1	2	3	4	5	6-8																				
POINTS																									
0	2	4	6	8	8																				

<p><b>703.4.2</b> All space cooling is provided by a system(s) that does not include air ducts.</p> <p style="text-align: center;"><b>Table 703.4.2</b> <b>Ductless cooling system</b></p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">Climate Zone</th> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6-8</td> </tr> <tr> <th colspan="6" style="text-align: center;">POINTS</th> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">8</td> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> </table> <p><b>(No points awarded for multifamily buildings four or more stories in height.)</b></p>	Climate Zone						1	2	3	4	5	6-8	POINTS						8	8	4	2	1	0	<p>Per Table 703.4.2</p>
Climate Zone																									
1	2	3	4	5	6-8																				
POINTS																									
8	8	4	2	1	0																				

<p><b>703.4.3</b> Ductwork is in accordance with all of the following:</p> <p>(1) Building cavities are not used as return ductwork.</p> <p>(2) Heating and cooling ducts and mechanical equipment are installed within the conditioned building space.</p> <p>(3) Ductwork is not installed in exterior walls.</p> <p style="text-align: center;"><b>Table 703.4.3</b> <b>Ducts</b></p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">Climate Zone</th> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6-8</td> </tr> <tr> <th colspan="6" style="text-align: center;">POINTS</th> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">10</td> <td style="text-align: center;">8</td> <td style="text-align: center;">8</td> <td style="text-align: center;">8</td> <td style="text-align: center;">4</td> </tr> </table> <p><b>(No points awarded for multifamily buildings four or more stories in height.)</b></p>	Climate Zone						1	2	3	4	5	6-8	POINTS						8	10	8	8	8	4	<p>Per Table 703.4.3</p>
Climate Zone																									
1	2	3	4	5	6-8																				
POINTS																									
8	10	8	8	8	4																				

<p><b>703.4.4 Duct Leakage.</b> The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for total leakage at a pressure differential of 0.1 inches w.g. (25 Pa) and maximum air leakage is equal to or less than 6 percent of the system design flow rate or 4 cubic feet per minute per 100 square feet of conditioned floor area.</p> <p style="text-align: center;"><b>Table 703.4.4</b> <b>Duct Leakage</b></p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th rowspan="2" style="text-align: center;">Ductwork location</th> <th colspan="6" style="text-align: center;">Climate Zone</th> </tr> <tr> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">5</th> <th style="text-align: center;">6-8</th> </tr> <tr> <th colspan="7" style="text-align: center;">POINTS</th> </tr> <tr> <td style="padding: 5px;">ductwork <i>entirely outside</i> the building's thermal envelope</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="padding: 5px;">ductwork <i>entirely inside</i> the building's thermal envelope</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="padding: 5px;">ductwork <i>inside and outside</i> the building's thermal envelope</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </table>	Ductwork location	Climate Zone						1	2	3	4	5	6-8	POINTS							ductwork <i>entirely outside</i> the building's thermal envelope	4	5	4	3	2	1	ductwork <i>entirely inside</i> the building's thermal envelope	1	1	1	1	1	1	ductwork <i>inside and outside</i> the building's thermal envelope	3	4	3	2	1	1	<p>Per Table 703.4.4</p>
Ductwork location		Climate Zone																																								
	1	2	3	4	5	6-8																																				
POINTS																																										
ductwork <i>entirely outside</i> the building's thermal envelope	4	5	4	3	2	1																																				
ductwork <i>entirely inside</i> the building's thermal envelope	1	1	1	1	1	1																																				
ductwork <i>inside and outside</i> the building's thermal envelope	3	4	3	2	1	1																																				



GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

(Points not awarded if points are taken under Section 705.6.2.3)

**703.5 Water heating system**

**703.5.1** Water heater Uniform Energy Factor (UEF) is in accordance with the following:  
(Water heater design is based on only 1 (one) water heater per dwelling unit, based on approved methods from IPC or ASPE or manufacturer specifications.)  
(All table values are based on water heaters with medium water draws as defined by the US DOE text procedures (55 gallons per day).)  
~~(Where multiple systems are used, points awarded based on the system with the lowest efficiency.)~~

(1) Gas water heating

Per Table 703.5.1(1)(a) ~~or through~~ 703.5.1(1)(b)

**Table 703.5.1(1)(a)**  
**Gas Water Heating<sup>a</sup>**  
Storage water heater, rated storage volume > 20 gallons and ≤ 55 gallons, medium water draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
POINTS								
0.657 to <0.780	32	32	2	2	2	2	2	1
≥0.780	43	43	3	3	3	3	3	2

a. Points for multifamily buildings four or more stories in height are awarded at 2 times the point value listed in Table 703.5.1(1)(a)

**Table 703.5.1(1)(b)**  
**Gas Water Heating**  
Storage water heater, rated storage volume > 55 gallons and ≤ 100 gallons, Medium water draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
POINTS								
>0.78	1	1	1	1	1	1	1	1

**Table 703.5.1(1)(bc)**  
**Gas Water Heating**  
(Storage water heater with input rate greater than 75,000 Btu/h or instantaneous input rate greater than 200,000 Btu/h (commercial))

Thermal Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
POINTS								
≥0.90 to < 0.95	6	6	5	3	3	3	3	2
≥0.95	7	7	5	4	4	4	4	2

**Table 703.5.1(1)(d)**  
**Gas Water Heating**  
Storage water heater with input rate greater than 75,000 Btu/h (commercial), in Buildings with high-capacity service water-heating systems (1,000,000 Btu/h or greater)

Thermal Efficiency	Climate Zone
--------------------	--------------

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	<b>POINTS</b>							
0.92 to < 0.95	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
≥0.95	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>

**Table 703.5.1(1)(e)**  
**Gas Water Heating**  
Instantaneous water heater, rated storage volume < 2 gallons and input rate of > 50,000 Btu/h, Medium water draw

	<b>Climate Zone</b>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	<b>POINTS</b>							
0.89 to < 0.94	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
≥0.94	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>

(2) Electric water heating

**Table 703.5.1(2)(a)**  
Storage water heater, rated storage volume ≥ 20 gallons and ≤ 55 gallons, Medium water draw  
Electric Water Heating

	<b>Climate Zone</b>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	<b>POINTS</b>							
≥0.945 to <1.0	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
≥1.0 to <1.5	<u>4</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
≥1.5 to <2.0	<u>7</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>
≥2.0 to <2.2	<u>14</u>	<u>8</u>	<u>7</u>	<u>5</u>	<u>4</u>	<u>4</u>	<u>2</u>	<u>2</u>
≥2.2 to <2.5	<u>17</u>	<u>9</u>	<u>8</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>3</u>
≥2.5 to <3.0	<u>18</u>	<u>12</u>	<u>10</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>3</u>	<u>3</u>
≥3.0	<u>22</u>	<u>16</u>	<u>13</u>	<u>11</u>	<u>8</u>	<u>8</u>	<u>4</u>	<u>3</u>

**Table 703.5.1(2)(b)**  
Storage water heater, rated storage volume ≥ 55 gallons and ≤ 120 gallons, Medium water draw

	<b>Climate Zone</b>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	<b>POINTS</b>							
≥2.2 to <2.5	<u>6</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>
≥2.5 to <3.0	<u>7</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>
≥3.0 to <3.5	<u>8</u>	<u>5</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>2</u>
≥3.5	<u>9</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>2</u>

**Table 703.5.1(2)(c)**  
Electric Tabletop Water Heating  
(Tabletop water heater, rated storage volume ≥ 20 gallons and ≤ 120 gallons, Medium water draw)

	<b>Climate Zone</b>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	<b>POINTS</b>							
≥0.91	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>

Per Table 703.5.1(2)(a) or through Table 703.5.1(2)(e)

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

**Table 703.5.1(2)(d)**  
**Electric Instantaneous Water Heating<sup>a</sup>**  
(Instantaneous electric water heater, rated storage volume < 2 gallons, Medium water draw)

Uniform Energy Factor or Thermal Efficiency <sup>b</sup>	Climate Zone							
	1	2	3	4	5	6	7	8
$\geq 0.97$	2	2	2	2	2	2	2	2

a. Applies to any size water heater.  
 b. Electric instantaneous water heaters have either a Uniform Energy Factor (capacity less than or equal to 12 kW) or a Thermal Efficiency (capacity greater than 12 kW).

**Table 703.5.1(2)(e)**  
**Electric Grid Enabled Water Heating**  
(Grid enabled storage water heater, rated storage volume  $\geq$  75 gallons, Medium water draw)

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
$\geq 0.95$	1	1	1	1	1	1	1	1

(3) Oil water heating

Per Table 703.5.1(3)

**Table 703.5.1(3)**  
**Oil Water Heating**  
(Oil water heating, < 50 gallons, Medium water draw)

Size (gallons)	Energy Factor	Climate Zone							
		1	2	3	4	5	6	7	8
30 to <50	0.59	4	4	4	4	4	4	4	4
$\geq 50$	0.59	4	4	4	4	4	4	4	4

For SI: 1 gallon = 3.785 L

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
$\geq 0.62$	1	1	1	1	1	1	1	1

(4) Heat pump water heating

Per Table 703.5.1(4)

**Table 703.5.1(4)**  
**Heat Pump Water Heating**

Energy Factor	Climate Zone						
	4	2	3	4	5	6	7-8
1.5 to <2.0	8	5	4	3	2	2	1
2.0 to <2.2	16	9	8	6	5	4	2
2.2	19	10	9	7	6	5	3

703.5.2 Desuperheater is installed by a qualified installer or is pre-installed in the factory.

--

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>Table 703.5.2 Desuperheater</b>							<b>Per Table 703.5.2</b>
<b>Climate Zone</b>							
1	2	3	4	5	6	7-8	
<b>POINTS</b>							
23	17	9	7	5	4	2	

<b>703.5.3</b> Drain-water heat recovery system is installed. <p style="text-align: right;"><b>(Points awarded per building.)</b></p>	<b>2</b>
---	----------

<b>703.5.4</b> Indirect-fired water heater storage tanks heated from boiler systems are installed.	<b>1</b>
--	----------

<b>703.5.5 Solar water heater.</b> SRCC (Solar Rating & Certification Corporation) OG 300 rated, or equivalent, solar domestic water heating system is installed. Solar Energy Factor (SEF) as defined by SRCC is in accordance with Table 703.45.5(a) and Table 703.5.5(b).	<b>Per Table 703.5.5(a) or 703.5.5(b)</b>
--	---

**Table 703.5.5(a)**  
Storage water heater, rated storage volume of backup water heater is ≥ 0.1 gallon and ≤ 55 gallons, Medium water draw Solar Hot Water Systems

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
POINTS							
SEF ≥ 1.3	1	2	3	5	7	8	7
SEF ≥ 1.51	2	2	4	7	10	14	11
SEF ≥ 1.81	2	3	6	10	14	16	15
SEF ≥ 2.31	4	5	9	16	21	23	22
SEF ≥ 3.01	6	8	12	23	30	34	33

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
POINTS							
SEF > 1.3	1	2	3	5	6	7	6
SEF > 1.51	2	2	4	6	9	10	10
SEF > 1.81	2	3	5	9	13	14	14
SEF > 2.31	4	5	8	14	19	21	20
SEF > 3.01	5	7	11	21	27	31	30

**Table 703.5.5(b)**  
Storage water heater, rated storage volume of backup water heater is >55 gallons, Medium water draw

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
POINTS							
SEF > 1.3	1	1	2	3	4	5	4
SEF > 1.51	1	1	2	4	6	7	7
SEF > 1.81	1	2	4	6	8	10	9
SEF > 2.31	2	3	5	10	13	14	13
SEF > 3.01	4	5	7	14	18	20	20

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

### 703.6 Lighting and appliances

#### 703.6.1 Hard-wired lighting. Hard-wired lighting is in accordance with one of the following:

- (1) A minimum percent of the total hard-wired interior luminaires or lamps qualify as ENERGY STAR, [DesignLights Consortium \(DLC\)](#), or [applicable](#) equivalent.

**Table 703.6.1(1)  
Hard-wired Lighting**

Minimum percent of fixtures	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
95%	3	3	3	2	2	2	2	2

**Per Table  
703.6.1(1)**

- (2) A minimum of 80 percent of the exterior lighting wattage has a minimum efficacy of [40-61](#) lumens per watt or is solar-powered.

**1**

- (3) In multifamily buildings, common area lighting power density (LPD) is less than 0.51 Watts per square foot.

**7**

#### 703.6.2 Appliances. ENERGY STAR or equivalent appliance(s) are installed:

- (1) Refrigerator

**Table 703.6.2(1)  
Refrigerator**

Climate Zone							
1	2	3	4	5	6	7	8
<b>POINTS</b>							
1	1	1	1	1	1	1	1

**Per Table  
703.6.2(1)**

- (2) Dishwasher

**1**

- (3) Washing machine

**4**

### 703.7 Passive solar design

#### 703.7.1 Sun-tempered design. Building orientation, sizing of glazing, and design of overhangs are in accordance with all of the following:

**4**

- (1) The long side (or one side if of equal length) of the building faces within 20 degrees of true south.

- (2) Vertical glazing area is between 5 and 7 percent of the gross conditioned floor area on the south face [also see Section 703.7.1(8)] [and glazing U-factors meet Table 703.2.5.2\(a\)](#).

- (3) Vertical glazing area is less than 2 percent of the gross conditioned floor area on the west face, and glazing [meets Table 703.2.5.2\(a\) is ENERGY STAR compliant or equivalent](#).

- (4) Vertical glazing area is less than 4 percent of the gross conditioned floor area on the east face, and glazing [meets Table 703.2.5.2\(a\) is ENERGY STAR compliant or equivalent](#).

- (5) Vertical glazing area is less than 8 percent of the gross conditioned floor area on the north face, and glazing [meets Table 703.2.5.2\(a\) is ENERGY STAR compliant or equivalent](#).

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

- (6) Skylights, where installed, are in accordance with the following:
- (a) shades and insulated wells are used, and all glazing [meets Table 703.2.5.2\(a\)](#) ~~is ENERGY STAR compliant or equivalent~~
  - (b) horizontal skylights are less than 0.5 percent of finished ceiling area
  - (c) sloped skylights on slopes facing within 45 degrees of true south, east, or west are less than 1.5 percent of the finished ceiling area

- (7) Overhangs or adjustable canopies or awnings or trellises provide shading on south-facing glass for the appropriate climate zone in accordance with Table 703.6.1(7):

**Table 703.7.1(7)  
South-Facing Window Overhang Depth**

		Vertical distance between bottom of overhang and top of window sill				
		≤7' 4"	≤6' 4"	≤5' 4"	≤4' 4"	≤3' 4"
Climate Zone	1 & 2 & 3	2' 8"	2' 8"	2' 4"	2' 0"	2' 0"
	4 & 5 & 6	2' 4"	2' 4"	2' 0"	2' 0"	1' 8"
	7 & 8	2' 0"	1' 8"	1' 8"	1' 4"	1' 0"

For SI: 1 inch = 25.4 mm

- (8) The south face windows have a SHGC of 0.40 or higher.
- (9) Return air or transfer grilles/ducts are in accordance with Section 705.4.

**Multifamily Building Note:** *The site is designed such that at least 40 percent of the multifamily dwelling [or sleeping](#) units have one south facing wall (within 15 degrees) containing at least 50 percent of glazing for entire unit. Effective shading is required for passive solar control on all south facing glazing. The floor area of at least 15 feet from the south facing perimeter glazing is massive and exposed to capture solar heat during the day and reradiate at night.*

<b>703.7.2 Window shading.</b> Automated solar protection or dynamic glazing is installed to provide shading for windows.	<b>1</b>
---	----------

<b>703.7.3 Passive cooling design.</b> Passive cooling design features are in accordance with three or more of the following:	<b>Points for three items:</b>	<b>3</b>
	<b>Points for one additional item:</b>	<b>1</b>

- (1) Exterior shading is provided on east and west windows using one or a combination of the following:
- (a) vine-covered trellises with the vegetation separated a minimum of 1 foot (305 mm) from face of building
  - (b) moveable awnings or louvers
  - (c) covered porches
  - (d) attached or detached conditioned/unconditioned enclosed space that provides full shade of east and west windows (e.g., detached garage, shed, or building)

GREEN BUILDING PRACTICES	POINTS
<p>(2) Overhangs are installed to provide shading on south-facing glazing in accordance with Section 703.7.1(7). <b>(Points not awarded if points are taken under Section 703.7.1.)</b></p> <p>(3) Windows and/or venting skylights are located to facilitate cross <u>and stack effect</u> ventilation.</p> <p>(4) Solar reflective roof or radiant barrier is installed in climate zones 1, 2, or 3 and roof material achieves a 3-year aged criteria of 0.50.</p> <p>(5) Internal exposed thermal mass is a minimum of three inches (76 mm) in thickness. Thermal mass consists of concrete, brick, and/or tile fully adhered to a masonry base or other masonry material in accordance with one or a combination of the following:</p> <p>(a) A minimum of 1 square foot (0.09 m<sup>2</sup>) of exposed thermal mass of floor per 3 square feet (2.8 m<sup>2</sup>) of gross finished floor area.</p> <p>(b) A minimum of 3 square feet (2.8 m<sup>2</sup>) of exposed thermal mass in interior walls or elements per square foot (0.09 m<sup>2</sup>) of gross finished floor area.</p> <p>(6) Roofing material is installed with a minimum 0.75 inch (19 mm) continuous air space offset from the roof deck from eave to ridge.</p>	
<p><b>703.7.4 Passive solar heating design.</b> In addition to the sun-tempered design features in Section 703.7.1, all of the following are implemented: <b>(Points shall not be awarded in the Tropical Climate Zone)</b></p>	<b>4</b>
<p>(1) Additional glazing, no greater than 12 percent, is permitted on the south wall. This additional glazing is in accordance with the requirements of Section 703.7.1.</p> <p>(2) Additional thermal mass for any room with south-facing glazing of more than 7 percent of the finished floor area is provided in accordance with the following:</p> <p>(a) Thermal mass is solid and a minimum of 3 inches (76 mm) in thickness. Where two thermal mass materials are layered together (e.g., ceramic tile on concrete base) to achieve the appropriate thickness, they are fully adhered to (touching) each other.</p> <p>(b) Thermal mass directly exposed to sunlight is provided in accordance with the following minimum ratios:</p> <p>(i) Above latitude 35 degrees: 5 square feet (0.465 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.</p> <p>(ii) Latitude 30 degrees to 35 degrees: 5.5 square feet (0.51 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.</p> <p>(iii) Latitude 25 degrees to 30 degrees: 6 square feet (0.557 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.</p> <p>(c) Thermal mass not directly exposed to sunlight is permitted to be used to achieve thermal mass requirements of Section 703.7.4 (2) based on a ratio of 40 square feet (3.72 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.</p>	
<p>(3) In addition to return air or transfer grilles/ducts required by Section 703.7.1(9), provisions for forced airflow to adjoining areas are implemented as needed.</p>	

GREEN BUILDING PRACTICES	POINTS
<b>704 HERS INDEX TARGET PATH</b>	
<p><b>704.1 HERS index target compliance.</b> Compliance with the energy chapter shall be permitted to be based on the EPA HERS Index Target Procedure for Energy Star Qualified Homes. Points from Section 704 (HERS Index Target) shall not be combined with points from Section 702 (Performance Path) or Section 703 (Prescriptive Path).  <a href="#">Dwelling ratings shall be submitted to a quality control registry approved by the Adopting Entity for calculating points under this section.</a></p>	
<p><b>704.2 Point calculation.</b> Points for Section 704 shall be computed based on Steps “1a” through “1d” of the EPA HERS Index Target Procedure. Points shall be computed individually for each building as follows:  <math>30 + (\text{percent-Number of HERS Index Points less than EnergyStar HERS Index Target for that building}) * 2.</math></p>	
<b>705 ADDITIONAL PRACTICES</b>	
<p><b>705.1 Application of additional practice points.</b> Points from Section 705 can be added to points earned in Section 702 (Performance Path), Section 703 (Prescriptive Path), Section 704 (HERS Index Target Path), or Section 701.1.4 (alternative bronze and silver level compliance).</p>	
<b>705.2 Lighting</b>	
<p><b>705.2.1 Lighting controls</b>  <b>(Percentages for point thresholds are based on lighting not required for means of egress or security lighting as defined by local building codes.)</b></p>	
<p><b>705.2.1.1 Interior lighting.</b> In dwelling units <a href="#">or sleeping units</a>, permanently installed interior lighting fixtures are controlled with an occupancy sensor, or dimmer:</p>	
(1) 50 percent to less than 75 percent of lighting fixtures.	1
(2) A minimum of 75 percent of lighting fixtures.	2
<p><b>705.2.1.2 Exterior lighting.</b> Photo or motion sensors are installed on 75 percent of outdoor lighting fixtures to control lighting.  <b>(Percentages for point thresholds does not include lighting equipped with photovoltaics.)</b></p>	
<b>705.2.1.3 Multifamily common areas</b>	
<p>(1) In a multifamily building, occupancy sensors, or dimmers are installed in common areas (except corridors and stairwells).</p>	
(a) 50 percent to less than 75 percent of lighting fixtures.	1
(b) A minimum of 75 percent of lighting fixtures.	2



GREEN BUILDING PRACTICES		POINTS
<b>(2)</b> In a multifamily building, occupancy controls are installed to automatically reduce light levels in interior corridors and exit stairwells when the space is unoccupied. Light levels are reduced by:		
<b>(a)</b>	50 percent to less than 75 percent or to local minimum requirements	<b>2</b>
<b>(b)</b>	A minimum of 75 percent	<b>3</b>
<b>705.2.1.4</b> In a multifamily building, occupancy controls are installed to automatically reduce light levels in garages and parking structures when the space is unoccupied. Light levels are reduced by:		
<b>(1)</b>	50 percent to less than 75 percent or to local minimum requirements	<b>2</b>
<b>(2)</b>	A minimum of 75 percent	<b>3</b>
<b>705.2.2 TDDs and skylights.</b> A tubular daylighting device (TDD) or a skylight that meets the requirements of Table 703.2.5.2(a) is installed in rooms without windows. <b>(Points awarded per building.)</b>		<b>2</b>
<b>705.2.3 Lighting outlets.</b> Occupancy sensors are installed for a minimum of 80 percent of hard-wired lighting outlets in the interior living space.		<b>1</b>
<b>705.2.4 Recessed luminaires.</b> The number of recessed luminaires that penetrates the thermal envelope is less than 1 per 400 square feet (37.16 m <sup>2</sup> ) of total conditioned floor area and they are in accordance with Section <b>701.4.3.5</b> .		<b>1</b>
<b>705.3 Induction cooktop.</b> Induction cooktop is installed.		<b>1</b>
<b>705.4 Return ducts and transfer grilles.</b> Return ducts or transfer grilles are installed in every room with a door. Return ducts or transfer grilles are not required for bathrooms, kitchens, closets, pantries, and laundry rooms.		<b>2</b>
<b>705.5 HVAC design and installation</b>		
<b>705.5.1</b> <u>Meet one or both of the following:</u> <u>HVAC contractor and service technician are certified by a nationally or regionally recognized program (e.g., North American Technician Excellence, Inc. (NATE), Air Conditioning Contractors of Americas Quality Assured Program (ACCA/QA), Building Performance Institute (BPI), Radiant Panel Association, or a manufacturer's training program).</u>		<b>4</b>
<b>(1)</b>	<u>HVAC contractor is certified by the Air Conditioning Contractors of Americas Quality Assured Program (ACCA/QA) or by an EPA-recognized HVAC Quality Installation Training Oversight Organization (H-QUITO) or equivalent.</u>	<b>1</b>
<b>(2)</b>	<u>HVAC installation technician(s) is certified by North American Technician Excellence, Inc. (NATE) or equivalent.</u>	<b>1</b>
<b>705.5.2</b> Performance of the heating and/or cooling system is verified by the HVAC contractor in accordance with all of the following:		<b>3</b>
<b>(1)</b>	Start-up procedure is performed in accordance with the manufacturer's instructions.	

GREEN BUILDING PRACTICES		POINTS
(2)	Refrigerant charge is verified by super-heat and/or sub-cooling method.	
(3)	Burner is set to fire at input level listed on nameplate.	
(4)	Air handler setting/fan speed is set in accordance with manufacturer's instructions.	
(5)	Total airflow is within 10 percent of design flow.	
(6)	Total external system static does not exceed equipment capability at rated airflow.	
<b>705.3 HVAC Design is verified by 3<sup>rd</sup> party as follows:</b>		
(1)	The ENERGY STAR HVAC Design and Rater Design Review Checklists are completed without correction needed.	3
(2)	HVAC Installation is inspected and conforms to HVAC design documents and plans.	3
<b>705.6 Installation and performance verification</b>		
<b>705.6.1</b> Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Minimum of two inspections are performed: one inspection after insulation is installed and prior to covering, and another inspection upon completion of the building. Where multiple buildings or dwelling units of the same model <a href="#">or sleeping units of the same model</a> are built by the same builder, a representative sample inspection of a minimum of 15 percent of the buildings or dwelling units <a href="#">or sleeping units</a> is permitted.		3
(1)	Ducts are installed in accordance with the ICC IRC or IMC and ducts are sealed.	
(2)	Building envelope air sealing is installed.	
(3)	Insulation is installed in accordance with Section 701.4.3.2.1.	
(4)	Windows, skylights, and doors are flashed, caulked, and sealed in accordance with manufacturer's instructions and in accordance with Section 701.4.3.	
<b>705.6.2 Testing.</b> Testing is conducted to verify performance.		
<b>705.6.2.1 Air leakage validation of building or dwelling units <a href="#">or sleeping units</a>.</b> A visual inspection is performed as described in 701.4.3.2(2) and air leakage testing is performed in accordance with ASTM E779 or ASTM E1827. <b>(Points awarded only for buildings where building envelope leakage testing is not required by <a href="#">2015-ICC IECC</a>.)</b> <b>(Points not awarded if points are taken under Section 703.2.4)</b>		
(1)	A blower door test.	3
(2)	Third-party verification is completed.	5
<b>705.6.2.2 HVAC airflow testing.</b> Balanced HVAC airflows are demonstrated by flow hood or other acceptable flow measurement tool by a third party. Test results are in accordance with <del>both of</del> the following:		5
(1)	Measured flow at each supply and return register meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.	5
(2)	Total airflow meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.	3

<b>705.6.2.3 HVAC duct leakage testing.</b> One of the following is achieved: <b>(Points awarded only for buildings where duct leakage testing is not required by IECC.)</b> <b>(Points not awarded if points are taken under Section 703.4.4)</b>	
(1) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4.	<b>3</b>
(2) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4, and testing is conducted by an independent third party.	<b>5</b>
<b>705.6.3 Insulating hot water pipes.</b> Insulation with a minimum thermal resistance (R-value) of at least R-3 is applied to the following, as applicable: <b>(Points awarded only where these practices are not required by IECC.)</b>	
(a) piping 3/4-inch and larger in outside diameter	
(b) piping serving more than one dwelling unit <u>or sleeping unit</u>	
(c) piping located outside the conditioned space	
(d) piping from the water heater to a distribution manifold	
(e) piping located under a floor slab	
(f) buried piping	
(g) supply and return piping in recirculation systems other than demand recirculation systems	

**705.6.4 Potable hot water demand re-circulation system.**

<b>705.6.4.1</b> Potable hot water demand re-circulation system is installed in a single-family unit.	<b>1</b>
<b>705.6.4.2</b> Potable hot water demand re-circulation system(s) <u>that serves every unit is installed</u> in a multifamily <u>unit-building is installed</u> in place of a standard circulation pump and control.	<b>2</b>
<b>705.7 Submetering system.</b> In multifamily buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. The device provides consumption information on a monthly or near real-time basis. The information is available to the occupants at a minimum on a monthly basis.	<b>1</b>

**706  
INNOVATIVE PRACTICES**

<b>706.1 Energy consumption control.</b> A whole-building or whole-dwelling unit <u>or whole-sleeping unit</u> device or system is installed that controls or monitors energy consumption.	<b>3 Max</b>
(1) programmable communicating thermostat with the capability to be controlled remotely	<b>1</b>
(2) energy-monitoring device or system	<b>1</b>
(3) energy management control system	<b>3</b>
(4) programmable thermostat with control capability based on occupant presence or usage pattern	<b>1</b>
(5) lighting control system	<b>1</b>

**ENERGY EFFICIENCY**

<b>706.2 Renewable energy service plan.</b> Renewable energy service plan is provided as follows:		
(1)	Builder selects a renewable energy service plan provided by the local electrical utility for interim (temporary) electric service, <u>or purchases renewable energy certificates (RECs) to cover electricity used.</u> The builder's local administrative office has renewable energy service <u>or has otherwise been paired with RECs. Green-certified (or equivalent) is required for renewable electricity purchases.</u>	1
(2)	The buyer of the building selects one of the following renewable energy service plans provided by the utility prior to occupancy of the building with a minimum two-year commitment.	
(a)	less than half of the dwelling's projected electricity and gas use is provided by renewable energy	1
(b)	half or more of the of the dwelling's projected electricity and gas use is provided by renewable energy	2

<b>706.3 Smart appliances and systems.</b> Smart appliances and systems are installed as follows:		
(1)	Refrigerator	
(2)	Freezer	
(3)	Dishwasher	
(4)	Clothes Dryer	
(5)	Clothes Washer	
(6)	Room Air Conditioner	
(7)	HVAC Systems	
(8)	Service Hot Water Heating Systems	
	Three to five smart appliances installed	1
	Six or more smart appliances installed	2
<b>(Items (7) and (8) are permitted to count as two appliances each for the purpose of awarding points.)</b>		
<b>(where points awarded in Section 706.3, points shall not be awarded in Section 706.7 and 706.9)</b>		

<b>706.4 Pumps</b>
--------------------

<b>706.4.1</b> Pool, spa, and water features equipped with filtration pumps as follows:		
(1)	Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater).	1
(2)	Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater) in a pool	3

<b>706.4.2</b> Sump pump(s) with electrically commutated motors (ECMs) or permanent split capacitor (PSC) motors is installed (full load efficiency of 90 percent or greater).	1
--	---

<b>706.5 On-site renewable energy system.</b> <del>An on-site renewable energy system(s) is installed on the property. One of the following options is implemented.</del>		<b>2 points per kW Divided by number of dwelling units</b>
<b>(1)</b> <a href="#">Building is Solar-Ready in compliance with IECC Appendix A Solar Ready Provisions</a>		<b><u>1</u></b>
<b>(2)</b> <a href="#">An on-site renewable energy system(s) is installed on the property</a>		<b><u>2 point per kW</u></b>
<b>(3)</b> <a href="#">An on-site renewable energy system(s) and a battery energy storage system are installed on the property</a>		<b><u>2 points per kW or renewable energy system plus 1 point per each 2 kWh or battery energy storage system</u></b>
<p align="center"><b>(Points shall not be awarded in this section for solar thermal or geothermal systems that provide space heating, space cooling, or water heating, Points for these systems are awarded in Section 703.)</b></p> <p align="center"><b>(Where onsite renewable energy is included in Section 702 Performance Path or 704 HERS Index Target Path, Section 706.5 shall not be awarded.)</b></p>		
<p align="center"><b><u>(Points awarded in this section shall not be combined with points for renewable energy in another section of this chapter. The solar-ready zone roof area in #1 is area per dwelling unit. Points in item #2 and #3 shall be divided by the number of dwelling units.)</u></b></p>		
<b>Multifamily Building Note:</b> <i>Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.</i>		
<b>706.6 Parking garage efficiency.</b> Structured parking garages are designed to require no mechanical ventilation for fresh air requirements.		<b>2</b>
<b>706.7 Grid-interactive electric thermal storage system.</b> A grid-interactive electric thermal storage system is installed.		
<b>(1)</b> Grid-Interactive Water Heating System		<b>1</b>
<b>(2)</b> Grid-Interactive Space Heating and cooling System		<b>1</b>
<p align="center"><b>(where points awarded in Section 706.7, points shall not be awarded in Section 706.3 and 706.9)</b></p>		
<b>706.8 Electrical vehicle charging station.</b> A Level 2 ( <a href="#">208/240V 40-80 amp</a> ) or Level 3 electric vehicle charging station is installed on the building site. (Note: Charging station shall not be included in the building energy consumption.)		<b>2</b>
<b>706.9 CNG vehicle fueling station.</b> <a href="#">A CNG vehicle residential fueling appliance is installed on the building site. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV</a>		<b><u>1</u></b>

ENERGY EFFICIENCY

<a href="#">5.1 and installed in accordance to the appliance manufacturer's installation instructions. (Note: The fueling appliance shall not be included in the building energy consumption.)</a>	
--	--

<p><b>706.109 Automatic demand response.</b> Automatic demand response system is installed that curtails energy usage upon a signal from the utility or an energy service provider is installed.</p> <p style="text-align: center;"><b>(where points awarded in Section 706.9, points shall not be awarded in Section 706.3 and 706.7)</b></p>	<b>1</b>
--	----------

<a href="#">706.11 Battery Storage System.</a> A battery storage system of not less than 6 kWh of available capacity is installed that stores electric energy from an on-site renewable electric generation system or is grid-interactive or can perform both functions.	<u>2</u>
--	----------

<a href="#">706.12 Smart Ventilation.</a> A whole-building ventilation systems is installed with automatic ventilation controls to limit ventilation during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads and is in accordance with the specifications of Appendix B.	<u>1</u>
---	----------

<a href="#">706.13 Alternative Refrigerant.</a> Use of the following in mechanical space cooling systems for dwellings.	
<a href="#">(1)</a> Use alternative refrigerant with a GWP < 1000	<u>1</u>
<a href="#">(2)</a> Do not use refrigerants	<u>2</u>

<a href="#">706.14 Third-Party Utility Benchmarking Service.</a>	
<a href="#">(1)</a> For a multifamily building, the owner has contracted with a third-party utility benchmarking service with at least five (5) years of experience in utility data management and analysis to perform a monthly analysis of whole-building energy and water consumption for a minimum of 1 year.	<u>3</u>
<a href="#">(2)</a> The building owner commits to reporting energy data using U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager for a minimum of three years	<u>1</u>

<a href="#">706.15 Entryway Air Seal.</a> For multifamily buildings, where not required by the building or energy code, to slow the movement of unconditioned air from outdoors to indoors at the main building entrance, the following is installed:	
<a href="#">(1)</a> Building entry vestibule.	<u>2</u>
<a href="#">(2)</a> Revolving entrance doors.	<u>2</u>

## CHAPTER 8

# WATER EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
<b>801</b> <b>INDOOR AND OUTDOOR WATER USE</b>	
<p><b>801.0 Intent.</b> <del>Implement</del> measures that reduce indoor and outdoor water usage. <del>are implemented</del> <u>Implement measures that include collection and use of alternative sources of water.</u> <u>Implement measures that treat water on site.</u></p>	
<p><b>801.1 Mandatory requirements.</b> <u>The building shall comply with Section 802 (Prescriptive Path) and 803 (Innovative Practices) or Section 804 (Performance Path). Points from Section 804 (Performance Path) shall not be combined with points from Section 802 (Prescriptive Path) or Section 803 (Innovative Practices). The mandatory provisions of Section 802 (Prescriptive Path) and Section 803 (Innovative Practices) are not required when using the Water Rating Index of Section 804 (Performance Path) for Chapter 8 Water Efficiency compliance.</u></p>	
<b>802</b> <b>PRESCRIPTIVE PATH</b>	
<p><b>802.1 Indoor hot water usage.</b> Indoor hot water supply system is in accordance with one of the practices listed in items (1) through (5). The maximum water volume from the source of hot water to the termination of the fixture supply is determined in accordance with Tables 801.1(1) or 801.1(2). The maximum pipe length from the source of hot water to the termination of the fixture supply is 50 feet.</p> <p style="text-align: center;"><b>(Where more than one water heater is used or where more than one type of hot water supply system, including multiple circulation loops, is used, points are awarded only for the system that qualifies for the minimum number of points.)</b></p> <p style="text-align: center;"><b>(Systems with circulation loops are eligible for points only if pumps are demand controlled. Circulation systems with timers or aquastats and constant-on circulation systems are not eligible to receive points.)</b></p> <p style="text-align: center;"><b>(Points awarded only if the pipes are insulated in accordance with Section 705.6.3.)</b></p>	
<p><b>(1)</b> The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 128 ounces (1 gallon or 3.78 liters).</p>	<b>418</b>
<p><b>(2)</b> The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 64 ounces (0.5 gallon or 1.89 liters).</p>	<b>4712</b>
<p><b>(3)</b> The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 32 ounces (0.25 gallon or 0.945 liters).</p>	<b>2920</b>
<p><b>(4)</b> A demand controlled hot water priming pump is installed on the main supply pipe of the circulation loop and the maximum volume from this supply pipe to the furthest fixture is 24 ounces (0.19 gallons or 0.71 liters).</p>	<b>3524</b>
<p><b>(a)</b> The volume in the circulation loop (supply) from the water heater or boiler to the branch for the furthest fixture is no more than 128 ounces (1 gallon or 3.78 liters).</p>	<b>4 Additional</b>

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

**(5)** A central hot water recirculation system is implemented in multifamily buildings in which the hot water line distance from the recirculating loop to the engineered parallel piping system (i.e., manifold system) is less than 30 feet (9,144 mm) and the parallel piping to the fixture fittings contains a maximum of 64 ounces (1.89 liters) (115.50 cubic inches) (0.50 gallons).

**9**

**(6)** Tankless water heater(s) with at least 0.5 gallon (1.89 liters) of storage are installed, or a tankless water heater that ramps up to at least 110F within 5 seconds is installed. The storage may be internal or external to the tankless water heater.

**4.1  
Additional**

**Table 801.1(1)  
Maximum Pipe Length Conversion Table<sup>a</sup>**

Nominal Pipe Size (inch)	Liquid Ounces per Foot of Length	Main, Branch, and Fixture Supply System Volume Category			Branch and Fixture Supply Volume from Circulation Loop
		128 ounces (1 gallons) [per 801.1(1)]	64 ounces (0.5 gallon) [per 801.1(2)]	32 ounces (0.25 gallon) [per 801.1(3)]	24 ounces (0.19 gallon) [per 801.1(4)]
		Maximum Pipe Length (feet)			
1/4 <sup>b</sup>	0.33	50	50	50	50
5/16 <sup>b</sup>	0.5	50	50	50	48
3/8 <sup>b</sup>	0.75	50	50	43	32
1/2	1.5	50	43	21	16
5/8	2	50	32	16	12
3/4	3	43	21	11	8
7/8	4	32	16	8	6
1	5	26	13	6	5
1 1/4	8	16	8	4	3
1 1/2	11	12	6	3	2
2	18	7	4	2	1

a. Maximum pipe length figures apply when the entire pipe run is one nominal diameter only. Where multiple pipe diameters are used, the combined volume shall not exceed the volume limitation in Section 801.1.

b. The maximum flow rate through 1/4 inch nominal piping shall not exceed 0.5 gpm. The maximum flow rate through 5/16 inch nominal piping shall not exceed 1 gpm. The maximum flow rate through 3/8 inch nominal piping shall not exceed 1.5 gpm.

**Table 801.1(2)  
Common Hot Water Pipe Internal Volumes  
OUNCES OF WATER PER FOOT OF PIPE**

Size Nominal, Inch	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9	PP SDR 7.4 F2389	PP SDR 9 F2389
3/8	1.06	0.97	0.84	N/A	1.17	N/A	0.64	0.63	0.64	N/A	N/A
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18	1.72	1.96
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35	2.69	3.06
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91	4.41	5.01
1 ¼	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81	6.90	7.83
1 ½	12.18	11.83	11.45	9.22	13.2	11.38	8.09	13.88	8.09	10.77	12.24



GREEN BUILDING PRACTICES											POINTS
--------------------------	--	--	--	--	--	--	--	--	--	--	--------

2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86	17.11	19.43
---	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

<b>8021.2 Water-conserving appliances.</b> ENERGY STAR or equivalent water-conserving appliances are installed.	
(1) <del>dishwasher</del>	<b>2</b>
(2) <del>washing machineclothes washer</del> , or	<b>13</b>
(3) <del>washing machineclothes washer</del> with an <del>Integrated w</del> Water <del>f</del> Factor of <del>4-03.8</del> or less	<b>2418</b>
<i><b>Multifamily Building Note:</b> Washing machines are installed in individual units or provided in common areas of multifamily buildings.</i>	

<b>802.3 Water Usage Metering.</b> Water meters are installed meeting the following:	
(1) <u>Single Family Buildings: Water Usage Metering.</u>	
(a) <u>Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site</u>	<b>2 per unique use meter</b>
(b) <u>Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered)</u>	<b>2 per sensor package</b>
(2) <u>Multi-Family Buildings: Water Usage Metering.</u>	
(a) <u>Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site</u>	<b>2 per unique use meter</b>
(b) <u>Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered)</u>	<b>2 per sensor package</b>

<b>8021.3-4 Showerheads.</b> Showerheads are in accordance with the following:	
<p>(1) The total maximum combined flow rate of all showerheads <del>controlled by a single valve at any point in time</del> in a shower compartment <u>with floor area of 1800 square inches or less is 4.6 to equal or less than 2.5-0 gpm. Maximum of two valves are installed per shower compartment. The flow rate is tested at 80 psi (552 kPa) in accordance with ASME A112.18.1</u>For each additional 1300 square inches of shower compartment floor area, an additional 2.0 gpm combined showerhead flow rate is allowed. Showerheads shall comply with ASME A112.18/CSA B125.1. Showerheads <del>are</del>shall be served by an automatic compensating valve that complies with ASSE 1016/<u>ASME A112.1016/CSA B125.16</u> or ASME A112.18.1/<u>CSA B125.1</u> and specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.</p> <p><b>(Points awarded per shower compartment. In multifamily buildings, the average of the points assigned to individual dwelling units <u>or sleeping units</u> may be used as the number of points awarded for this practice, rounded to the nearest whole number.)</b></p>	<p><b>4 for first compartment</b></p> <p><b>1 for each additional compartment in dwelling</b></p> <p><b>7 Max</b></p>

**WATER EFFICIENCY**

<p>(2) All shower compartments in the dwelling unit(s) <u>or sleeping unit(s)</u> and common areas meet the requirements of 801.3(1) and all showerheads are in accordance with one of the following:</p> <p>(a) <del>2.0 to less than 2.5</del> <u>maximum of 1.8</u> gpm</p> <p>(b) <del>1.6 to less than 2.0</del> <u>maximum of 1.5</u> gpm</p> <p><del>(c) Less than 1.6</del> gpm</p> <p>(3) Any shower control that can shut off water flow without affecting temperature is installed.</p> <p style="text-align: right;"><b>(Points awarded per shower control.)</b></p>	<b>6 Additional</b>
	<b>10 Additional</b>
	<b>14 Additional</b>
	<b>1 3 Max</b>
For SI: 1 gallon per minute = 3.785 L/m	

**802.4.5 Lavatory fFaucets**

<p><del>802.4.5.1</del> <u>802.4.5.1</u> <del>W</del><u>Install</u> water-efficient lavatory faucets with <del>a maximum</del> <u>flow rates not more than of</u> 1.5 gpm (5.68 L/m), tested <del>at 60 psi (414 kPa)</del> in <del>accordance</del> <u>compliance</u> with ASME A112.18.1/<u>CSA B125.1</u> and <u>meeting the performance criteria of the EPA WaterSense High-Efficiency Lavatory Faucet Specification, are installed or equivalent:</u></p>	
<p>(1) <del>a bathroom (all faucets in a bathroom are in compliance)</del> <u>Flow rate ≤ 1.5 gpm</u></p> <p style="text-align: center;"><b>(Points awarded for each bathroom. In multifamily buildings, the average of the points assigned to individual dwelling units <u>or sleeping units</u> may be used as the number of points awarded for this practice, rounded to the nearest whole number.)</b></p>	<b>1 3 Max (all faucets in a bathroom are in compliance)</b>
<p>(2) <u>Flow rate ≤ 1.20 gpm</u></p>	<b>2 6 Max (all faucets in a bathroom are in compliance)</b>
<p><del>(3)</del> <u>Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s) <u>or sleeping unit(s)</u></u></p>	<b>6 Additional</b>
<p><del>(4)</del> <u>Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s), and at least one bathroom has faucets with flow rates ≤ 1.20 gpm</u></p>	<b>8 Additional</b>
<p><del>(5)</del> <u>Flow rate ≤ 1.20 gpm for all lavatory faucets in the dwelling unit(s)</u></p>	<b>12 Additional</b>

<p><del>801.4.2</del> <u>Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation.</u></p> <p style="text-align: right;"><b>(Points awarded per fixture.)</b></p>	<b>1 3 Max</b>
--	--------------------

<p><u>802.5.2</u> Water-efficient kitchen faucets are installed in accordance with ASME A112.18.1/CSA B125.1. Kitchen faucets may temporarily increase the flow above the maximum rate but not to exceed 2.2 gpm.</p>	
<p>(1) All kitchen faucets have a maximum flow rate of 1.8 gpm</p>	<b>3</b>
<p>(2) All residential kitchen faucets have a maximum flow rate of 1.5 gpm</p>	<b>1 Additional</b>

<p><u>802.5.3</u> Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation.</p> <p style="text-align: right;"><b>(Points awarded per fixture.)</b></p>	<b>1 3 Max</b>
---	--------------------

<b>8024.5.4 Water closets and urinals.</b> Water closets and urinals are in accordance with the following:	
<b>(Points awarded for 801.5(2) or 801.5(3), not both.)</b>	
(1) Gold and emerald levels: All water closets and urinals are in accordance with Section 801.5.	<b>Mandatory</b>
(2) A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less <del>and meets the flush performance criteria when tested</del> in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable. <u>Tank-type water closets shall be in accordance with the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type Toilets.</u>  <b>(Points awarded per fixture. In multifamily buildings, the average of the points assigned to individual dwelling units <u>or sleeping units</u> may be used as the number of points awarded for this practice, rounded to the nearest whole number.)</b>	<del>24</del> <b>126 Max</b>
(3) All water closets are in accordance with Section 801.5(2).	<del>14-17</del>
(4) All water closets are in accordance with Section 801.5(2) and one or more of the following are installed:	
(a) Water closets that have a flush volume of 1.2 gallons or less.  <b>(Points awarded per toilet. In multifamily buildings, the average of the points assigned to individual dwelling units <u>or sleeping units</u> may be used as the number of points awarded for this practice, rounded to the nearest whole number.)</b>	<del>4-2</del> <b>Additional</b>  <del>3-6</del> <b>Additional Max</b>
(b) One or more urinals with a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2/ <u>CSA B45.1</u> .	<del>4-2</del> <b>Additional</b>
(c) One or more composting or waterless toilets and/or <u>nonwater</u> urinals. <u>Nonwater urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1.</u>	<del>6-12</del> <b>Additional</b>

**8024.6 Irrigation systems**

<u>802.6.1</u> Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional as approved by Adopting Entity.	<b>Mandatory</b>
--	------------------

<del>8024.6.24</del> <u>S</u> rrigation sprinkler nozzles <del>have a maximum precipitation rate of 1.20 inches per hour for turf or landscapingshall be tested according to ANSI standard ASABE/ICC 802-2014 Landscape Irrigation Sprinkler and Emitter Standard. Nozzle performance is tested</del> by an accredited third party laboratory and results are posted on <u>Smart Water Application Technologiesmanufacturers</u> website or similar.	<b>6</b>
--	----------

<del>8024.6.32</del> Drip irrigation is installed.	<b>13 Max</b>
(1) Drip irrigation is installed for all landscape beds.	<b>4</b>
(2) Subsurface drip is installed for all turf grass areas.	<b>4</b>
(3) Drip irrigation zones specifications show plant type by name and water use/need for each emitter (Points awarded only if specifications are implemented.)	<b>5</b>

<del>801.6.3</del> Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional certified by a WaterSense labeled program or equivalent program as approved by Adopting Entity.	<b>Mandatory</b>
--	------------------

**WATER EFFICIENCY**

<b>8024.6.4</b> The irrigation system(s) is controlled by a smart controller or no irrigation is installed. <b>(Points are not additive.)</b>		
<b>(1)</b>	<del>Evapotranspiration (ET) based irrigation controller with a rain sensor or soil moisture sensor based irrigation controller.</del>	<b>8</b>
<b>(21)</b>	Irrigation controllers are labeled by EPA WaterSense program	<b>10</b>
<b>(32)</b>	No irrigation is installed and a landscape plan is developed in accordance with Section 503.5, as applicable.	<b>15</b>

<b>802.6.5 Commissioning and Water Use Reduction for Irrigation Systems</b>		<b>Points are additive per each section</b>
<b>(1)</b>	All irrigation zones utilize pressure regulation so emission devices (sprinklers and drip emitters) operate at manufacturer’s recommended operating pressure.	<b>3</b>
<b>(2)</b>	<u>Where dripline tubing is installed, a filter with mesh size in accordance with the manufacturer’s recommendation is installed on all drip zones.</u>	<b>3</b>
<b>(3)</b>	<u>Utilize spray bodies that incorporate an in-stem or external flow shut-off device.</u>	<b>3</b>
<b>(4)</b>	<u>For irrigation systems installed on sloped sites, either an in-stem or external check valve is utilized for each spray body.</u>	<b>3</b>
<b>(5)</b>	<u>Where an irrigation system is installed, a flow sensing device is installed to monitor and alert the controller when flows are outside design range.</u>	<b>3</b>

**8024.7 Rainwater collection and distribution.** Rainwater collection and distribution is provided.

<b>8024.7.1</b> Rainwater is used for irrigation in accordance with one of the following:		
<b>(1)</b>	Rainwater is diverted for landscape irrigation without impermeable water storage	<b>5</b>
<b>(2)</b>	Rainwater is diverted for landscape irrigation with impermeable water storage in accordance with one of the following:	
<b>(a)</b>	50 – 499 gallon storage capacity	<b>5</b>
<b>(b)</b>	500 – 2499 gallon storage capacity	<b>10</b>
<b>(c)</b>	2500 gallon or larger storage capacity (system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent)	<b>15</b>
<b>(d)</b>	All irrigation demands are met by rainwater capture (documentation demonstrating the water needs of the landscape is provided and the system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent).	<b>25</b>

<b>8024.7.2</b> Rainwater is used for indoor domestic demand as follows. The system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent.		
<b>(1)</b>	Rainwater is used to supply an indoor appliance or fixture for any locally approved use. <b>(Points awarded per appliance or fixture.)</b>	<b>5</b> <b>15 Max</b>
<b>(2)</b>	Rainwater provides for total domestic demand.	<b>25</b>

<b>802.8 Sediment filters.</b> Water filter is installed to reduce sediment and protect plumbing fixtures for the whole building or the entire dwelling unit <u>or the sleeping unit.</u>	<b>1</b>
---	----------

<b>802.9 Water Treatment Devices.</b>
---------------------------------------

**802.9.1** Water Softeners shall not be installed where the supplied water hardness is less than 8.0 grains per gallon measured as total calcium carbonate equivalents. Water softeners shall be listed to NSF 44 and a rated salt efficiency of 3400 grains of total hardness per 1.0 pound of salt based on sodium chloride equivalency. Devices shall not discharge more than 4.0 gallons of water per 1000 grains of hardness removed during the service or recharge cycle.

<b>(1)</b> <u>No water softener</u>	<u>5</u>
<b>(2)</b> <u>Water softener installed to supply softened water only to domestic water heater</u>	<u>2</u>

**802.9.2** Reverse Osmosis (R/O) water treatment systems shall be listed to NSF 58 and shall include automatic shut-off valve to prevent water discharge when storage tank is full

<b>(1)</b> <u>No R/O system</u>	<u>3</u>
<b>(2)</b> <u>Combined capacity of all R/O systems does not exceed 0.75 gallons</u>	<u>1</u>

<b>802.10 Pools and Spas</b>
------------------------------

**801.10.1** Pools and Spas with water surface area greater than 36 square feet and connected to a water supply shall have a dedicated meter to measure the amount of water supplied to the pool or spa.

<b>(1)</b> <u>Automated motorized non-permeable pool cover that covers the entire pool surface.</u>	<u>10</u>
---	-----------

<b>8032 INNOVATIVE PRACTICES</b>
--------------------------------------

**8032.1 Reclaimed, gray, or recycled water.** Reclaimed, gray, or recycled water is used as permitted by applicable code.  
**(Points awarded for either Section 802.1(1) or 802.1(2), not both.)**  
**(Points awarded for either Section 802.6 or 802.1, not both.)**

<b>(1)</b> each water closet flushed by reclaimed, gray, or recycled water <b>(Points awarded per fixture or appliance.)</b>	<b>5 20 Max</b>
<b>(2)</b> irrigation from reclaimed, gray, or recycled water on-site	<b>10</b>

**8032.2 Reclaimed water, graywater, or rainwater pre-piping.** Reclaimed, graywater, or rainwater systems are rough plumbed (and permanently marked, tagged or labeled) into buildings for future use.

	<b>3 per roughed in system</b>
--	--

**8032.3 Automatic ~~shutoff water supply~~ leak detection and control devices.** One of the following ~~automatic shutoff water supply~~ devices is installed. Where a fire sprinkler system is present, ~~installer is to ensure~~ the device will be installed to not interfere with the operation of the fire sprinkler system.

<b>(1)</b> <del>excess water flow</del> <u>automatic <del>shutoff</del>water leak detection and control devices</u>	<b>2</b>
---	----------

**WATER EFFICIENCY**

(2) ~~leak detection system with~~ automatic [water leak detection and](#) shutoff [devices](#)

**8032.4 Engineered biological system or intensive bioremediation system.** An engineered biological system or intensive bioremediation system is installed and the treated water is used on site. Design and implementation are approved by appropriate regional authority. **20**

**8032.5 Recirculating humidifier.** Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional “flow through” type. **1**

**8032.6 Advanced wastewater treatment system.** Advanced wastewater (aerobic) treatment system is installed and treated water is used on site. **20**  
**(Points awarded for either Section 802.6 or 802.1, not both.)**

**804**  
**PERFORMANCE PATH**

**804.1 Water Rating Index.** [Water Rating Index \(WRI\) score is calculated in accordance with Appendix F or equivalent methodology.](#)

**804.2 Water Efficiency Rating Levels.** [In lieu of threshold levels for Chapter 8 in Table 303, rating levels for Section 804.1 are in accordance with Table 804.2.](#)

<b>Tables 804.2</b>			
<b>Maximum WRI Scores for NGBS Certification in Chapter 8</b>			
<a href="#">Bronze</a>	<a href="#">Silver</a>	<a href="#">Gold</a>	<a href="#">Emerald</a>
<a href="#">70</a>	<a href="#">60</a>	<a href="#">50</a>	<a href="#">40</a>

**804.3 Water Efficiency NGBS Points Equivalency.** [The additional points for use with Table 303 from the Chapter 8 Water Efficiency Category are determined in accordance with equation 804.3.](#)

**Equation 804.3**  
**[NGBS = WRI x \(-2.29\) + 181.7](#)**

## CHAPTER 9

# INDOOR ENVIRONMENTAL QUALITY

GREEN BUILDING PRACTICES	POINTS
<b>901 POLLUTANT SOURCE CONTROL</b>	
<b>901.0 Intent.</b> Pollutant sources are controlled.	
<b>901.1 Space and water heating options</b>	
<b>901.1.1</b> Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source and is sealed and insulated to separate it from the conditioned space(s).  <b>(Points are awarded only for buildings that use natural draft combustion space or water heating equipment.)</b>	<b>5</b>
<b>901.1.2</b> Air handling equipment or return ducts are not located in the garage, unless placed in isolated, air-sealed mechanical rooms with an outside air source.	<b>5</b>
<b>901.1.3</b> The following combustion space heating or water heating equipment is installed within conditioned space:	
<b>(1)</b> all furnaces or all boilers <b>(a)</b> power-vent furnace(s) or boiler(s) <b>(b)</b> direct-vent furnace(s) or boiler(s)	<b>3</b>
<b>(b)</b> direct-vent furnace(s) or boiler(s)	<b>5</b>
<b>(2)</b> all water heaters	
<b>(a)</b> power-vent water heater(s)	<b>3</b>
<b>(b)</b> direct-vent water heater(s)	<b>5</b>
<b>901.1.4</b> Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units <a href="#">or sleeping units</a> and direct heating equipment are vented to the outdoors. <a href="#">Alcohol burning devices and kerosene heaters are vented to the outdoors.</a>	<b>Mandatory</b>
<b>901.1.5</b> Natural gas and propane fireplaces are direct vented, have permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88/CSA 2.33 or CSA Z21.50b/CSA 2.22b.	<b>7</b>
<b>901.1.6</b> The following electric equipment is installed:	
<b>(1)</b> heat pump air handler in unconditioned space	<b>2</b>
<b>(2)</b> heat pump air handler in conditioned space	<b>5</b>



GREEN BUILDING PRACTICES	POINTS
<b>901.2 Solid fuel-burning appliances</b>	
<b>901.2.1</b> Solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:	<b>Mandatory</b>
(1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.	<b>4</b>
(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are <del>an EPA certified or</del> Phase 2 <a href="#">Emission Level</a> Qualified <a href="#">Model</a> .	<b>6</b>
(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).	<b>6</b>
(4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.	<b>6</b>
(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC Section 2112.1.	<b>6</b>
<b>901.2.2</b> Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.	<b>6</b>
<b>901.3 Garages.</b> Garages are in accordance with the following:	
(1) Attached garage	
(a) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed.	<b>Mandatory 2</b>
(b) A continuous air barrier is provided separating the garage space from the conditioned living spaces.	<b>Mandatory 2</b>
(c) For one- and two-family dwelling units, a 100 cfm (47 L/s) or greater ducted or 70 cfm (33 L/s) cfm or greater unducted wall exhaust fan is installed and vented to the outdoors and is designed and installed for continuous operation or has controls (e.g., motion detectors, pressure switches) that activate operation for a minimum of 1 hour when either human passage door or roll-up automatic doors are operated. For ducted exhaust fans, the fan airflow rating and duct sizing are in accordance with Appendix A.	<b>8</b>
(2) A carport is installed, the garage is detached from the building, or no garage is installed.	<b>10</b>
<b>901.4 Wood materials.</b> A minimum of 85 percent of material within a product group (i.e., wood structural panels, countertops, composite trim/doors, custom woodwork, and/or component closet shelving) is manufactured in accordance with the following:	
(1) Structural plywood used for floor, wall, and/or roof sheathing is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.	<b>Mandatory</b>
(2) Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively.	<b>2</b>
<b>(Points awarded per product group.)</b>	



GREEN BUILDING PRACTICES		POINTS
(3)	Hardwood plywood in accordance with HPVA HP-1. <b>(Points awarded per product group.)</b>	2
(4)	Particleboard, MDF, or hardwood plywood is in accordance with CPA 4. <b>(Points awarded per product group.)</b>	3
(5)	Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the CARB <i>Composite Wood Air Toxic Contaminant Measure Standard</i> . <b>(Points awarded per product group.)</b>	4
(6)	Non-emitting products. <b>(Points awarded per product group.)</b>	4

<b>901.5 Cabinets.</b> A minimum of 85 percent of installed cabinets are in accordance with one or both of the following: <b>(Where both of the following practices are used, only 3 points are awarded.)</b>		
(1)	All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.	5
(2)	The composite wood used in wood cabinets is in accordance with CARB <i>Composite Wood Air Toxic Contaminant Measure Standard</i> or equivalent as certified by a third-party program such as, but not limited to, those in Appendix D.	3

<b>901.6 Carpets.</b> Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.	<b>Mandatory</b>
---	------------------

<b>901.7 Floor materials.</b> The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D. <b>(Points are awarded for every 10% of conditioned floor space using one of the below materials.)</b>		1 8 max
(1)	Hard surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice: <ul style="list-style-type: none"> <li>(a) Ceramic tile flooring</li> <li>(b) Organic-free, mineral-based flooring</li> <li>(c) Clay masonry flooring</li> <li>(d) Concrete masonry flooring</li> <li>(e) Concrete flooring</li> <li>(f) Metal flooring</li> </ul>	
(2)	Carpet and carpet cushion is installed. <b>(When carpet cushion meeting the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.)</b>	

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<p><b>901.8 Wall coverings.</b> A minimum of 10 percent of the interior wall surfaces are covered and a minimum of 85 percent of wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.</p>	<b>4</b>
---	----------

<p><b>901.9 Interior architectural coatings.</b> A minimum of 85 percent of the interior architectural coatings are in accordance with either Section 901.9.1 or Section 901.9.3, not both. A minimum of 85 percent of architectural colorants are in accordance with Section 901.9.2.</p> <p><b>Exception:</b> Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air -- Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.</p>
--

<p><b>901.9.1</b> Site-applied interior architectural coatings, which are inside the water proofing envelope, are in accordance with one or more of the following:</p>	<b>5</b>
--	----------

<p><b>(1)</b> Zero VOC as determined by EPA Method 24 (VOC content is below the detection limit for the method)</p>
---

<p><b>(2)</b> GreenSeal GS-11</p>
-----------------------------------

<p><b>(3)</b> CARB <i>Suggested Control Measure for Architectural Coatings</i> (see Table 901.9.1).</p>
---

**Table 901.9.1**  
**VOC Content Limits For Architectural Coatings<sup>a,b,c</sup>**

Coating Category	LIMIT <sup>d</sup> (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat High-Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120 <sup>e</sup>
Magnesite Cement Coatings	450

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

Coating Category	LIMIT <sup>d</sup> (g/l)
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.

b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.

c. Table 901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.

d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

e. Limit is expressed as VOC actual.

<p><b>901.9.2</b> Architectural coating colorant additive VOC content is in accordance with Table 901.9.2. <b>(Points for 901.9.2 are awarded only if base architectural coating is in accordance with 901.9.1.)</b></p>	<b>1</b>
--	----------

Table 901.9.2 VOC Content Limits for Colorants	
Colorant	LIMIT (g/l)
Architectural Coatings, excluding IM Coatings	50
Solvent-Based IM	600
Waterborne IM	50

<p><b>901.9.3</b> Site-applied interior architectural coatings, which are inside the waterproofing envelope, are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.</p>	<b>8</b>
--	----------

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

**901.10 Interior adhesives and sealants.** A minimum of 85 percent of site-applied adhesives and sealants located inside the waterproofing envelope are in accordance with one of the following, as applicable.

- |   |          |
|---|----------|
| <p><b>(1)</b> The emission levels are in accordance with CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.</p> | <b>8</b> |
| <p><b>(2)</b> GreenSeal GS-36.</p>  | <b>5</b> |
| <p><b>(3)</b> SCAQMD Rule 1168 in accordance with Table 901.10(3), excluding products that are sold in 16-ounce containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulations.</p>  | <b>5</b> |

**Table 901.10(3)  
Site Applied Adhesive and Sealants VOC Limits<sup>a,b</sup>**

ADHESIVE OR SEALANT	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer	
Non-porous	250
Porous	775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140

a. VOC limit less water and less exempt compounds in grams/liter  
 b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.

GREEN BUILDING PRACTICES	POINTS
<p><b>901.11 Insulation.</b> Emissions of 85 percent of wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. Insulation is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.</p>	<b>4</b>
<p><b>901.12 Carbon monoxide (CO) alarms.</b> A carbon monoxide (CO) alarm is provided in accordance with the IRC Section R315.</p>	<b>Mandatory</b>
<p><b>901.13 Building entrance pollutants control.</b> Pollutants are controlled at all main building entrances by one of the following methods:</p>	
<p>(1) Exterior grilles or mats are installed in a fixed manner and may be removable for cleaning.</p>	<b>1</b>
<p>(2) Interior grilles or mats are installed in a fixed manner and may be removable for cleaning.</p>	<b>1</b>
<p><b>901.14 Non-smoking areas.</b> Environmental tobacco smoke is minimized by one or more of the following:</p>	
<p>(1) All interior common areas of a multifamily building are designated as non-smoking areas with posted signage.</p>	<b>1</b>
<p>(2) Exterior smoking areas of a multifamily building are designated with posted signage and located a minimum of 25 feet from entries, outdoor air intakes, and operable windows.</p>	<b>1</b>
<p><b>902 POLLUTANT CONTROL</b></p>	
<p><b>902.0 Intent.</b> Pollutants generated in the building are controlled.</p>	
<p><b>902.1 Spot ventilation</b></p>	
<p><b>902.1.1</b> Spot ventilation is in accordance with the following:</p>	
<p>(1) Bathrooms are vented to the outdoors. The minimum ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms.  <b>(Points are awarded only if a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.)</b></p>	<b>Mandatory 1</b>
<p>(2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.</p>	<b>Mandatory</b>
<p>(3) Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.</p>	<b>8</b>
<p><b>902.1.2</b> Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:</p>	
<p>(1) for first device</p>	<b>5</b>
<p>(2) for each additional device</p>	<b>2</b>

GREEN BUILDING PRACTICES	POINTS
<p><b>902.1.3</b> Kitchen range, bathroom, and laundry exhaust are verified to air flow specification. Ventilation airflow at the point of exhaust is tested to a minimum of:</p> <p>(a) 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and</p> <p>(b) 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry</p>	<b>8</b>
<p><b>902.1.4</b> Exhaust fans are ENERGY STAR, as applicable.</p> <p>(1) ENERGY STAR, or equivalent, fans <b>(Points awarded per fan.)</b></p> <p>(2) ENERGY STAR, or equivalent, fans operating at or below 1 sone <b>(Points awarded per fan.)</b></p>	<p><b>12 Max</b></p> <p><b>2</b></p> <p><b>3</b></p>
<p><b>902.1.5</b> Fenestration in spaces other than those identified in 902.1.1 through 902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:</p> <p>(1) Operable windows, operable skylights, or sliding glass doors with a total area of at least 15 percent of the <u>total</u> conditioned floor area are provided.</p> <p>(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.</p> <p>(3) A minimum of two operable windows or sliding glass doors are placed in adjacent or opposite walls. If there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.</p>	<b>3</b>
<b>902.2 Building ventilation systems</b>	
<p><b>902.2.1</b> One of the following whole building ventilation systems is implemented and is in accordance with the specifications of Appendix B and an explanation of the operation and importance of the ventilation system is included in either 1001.1 or 1002.2.</p> <p>(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls</p> <p>(2) balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building</p> <p>(3) heat-recovery ventilator</p> <p>(4) energy-recovery ventilator</p> <p>(5) <u>Ventilation air is preconditioned by a system not specified above.</u></p>	<p><b>Mandatory where the maximum air infiltration rate is less than 5.0 ACH50</b></p> <p><b>3</b></p> <p><b>6</b></p> <p><b>7</b></p> <p><b>8</b></p>
<p><b>902.2.2</b> Ventilation airflow is tested to achieve the design fan airflow <u>at point of exhaust</u> in accordance with <u>ANSI/RESNET/ICC 380 and</u> Section 902.2.1.</p>	<b>4</b>

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>902.2.3</b> MERV filters 8 to 13 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of MERV 8 to 13 filters.	<b>2</b>
--	----------

<b>902.2.4</b> MERV filters 14 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter used.	<b>3</b>
---	----------

<b>902.3 Radon <del>control</del>reduction measures.</b> Radon <del>control</del> reduction measures are in accordance with ICC IRC Appendix F <u>or 902.3.1. Radon Zones as identified by the AHJ or, if the zone is not identified by the AHJ,</u> as defined in Figure 9(1).	
<b>(1)</b> Buildings located in Zone 1	<b>Mandatory</b>
<b>(a)</b> a passive radon system is installed	<del>7</del> <b>Mandatory</b>
<b>(b)</b> an active radon system is installed	<del>10</del> <b>12</b>
<b>(2)</b> Buildings located in Zone 2 or Zone 3	
<b>(a)</b> a passive <del>or active</del> radon system is installed	<del>7</del> <b>6</b>
<b>(b)</b> <u>An active radon system is installed</u>	<b>12</b>

<b>902.3.1 Radon reduction option.</b> This option requires section 902.3.2.1 through 902.3.2.7.	
<b>902.3.1.1 Soil-gas barriers and base course.</b> A base course in accordance with Section 506.2.2 of the IRC shall be installed below slabs and foundations. There shall be a continuous gas-permeable base course under each soil-gas retarder that is separated by foundation walls or footings. Between slabs and the base course, damp proofing or water proofing shall be installed in accordance with Section 406 of the IRC. Punctures, tears and gaps around penetrations of the soil-gas retarder shall be repaired or covered with an additional soil-gas retarder. The soil-gas retarder shall be a continuous 6-mil (0.15 mm) polyethylene or an approved equivalent.	
<b>902.3.1.2 Soil gas collection.</b> There shall be an unobstructed path for soil gas flow between the void space installed in the base course and the vent through the roof. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than 4 inches (10 cm) and not less than 5 feet (1.5 m) in total length. A tee fitting or equivalent method shall provide two horizontal openings to the radon collection. The tee fitting shall be designed to prevent clogging of the radon collection path. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method	
<b>902.3.1.3 Soil gas entry routes.</b> Openings in slabs, soil-gas retarders, and joints such as, but not limited to, plumbing, ground water control systems, soil-gas vent pipes, piping and structural supports, shall be sealed against air leakage at the penetrations. The sealant shall be a polyurethane caulk, expanding foam or other approved method. Foundation walls shall comply with Section 103.2.3 of the IRC. Sumps shall be sealed in accordance with Section 103.2.2 of the IRC. Sump pits and sump lids intended for ground water control shall not be connected to the sub-slab soil-gas exhaust system	
<b>902.3.1.4 Soil gas vent.</b> A gas-tight pipe vent shall extend from the soil gas permeable layer through the roof. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof. Exposed and visible interior vent pipes shall be identified with not less than one label reading "Radon Reduction System" on each floor and in habitable attics	

**902.3.1.5 Vent pipe diameter.** The minimum vent pipe diameter shall be as specified in Table 902.3.2.5

**TABLE 902.3.2.5 MAXIMUM VENTED FOUNDATION AREA**

Maximum area vented	Nominal pipe diameter
2,500 ft <sup>2</sup> (232 m <sup>2</sup> )	3 inch (7.6 cm)
4,000 ft <sup>2</sup> (372 m <sup>2</sup> )	4 inch (10 cm)
Unlimited	6 inch (15.2 cm)

**902.3.1.6 Multiple vented areas.** In dwellings where interior footings or other barriers separate the soil-gas permeable layer, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof

**902.3.1.7 Fan.** Each sub-slab soil-gas exhaust system shall include a fan, or dedicated space for the post-construction installation of a fan. The electrical supply for the fan shall be located within 6 feet (1.8 m) of the fan

**902.3.2 Radon testing.** Radon testing is mandatory for Zone 1

**Except:** testing is not mandatory where the authority having jurisdiction has defined the radon zone as Zone 2 or 3.

(1) Testing specifications. Testing is performance as specified in (a) through (j) **8**

(a) Testing is performed after the residence passes its airtightness test.

(b) Testing is performed at the lowest level which will be occupied, even if the space is not finished.

(c) Testing is not performed in a closet, hallway, stairway, laundry room, furnace room or bathroom.

(d) Testing is performed with a commercially available test kit or with a radon monitor. Testing shall be in accordance with the manufacturer's instructions.

(e) Testing can be performed by the builder or a third party.

(f) Testing shall extend at least 48 hours or to the minimum specified by the manufacturer, which ever is longer. This initial testing can extend past occupancy.

(g) Test results shall be provided directly to the homeowner by the test lab or testing party. The test results are not required to be delivered before occupancy.

(h) An additional pre-paid test kit shall be provided to the homeowner to use when they choose. The test kit shall include mailing, or emailing the results from the testing lab to the homeowner. The homebuilder may also receive the test results.

(i) This section does not require a specific test result, rather it requires the test be performed and the results provided to the homeowner.

(j) The homeowner shall be informed prior to occupancy and in writing that "A radon test result of 4 pCi/L or above is the 'action level' set by EPA."

(2) Testing results. A radon test done in accordance with 902.3.1 and completed before occupancy receives a results of 2 pCi/L or less. **6**

**902.4 HVAC system protection.** One of the following HVAC system protection measures is performed. **3**

(1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.



<b>(2)</b>	Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.
<b>(3)</b>	<a href="#"><u>If HVAC systems are to be operated, during construction, all return grilles have a temporary MERV 8 or higher filter installed in a manner ensuring no leakage around the filter.</u></a>

<b>902.5 Central vacuum systems.</b> Central vacuum system is installed and vented to the outside.	<b>3</b>
--	----------

<b>902.6 Living space contaminants.</b> The living space is sealed in accordance with Section 701.4.3.1 to prevent unwanted contaminants.	<b>Mandatory</b>
---	------------------

**903  
MOISTURE MANAGEMENT: VAPOR, RAINWATER, PLUMBING, HVAC**

<b>903.0 Intent.</b> Moisture and moisture effects are controlled.
--

<b>903.1 Plumbing</b>
-----------------------

<b>903.1.1</b> Cold water pipes in unconditioned spaces are insulated to a minimum of R-4 with pipe insulation or other covering that adequately prevents condensation.	<b>2</b>
---	----------

<b>903.1.2</b> Plumbing is not installed in unconditioned spaces.	<b>5</b>
---	----------

<b>903.2 Duct insulation.</b> Ducts are in accordance with one of the following.
--

<b>(1)</b> All HVAC ducts, plenums, and trunks are located in conditioned space.	<b>1</b>
--	----------

<b>(2)</b> All HVAC ducts, plenums, and trunks are in conditioned space. All HVAC ducts are insulated to a minimum of R4.	<b>3</b>
---	----------

<b>903.3 Relative humidity.</b> In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60 percent using one of the following:  <b>(Points not awarded in other climate zones.)</b>	<b>7</b>
--	----------

<b>(1)</b> additional dehumidification system(s)
--

<b>(2)</b> central HVAC system equipped with additional controls to operate in dehumidification mode
--

**904  
INDOOR AIR QUALITY**

<b>904.0 Intent.</b> IAQ is protected by best practices to control ventilation, moisture, pollutant sources and sanitation.
---

<b>904.1 Indoor Air Quality (IAQ) during construction.</b> Wood is dry before close-in (602.1.7.1(3)), materials comply with emission criteria (901.4- 901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible	<b>2</b>
---	----------

**INDOOR ENVIRONMENTAL QUALITY**

interior surfaces are dry and free of visible suspect growth (per ASTM D7338-10 section 6.3), and water damage (per ASTM D7338-10 section 7.4.3).	
---	--

<b>904.2 Indoor Air Quality (IAQ) Post Completion.</b> Verify there are no moisture, mold, and dust issues per 602.1.7.1(3), 901.4-901.11, ASTM D7338 Section 6.3, and ASTM D7338 Section 7.4.3.	<b>3</b>
--	----------

**905  
INNOVATIVE PRACTICES**

<b>905.1 Humidity monitoring system.</b> A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has a minimum of two remote sensor units. One remote sensor unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space.	<b>2</b>
--	----------

<b>905.2 Kitchen exhaust.</b> A kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, and make-up air is provided.	<b>2</b>
---	----------

**906  
ADDITIONAL / NEW**

<b>906.1 Enhanced Air Filtration.</b> Meet all of the following.	<b>2</b>
(1) <u>Design for and install a secondary filter rack space for activated carbon filters.</u>	
(2) <u>Provide the manufacturer's recommended filter maintenance schedule to the homeowner or building manager.</u>	

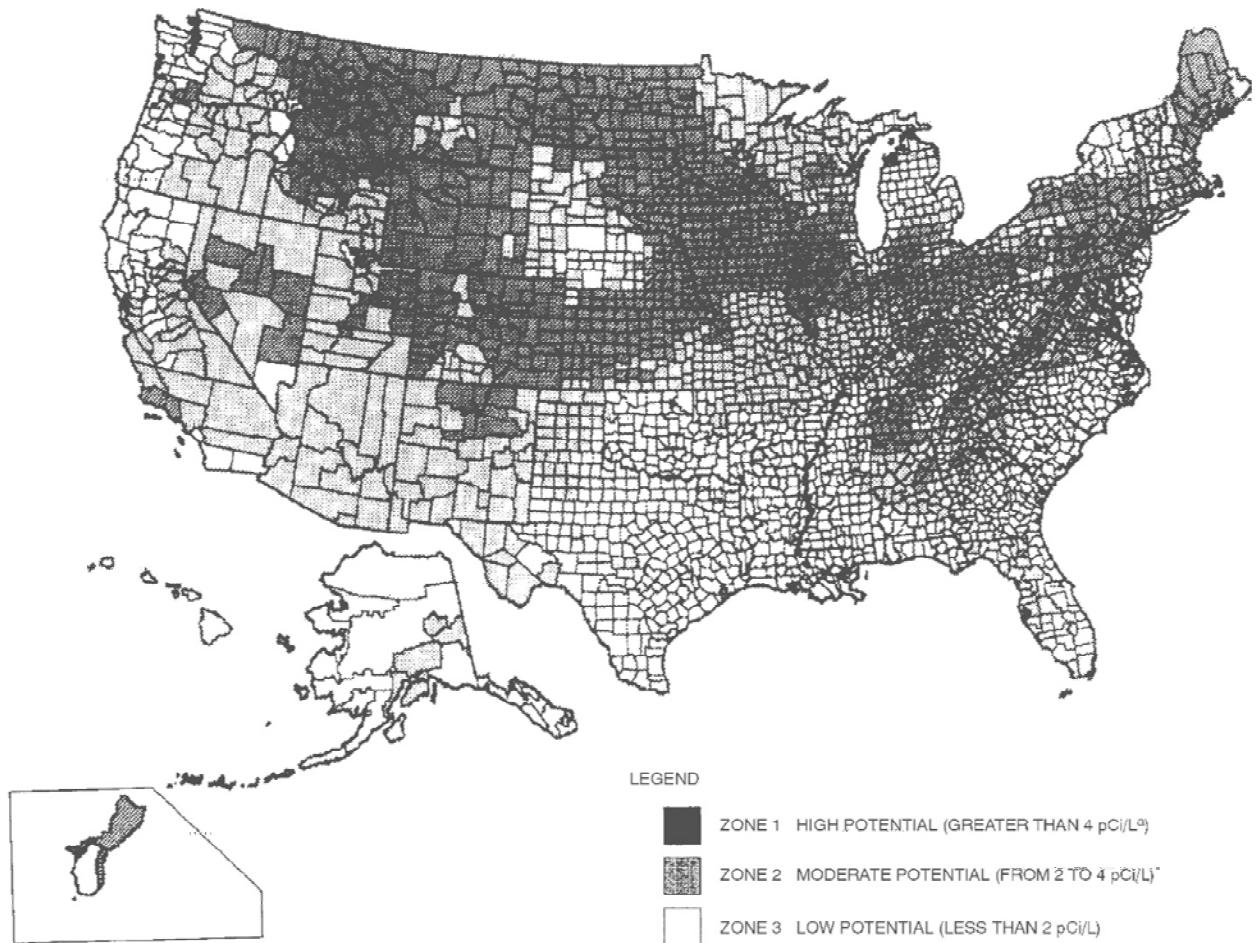
<b>906.2 Sound Barrier.</b> Provide room-to-room privacy between bedrooms and adjacent living spaces within dwelling units or homes by achieving an articulation index (AI) between 0 and 0.15 per the criteria below.	<b>1 pt for single family</b>
<u>Articulation Index 0 to 0.05 = STC &gt; 55 (NIC &gt;47)</u>	<b>3 pts for multifamily</b>
<u>Articulation Index 0.05 to 0.15 = STC 52 – 55 (NIC 44 – 47)</u>	

<b>906.3 Ventilation for Multifamily Common Spaces.</b> Systems are implemented and are in accordance with the specifications of ASHRAE 62.1 and an explanation of the operation and importance of the ventilation system is included in 1002.1 and 1002.2 of NGBS	
--	--

<b>906.4 Furniture and Furnishings.</b> In a multifamily building, all furniture in common areas shall have VOC emission levels in accordance with ANSI/BIFMA e3-Furniture Sustainability Standard sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1	
--	--

<b>906.5 Evaporative Coil Mold Prevention.</b> For buildings with a mechanical system for cooling, ultraviolet lamps are installed on the cooling coils and drain pans of the mechanical system supplies. Lamps produce ultraviolet radiation at a wavelength of 254 nm so as not to generate ozone. Lamps have ballasts housed in a NEMA-rated enclosure.	<b>2</b>
--	----------

<p><b>906.6 Microbial Growth &amp; Moisture Inspection and Remediation.</b> A visual inspection is performed to confirm the following:</p>		
(1)	<p>Verify that no visible signs of discoloration and microbial growth on ceilings, walls or floors, or other building assemblies</p>	<b>Mandatory</b>
	<p><b>Notes:</b> If minor microbial growth is observed (less than within a total area of 25 square feet) in homes or multifamily buildings, reference EPA Document 402-K-02-003 (A Brief Guide to Mold, Moisture, and Your Home) for guidance on how to properly remediate the issue. If microbial growth is observed, on a larger scale in homes or multifamily buildings (greater than 25 sq ft), reference EPA document 402-k-01-001 (Mold Remediation in Schools and Commercial Buildings) for guidance on how to properly remediate the issue.</p>	
(2)	<p>Verify that there are no visible signs of water damage or pooling. If signs of water damage or pooling are observed, verify that the source of the leak has been repaired, and that damaged materials are either properly dried or replaced as needed.</p>	<b>Mandatory</b>



a. pCi/L standard for picocuries per liter of radon gas. The U.S. Environmental Protection Agency (EPA) recommends that all homes that measure 4 pCi/L and greater be mitigated.

The EPA and the U.S. Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed to assist *building officials* in deciding whether radon-resistant features are applicable in new construction.

The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon control methods. The radon zone designation of highest priority is Zone 1. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through state radon offices or from EPA regional offices.

**FIGURE 9(1)**  
**EPA MAP OF RADON ZONES**

Reprinted with permission from the 2015 International Residential Code, a copyrighted work of the International Code Council, [www.iccsafe.org](http://www.iccsafe.org).

THIS PAGE INTENTIONALLY LEFT BLANK

## CHAPTER 10

# OPERATION, MAINTENANCE, AND BUILDING OWNER EDUCATION

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

<b>1001 HOMEOWNER'S MANUAL AND TRAINING GUIDELINES FOR ONE- AND TWO-FAMILY DWELLINGS</b>
--

<b>1001.0 Intent.</b> Information on the building's use, maintenance, and green components is provided.
---

<b>1001.1 Homeowner's manual.</b> A homeowner's manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable. <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b>	<b>1 8 Max</b>
<b>(1)</b> A National Green Building Standard certificate with a web link and completion document.	<b>Mandatory</b>
<b>(2)</b> List of green building features (can include the national green building checklist).	<b>Mandatory</b>
<b>(3)</b> Product manufacturer's manuals or product data sheet for installed major equipment, fixtures, and appliances. If product data sheet is in the building owners' manual, manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owners' manual.	<b>Mandatory</b>
<b>(4)</b> Maintenance checklist.	
<b>(5)</b> Information on local recycling and composting programs.	
<b>(6)</b> Information on available local utility programs that purchase a portion of energy from renewable energy providers.	
<b>(7)</b> Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.	
<b>(8)</b> A list of practices to conserve water and energy.	
<b>(9)</b> Information on the importance and operation of the home's fresh air ventilation system.	
<b>(10)</b> Local public transportation options.	
<b>(11)</b> A diagram showing the location of safety valves and controls for major building systems.	
<b>(12)</b> Where frost-protected shallow foundations are used, owner is informed of precautions including:	
<b>(a)</b> instructions to not remove or damage insulation when modifying landscaping.	
<b>(b)</b> providing heat to the building as required by the ICC IRC or IBC.	
<b>(c)</b> keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.	
<b>(13)</b> A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	

GREEN BUILDING PRACTICES	POINTS
(14) A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.	
(15) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(16) Information on organic pest control, fertilizers, deicers, and cleaning products.	
(17) Information on native landscape materials and/or those that have low water requirements.	
(18) Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.	
(19) Instructions for inspecting the building for termite infestation.	
(20) Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of 5 feet away from foundation.	
(21) A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.	
(22) Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.	
(23) Explanation of and benefits from green cleaning in the home.	
(24) Retrofit energy calculator that provides baseline for future energy retrofits.	

<b>1001.2 Training of initial homeowners.</b> Initial homeowners are familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:	<b>Mandatory</b> <u>8 pts</u>
(1) HVAC filters.	
(2) Thermostat operation and programming.	
(3) Lighting controls.	
(4) Appliances operation.	
(5) Water heater settings and hot water use.	
(6) Fan controls.	
(7) Recycling and composting practices.	
(8) <a href="#">Whole-dwelling mechanical ventilation systems.</a>	

**1002  
CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR  
MULTIFAMILY BUILDINGS**

**1002.0 Intent.** Manuals are provided to the responsible parties (owner, management, tenant, and/or maintenance team) regarding the construction, operation, and maintenance of the building. Paper or digital format manuals are to include information regarding those aspects of the building's construction, maintenance, and operation that are within the area of responsibilities of the respective recipient. One or more responsible parties are to receive a copy of all documentation for archival purposes.

GREEN BUILDING PRACTICES	POINTS
<p><b>1002.1 Building construction manual.</b> A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 1002.0.  <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b></p>	<b>1</b>
<p>(1) A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals.</p>	<b>Mandatory</b>
<p>(2) A local green building program certificate as well as a copy of the <i>National Green Building Standard™</i>, as adopted by the Adopting Entity, and the individual measures achieved by the building.</p>	<b>Mandatory</b>
<p>(3) Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes.</p>	<b>Mandatory</b>
<p>(4) Record drawings of the building.</p>	
<p>(5) A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.</p>	
<p>(6) A diagram showing the location of safety valves and controls for major building systems.</p>	
<p>(7) A list of the type and wattage of light bulbs installed in light fixtures.</p>	
<p>(8) A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.</p>	
<p><b>1002.2 Operations manual.</b> Operations manuals are created and distributed to the responsible parties in accordance with Section 1002.0. Between all of the operation manuals, five or more of the following options are included.  <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b></p>	<b>1</b>
<p>(1) A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals.</p>	<b>Mandatory</b>
<p>(2) A list of practices to conserve water and energy (e.g., turning off lights when not in use, switching the rotation of ceiling fans in changing seasons, purchasing ENERGY STAR appliances and electronics).</p>	<b>Mandatory</b>
<p>(3) Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.</p>	
<p>(4) Information on opportunities to purchase renewable energy from local utilities or national green power providers and information on utility and tax incentives for the installation of on-site renewable energy systems.</p>	
<p>(5) Information on local and on-site recycling and hazardous waste disposal programs and, if applicable, building recycling and hazardous waste handling and disposal procedures.</p>	
<p>(6) Local public transportation options.</p>	
<p>(7) Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.</p>	
<p>(8) Information on native landscape materials and/or those that have low water requirements.</p>	
<p>(9) Information on the radon mitigation system, where applicable.</p>	



GREEN BUILDING PRACTICES	POINTS
(10) A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.	
(11) Information on the importance and operation of the building's fresh air ventilation system.	
<p><b>1002.3 Maintenance manual.</b> Maintenance manuals are created and distributed to the responsible parties in accordance with Section 1002.0. Between all of the maintenance manuals, five or more of the following options are included.</p> <p><b>(Points awarded per two items. Points awarded for non-mandatory items.)</b></p>	<b>1</b>
(1) A narrative detailing the importance of maintaining a green building. This narrative is included in all responsible parties' manuals.	<b>Mandatory</b>
(2) A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	
<p>(3) User-friendly maintenance checklist that includes:</p> <p>(a) HVAC filters</p> <p>(b) thermostat operation and programming</p> <p>(c) lighting controls</p> <p>(d) appliances and settings</p> <p>(e) water heater settings</p> <p>(f) fan controls</p>	
(4) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(5) Information on organic pest control, fertilizers, deicers, and cleaning products.	
(6) Instructions for maintaining gutters and downspouts and the importance of diverting water a minimum of 5 feet away from foundation.	
(7) Instructions for inspecting the building for termite infestation.	
(8) A procedure for rental tenant occupancy turnover that preserves the green features.	
(9) An outline of a formal green building training program for maintenance staff.	
(10) A green cleaning plan which includes guidance on sustainable cleaning products.	
(11) <a href="#">A maintenance plan for active recreation and play spaces (e.g., playgrounds, ground markings, exercise equipment)</a>	
<p><b>1002.4 Training of building owners.</b> Building owners are familiarized with the role of occupants in achieving green goals. On-site training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:</p>	<b>Mandatory</b> <b><u>8 pts</u></b>
(1) HVAC filters	
(2) thermostat operation and programming	

GREEN BUILDING PRACTICES	POINTS
(3) lighting controls	
(4) appliances operation	
(5) water heater settings and hot water use	
(6) fan controls	
(7) recycling and composting practices	
(8) <a href="#">Whole-dwelling mechanical ventilation systems.</a>	

<a href="#">1002.5 Multifamily occupant manual.</a> An occupant manual is compiled and distributed in accordance with Section 1002.0	<b>1 pt per two items</b>
<b>Points awarded for non-mandatory items</b>	
(1) <a href="#">NGBS certificate</a>	<b>Mandatory</b>
(2) <a href="#">List of green building features</a>	<b>Mandatory</b>
(3) <a href="#">Operations manuals for all appliances and occupant operated equipment including lighting and ventilation controls, thermostats, etc.</a>	<b>Mandatory</b>
(4) <a href="#">Information on recycling and composting programs</a>	
(5) <a href="#">Information on purchasing renewable energy from utility</a>	
(6) <a href="#">Information on energy efficient replacement lamps</a>	
(7) <a href="#">List of practices to save water and energy</a>	
(8) <a href="#">Local public transportation options</a>	
(9) <a href="#">Explanation of benefits of green cleaning</a>	

<a href="#">1002.6 Training of multifamily occupants.</a> Prepare a training outline, video or website that familiarizes occupants with their role in maintaining the green goals of the project. Include all equipment that the occupant(s) is expected to operate including but not limited:	<b>1 pt per two items</b>
(1) <a href="#">Lighting controls</a>	
(2) <a href="#">Ventilation controls</a>	
(3) <a href="#">Thermostat operation and programming</a>	
(4) <a href="#">Appliances operation</a>	
(5) <a href="#">Recycling and composting</a>	
(6) <a href="#">HVAC filters</a>	
(7) <a href="#">Water heater setting and hot water use</a>	

**1003  
PUBLIC EDUCATION**

**1003.0 Intent.** Increase public awareness of the National Green Building Standard and projects constructed in accordance with National Green Building Standard to help increase demand for high-performance homes.

<b>1003.1 Public education.</b> One or more of the following is implemented.	<b>2 Max</b>
(1) <b>Signage.</b> Signs showing the project is designed and built in accordance with the National Green Building Standard are posted on the construction site.	<b>1</b>
(2) <b>Certification Plaques.</b> National Green Building Standard certification plaques with rating level attained are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of a multifamily building.	<b>1</b>
(3) <b>Education.</b> A URL for the National Green Building Standard is included on site signage, builder website (or property website for multifamily buildings), and marketing materials for homes certified under the National Green Building Standard.	<b>1</b>

**1004  
POST OCCUPANCY PERFORMANCE ASSESSMENT**

**1004.0 Intent.** A verification system for post occupancy assessment of the building is intended to be a management tool for the building owner to determine if energy or water usage have deviated from expected levels so that inspection and correction action can be taken.

<b>1004.1 Verification system.</b> A verification system plan is provided in the building owner's manual (Sections 1001 or 1002). The verification system provides methods for demonstrating continued energy and water savings that are determined from the building's initial year of occupancy of water and energy consumption as compared to annualized consumption at least every four years.	
(1) Verification plan is developed to monitor post-occupancy energy and water use and is provided in the building owner's manual.	<b>1</b>
(2) Verification system is installed in the building to monitor post-occupancy energy and water use.	<b>3</b>

**1005  
INNOVATIVE PRACTICES**

<b>1005.1 Appraisals.</b> <u>One or more of the following is implemented:</u> <del>(Reserved)</del>	
(1) <u>Energy rating or usage data is posted by submitting rating or data to the RESNET registry, affixing the HERS or ERI data to a sticker in an appropriate location in the home, or an equivalent posting so that an appraiser can access the energy data for an energy efficiency property valuation.</u>	<u>2</u>
(2) <u>An Appraisal Institute Form 820.05 "Residential Green and Energy Addendum" or Form 821 "Commercial Green and energy Efficient Addendum" that consider NGBS, LEED, ENERGY STAR certifications and equivalent programs, is completed for the appraiser by a qualified professional or builder to use in performing the valuation of the property</u>	<u>2</u>
(3) <u>NGBS certification information or one of the Appraisal Institute Forms cited in (2) above is uploaded to a multiple listing service (MLS) or equivalent database so that appraisers can access it to compare property valuations</u>	<u>2</u>

THIS PAGE INTENTIONALLY LEFT BLANK

## CHAPTER 11

# REMODELING

GREEN BUILDING PRACTICES	POINTS
--------------------------	--------

*Note: Where applicable, section numbering in Chapter 11 parallels a corresponding practice in a previous chapter.*

### 11.500 LOT DESIGN, PREPARATION, AND DEVELOPMENT

**11.500.0 Intent.** This section applies to the lot and changes to the lot due to remodeling of an existing building.

### 11.501 LOT SELECTION

**11.501.2 Multi-modal transportation.** A range of multi-modal transportation choices are promoted by one or more of the following:

<p><b>(1)</b> The building is located within one-half mile (805 m) of pedestrian access to a mass transit system.</p>	<b>6</b>
<p><b>(2)</b> The building is located within five miles (8,046 m) of a mass transit station with provisions for parking.</p>	<b>3</b>
<p><b>(3)</b> The building is located within one-half mile (805 m) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following:  <i>Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks.</i>  <i>Retail: grocery store, restaurant, retail store.</i>  <i>Civic: post office, place of worship, community center.</i>  <i>Services: bank, daycare center, school, medical/dental office, Laundromat/dry cleaners.</i>  <u>OR</u>  <a href="#">A lot is selected within a census block group that, compared to its region, has above-average neighborhood walkability using an index within the USEPA's Smart Location Database:</a></p>	<b>4</b>
<p style="padding-left: 40px;"><a href="#">(a) Walkability is within the top quartile for the region.</a></p>	<b>5</b>
<p style="padding-left: 40px;"><a href="#">(b) Walkability is within the second quartile for the region.</a></p>	<b>2</b>
<p><b>(4)</b> The building is on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or is on an infill lot located within 1/2 mile of a bicycle lane designated by the jurisdiction.</p>	<b>5</b>
<p><b>(5)</b> Dedicated bicycle parking and racks are constructed for mixed-use and multifamily buildings:</p>	
<p style="padding-left: 40px;"><b>(a)</b> Minimum of 1 bicycle parking space per 3 residential units</p>	<b>2</b>
<p style="padding-left: 40px;"><b>(b)</b> Minimum of 1 bicycle parking space per 2 residential units</p>	<b>4</b>
<p style="padding-left: 40px;"><b>(c)</b> Minimum of 1 bicycle parking space per 1 residential unit.</p>	<b>6</b>

REMODELING

GREEN BUILDING PRACTICES	POINTS
<a href="#">(d) Bicycle enclosed storage is provided or parking spaces are covered or otherwise protected from the elements.</a>	<a href="#">2 points per (a) – (c)</a>
<a href="#">(6) The remodel includes the new development and implementation of a community scale bike sharing</a>	<a href="#">3</a>
<a href="#">(7) The remodel includes the new development and implementation of a community scale motorized vehicle sharing program</a>	<a href="#">5</a>

**11.502  
PROJECT TEAM, MISSION STATEMENT, AND GOALS**

<b>11.502.1 Project team, mission statement, and goals.</b> A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project’s green goals and objectives are written into a mission statement.	<b>4</b>
---	----------

**11.503  
LOT DESIGN**

**11.503.0 Intent.** The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot.  
**(Points awarded only if the intent of the design is implemented.)**

<b>11.503.1 Natural resources.</b> Natural resources are conserved by one or more of the following:	
<b>(1)</b> A natural resources inventory is completed under the direction of a qualified professional.	<b>5</b>
<b>(2)</b> A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources.	<b>6</b>
<b>(3)</b> Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional.	<b>4</b>
<b>(4)</b> Basic training in tree or other natural resource protection is provided for the on-site supervisor.	<b>4</b>
<b>(5)</b> All tree pruning on-site is conducted by a certified arborist or other qualified professional.	<b>3</b>
<b>(6)</b> Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices.	<b>4</b>
<b>(7)</b> Where a lot adjoins a landscaped common area, a protection plan from the remodeling construction activities next to the common area is implemented.	<b>5</b>
<a href="#">(8) Developer has a plan to design and construct the lot in accordance with the International Wildland-Urban Interface Code (IWUIC).</a>  <a href="#">(Only applicable where the AHJ has not declared a wildland-urban interface area, but a fire protection engineer, certified fire marshal, or other qualified party has determined and documented the site as hazarded per the IWUIC).</a>	<a href="#">6</a>

**11.503.2 Slope disturbance.** Slope disturbance is minimized by one or more of the following:

GREEN BUILDING PRACTICES		POINTS
(1)	The use of terrain-adaptive architecture.	5
(2)	Hydrological/soil stability study is completed and used to guide the design of any additions to buildings on the lot.	5
(3)	All or a percentage of new driveways and parking are aligned with natural topography to reduce cut and fill.	
	(a) 10 percent to 25 percent	1
	(b) 25 percent to 75 percent	4
	(c) greater than 75 percent	6
(4)	Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques.	6
(5)	Underground parking uses the natural slope for parking entrances.	5
<b>11.503.3 Soil disturbance and erosion.</b> Soil disturbance and erosion are minimized by one or more of the following: (also see Section 11.504.3)		
(1)	Remodeling construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days.	52
(2)	The new utilities on the lot are designed to use one or more alternative means:	52
	(a) tunneling instead of trenching	
	(b) use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment	
	(c) shared utility trenches or easements	
	(d) placement of utilities under paved surfaces instead of yards	
(3)	Limits of new clearing and grading are demarcated on the lot plan.	52
<b>11.503.4 Stormwater Management.</b> The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:		
(1)	A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.	7
(2)	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:	
	(a) 80th percentile storm event	5
	(b) 90th percentile storm event	8
	(c) 95th percentile storm event	10
(3)	Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:	
	(a) <u>10 percent to</u> less than 25 percent	52

GREEN BUILDING PRACTICES	POINTS
<a href="#">(add 2 points for use of vegetative paving system)</a>	
<b>(b)</b> 25-50 percent <a href="#">(add 4 points for use of vegetative paving system)</a>	<u>85</u>
<b>(c)</b> Greater than 50 percent <a href="#">(add 6 points for use of vegetative paving system)</a>	10
<b><a href="#">(Points for vegetative paving systems are only awarded for locations receiving more than 20 inches per year of annual average precipitation)</a></b>	
<b>(4)</b> <a href="#">Complete gutter and downspout system directs storm water away from foundation to landscaping or catchment.</a>	<u>8</u>

<p><b>11.503.5 Landscape plan.</b> A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment.</p> <p style="text-align: center;"><b>(Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8))</b></p>	
<b>(1)</b> A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.	
<b>(a)</b> 100 percent of the natural area	4
<b>(b)</b> 50 percent of the natural area	3
<b>(c)</b> 25 percent of the natural area	2
<b>(d)</b> 12 percent of then natural area	1
<b>(2)</b> Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote.	4
<b>(3)</b> To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	3
<b>(4)</b> EPA WaterSense Water Budget Tool or equivalent is used when implementing <a href="#">up to</a> the maximum percentage of turf areas.	<u>25</u>
<b>(5)</b> <a href="#">Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent third party qualified water efficient grasses are used.</a>	<u>3</u>
<b>(56)</b> For landscaped vegetated areas, the maximum percentage of all turf areas is:	
<b>(a)</b> 0 percent	5
<b>(b)</b> Greater than 0 percent to less than 20 percent	4
<b>(c)</b> 20 percent to less than 40 percent	3
<b>(d)</b> 40 percent to 60 percent	2
<b>(67)</b> Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan.	5
<b>(78)</b> Summer shading by planting installed to shade a minimum of 30 percent of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice.	5
<b>(89)</b> Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions.	4



GREEN BUILDING PRACTICES		POINTS
<b>(910)</b>	Site- or community-generated tree trimmings or stump grinding of regionally appropriate trees are used on the site to provide protective mulch during construction or for landscaping.	3
<b>(110)</b>	An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	4
<b>(124)</b>	Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site.	3
<b>(132)</b>	Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site.	6

<b>11.503.6 Wildlife habitat.</b> Measures are planned to support wildlife habitat and include at least two of the following:		
<b>(1)</b>	Plants and gardens that encourage wildlife, such as bird and butterfly gardens.	3
<b>(2)</b>	<a href="#">To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing species. Invasive plant species shall not be utilized.</a>	3
<b>(32)</b>	Inclusion of a certified “backyard wildlife” program.	3
<b>(43)</b>	The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship.	3
<b>(54)</b>	Outdoor lighting techniques are utilized with regard for wildlife.	3

<b>11.503.7 Environmentally sensitive areas.</b> The lot is in accordance with one or both of the following:		
<b>(1)</b>	The lot does not contain any environmentally sensitive areas that are disturbed during remodeling.	4
<b>(2)</b>	On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through remodeling activities.	4

**11.504 LOT CONSTRUCTION**

**11.504.0 Intent.** Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized, and any significant impacts are mitigated.

<b>11.504.1 On-site supervision and coordination.</b> On-site supervision and coordination is provided during on-lot-clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 11.503.3)	4
--	---

<b>11.504.2 Trees and vegetation.</b> Designated trees and vegetation are preserved by one or more of the following:		
<b>(1)</b>	Fencing or equivalent is installed to protect trees and other vegetation.	3
<b>(2)</b>	Trenching, significant changes in grade, and compaction of soil and critical root zones in all “tree save” areas as shown on the lot plan are avoided.	5

REMODELING

(3) Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	4
---	---

<b>11.504.3 Soil disturbance and erosion implementation.</b> On-site soil disturbance and erosion during remodeling are minimized by one or more of the following in accordance with the SWPPP or applicable plan: (also see Section 11.503.3)	
(1) Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required.	5
(2) Limits of clearing and grading are staked out on the lot.	5
(3) “No disturbance” zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity.	5
(4) Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot.	5
(5) Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment).	4
(6) Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA, or in the approved SWPPP, where required.	3
(7) Soil is improved with organic amendments and mulch.	3
(8) Newly installed utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements).	5

**11.505 INNOVATIVE PRACTICES**

**11.505.0 Intent.** Innovative lot design, preparation and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained, and innovative zoning is used to implement such practices.

<b>11.505.1 Driveways and parking areas.</b> Driveways and parking areas are minimized or mitigated by one or more of the following:	
(1) Off-street parking areas are shared or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, if required.	5
(2) In a multifamily project, parking capacity does not exceed the local minimum requirements.	5
(3) Structured parking is utilized to reduce the footprint of surface parking areas.	
(a) 25 percent to less than 50 percent	4
(b) 50 percent to 75 percent	5
(c) greater than 75 percent	6
(4) <del>Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.</del>	
(a) <del>40 percent to less than 25 percent</del>	1
(b) <del>25 percent to 75 percent</del>	2
(c) <del>Greater than 75 percent</del>	3

<b>11.505.2 Heat island mitigation.</b> Heat island effect is mitigated by one or both of the following.		<b>4</b>
<b>(1)</b>	Hardscape: Not less than 50 percent of the surface area of the hardscape on the lot meets one or a combination of the following methods.	<b>5</b>
<b>(a)</b>	Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.	
<b>(b)</b>	Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.	
<b>(c)</b>	Permeable hardscaping: Permeable hardscaping materials are installed.	
<b>(2)</b>	Roofs: Not less than 75 percent of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate of the building lot. Invasive plant species are not permitted.	<b>5</b>

<b>11.505.3 Density.</b> The average density on the lot on a net developable area basis is:		
<b>(1)</b>	7 to less than 14 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>4</b>
<b>(2)</b>	14 to less than 21 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>5</b>
<b>(3)</b>	21 to less than 35 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>6</b>
<b>(4)</b>	35 to less than 70 dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>7</b>
<b>(5)</b>	70 or greater dwelling units/ <u>sleeping units</u> per acre (per 4,047 m <sup>2</sup> )	<b>8</b>

<b>11.505.4 Mixed-use development.</b> <del>The lot contains a mixed-use building.</del>		<b>8</b>
<b>(1)</b>	<u>The lot contains a mixed-use building</u>	<b>8</b>
<b>(2)</b>	<u>Lot is within ½ mile of mixed-use building(s).</u>	<b>4</b>

<b>11.505.5 Multifamily or mixed-use Ccommunity Ggarden(s).</b> <del>A portion of the lot is established as a community garden(s), available to residents of the lot, to provide for local food production to residents or area consumers.</del>		<b>3</b>
<b>(a)</b>	<u>A portion of the lot of at least 250 sq ft is established as community garden(s) for the residents of the site.</u>	<b>3 per 250 sq ft maximum 9 points</b>
<b>(b)</b>	<u>Locate the project within a 0.5-mile walking distance of an existing or planned farmers market/farm stand that is open or will operate at least once a week for at least five months of the year.</u>	<b>3</b>
<b>(c)</b>	<u>Areas and physical provisions are provided for composting.</u>	<b>1</b>
<b>(d)</b>	<u>Signs designating the garden area are posted.</u>	<b>1</b>

<b>11.505.6 Multi-unit plug-in electric vehicle charging.</b> Plug-in electric vehicle charging capability is provided for <del>at least</del> <u>not fewer than 24</u> percent of parking stalls. <b>(An additional two points can be earned for each percentage point above 2% for a maximum of 10 points.)</b> <u>Fractional values shall be rounded up to the nearest whole number.</u> Electrical capacity in main electric panels supports Level 2 charging (208/240V- <u>up to 840 amps or in accordance with</u>		<b>4</b> <b>Max 10</b>
--	--	---------------------------

REMODELING

<u>SAE J1772</u> ). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V- <u>up to 840 amp s or in accordance with SAE J1772</u> ) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (208/240V- <u>up to 840 amp s or in accordance with SAE J1772</u> ) or Level 2 charging stations ( <u>208-240V/840A</u> ) by a third party charging station.		
<u>11.505.7 Multi-unit residential CNG vehicle fueling.</u> CNG vehicle residential fueling appliances are provided for at least 1 percent of the parking stalls. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance to the appliance manufacturer’s installation instructions.		<u>4</u>
<u>11.505.8 Street Network.</u> Project is located in an area of high intersection density.		<u>5</u>
<u>11.505.9 Smoking prohibitions.</u> Signs are provided on multifamily and mixed-use lots prohibiting smoking at the following locations		
<u>(a)</u>	<u>Smoking is prohibited within 25 feet (7.5 m) of all building exterior doors and operable windows or building air intakes within 15 (4.5 m) vertical feet of grade or a walking surface.</u>	<u>3</u>
<u>(b)</u>	<u>Smoking is prohibited on decks, balconies, patios and other occupied exterior spaces.</u>	<u>3</u>
<u>(c)</u>	<u>Smoking is prohibited at all parks, playgrounds, and community activity or recreational spaces.</u>	<u>3</u>
<u>11.505.10</u> For multifamily buildings, on-site dedicated recreation space for exercise or play opportunities for adults and/or children open and accessible to residents is provided .		
<u>(a)</u>	<u>A dedicated area of at least 400 square feet is provided inside the building with adult exercise and/or children’s play equipment.</u>	<u>3</u>
<u>(b)</u>	<u>A courtyard, garden, terrace, or roof space at least 10% of the lot area that can serve as outdoor space for children’s play and /or adult activities is provided.</u>	<u>3</u>
<u>(c)</u>	<u>Active play/recreation areas are illuminated at night to extend opportunities for physical activity into the evening.</u>	<u>3</u>
<u>11.505.11 Battery Storage System.</u> A battery storage system of not less than 6 kWh of available capacity is installed that stores electric energy from an on-site renewable electric generation system or is grid-interactive or can perform both functions.		<u>2</u>

**11.601  
QUALITY OF CONSTRUCTION MATERIALS AND WASTE**

**11.601.0 Intent.** Design and construction practices that minimize the environmental impact of the building materials are incorporated, environmentally efficient building systems and materials are incorporated, and waste generated during construction is reduced.

**11.601.1 Conditioned floor area.** Finished floor area of a dwelling unit [or sleeping unit](#) after the remodeling is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily buildings. Only the finished floor area for stories above grade plane is included in the calculation.

<b>(1)</b> Less than or equal to 700 square feet (65 m <sup>2</sup> )	<b>14</b>
<b>(2)</b> less than or equal to 1,000 square feet (93 m <sup>2</sup> )	<b>12</b>
<b>(3)</b> less than or equal to 1,500 square feet (139 m <sup>2</sup> )	<b>9</b>
<b>(4)</b> less than or equal to 2,000 square feet (186 m <sup>2</sup> )	<b>6</b>
<b>(5)</b> less than or equal to 2,500 square feet (232 m <sup>2</sup> )	<b>3</b>
<b>(6)</b> greater than 4,000 square feet (372 m <sup>2</sup> ) <b>(For every 100 square feet (9.29 m<sup>2</sup>) over 4,000 square feet (372 m<sup>2</sup>), one point is to be added the threshold points shown in Table 305.3.7 for each rating level.)</b>	<b>Mandatory</b>
<i><b>Multifamily Building Note:</b> For a multifamily building, a weighted average of the individual unit sizes is used for this practice.</i>	

<b>11.601.2 Material usage.</b> Newly installed structural systems are designed or construction techniques are implemented that reduce and optimize material usage. <b>(Points awarded only when the newly installed portion of each structural system comprises at least 25 percent of the total area of that structural system after the remodel)</b>	<b>9 Max</b>
<b>(1)</b> Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.	<b>3</b>
<b>(2)</b> Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.	<b>3</b>
<b>(3)</b> Performance-based structural design is used to optimize lateral force-resisting systems.	<b>3</b>

<b>11.601.3 Building dimensions and layouts.</b> Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for a minimum of 80 percent of the newly installed areas: <b>(Points awarded only when the newly installed area of the building comprises at least 25 percent of the total area of that element of the building after the remodel)</b>	
<b>(1)</b> floor area	<b>3</b>
<b>(2)</b> wall area	<b>3</b>
<b>(3)</b> roof area	<b>3</b>
<b>(4)</b> cladding or siding area	<b>3</b>
<b>(5)</b> penetrations or trim area	<b>1</b>

REMODELING

<p><b>11.601.4 Framing and structural plans.</b> Detailed framing or structural plans, material quantity lists and on-site cut lists for newly installed framing, structural materials, and sheathing materials are provided.</p>	<p><b>4</b></p>
<p><b>11.601.5 Prefabricated components.</b> Precut or preassembled components, or panelized or precast assemblies are utilized for a minimum of 90 percent for the following system or building:  <b>(Points awarded only when the newly installed system comprises at least 25 percent of the total area of that system of the building after the remodel)</b></p>	<p><b>13 Max</b></p>
<p><b>(1)</b> floor system</p>	<p><b>4</b></p>
<p><b>(2)</b> wall system</p>	<p><b>4</b></p>
<p><b>(3)</b> roof system</p>	<p><b>4</b></p>
<p><b>(4)</b> modular construction for any new construction located above grade</p>	<p><b>13</b></p>
<p><b>11.601.6 Stacked stories.</b> Stories above grade are stacked, such as in 1½-story, 2-story, or greater structures. The area of the upper story is a minimum of 50 percent of the area of the story below, based on areas with a minimum ceiling height of 7 feet (2,134 mm).</p>	<p><b>8 Max</b></p>
<p><b>(1)</b> first stacked story</p>	<p><b>4</b></p>
<p><b>(2)</b> for each additional stacked story</p>	<p><b>2</b></p>
<p><b>11.601.7 Prefinished materials.</b> Prefinished building materials or assemblies listed below have no additional site-applied finishing material are installed.</p>	<p><b>12 Max</b></p>
<p><b>(a)</b> interior trim not requiring paint or stain</p>	
<p><b>(b)</b> exterior trim not requiring paint or stain</p>	
<p><b>(c)</b> window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces:  i. exterior surfaces  ii. interior surfaces</p>	
<p><b>(d)</b> interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application</p>	
<p><b>(e)</b> exterior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application</p>	
<p><b>(1)</b> 90 percent or more (after the remodel) of the installed building materials or assemblies listed above:  <b>(Points awarded for each type of material or assembly.)</b></p>	<p><b>5</b></p>
<p><b>(2)</b> 50 percent to less than 90 percent (after the remodel) of the installed building material or assembly listed above:  <b>(Points awarded for each type of material or assembly.)</b></p>	<p><b>2</b></p>
<p><b>(3)</b> 35 percent to less than 50 percent (after the remodel) of the installed building material or assembly listed above:  <b>(Points awarded for each type of material or assembly.)</b></p>	<p><b>1</b></p>
<p><b>11.601.8 Foundations.</b> A foundation system that minimizes soil disturbance, excavation quantities and material usage, such as frost-protected shallow foundations, isolated pier and pad foundations, deep foundations, post foundations, or helical piles is selected, designed, and constructed. The foundation is used on 25 percent or more of the building footprint after the remodel.</p>	<p><b>3</b></p>

**11.602  
ENHANCED DURABILITY AND REDUCED MAINTENANCE**

**11.602.0 Intent.** Design and construction practices are implemented that enhance the durability of materials and reduce in-service maintenance.

**11.602.1 Moisture management – building envelope**

**11.602.1.1 Capillary breaks**

**11.602.1.1.1** A capillary break and vapor retarder are installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3 or IBC Sections 1910 and 1805.4.1.  
**This practice is not mandatory for existing slabs without apparent moisture problem.**

**Mandatory**

**11.602.1.1.2** A capillary break to prevent moisture migration into foundation wall is provided between the footing and the foundation wall on all new foundations, and on not less than 25 percent of the total length of the foundation after the remodel.

**3**

**11.602.1.2 Foundation waterproofing.** Enhanced foundation waterproofing is installed on all new foundations, and on not less than 25 percent of the total length of the foundation after the remodel using one or both of the following:

**4**

**(1)** rubberized coating, or

**(2)** drainage mat

**11.602.1.3 Foundation drainage**

**11.602.1.3.1** Where required by the ICC IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed.  
**This practice is not mandatory for existing space without apparent moisture problem.**

**Mandatory**

**11.602.1.3.2** Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit on all new foundations and not less than 25 percent of the total length of the foundation after the remodel.

**4**

**11.602.1.4 Crawlspace.**

**11.602.1.4.1** Vapor retarder for all new unconditioned vented crawlspace foundations and not less than 25 percent of the total area after the remodel is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.

**(1)** Floors. Minimum 6 mil vapor retarder installed on the crawlspace floor and extended at least 6 inches up the wall and is attached and sealed to the wall.

**6**

**(2)** Walls. Dampproof walls are provided below finished grade.  
**This practice is not mandatory for existing walls without apparent moisture problem.**

**Mandatory**

**REMODELING**

<b>11.602.1.4.2</b> For all new foundations and not less than 25 percent of the total area of the crawlspace after the remodel, crawlspace that is built as a conditioned area is sealed to prevent outside air infiltration and provided with conditioned air at a rate not less than 0.02 cfm (.009 L/s) per square foot of horizontal area and one of the following is implemented:	
(1) a concrete slab over 6 mil polyethylene sheeting or other Class I vapor retarder installed in accordance with ICC IRC Section 408.3 or Section 506.	<b>8</b>
(2) 6 mil polyethylene sheeting or other Class I vapor retarder installed in accordance with ICC IRC Section 408.3 or Section 506.  <b>This practice is not mandatory for existing foundations without apparent moisture problem.</b>	<b>Mandatory</b>

<b>11.602.1.5 Termite barrier.</b> Continuous physical foundation termite barrier provided:	
(1) In geographic areas that have moderate to heavy infestation potential in accordance with figure 6(3), a no or low toxicity treatment is also installed.	<b>4</b>
(2) In geographic areas that have a very heavy infestation potential in accordance with figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented.	<b>4</b>

<b>11.602.1.6 Termite-resistant materials.</b> In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:	
(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 feet (610 mm) above the top of the foundation.	<b>2</b>
(2) In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 feet (914 mm) above the top of the foundation.	<b>4</b>
(3) In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings.	<b>6</b>

<b>11.602.1.7 Moisture control measures</b>
---

<b>11.602.1.7.1</b> Moisture control measures are in accordance with the following:	
(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.	<b>2</b>
(2) Insulation in cavities is dry in accordance with manufacturer’s instructions when enclosed (e.g., with drywall).	<b>Mandatory 2</b>
(3) The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or cavity enclosure.	<b>4</b>

<b>11.602.1.7.2</b> Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied.	<b>2</b>
---	----------

<b>11.602.1.7.3</b> Building envelope assemblies that are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis is required to incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation.	<b>4</b>
---	----------



<p><b>11.602.1.8 Water-resistive barrier.</b> Where required by the ICC IRC or IBC, a water-resistive barrier and/or drainage plane system is installed behind newly installed exterior veneer and/or siding and where there is evidence of a moisture problem.</p>	<p><b>Mandatory</b></p>
<p><b>11.602.1.9 Flashing.</b> Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer’s instructions, the flashing manufacturer’s instructions, or as detailed by a registered design professional.</p> <p style="text-align: center;"><b>Points awarded only when practices (2)-(7) are implemented in all newly installed construction and not less than 25 percent of the applicable building elements for the entire building after the remodel.</b></p>	
<p><b>(1)</b> Flashing is installed at all of the following locations, as applicable:</p> <ul style="list-style-type: none"> <li><b>(a)</b> around exterior fenestrations, skylights and doors</li> <li><b>(b)</b> at roof valleys</li> <li><b>(c)</b> at all building-to-deck, -balcony, -porch, and -stair intersections</li> <li><b>(d)</b> at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets</li> <li><b>(e)</b> at ends of and under masonry, wood, or metal copings and sills</li> <li><b>(f)</b> above projecting wood trim</li> <li><b>(g)</b> at built-in roof gutters, and</li> <li><b>(h)</b> drip edge is installed at eave and rake edges.</li> </ul> <p style="text-align: center;"><b>These practices are not mandatory for existing building elements without apparent moisture problem.</b></p>	<p><b>Mandatory</b></p>
<p><b>(2)</b> All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 or liquid applied flashing complying with AAMA 714-15 and installed in accordance with flashing fenestration or manufacturer’s installation instructions.</p>	<p><b>2</b></p>
<p><b>(3)</b> Pan flashing is installed at sills of all exterior windows and doors</p>	<p><b>3</b></p>
<p><b>(4)</b> Seamless, preformed kickout flashing, or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material.</p>	<p><b>3</b></p>
<p><b>(5)</b> A rainscreen wall design as follows is used for exterior wall assemblies</p>	<p><b>4 Max</b></p>
<p><b>(a)</b> a system designed with minimum ¼-inch air space exterior to the water-resistive barrier, vented to the exterior at top and bottom of the wall and integrated with flashing details, or</p>	<p><b>4</b></p>
<p><b>(b)</b> a cladding material or a water-resistive barrier with enhanced drainage, meeting 75 percent drainage efficiency determined in accordance with ASTM E2273.</p>	<p><b>2</b></p>
<p><b>(6)</b> Through-wall flashing is installed at transitions between wall cladding materials, or wall construction types.</p>	<p><b>2</b></p>
<p><b>(7)</b> Flashing is installed at expansion joints in stucco walls.</p>	<p><b>2</b></p>

<p><b>11.602.1.10 Exterior doors.</b> Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have either a storm door or a projection factor of 1.0 minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).</p>	<p><b>2 per exterior door</b></p> <p><b>6 Max</b></p>
<p>(a) installing a porch roof or awning</p> <p>(b) extending the roof overhang</p> <p>(c) recessing the exterior door</p> <p>(d) Installing a storm door</p>	

<p><b>11.602.1.11 Tile backing materials.</b> Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.</p> <p><b>This practice is not mandatory for existing tile surfaces without apparent moisture problem.</b></p>	<p><b>Mandatory</b></p>
--	-------------------------

<p><b>11.602.1.12 Roof overhangs.</b> Roof overhangs, in accordance with Table 11.602.1.12, are provided over a minimum of 90 percent of exterior walls to protect the building envelope.</p>	<p><b>4</b></p>												
<p style="text-align: center;"><b>Table 11.602.1.12</b></p> <p style="text-align: center;"><b>Minimum Roof Overhang for One- &amp; Two-Story Buildings</b></p> <table border="1"> <thead> <tr> <th>Inches of Rainfall <sup>(1)</sup></th> <th>Eave Overhang (Inches)</th> <th>Rake Overhang (Inches)</th> </tr> </thead> <tbody> <tr> <td>≤40</td> <td>12</td> <td>12</td> </tr> <tr> <td>&gt;41 and ≤70</td> <td>18</td> <td>12</td> </tr> <tr> <td>&gt;70</td> <td>24</td> <td>12</td> </tr> </tbody> </table> <p>(1) Annual mean total rainfall in inches is in accordance with Figure 6(2). For SI: 12 inches = 304.8 mm</p>		Inches of Rainfall <sup>(1)</sup>	Eave Overhang (Inches)	Rake Overhang (Inches)	≤40	12	12	>41 and ≤70	18	12	>70	24	12
Inches of Rainfall <sup>(1)</sup>	Eave Overhang (Inches)	Rake Overhang (Inches)											
≤40	12	12											
>41 and ≤70	18	12											
>70	24	12											

<p><b>11.602.1.13 Ice barrier.</b> In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier is installed in accordance with the ICC IRC or IBC at roof eaves of pitched roofs and extends a minimum of 24 inches (610 mm) inside the exterior wall line of the building.</p>	<p><b>Mandatory</b></p>
--	-------------------------

<p><b>11.602.1.14 Architectural features.</b> Architectural features that increase the potential for the water intrusion are avoided:</p>	
<p>(1) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.</p>	<p><b>Mandatory</b></p> <p><b>1</b></p>
<p>(2) No roof configurations that create horizontal valleys in roof design.</p>	<p><b>2</b></p>
<p>(3) No recessed windows and architectural features that trap water on horizontal surfaces.</p>	<p><b>2</b></p>

<p><a href="#"><b>11.602.1.15 Kitchen and vanity cabinets.</b> All kitchen and vanity cabinets are certified in accordance with the ANSI/KCMA A161.1 performance standard or equivalent.</a></p>	<p><b>2</b></p>
--	-----------------

<p><b>11.602.2 Roof surfaces.</b> A minimum of 90 percent of roof surfaces, not used for roof penetrations and associated equipment, on-site renewable energy systems such as photovoltaics or solar thermal energy collectors, or rooftop decks, amenities and walkways, are constructed of one or more of the following:</p>	<p><b>3</b></p>
<p>(1) products that are in accordance with the ENERGY STAR® cool roof certification or equivalent</p>	
<p>(2) a vegetated roof system</p>	
<p>(3) Minimum initial SRI of 78 for low-sloped roof (a slope less than 2:12) and a minimum initial SRI of 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980. Roof products are certified and labeled.</p>	

<p><b>11.602.3 Roof water discharge.</b> A gutter and downspout system or splash blocks and effective grading are provided to carry water a minimum of 5 feet (1524 mm) away from perimeter foundation walls.</p>	<p><b>4</b></p>
---	-----------------

**11.602.4 Finished grade**

<p><b>11.602.4.1</b> Finished grade at all sides of a building is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent.</p>	<p><b>Mandatory</b></p>
--	-------------------------

<p><b>11.602.4.2</b> The final grade is sloped away from the edge of the building at a minimum slope of 5 percent.</p>	<p><b>1</b></p>
--	-----------------

<p><b>11.602.4.3</b> Water is directed to drains or swales to ensure drainage away from the structure.</p>	<p><b>1</b></p>
--	-----------------

**11.603 REUSED OR SALVAGED MATERIALS**

**11.603.0 Intent.** Practices that reuse or modify existing structures, salvage materials for other uses, or use salvaged materials in the building’s construction are implemented.

<p><b>11.603.1 Reuse of existing building.</b> Major elements or components of existing buildings and structures are reused, modified, or deconstructed for later use. <b>(Points awarded for every 200 square feet (18.5 m<sup>2</sup>) of floor area.)</b></p>	<p><b>1 12 Max</b></p>
--	----------------------------

<p><b>11.603.2 Salvaged materials.</b> Reclaimed and/or salvaged materials and components are used. The total material value and labor cost of salvaged materials is equal to or exceeds 1 percent of the total construction cost. <b>(Points awarded per 1% of salvaged materials used based on the total construction cost.)</b> <b>(Materials, elements, or components awarded points under Section 11.603.1 shall not be awarded points under Section 11.603.2.)</b></p>	<p><b>1 9 Max</b></p>
--	---------------------------

<p><b>11.603.3 Scrap materials.</b> Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided).</p>	<p><b>4</b></p>
--	-----------------

**11.604  
RECYCLED-CONTENT BUILDING MATERIALS**

**11.604.1 Recycled content.** Building materials with recycled content are used for two minor and/or two major components of the building.

**Per Table  
11.604.1**

**Table 11.604.1  
Recycled Content**

<b>Material Percentage Recycled Content</b>	<b>Points For 2 Minor</b>	<b>Points For 2 Major</b>
25% to less than 50%	<b>1</b>	<b>2</b>
50% to less than 75%	<b>2</b>	<b>4</b>
more than 75%	<b>3</b>	<b>6</b>

**11.605  
RECYCLED CONSTRUCTION WASTE**

**11.605.0 Intent.** Waste generated during construction is recycled. ~~All waste classified as hazardous is properly handled and disposed of.~~

**11.605.1 Hazardous waste.** The construction waste management plan shall include information on the proper handling and disposal of hazardous waste. All hazardous waste is properly handled and disposed ~~of.~~

**Mandatory**

**11.605.2 Construction waste management plan.** A construction waste management plan is developed, posted at the jobsite, and implemented diverting through methods such as reuse, salvage, recycling, or manufacturer reclamation, a minimum of 50 percent (by weight) of nonhazardous construction and demolition ~~waste from disposal. For this practice, land clearing debris is not considered a construction waste materials, excluding land-clearing waste, from disposal in landfills and combustion, excluding energy and material recovery.~~ Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging.

**6**

For remodeling projects or demolition of an existing facility, the waste management plan includes the recycling of 95% of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards), by a ~~third-party certified~~ E-Waste recycling facility.

**Exceptions:**

- (1)** Waste materials generated from land clearing, soil and sub-grade excavation and ~~all manner of~~ vegetative debris shall not be in the calculations.
- (2)** A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.

<b>11.605.3 On-site recycling.</b> On-site recycling measures following applicable regulations and codes are implemented, such as the following:	<b>7</b>
(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. A minimum of 50 percent (by weight) of construction and land-clearing waste is diverted from landfill.	
(b) Alternative compliance methods approved by the Adopting Entity.	
(c) Compatible untreated biomass material (lumber, posts, beams etc.) are set aside for combustion if a Solid Fuel Burning Appliance per Section 11.901.2.1(2) will be available for on-site renewable energy.	

<b>11.605.4 Recycled construction materials.</b> Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite.	<b>6 Max</b>
(1) a minimum of two types of materials are recycled	<b>3</b>
(2) for each additional recycled material type	<b>1</b>

**11.606  
RENEWABLE MATERIALS**

**11.606.0 Intent.** Building materials derived from renewable resources are used.

<b>11.606.1 Biobased products.</b> The following biobased products are used:	<b>8 Max</b>
(a) certified solid wood in accordance with Section 11.606.2	
(b) engineered wood	
(c) bamboo	
(d) cotton	
(e) cork	
(f) straw	
(g) natural fiber products made from crops (soy-based, corn-based)	
(h) other biobased materials with a minimum of 50 percent biobased content (by weight or volume)	
(1) Two types of biobased materials are used, each for more than 0.5 percent of the project's projected building material cost.	<b>3</b>
(2) Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	<b>6</b>
(3) For each additional biobased material used for more than 0.5 percent of the project's projected building material cost.	<b>1 2 Max</b>

<b>11.606.2 Wood-based products.</b> Wood or wood-based products are certified to the requirements of one of the following recognized product programs:
(a) American Forest Foundation's <i>American Tree Farm System®</i> (ATFS)
(b) Canadian Standards Association's <i>Sustainable Forest Management System Standards</i> (CSA Z809)
(c) <i>Forest Stewardship Council</i> (FSC)
(d) <i>Program for Endorsement of Forest Certification Systems</i> (PEFC)

REMODELING

(e)	<i>Sustainable Forestry Initiative® Program (SFI)</i>	
(f)	<i>National Wood Flooring Association's Responsible Procurement Program (RPP)</i>	
(g)	other product programs mutually recognized by PEFC	
(h)	<a href="#">A manufacturer's fiber procurement system that has been audited by an approve agency as compliant with the provisions of ASTM D7612 as a responsible or certified source. Government or tribal forestlands whose water protection programs have been evaluated by an approved agency as compliant with the responsible source designation of ASTM D7612 are exempt from auditing in the manufacturer's fiber procurement system.</a>	
(1)	A minimum of two <a href="#">responsible or</a> certified wood-based products are used for minor components of the building.	3
(2)	A minimum of two <a href="#">responsible or</a> certified wood-based products are used in major components of the building.	4
<b>11.606.3 Manufacturing energy.</b> Materials are used for major components of the building that are manufactured using a minimum of 33 percent of the primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewable energy credits (RECs).  <p style="text-align: right;"><b>(2 points awarded per material.)</b></p>		<b>6 Max</b>

**11.607  
RECYCLING AND WASTE REDUCTION**

<b>11.607.1 Recycling and composting.</b> Recycling and composting by the occupant are facilitated by one or more of the following methods:		
(1)	<del>A built-in collection space in each kitchen and an aggregation/pick-up space in a garage, covered outdoor space, or other area for recycling containers is provided.</del> <a href="#">A readily accessible space(s) for recyclable and compostable material containers is provided and identified on the floorplan of the house. A readily accessible area(s) outside the living space is provided for recyclable and compostable material containers and identified on the site plan for the house or building. The area outside the living space shall</a>	3
	<a href="#">(a) Accommodate recycling bin(s) for recyclable materials accepted in local recycling programs.</a>	
	<a href="#">(b) Where a local composting program exists, accommodate composting container(s) for locally accepted materials OR where the lot has a space for gardening, accommodate a composting bin(s) for on-site composting.</a>	
<del>(2)</del>	<del>Compost facility is provided on the site.</del>	3
(2)	<a href="#">Management provides recycling container and has designated recycling dumpsters onsite and/or contract with offsite sorting recycling facility.</a>	3
<b>11.607.2 Food waste disposers.</b> A minimum of one food waste disposer is installed at the primary kitchen sink.		1

**11.608  
RESOURCE-EFFICIENT MATERIALS**

<p><b>11.608.1 Resource-efficient materials.</b> Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:</p>	<p><b>9 Max 3 per each material</b></p>
<p>(1) lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more than 25 percent</p>	
<p>(2) engineered wood or engineered steel products</p>	
<p>(3) roof or floor trusses</p>	

**11.609 REGIONAL MATERIALS**

<p><b>11.609.1 Regional materials.</b> Regional materials are used for major and/or minor components of the building.</p>	<p><b>10 Max 2 per each major component and 1 per each minor component</b></p>
<p><b>(For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category – 75 percent or more of the stone veneer on a project must be sources regionally.)</b></p>	

**11.610 LIFE CYCLE ASSESSMENT**

<p><b>11.610.1 Life cycle assessment.</b> A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or, entire building designs. Points are awarded in accordance with Section 11.610.1.1 or 11.610.1.2. Only one method of analysis or tool may be utilized. A reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in Section 11.1001.1 or 11.1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it states if operating energy was included in the LCA.</p>	<p><b>15 Max</b></p>
<p><b>11.610.1.1 Whole-building life cycle assessment.</b> A whole-building LCA is performed in conformance with ASTM E2921 using ISO14044 compliant life cycle assessment.</p>	<p><b>15</b></p>
<p>(1) Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:</p> <ul style="list-style-type: none"> <li>(a) Primary energy use</li> <li>(b) Global warming potential</li> <li>(c) Acidification potential</li> <li>(d) Eutrophication potential</li> <li>(e) Ozone depletion potential</li> <li>(f) Smog potential</li> </ul>	<p><b>8</b></p>
<p>(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located</p>	<p><b>5</b></p>

<b>(3)</b> Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA.	<b>2</b>
--	----------

<b>11.610.1.2 Life cycle assessment for a product or assembly.</b> An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.	<b>10 Max</b>
--	---------------

<b>11.610.1.2.1 Product LCA.</b> A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. The environmental impact measures used in the assessment are selected from the following:	<b>Per Table 11.610.1.2.1 10 Max</b>
--	--

- (a) Primary energy use
- (b) Global warming potential
- (c) Acidification potential
- (d) Eutrophication potential
- (e) Ozone depletion potential
- (f) Smog potential

**(Points awarded for each product/system comparison where the selected product/system improved upon the environmental impact measures by an average of 15 percent.)**

**Table 11.610.1.2.1  
Product LCA**

4 Impact Measures	5 Impact Measures
POINTS	
2	3

<b>11.610.1.2.2 Assembly LCA.</b> An assembly with improved environmental impact measures compared to a functionally comparable assembly is selected. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following functional building elements are eligible for points under this practice:	<b>Per Table 11.610.1.2.2 10 Max</b>
--	--

- (a) exterior walls
- (b) roof/ceiling
- (c) interior walls or ceilings
- (d) intermediate floors

The environmental impact measures used in the assessment are selected from the following:

- (a) Primary energy use
- (b) Global warming potential
- (c) Acidification potential
- (d) Eutrophication potential
- (e) Ozone depletion potential
- (f) Smog potential



(Points are awarded based on the number of functional building elements that improve upon environmental impact measures by an average of 15 percent.)

**Table 11.610.1.2.2  
Assembly LCA**

	4 Impact Measures	5 Impact Measures
	POINTS	
2 functional building elements	3	6
3 functional building elements	4	8
4 functional building elements	5	10

**11.611  
PRODUCT DECLARATIONS**

**11.611.1 Product declarations.** A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer’s name, company name, contact information, and date of the review.

**5**

**11.611.1.1 Industry-wide declaration.** A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope.

**(Each product complying with Section 611.4.1 shall be counted as one product for compliance with Section 611.4.)**

**11.611.1.2 Product Specific Declaration.** A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930.

**(Each product complying with Section 611.4.2 shall be counted as two products for compliance with Section 611.4.)**

**11.6124  
INNOVATIVE PRACTICES**

**11.6124.1 Manufacturer’s environmental management system concepts.** Product manufacturer’s operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent. The aggregate value of building products from registered ISO 14001 or equivalent production facilities is 1 percent or more of the estimated total building materials cost.

**10 Max**

**(1 point awarded per percent.)**

REMODELING

<p><b>11.6124.2 Sustainable products.</b> One or more of the following products are used for at least 30% of the floor or wall area of the entire dwelling unit <u>or sleeping unit</u>, as applicable. Products are certified by a third-party agency accredited to ISO 17065.</p>	<p><b>9 Max</b></p>
<p>(1) 50% or more of carpet installed (by square feet) is certified to NSF 140 <u>or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</u></p>	<p><b>3</b></p>
<p>(2) 50% or more of resilient flooring installed (by square feet) is certified to NSF 332 <u>or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</u></p>	<p><b>3</b></p>
<p>(3) 50% or more of the insulation installed (by square feet) is certified to <u>EcoLogo CCD-046UL 2985 or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</u></p>	<p><b>3</b></p>
<p>(4) 50% or more of interior wall coverings installed (by square feet) is certified to NSF 342 <u>or applicable multi-attribute standards.</u></p>	<p><b>3</b></p>
<p>(5) 50% or more of the gypsum board installed (by square feet) is certified to UL 100 <u>or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</u></p>	<p><b>3</b></p>
<p>(6) 50% or more of the door leaves installed (by number of door leaves) is certified to UL 102 <u>or applicable multi-attribute standards.</u></p>	<p><b>3</b></p>
<p>(7) 50% or more of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials <u>or applicable standard/ ecolabel as stated in EPA's Recommendations of Standards and Ecolabels.</u></p>	<p><b>3</b></p>

<p><b>11.6142.3 Universal design elements.</b> Dwelling incorporates one or more of the following universal design elements. Conventional industry tolerances are permitted.</p>	<p><b>12 Max</b></p>
<p>(1) Any no-step entrance into the dwelling which (1) is accessible from a substantially level parking or drop-off area (no more than 2%) via an accessible path which has no individual change in elevation or other obstruction of more than 1-1/2 inches in height with the pitch not exceeding 1 in 12 and (2) provides a minimum 32-inch wide clearance into the dwelling.</p>	<p><b>3</b></p>
<p>(2) Minimum 36-inch wide accessible route from the no-step entrance into at least one visiting room in the dwelling and into at least one full or half bathroom which has a minimum 32-inch clear door width and a 30-inch by 48-inch clear area inside the bathroom outside the door swing.</p>	<p><b>3</b></p>
<p>(3) Minimum 36-inch-wide accessible route from the no-step entrance into at least one bedroom which has a minimum 32-inch clear door width.</p>	<p><b>3</b></p>
<p>(4) Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, if applicable.</p>	<p><b>1</b></p>
<p>(5) All interior and exterior door handles are levers rather than knobs.</p>	<p><b>1</b></p>
<p>(6) All sink, <u>lavatory and showering controls that comply with ICC A117.1 faucet controls are single-handle controls of both volume and temperature.</u></p>	<p><b>1</b></p>
<p>(7) Interior convenience power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15 and 48 inches above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired.</p>	<p><b>1</b></p>
<p>(8) All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices) – no toggle-type switches may be used.</p>	<p><b>1</b></p>

<p><b>(9)</b> Anyone of the following <u>systems are automated and</u> can be controlled with a <del>{wireless} mobile device or voice-activated device such as a smartphone, tablet or laptop computer:</del> HVAC, <u>all permanently-installed</u> lighting, alarm system, <u>window treatments</u>, or door locks</p>	<p><b>1 <u>per system,</u> max 5</b></p>
---	--

<p><del><b>11.611.4 Product declarations.</b> A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review.</del></p>	<p><b>5</b></p>
---	-----------------

~~**11.611.4.1 Industry-wide declaration.** A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope.~~

~~**(Each product complying with Section 11.611.4.1 shall be counted as one product for compliance with Section 11.611.4.)**~~

~~**11.611.4.2 Product Specific Declaration.** A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930.~~

~~**(Each product complying with Section 11.611.4.2 shall be counted as two products for compliance with Section 11.611.4.)**~~

**11.613  
RESILIENT CONSTRUCTION**

**11.613.1 Intent.** Design and construction practices developed by a licensed design professional or equivalent are implemented that enhance the resilience and durability of the structure (above building code minimum design loads) so the structure can better withstand forces generated by; flooding, snow, wind or seismic (as applicable) and reduce the potential for the loss of life and property.

**11.613.2 Minimum structural requirements (base design).** Design and construction practices developed by a licensed design professional or equivalent are implemented that enhance the resilience and durability of the structure (above building code minimum design loads) so the structure can better withstand forces generated by; flooding, snow, wind or seismic (as applicable) and reduce the potential for the loss of life and property.

<p><b>11.613.3 Enhanced resilience – 10% above base design.</b> Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 10% higher than the base design.</p>	<p><b>3</b></p>
---	-----------------

REMODELING

<p><b>11.613.4 Enhanced resilience – 20% above base design.</b> Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 20% higher than the base design.</p>	<p><u>5</u></p>
<p><b>11.613.5 Enhanced resilience – 30% above base design.</b> Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 30% higher than the base design.</p>	<p><u>10</u></p>
<p><b>11.613.6 Enhanced resilience – 40% above base design.</b> Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 40% higher than the base design.</p>	<p><u>12</u></p>
<p><b>11.613.7 Enhanced resilience – 50% above base design.</b> Design and construction practices are implemented that enhance the resilience and durability of the structure by designing and building to forces generated by; flooding, snow, wind or seismic (as applicable) that are 50% higher than the base design.</p>	<p><u>15</u></p>

**11.701  
MINIMUM ENERGY EFFICIENCY REQUIREMENTS**

**11.701.4 Mandatory practices**

<p><b>11.701.4.0 Minimum energy efficiency requirements.</b> Additions, alterations, or renovations to an existing building, building system or portion thereof <u>shall</u> comply with the provisions of the <del>International Energy Conservation Code</del> <u>ICC IECC</u> as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with <del>this code</del> <u>the ICC IECC</u>. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the <u>ICC IECC</u> as a single building.</p>	<p><b>Mandatory</b></p>
--	-------------------------

**11.701.4.1 HVAC systems**

<p><b>11.701.4.1.1 HVAC system sizing.</b> Newly installed or modified space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. New equipment is selected using ACCA Manual S or equivalent.</p>	<p><b>Mandatory</b></p>
---	-------------------------

<p><b>11.701.4.1.2 Radiant and hydronic space heating.</b> Where installed as a primary heat source in the building, new radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ANSI/ACCA 5 QI-2010, or an accredited design professional’s and manufacturer’s recommendations).</p>	<p><b>Mandatory</b></p>
---	-------------------------

**11.701.4.2 Duct systems**

<p><b>11.701.4.2.1 Duct air sealing.</b> Newly installed, modified, or ducts that are exposed during the remodel are air sealed. All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer’s instructions.</p>	<p><b>Mandatory</b></p>
---	-------------------------

<p><b>11.701.4.2.2 Ducts and plenums.</b> Building framing cavities are not used as ducts or plenums. Existing building cavities currently used as supply ducts exposed during the remodel are lined.</p>	<p><b>Mandatory</b></p>
---	-------------------------

<p><b>11.701.4.2.3 Duct system sizing.</b> New or modified Duct system is sized and designed in accordance with ACCA Manual D or equivalent.</p>	<p><b>Mandatory</b></p>
--	-------------------------

**11.701.4.3 Insulation and air sealing**

<p><b>11.701.4.3.1 Building thermal envelope air sealing.</b> The building thermal envelope exposed or created during the remodel is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material:</p>	<p><b>Mandatory</b></p>
--	-------------------------

- |  |
|--|
| <p>(a) All joints, seams and penetrations.</p>   |
| <p>(b) Site-built windows, doors and skylights.</p>  |
| <p>(c) Openings between window and door assemblies and their respective jambs and framing.</p>   |
| <p>(d) Utility penetrations.</p>   |
| <p>(e) Dropped ceilings or chases adjacent to the thermal envelope.</p>  |
| <p>(f) Knee walls.</p>   |
| <p>(g) Walls <del>and</del> ceilings <u>and floors</u> separating <del>a garage from</del> conditioned spaces <u>from unconditioned space</u>.</p> |
| <p>(h) Behind tubs and showers on exterior walls.</p>  |
| <p>(i) Common walls between dwelling units <u>or sleeping units</u>.</p>   |
| <p>(j) Attic access openings.</p>  |
| <p>(k) <del>Rim joist junction</del> <u>Joints of framing members at rim joists</u>.</p>   |
| <p>(l) <u>Top and bottom plates</u></p>  |
| <p>(m) Other sources of infiltration.<br/>)</p>  |

<p><b>11.701.4.3.2 Air barrier, air sealing, building envelope testing and insulation.</b> <del>Grade II and III insulation installation is not permitted. For portions of the building envelope that are exposed or created during the remodel, building envelope air tightness and insulation installation is verified to be in accordance with this Section 11.701.4.3.2(1) and 11.701.4.3.2(2) and Section 11.701.4.3.2.1. Insulation installation other than Grade 1 is not permitted.</del></p>	<p><b>Mandatory</b></p>
<p><b>(1) Testing.</b> Building envelope tightness is tested. Testing is conducted in accordance with ASTM E-779 using a blower door at a test pressure of 1.04 psf (50 Pa). Testing is conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. Testing is conducted under the following conditions:</p> <ul style="list-style-type: none"> <li><b>(a)</b> Exterior windows and doors, fireplace and stove doors are closed, but not sealed;</li> <li><b>(b)</b> Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft, and flue dampers;</li> <li><b>(c)</b> Interior doors are open;</li> <li><b>(d)</b> Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;</li> <li><b>(e)</b> Heating and cooling system(s) is turned off;</li> <li><b>(f)</b> HVAC ducts terminations are not sealed; and</li> <li><b>(g)</b> Supply and return registers are not sealed.</li> </ul>	
<p><b>Multifamily Building Note:</b> Testing by dwelling units, <u>sleeping units</u>, groups of dwelling units, <u>groups of sleeping units</u>, or the building as a whole is acceptable.</p>	
<p><b>(2) Visual inspection.</b> The air barrier and insulation items listed in Table 11.701.4.3.2(2) are field verified by visual inspection.</p>	

<p><b>11.701.4.3.2.1 Grade I insulation installation.</b> <del>Field-installed insulation products to ceilings, walls, floors, and joists, rim joists, conditioned attics, basements, and crawlspaces, except as specifically noted, are verified as Grade I by a third-party in accordance with the followings are in accordance with the following:</del></p>	<p><b>Mandatory</b></p>
<p><del>(1) Grading applies to field-installed insulation products.</del></p>	
<p><del>(2) Grading applies to ceilings, walls, floors, and joists, rim joists, conditioned attics, basements and crawlspaces, except as specifically noted.</del></p>	
<p><del>(13)</del> Inspection is conducted before insulation is covered.</p>	
<p><del>(24)</del> Air-permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate.</p>	
<p><del>(35)</del> Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).</p>	
<p><del>(46)</del> Cavity insulation compression or incomplete fill amounts to 2 percent or less, presuming the compressed or incomplete areas are a minimum of 70 percent of the intended fill thickness; occasional small gaps are acceptable.</p>	
<p><del>(57)</del> Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.</p>	
<p><del>(68)</del> Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.</p>	
<p><del>(79)</del> Exterior sheathing is not visible from the interior through gaps in the cavity insulation.</p>	

- |                  |  |
|------------------|--|
| <del>(810)</del> | Faced batt insulation is permitted to have side-stapled tabs, provided the tabs are stapled neatly with no buckling, and provided the batt is compressed only at the edges of each cavity, to the depth of the tab itself. |
| <del>(914)</del> | Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with <del>the Grade 1 insulation installation requirements</del> <a href="#">this section</a> .     |

**Table 11.701.4.3.2(2)  
Air Barrier and Insulation Installation**

<b>COMPONENT</b>	<b>AIR BARRIER CRITERIA</b>	<b>INSULATION INSTALLATION CRITERIA</b>
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjamb and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.



**11.701.4.3.3 Multifamily air leakage alternative.** Multifamily buildings four or more stories in height and in compliance with IECC section C402.5 (Air leakage-thermal envelope) are deemed to comply with Sections 701.4.3.1 and 701.4.3.2.

<p><b>11.701.4.3.4 Fenestration air leakage.</b> Newly installed Windows, skylights and sliding glass doors have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m<sup>2</sup>), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m<sup>2</sup>), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. <a href="#">Site-built fenestration products have a certificate of compliance.</a> This practice does not apply to <del>site-built windows, skylights, and doors</del><a href="#">field-fabricated fenestration products.</a></p>	<b>Mandatory</b>
<p><a href="#">Exception: For Tropical Zones only, jalousie windows are permitted to be used as a conditioned space boundary and shall have an air infiltration rate of not more than 1.3 cfm per square foot.</a></p>	

<p><b>11.701.4.3.5 <del>Recessed lighting</del>Lighting and building thermal envelope.</b> Newly installed <del>recessed</del> luminaires installed in the building thermal envelope <a href="#">which penetrate the air barrier</a> are sealed to limit air leakage between conditioned and unconditioned spaces. All <del>recessed</del> luminaires are IC-rated and labeled as meeting ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All <del>recessed</del> luminaires <a href="#">installed in the building thermal envelope which penetrate the air barrier</a> are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.</p>	<b>Mandatory</b>
---	------------------

<p><b>11.701.4.4 High-efficacy lighting.</b> <del>Lighting efficacy in dwelling units is in accordance with one of the following:</del><a href="#">A minimum of 90 percent of newly installed hard-wired lighting fixtures or the bulbs in those fixtures shall be high efficacy.</a></p>	<b>Mandatory</b>
<p><del>(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent</del></p> <p><del>(2) Lighting power density, measured in watts/square foot, is 1.1 or less.</del></p>	

<p><b>11.701.4.5 Boiler <del>supply</del> piping.</b> Boiler <del>supply</del> piping in unconditioned space <a href="#">supplying and returning heated water or steam</a> that is accessible during the remodel is insulated. <a href="#">Exception: where condensing boilers are installed, insulation is not required for return piping</a></p>	<b>Mandatory</b>
--	------------------

<p><b>11.701.4.6 Fenestration specifications.</b> The NFRC-certified U-factor and SHGC of newly installed windows, exterior doors, skylights, and tubular daylighting devices (TDDs) do not exceed the values in Table 703.2.5.1.</p>	<b>Mandatory</b>
---	------------------

<p><b>11.701.4.7 Replacement fenestration.</b> Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the NFRC-certified U-factor and SHGC of the replacement fenestration unit do not exceed the values in Table 703.2.5.1.</p>	<b>Mandatory</b>
---	------------------

**[11.703.1 Mandatory Practices](#)**

<p><b><a href="#">11.703.1.1 UA Compliance.</a></b> <a href="#">The building thermal envelope is in compliance with Section 11.703.1.1.1 or 11.703.1.1.2.</a></p>
<p><a href="#">Exception: Section 11.703.1.1 is not required for Tropical Climate Zone</a></p>

**11.703.1.1.1 Maximum UA.** For IECC residential, the total building UA is less than or equal to the total maximum UA as computed by 2018 IECC Section R402.1.5. For IECC commercial, the total UA is less than or equal to the sum of the UA for 2018 IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.

**11.703.1.1.2 Prescriptive R-value and fenestration requirements.** The building thermal envelope is in accordance with the insulation and fenestration requirements of 2018 IECC R502.1.1.1. The SHGC is in accordance with the 2018 IECC requirements.

**11.703.1.2 Building Envelope Leakage.** The building thermal envelope is in accordance with 2018 IECC R502.1.1.1 or R503.1.1 as applicable.

**Exception:** Section 11.703.1.2 is not required for Tropical Climate Zone.

**11.703.1.3 Duct Testing.** The duct system is in accordance with 2018 IECC R403.3.2 through R403.3.5 as applicable.

**11.703.2 Building envelope**

**11.703.2.1 UA improvement.** The total building thermal envelope UA is less than or equal to the baseline total UA resulting from the U-factors provided in Table 11.703.2.1(a) or ICC IECC Tables C402.1.4 and C402.4, as applicable. Where insulation is used to achieve the UA improvement, the insulation installation is in accordance with Grade 1 meeting Section 701.4.3.2.1 as verified by a third-party. Total UA is documented using a RESCheck, COMCheck, or equivalent report to verify the baseline and the UA improvement.

**Table 11.703.2.1(a)  
Baseline U-Factors<sup>a</sup>**

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor <sup>b</sup>	Floor U-Factor	Basement Wall U-Factor	Crawlspace Wall U-Factor <sup>c</sup>
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091 <sup>c</sup>	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

- a. Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.
- b. Where more the half the insulation is on the interior, the mass wall U-factors is a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except in Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
- c. Basement wall U-factor of 0.360 in warm-humid locations.

**Table 11.703.2.1(b)  
Points for Improvement in Total Building Thermal Envelope UA Compared to Baseline UA**

Minimum UA Improvement	Climate Zone							
	1 <sup>a</sup>	2	3	4	5	6	7	8

	<b>POINTS</b>							
<u>0 to &lt;5%</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>5% to &lt;10%</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
<u>10% to &lt;15%</u>	<u>3</u>	<u>6</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>7</u>
<u>15% to &lt;20%</u>	<u>5</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>8</u>	<u>10</u>
<u>20% to &lt;25%</u>	<u>6</u>	<u>12</u>	<u>10</u>	<u>12</u>	<u>12</u>	<u>12</u>	<u>11</u>	<u>13</u>
<u>25% to &lt;30%</u>	<u>8</u>	<u>15</u>	<u>13</u>	<u>16</u>	<u>14</u>	<u>15</u>	<u>14</u>	<u>17</u>
<u>30% to &lt;35%</u>	<u>10</u>	<u>18</u>	<u>16</u>	<u>19</u>	<u>17</u>	<u>18</u>	<u>16</u>	<u>20</u>
<u>≥35%</u>	<u>11</u>	<u>21</u>	<u>18</u>	<u>22</u>	<u>20</u>	<u>21</u>	<u>19</u>	<u>23</u>
a. Tropical Climate Zone: Points are Climate Zone 1 points divided by 2 and rounded down								
Exception: For the Tropical Climate Zone, crawl space, basement, and floor u-factors are excluded from the total building thermal envelope UA improvement calculation.								

**11.703.2.2 Mass walls.** More than 75 percent of the above-grade exterior opaque wall area of the building is mass walls.

**Table 11.703.2.2  
Exterior Mass Walls**

Mass thickness	Climate Zone			
	1-4	5	6	7-8
<b>POINTS</b>				
≥3 inch to <6 inch	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
>6 inch	<u>3</u>	<u>2</u>	<u>2</u>	<u>0</u>

**11.703.2.3** A radiant barrier with an emittance of 0.05 or less is used in the attic. The product is tested in accordance with ASTM C1371 and installed in accordance with the manufacturer's instructions.

**Table 703.2.3  
Radiant Barriers**

Climate Zone	POINTS
<u>Tropical</u>	<u>3</u>
<u>1</u>	<u>2</u>
<u>2-3</u>	<u>3</u>
<u>4-5</u>	<u>1</u>
<u>6-8</u>	<u>0</u>

**(In climate zones 1-3, one point maximum for multifamily buildings four or more stories in height.)**

**11.703.2.4 Building envelope leakage.** The maximum building envelope leakage rate is in accordance with Table 703.2.4a or Table 703.2.4b and whole building ventilation is provided in accordance with Section 902.2.1.

**Table 703.2.4a  
Building Envelope Leakage**

Max Envelope Leakage Rate (ACH50)	Climate Zone							
	1	2	3	4	5	6	7	8
<b>POINTS</b>								
<u>4</u>	<u>1</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>3</u>	<u>2</u>	<u>4</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>2</u>	<u>3</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>7</u>

1	4	7	5	7	7	10	15	11
---	---	---	---	---	---	----	----	----

**Table 703.2.4b  
Building Envelope Leakage**

Max Envelope Leakage Rate (ELR50)	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
0.28	1	2	-	-	-	-	-	-
0.23	2	4	-	-	-	-	-	-
0.18	3	5	3	4	4	6	8	7
0.13	4	7	5	7	7	10	15	11

Where ELR50 = CFM50 / Shell Area

**(Points not awarded if points are taken under Section 705.6.2.1)**

**11.703.2.5 Fenestration**

**11.703.2.5.1 NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) on an area-weighted average basis do not exceed the values in Table 11.703.2.5.1. Area weighted averages are calculated separately for the categories of 1) windows and exterior doors and 2) skylights and tubular daylighting devices (TDDs). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m2) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.**

**Table 703.2.5.1  
Fenestration Specifications**

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified rating)	
1	0.50	0.25
2	0.40	0.25
3	0.32	0.25
4	0.32	0.40
5 to 8	0.30*	Any
	Skylights and TDDs (maximum certified ratings)	
1	0.75	0.30
2	0.65	0.30
3	0.55	0.30
4	0.55	0.40
5 to 8	0.55	Any

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.  
 \* Exception: A maximum U-factor of 0.32 shall apply in climate zones 5 – 8 to vertical fenestration products installed in buildings located: (i) above 4000 feet in elevation above sea level or (ii) in windborne debris regions where protection of openings is provided by fenestration as required under IRC section R301.2.1.2.

**11.703.2.5.1.1 Dynamic glazing.** Dynamic glazing is permitted to satisfy the SHGC requirements of Table 703.2.5.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4 and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration and area-weighted averaging with

fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Table 703.2.5.1.

**11.703.2.5.2** The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.2.5.2(a), (b), or (c). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m<sup>2</sup>) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.

**Table 11.703.2.5.2(a)**  
**Enhanced Fenestration Specifications**

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
<u>1</u>	<u>0.40</u>	<u>0.25</u>	<u>0.60</u>	<u>0.28</u>	<u>1</u>
<u>2</u>	<u>0.40</u>	<u>0.25</u>	<u>0.60</u>	<u>0.28</u>	<u>1</u>
<u>3</u>	<u>0.30</u>	<u>0.25</u>	<u>0.53</u>	<u>0.28</u>	<u>2</u>
<u>4</u>	<u>0.30</u>	<u>0.40</u>	<u>0.53</u>	<u>0.35</u>	<u>3</u>
<u>5</u>	<u>0.27<sup>a</sup></u>	<u>Any</u>	<u>0.50</u>	<u>Any</u>	<u>3</u>
<u>6</u>	<u>0.27<sup>a</sup></u>	<u>Any</u>	<u>0.50</u>	<u>Any</u>	<u>4</u>
<u>7</u>	<u>0.27<sup>a</sup></u>	<u>Any</u>	<u>0.50</u>	<u>Any</u>	<u>4</u>
<u>8</u>	<u>0.27<sup>a</sup></u>	<u>Any</u>	<u>0.50</u>	<u>Any</u>	<u>4</u>

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

**Table 11.703.2.5.2(b)**  
**Enhanced Fenestration Specifications**

Climate Zone	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
<u>1</u>	<u>0.38</u>	<u>0.25</u>	<u>0.55</u>	<u>0.28</u>	<u>2</u>
<u>2</u>	<u>0.38</u>	<u>0.25</u>	<u>0.53</u>	<u>0.28</u>	<u>3</u>
<u>3</u>	<u>0.30</u>	<u>0.25</u>	<u>0.50</u>	<u>0.28</u>	<u>4</u>
<u>4</u>	<u>0.28</u>	<u>0.40</u>	<u>0.50</u>	<u>0.35</u>	<u>4</u>
<u>5</u>	<u>0.25</u>	<u>Any</u>	<u>0.48</u>	<u>Any</u>	<u>4</u>
<u>6</u>	<u>0.25</u>	<u>Any</u>	<u>0.48</u>	<u>Any</u>	<u>5</u>
<u>7</u>	<u>0.25</u>	<u>Any</u>	<u>0.46</u>	<u>Any</u>	<u>5</u>
<u>8</u>	<u>0.25</u>	<u>Any</u>	<u>0.46</u>	<u>Any</u>	<u>4</u>

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

**Table 703.2.5.2(c)**  
**Enhanced Fenestration Specifications**

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
<u>4</u>	<u>0.25</u>	<u>0.40</u>	<u>0.45</u>	<u>0.40</u>	<u>6</u>

5-8	0.22	Any	0.42	Any	6
-----	------	-----	------	-----	---

**(Points for multifamily buildings four or more stories in height are awarded at 3 times the point value listed in Table 703.2.5.2(c))**

**11.703.2.5.2.1 Dynamic glazing.** Dynamic glazing is permitted to satisfy the SHGC requirements of Tables 11.703.2.5.2(a), 11.703.2.5.2(b), and 11.703.2.5.2(c) provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration, and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Tables 11.703.2.5.2(a), 11.703.2.5.2(b), and 11.703.2.5.2(c).

**11.703.3 HVAC equipment efficiency**

**11.703.3.0 Multiple heating and cooling systems.** For multiple heating or cooling systems in one home, practices 703.3.1 through 703.3.6 apply to the system that supplies 80% or more of the total installed heating or cooling capacity. Where multiple systems each serve less than 80% of the total installed heating or cooling capacity, points under Sections 703.3.1 through 703.3.6 are awarded either for the system eligible for the fewest points or the weighted average of the systems. The weighted average shall be calculated in accordance with the following equation and be based upon the efficiency and capacity of the equipment as selected in accordance with ACCA Manual S with its loads calculated in accordance with ACCA Manual J.

$$\text{Weighted Average} = [(E_{\text{unit } 1} * C_{\text{unit } 1}) + (E_{\text{unit } 2} * C_{\text{unit } 2}) + \dots + (E_{\text{unit } n} * C_{\text{unit } n})] / (C_{\text{unit } 1} + C_{\text{unit } 2} + \dots + C_{\text{unit } n})$$

where:

E = Rated AHRI efficiency for unit

C = Rated heating or cooling capacity for unit

n = Unit count

**11.703.3.1** Combination space heating and water heating system (combo system) is installed using either a coil from the water heater connected to an air handler to provide heat for the building, or dwelling unit or sleeping unit, or a space heating boiler using an indirect-fired water heater. Devices have a minimum combined annual efficiency of 0.80 and a minimum water heating recovery efficiency of 0.87.

**11.703.3.2** Furnace and/or boiler efficiency is in accordance with one of the following:

(1) Gas and propane heaters:

**Table 11.703.3.2(1)(a)  
Gas and Propane Heaters**

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥90% AFUE	0	2	3	6	6	9	10	12
≥92% AFUE	0	2	4	7	8	10	12	14
≥94% AFUE	0	3	4	9	9	12	14	16
≥96% AFUE	1	3	5	10	10	14	16	19
≥98% AFUE	1	3	6	11	12	16	18	21

**Table 11.703.3.2(1)(b)  
Gas and Propane Heaters for Multifamily Buildings Four or More Stories  
in Height**

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥90% AFUE	0	4	4	8	8	10	11	13
≥92% AFUE	0	4	4	9	10	11	12	14
≥94% AFUE	0	5	5	10	11	12	14	16
≥96% AFUE	0	5	5	12	12	13	15	17
≥98% AFUE	0	6	6	13	13	14	16	18

(2) Oil furnace:

**Table 11.703.3.2(2)**  
**Oil Furnace**

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥85% AFUE	0	1	2	3	3	4	5	6
≥90% AFUE	0	2	3	6	6	9	10	12

(3) Gas boiler:

**Table 11.703.3.2(3)**  
**Gas Boiler**

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥85% AFUE	0	1	1	2	3	4	4	4
≥90% AFUE	0	1	2	4	6	7	8	6
≥94% AFUE	0	2	3	5	8	9	10	8
≥96% AFUE	0	2	4	6	9	11	12	10

(4) Oil boiler:

**Table 11.703.3.2(4)**  
**Oil Boiler**

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥85% AFUE	0	1	1	3	3	4	4	5
≥90% AFUE	1	2	3	5	6	7	9	10

**11.703.3.3** Heat pump heating efficiency is in accordance with Table 703.3.3(1) or Table 703.3.3(2) or Table 703.3.3(3). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010

**Table 11.703.3.3(1)**  
**Electric Heat Pump Heating**

Efficiency	Climate Zone					
	1	2	3	4	5	6-8 <sup>a</sup>
	<b>POINTS</b>					
≥8.5 HSPF (11.5 EER)	0	1	1	2	2	2
≥9.0 HSPF	0	2	4	5	6	10

(12.5 EER)						
≥9.5 HSPF	<u>0</u>	<u>3</u>	<u>7</u>	<u>7</u>	<u>11</u>	<u>18</u>
≥10.0 HSPF	<u>1</u>	<u>5</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>26</u>
≥12.0 HSPF	<u>1</u>	<u>6</u>	<u>11</u>	<u>11</u>	<u>17</u>	<u>28</u>

**Table 11.703.3.3(2)**  
**Electric Heat Pump Heating for Multifamily Buildings Four or More Stories in Height**

Efficiency	Climate Zone					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8<sup>a</sup></u>
	POINTS					
≥8.5 HSPF (11.5 EER)	<u>0</u>	<u>3</u>	<u>4</u>	<u>8</u>	<u>11</u>	<u>13</u>

**Table 11.703.3.3(3)**  
**Gas Engine-Driven Heat Pump Heating**

Efficiency	Climate Zone					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
	POINTS					
≥1.3 COP at 47°F	<u>2</u>	<u>7</u>	<u>11</u>	<u>14</u>	<u>16</u>	<u>18</u>

**11.703.3.4** Cooling efficiency is in accordance with Table 11.703.3.4(1) or Table 11.703.3.4(2). Refrigerant charge is verified for compliance with manufacturer’s instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

**Table 11.703.3.4(1)**  
**Electric Air Conditioner and Heat Pump Cooling<sup>a</sup>**

Efficiency	Climate Zone							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
	POINTS							
≥15 SEER (12.5 EER)	<u>6</u>	<u>4</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>
≥17 SEER (12.5 EER)	<u>11</u>	<u>9</u>	<u>7</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>0</u>
≥19 SEER (12.5 EER)	<u>19</u>	<u>12</u>	<u>10</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>0</u>
≥21 SEER	<u>26</u>	<u>15</u>	<u>14</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>0</u>
≥25 SEER	<u>29</u>	<u>18</u>	<u>17</u>	<u>10</u>	<u>8</u>	<u>8</u>	<u>6</u>	<u>0</u>

a. Tropical Climate Zone: where none of the occupied space is air conditioned and where ceiling fans are provided for bedrooms and the largest space which is not used as a bedroom, 20 points is awarded.

**Table 11.703.3.4(2)**  
**Gas Engine-Driven Heat Pump Cooling**

Efficiency	Climate Zone					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
	POINTS					
>1.2 COP at 95°F	<u>3</u>	<u>6</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>0</u>

**11.703.3.5** Water source cooling and heating efficiency is in accordance with Table 11.703.3.5. Refrigerant charge is verified for compliance with manufacturer’s instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.



**Table 11.703.3.5**  
**Water Source Cooling And Heating**

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
	<b>POINTS</b>					
<u>≥15 EER, ≥4.0 COP</u>	<u>14</u>	<u>18</u>	<u>22</u>	<u>30</u>	<u>37</u>	<u>37</u>

**11.703.3.6** Ground source heat pump is installed by a Certified Geothermal Service Contractor in accordance with Table 11.703.2.5. Refrigerant charge is verified for compliance with manufacturer’s instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

**Table 11.703.3.6**  
**Ground source heat pump<sup>a</sup>**

Efficiency	Climate Zone				
	1	2	3	4	5-8
	<b>POINTS</b>				
<u>≥16.0 EER, ≥3.6 COP</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>16</u>	<u>22</u>
<u>≥24.0 EER, ≥4.3 COP</u>	<u>24</u>	<u>29</u>	<u>22</u>	<u>31</u>	<u>35</u>
<u>≥28.0 EER, ≥4.8 COP</u>	<u>42</u>	<u>46</u>	<u>35</u>	<u>42</u>	<u>44</u>

a. The ground loop is sized to account for the ground conductance and the expected minimum incoming water temperature to achieve rated performance.

**11.703.3.7** ENERGY STAR, or equivalent, ceiling fans are installed.  
**(Points awarded per building.)**

**For Tropical Climate Zone and Climate Zones 2B, 3B, and 4B: points awarded per fan where AC is not installed in the dwelling unit or sleeping unit (Max 8 points), and where points awarded in Section 11.703.3.8 for these specific climate zones, points shall not be awarded in Section 11.703.3.7)**

**11.703.3.8** Whole-building or whole-dwelling unit or whole-sleeping unit fan(s) with insulated louvers and a sealed enclosure is installed.  
**(Points awarded per building.)**

**Table 11.703.3.8**  
**Whole dwelling unit fan**

Climate Zone		
1-3, Tropical	4-6	7-8
<b>POINTS</b>		
<u>4</u>	<u>3</u>	<u>0</u>

**11.703.4 Duct Systems**

**11.703.4.1** All space heating is provided by a system(s) that does not include air ducts.

**Table 11.703.4.1**  
**Ductless heating system**

Climate Zone
--------------

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
<b>POINTS</b>					
<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>

**(No points awarded for multifamily buildings four or more stories in height.)**

**11.703.4.2** All space cooling is provided by a system(s) that does not include air ducts.

**Table 11.703.4.2**

**Ductless cooling system**

<b>Climate Zone</b>					
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
<b>POINTS</b>					
<u>8</u>	<u>8</u>	<u>4</u>	<u>2</u>	<u>1</u>	<u>0</u>

**(No points awarded for multifamily buildings four or more stories in height.)**

**11.703.4.3** Ductwork is in accordance with all of the following:

- (1) Building cavities are not used as return ductwork.
- (2) Heating and cooling ducts and mechanical equipment are installed within the conditioned building space.
- (3) Ductwork is not installed in exterior walls.

**Table 11.703.4.3**

**Ducts**

<b>Climate Zone</b>					
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
<b>POINTS</b>					
<u>8</u>	<u>10</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>4</u>

**(No points awarded for multifamily buildings four or more stories in height.)**

**11.703.4.4 Duct Leakage.** The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for total leakage at a pressure differential of 0.1 inches w.g. (25 Pa) and maximum air leakage is equal to or less than 6 percent of the system design flow rate or 4 cubic feet per minute per 100 square feet of conditioned floor area.

**Table 11.703.4.4**

**Duct Leakage**

<b><u>Ductwork location</u></b>	<b>Climate Zone</b>					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-8</u>
<b>POINTS</b>						
<u>ductwork entirely outside the building's thermal envelope</u>	<u>4</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
<u>ductwork entirely inside the building's thermal envelope</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
<u>ductwork inside and outside the building's thermal envelope</u>	<u>3</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>1</u>

**(Points not awarded if points are taken under Section 705.6.2.3)**

**11.703.5 Water Heating System**

**11.703.5.1** Water heater Uniform Energy Factor (UEF) is in accordance with the following: Water heater design is based on only 1 (one) water heater per dwelling unit, based on approved methods from IPC or ASPE or manufacturer specifications. All table values are based on water heaters with medium water draws as defined by the US DOE text procedures (55 gallons per day).

(1) Gas water heating

**Table 11.703.5.1(1)(a)**  
**Gas Water Heating**

**Storage water heater, rated storage volume > 20 gallons and ≤ 55 gallons, medium water draw**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
0.65 to <0.78	2	2	2	2	2	2	2	1
≥0.78	2	3	3	3	3	3	3	2

**Table 11.703.5.1(1)(b)**  
**Gas Water Heating**

**Storage water heater, rated storage volume > 55 gallons and ≤ 100 gallons, Medium water draw**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
>0.78	1	1	1	1	1	1	1	1

**Table 11.703.5.1(1)(c)**  
**Gas Water Heating**

**Storage water heater with input rate greater than 75,000 Btu/h (commercial)**

Thermal Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.90 to < 0.95	6	6	5	3	3	3	3	2
≥0.95	7	7	5	4	4	4	4	2

**Table 11.703.5.1(1)(d)**  
**Gas Water Heating**

**Storage water heater with input rate greater than 75,000 Btu/h (commercial), in Buildings with high-capacity service water-heating systems (1,000,000 Btu/h or greater)**

Thermal Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.92 to < 0.95	1	1	1	1	1	1	1	1
≥0.95	2	2	2	2	2	2	2	1

**Table 11.703.5.1(1)(e)**  
**Gas Water Heating**

**Instantaneous water heater, rated storage volume < 2 gallons and input rate of > 50,000 Btu/h, Medium water draw**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.89 to < 0.94	2	2	2	1	1	1	1	1
≥0.94	3	3	2	2	2	2	2	1

(2) Electric water heating

**Table 11.703.5.1(2)(a)**

**Storage water heater, rated storage volume ≥ 20 gallons and ≤ 55 gallons, Medium water draw**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.94 to <1.0	1	1	1	1	1	1	1	1
≥1.0 to <1.5	4	2	2	2	1	1	1	1
≥1.5 to <2.0	7	4	3	2	2	2	1	1
≥2.0 to <2.2	14	8	7	5	4	4	2	2
≥2.2 to <2.5	17	9	8	6	5	4	3	3
≥2.5 to <3.0	18	12	10	8	6	6	3	3
≥3.0	22	16	13	11	8	8	4	3

**Table 11.703.5.1(2)(b)**

**Storage water heater, rated storage volume ≥ 55 gallons and ≤ 120 gallons, Medium water draw**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥2.2 to <2.5	6	4	3	3	2	2	1	1
≥2.5 to <3.0	7	5	4	3	3	3	2	2
≥3.0 to <3.5	8	5	5	4	3	3	3	2
≥3.5	9	6	6	5	4	4	3	2

**Table 11.703.5.1(2)(c)**

**Electric Tabletop Water Heating**

**(Tabletop water heater, rated storage volume ≥ 20 gallons and ≤ 120 gallons, Medium water draw)**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.91	1	1	1	1	1	1	1	1

**Table 11.703.5.1(2)(d)**

**Electric Instantaneous Water Heating<sup>a</sup>**

**(Instantaneous electric water heater, rated storage volume < 2 gallons, Medium water draw)**

Uniform Energy Factor or Thermal Efficiency <sup>b</sup>	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.97	2	2	2	2	2	2	2	2

a. Applies to any size water heater.

b. Electric instantaneous water heaters have either a Uniform Energy Factor (capacity less than or equal to 12 kW) or a Thermal Efficiency (capacity greater than 12 kW).

**Table 11.703.5.1(2)(e)**  
**Electric Grid Enabled Water Heating**  
**(Grid enabled storage water heater, rated storage volume ≥ 75 gallons,**  
**Medium water draw)**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.95	1	1	1	1	1	1	1	1

(3) Oil water heating

**Table 11.703.5.1(3)**  
**Oil Water Heating**  
**(Oil water heating, < 50 gallons, Medium water draw)**

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
≥0.62	1	1	1	1	1	1	1	1

**11.703.5.2** Desuperheater is installed by a qualified installer or is pre-installed in the factory.

**Table 11.703.5.2**  
**Desuperheater**

Climate Zone						
1	2	3	4	5	6	7-8
<b>POINTS</b>						
23	17	9	7	5	4	2

**11.703.5.3** Drain-water heat recovery system is installed.  
**(Points awarded per building.)**

**11.703.5.4** Indirect-fired water heater storage tanks heated from boiler systems are installed.

**11.703.5.5 Solar water heater.** SRCC (Solar Rating & Certification Corporation) OG 300 rated, or equivalent, solar domestic water heating system is installed. Solar Energy Factor (SEF) as defined by SRCC is in accordance with Table 11.703.5.5(a) and Table 11.703.5.5(b)..

**Table 11.703.5.5(a)**

**Storage water heater, rated storage volume of backup water heater is ≥ 0.1 gallon and ≤ 55 gallons, Medium water draw**

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
	<b>POINTS</b>						
SEF >1.3	1	2	3	5	6	7	6
SEF >1.51	2	2	4	6	9	10	10
SEF >1.81	2	3	5	9	13	14	14
SEF >2.31	4	5	8	14	19	21	20
SEF >3.01	5	7	11	21	27	31	30

**Table 11.703.5.5(b)**

**Storage water heater, rated storage volume of backup water heater is >55 gallons, Medium water draw**

SEF	Climate Zone

REMODELING

	Tropical & 1	2	3	4	5	6	7-8
	<b>POINTS</b>						
SEF >1.3	1	1	2	3	4	5	4
SEF >1.51	1	1	2	4	6	7	7
SEF >1.81	1	2	4	6	8	10	9
SEF >2.31	2	3	5	10	13	14	13
SEF >3.01	4	5	7	14	18	20	20

**11.703.6 Lighting and appliances**

**11.703.6.1 Hard-wired lighting.** Hard-wired lighting is in accordance with one of the following:

(1) A minimum percent of the total hard-wired interior luminaires or lamps qualify as ENERGY STAR, DesignLights Consortium (DLC), or applicable equivalent.

**Table 11.703.6.1(1)  
Hard-wired Lighting**

<b>Minimum percent of fixtures</b>	<b>Climate Zone</b>							
	1	2	3	4	5	6	7	8
	<b>POINTS</b>							
95%	3	3	3	2	2	2	2	2

(2) A minimum of 80 percent of the exterior lighting wattage has a minimum efficacy of 61 lumens per watt or is solar-powered.

(3) In multifamily buildings, common area lighting power density (LPD) is less than 0.51 Watts per square foot.

**11.703.6.2 Appliances.** ENERGY STAR or equivalent appliance(s) are installed:

(1) Refrigerator

**Table 11.703.6.2(1)  
Refrigerator**

<b>Climate Zone</b>							
1	2	3	4	5	6	7	8
<b>POINTS</b>							
1	1	1	1	1	1	1	1

(2) Dishwasher

(3) Washing machine

**11.703.7 Passive Solar Design**

**11.703.7.1 Sun tempered design.** Building orientation, sizing of glazing, and design of overhangs are in accordance with all of the following:

(1) The long side (or one side if of equal length) of the building faces within 20 degrees of true south.

(2) Vertical glazing area is between 5 and 7 percent of the gross conditioned floor area on the south face [also see Section 11.703.7.1(8)] and glazing U-factors meet Table 11.703.2.5.2(a).

(3) Vertical glazing area is less than 2 percent of the gross conditioned floor area on the west face, and glazing meets Table 11.703.2.5.2(a).

(4) Vertical glazing area is less than 4 percent of the gross conditioned floor area on the east face, and glazing meets Table 11.703.2.5.2(a).

(5) Vertical glazing area is less than 8 percent of the gross conditioned floor area on the north face, and glazing meets Table 11.703.2.5.2(a).

(6) Skylights, where installed, are in accordance with the following:

(a) shades and insulated wells are used, and all glazing meets Table 11.703.2.5.2(a)

(b) horizontal skylights are less than 0.5 percent of finished ceiling area

(c) sloped skylights on slopes facing within 45 degrees of true south, east, or west are less than 1.5 percent of the finished ceiling area

(7) Overhangs or adjustable canopies or awnings or trellises provide shading on south-facing glass for the appropriate climate zone in accordance with Table 11.703.6.1(7):

**Table 11.703.7.1(7)  
South-Facing Window Overhang Depth**

		<u>Vertical distance between bottom of overhang and top of window sill</u>				
		<u>≤7' 4"</u>	<u>≤6' 4"</u>	<u>≤5' 4"</u>	<u>≤4' 4"</u>	<u>≤3' 4"</u>
<u>Climate Zone</u>	<u>1 &amp; 2 &amp; 3</u>	<u>2' 8"</u>	<u>2' 8"</u>	<u>2' 4"</u>	<u>2' 0"</u>	<u>2' 0"</u>
	<u>4 &amp; 5 &amp; 6</u>	<u>2' 4"</u>	<u>2' 4"</u>	<u>2' 0"</u>	<u>2' 0"</u>	<u>1' 8"</u>
	<u>7 &amp; 8</u>	<u>2' 0"</u>	<u>1' 8"</u>	<u>1' 8"</u>	<u>1' 4"</u>	<u>1' 0"</u>

For SI: 1 inch = 25.4 mm

(8) The south face windows have a SHGC of 0.40 or higher.

(9) Return air or transfer grilles/ducts are in accordance with Section 705.4.

**Multifamily Building Note:** *The site is designed such that at least 40 percent of the multifamily dwelling or sleeping units have one south facing wall (within 15 degrees) containing at least 50 percent of glazing for entire unit, Effective shading is required for passive solar control on all south facing glazing. The floor area of at least 15 feet from the south facing perimeter glazing is massive and exposed to capture solar heat during the day and reradiate at night.*

**11.703.7.2 Window shading.** Automated solar protection or dynamic glazing is installed to provide shading for windows.

**11.703.7.3 Passive cooling design.** Passive cooling design features are in accordance with three or more of the following:

**Points for three items: 3**

**Points for one additional item: 1**

(1) Exterior shading is provided on east and west windows using one or a combination of the following:

(a) vine-covered trellises with the vegetation separated a minimum of 1 foot (305 mm) from face of building

(b) moveable awnings or louvers

(c) covered porches

(d) attached or detached conditioned/unconditioned enclosed space that provides full shade of east and west windows (e.g., detached garage, shed, or building)

(2) Overhangs are installed to provide shading on south-facing glazing in accordance with Section 703.7.1(7).

**(Points not awarded if points are taken under Section 703.7.1.)**

(3) Windows and/or venting skylights are located to facilitate cross and stack effect ventilation.

(4) Solar reflective roof or radiant barrier is installed in climate zones 1, 2, or 3 and roof material achieves a 3-year aged criteria of 0.50.

(5) Internal exposed thermal mass is a minimum of three inches (76 mm) in thickness. Thermal mass consists of concrete, brick, and/or tile fully adhered to a masonry base or other masonry material in accordance with one or a combination of the following:

(a) A minimum of 1 square foot (0.09 m<sup>2</sup>) of exposed thermal mass of floor per 3 square feet (2.8 m<sup>2</sup>) of gross finished floor area.

(b) A minimum of 3 square feet (2.8 m<sup>2</sup>) of exposed thermal mass in interior walls or elements per square foot (0.09 m<sup>2</sup>) of gross finished floor area.

(6) Roofing material is installed with a minimum 0.75 inch (19 mm) continuous air space offset from the roof deck from eave to ridge.

**11.703.7.4 Passive solar heating design.** In addition to the sun-tempered design features in Section 703.7.1, all of the following are implemented:

**(Points shall not be awarded in the Tropical Climate Zone)**

(1) Additional glazing, no greater than 12 percent, is permitted on the south wall. This additional glazing is in accordance with the requirements of Section 11.703.7.1.

(2) Additional thermal mass for any room with south-facing glazing of more than 7 percent of the finished floor area is provided in accordance with the following:

(a) Thermal mass is solid and a minimum of 3 inches (76 mm) in thickness. Where two thermal mass materials are layered together (e.g., ceramic tile on concrete base) to achieve the appropriate thickness, they are fully adhered to (touching) each other.



(b) Thermal mass directly exposed to sunlight is provided in accordance with the following minimum ratios:

(i) Above latitude 35 degrees: 5 square feet (0.465 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.

(ii) Latitude 30 degrees to 35 degrees: 5.5 square feet (0.51 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.

(iii) Latitude 25 degrees to 30 degrees: 6 square feet (0.557 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.

(c) Thermal mass not directly exposed to sunlight is permitted to be used to achieve thermal mass requirements of Section 703.7.4 (2) based on a ratio of 40 square feet (3.72 m<sup>2</sup>) of thermal mass for every 1 square foot (0.0929 m<sup>2</sup>) of south-facing glazing.

(3) In addition to return air or transfer grilles/ducts required by Section 703.7.1(9), provisions for forced airflow to adjoining areas are implemented as needed.

### **11.705 Additional practices**

**11.705.1 Application of additional practice points.** Points from Section 11.705 can be added to points earned in Section 11.703 (Prescriptive Path).

### **11.705.2 Lighting**

#### **11.705.2.1 Lighting controls**

**(Percentages for point thresholds are based on lighting not required for means of egress or security lighting as defined by local building codes.)**

**11.705.2.1.1 Interior lighting.** In dwelling units or sleeping units, permanently installed interior lighting fixtures are controlled with an occupancy sensor, or dimmer:

(1) 50 percent to less than 75 percent of lighting fixtures.

(2) A minimum of 75 percent of lighting fixtures.

**11.705.2.1.2 Exterior lighting.** Photo or motion sensors are installed on 75 percent of outdoor lighting fixtures to control lighting.

**(Percentages for point thresholds does not include lighting equipped with photovoltaics.)**

#### **11.705.2.1.3 Multifamily common areas**

(1) In a multifamily building, occupancy sensors, or dimmers are installed in common areas (except corridors and stairwells).

(a) 50 percent to less than 75 percent of lighting fixtures.

(b) A minimum of 75 percent of lighting fixtures.

(2) In a multifamily building, occupancy controls are installed to automatically reduce light levels in interior corridors and exit stairwells when the space is unoccupied. Light levels are reduced by:

(a) 50 percent to less than 75 percent or to local minimum requirements

(b) A minimum of 75 percent

11.705.2.1.4 In a multifamily building, occupancy controls are installed to automatically reduce light levels in garages and parking structures when the space is unoccupied. Light levels are reduced by:

(1) 50 percent to less than 75 percent or to local minimum requirements

(2) A minimum of 75 percent

11.705.2.2 TDDs and skylights. A tubular daylighting device (TDD) or a skylight that meets the requirements of Table 11.703.2.5.2(a) is installed in rooms without windows. (Points awarded per building.)

11.705.2.3 Lighting outlets. Occupancy sensors are installed for a minimum of 80 percent of hard-wired lighting outlets in the interior living space.

11.705.2.4 Recessed luminaires. The number of recessed luminaires that penetrates the thermal envelope is less than 1 per 400 square feet (37.16 m<sup>2</sup>) of total conditioned floor area and they are in accordance with Section 11.701.4.3.5.

11.705.3 Induction cooktop. Induction cooktop is installed.

11.705.4 Return ducts and transfer grilles. Return ducts or transfer grilles are installed in every room with a door. Return ducts or transfer grilles are not required for bathrooms, kitchens, closets, pantries, and laundry rooms.

#### 11.705.5 HVAC design and installation

11.705.5.1 Meet one or both of the following:

(1) HVAC contractor is certified by the Air Conditioning Contractors of Americas Quality Assured Program (ACCA/QA) or by an EPA-recognized HVAC Quality Installation Training Oversight Organization (H-QUITO) or equivalent.

(2) HVAC installation technician(s) is certified by North American Technician Excellence, Inc. (NATE) or equivalent.

11.705.5.2 Performance of the heating and/or cooling system is verified by the HVAC contractor in accordance with all of the following:

(1) Start-up procedure is performed in accordance with the manufacturer's instructions.

(2) Refrigerant charge is verified by super-heat and/or sub-cooling method.

(3) Burner is set to fire at input level listed on nameplate.

(4) Air handler setting/fan speed is set in accordance with manufacturer's instructions.

(5) Total airflow is within 10 percent of design flow.

(6) Total external system static does not exceed equipment capability at rated airflow.

**11.705.5.3 HVAC Design is verified by 3<sup>rd</sup> party as follows:**

(1) The ENERGY STAR HVAC Design and Rater Design Review Checklists are completed without correction needed.

(2) HVAC Installation is inspected and conforms to HVAC design documents and plans.

### **11.705.6 Installation and performance verification**

**11.705.6.1** Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Minimum of two inspections are performed: one inspection after insulation is installed and prior to covering, and another inspection upon completion of the building. Where multiple buildings or dwelling units of the same model or sleeping units of the same model are built by the same builder, a representative sample inspection of a minimum of 15 percent of the buildings or dwelling units or sleeping units is permitted.

(1) Ducts are installed in accordance with the ICC IRC or IMC and ducts are sealed.

(2) Building envelope air sealing is installed.

(3) Insulation is installed in accordance with Section 11.701.4.3.2.1.

(4) Windows, skylights, and doors are flashed, caulked, and sealed in accordance with manufacturer's instructions and in accordance with Section 11.701.4.3.

**11.705.6.2 Testing.** Testing is conducted to verify performance.

**11.705.6.2.1 Air leakage validation of building or dwelling units or sleeping units.** A visual inspection is performed as described in 11.701.4.3.2(2) and air leakage testing is performed in accordance with ASTM E779 or ASTM E1827.

**(Points awarded only for buildings where building envelope leakage testing is not required by ICC IECC.)**

**(Points not awarded if points are taken under Section 703.2.4)**

(1) A blower door test.

(2) Third-party verification is completed.

**11.705.6.2.2 HVAC airflow testing.** Balanced HVAC airflows are demonstrated by flow hood or other acceptable flow measurement tool by a third party. Test results are in accordance with both of the following:

(1) Measured flow at each supply and return register meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.

(2) Total airflow meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.

**11.705.6.2.3 HVAC duct leakage testing.** One of the following is achieved:

(Points awarded only for buildings where duct leakage testing is not required by IECC)  
(Points not awarded if points are taken under Section 703.4.4)

(1) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4.

(2) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4, and testing is conducted by an independent third party.

11.705.6.3 Insulating hot water pipes. Insulation with a minimum thermal resistance (R-value) of at least R-3 is applied to the following, as applicable:

(Points awarded only where these practices are not required by IECC.)

(a) piping 3/4-inch and larger in outside diameter

(b) piping serving more than one dwelling unit or sleeping unit

(c) piping located outside the conditioned space

(d) piping from the water heater to a distribution manifold

(e) piping located under a floor slab

(f) buried piping

(g) supply and return piping in recirculation systems other than demand recirculation systems

11.705.6.4 Potable hot water demand re-circulation system

11.705.6.4.1 Potable hot water demand re-circulation system is installed in a single-family unit.

11.705.6.4.2 Potable hot water demand re-circulation system(s) that serves every unit i in a multifamily building is installed in place of a standard circulation pump and control.

11.705.7 Submetering system. In multifamily buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. The device provides consumption information on a monthly or near real-time basis. The information is available to the occupants at a minimum on a monthly basis.

11.706 Innovation practices

11.706.1 Energy consumption control. A whole-building or whole-dwelling unit or whole-sleeping unit device or system is installed that controls or monitors energy consumption.

(1) programmable communicating thermostat with the capability to be controlled remotely

(2) energy-monitoring device or system

(3) energy management control system

(4) programmable thermostat with control capability based on occupant presence or usage pattern

(5) lighting control system

**11.706.2 Renewable energy service plan.** Renewable energy service plan is provided as follows:

(1) Builder selects a renewable energy service plan provided by the local electrical utility for interim (temporary) electric service, or purchases renewable energy certificates (RECs) to cover electricity used. The builder's local administrative office has renewable energy service or has otherwise been paired with RECs. Green-certified (or equivalent) is required for renewable electricity purchases.

(2) The buyer of the building selects one of the following renewable energy service plans provided by the utility prior to occupancy of the building with a minimum two-year commitment.

(a) less than half of the dwelling's projected electricity and gas use is provided by renewable energy

(b) half or more of the of the dwelling's projected electricity and gas use is provided by renewable energy

**11.706.3 Smart appliance and systems.** Smart appliances and systems are installed as follows:

(1) Refrigerator

(2) Freezer

(3) Dishwasher

(4) Clothes Dryer

(5) Clothes Washer

(6) Room Air Conditioner

(7) HVAC Systems

(8) Service Hot Water Heating Systems

Three to five smart appliances installed 1 point

Six or more smart appliances installed 2 points

**(Items (7) and (8) are permitted to count as two appliances each for the purpose of awarding points.)**

**(where points awarded in Section 11.706.3, points shall not be awarded in Section 11.706.7 and 11.706.9)**

#### **11.706.4 Pumps**

**11.706.4.1 Pool, spa, and water features equipped with filtration pumps as follows:**

(1) Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater).

(2) Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater) in a pool

11.706.4.2 Sump pump(s) with electrically commutated motors (ECMs) or permanent split capacitor (PSC) motors is installed (full load efficiency of 90 percent or greater).

11.706.5 On-site renewable energy system. One of the following options is implemented:

- (1) Building is Solar-Ready in compliance with IECC Appendix A Solar Ready Provisions
- (2) An on-site renewable energy system(s) is installed on the property.
- (3) An on-site renewable energy system(s) and a battery energy storage system are installed on the property.

(Points shall not be awarded in this section for solar thermal or geothermal systems that provide space heating, space cooling, or water heating, Points for these systems are awarded in Section 11.703.)

(Where onsite renewable energy is included in Section 702 Performance Path or 704 HERS Index Target Path, Section 706.5 shall not be awarded.)

(Points awarded in this section shall not be combined with points for renewable energy in another section of this chapter. The solar-ready zone roof area in #1 is area per dwelling unit. Points in item #2 and #3 shall be divided by the number of dwelling units.)

*Multifamily Building Note: Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.*

11.706.6 Parking garage efficiency. Structured parking garages are designed to require no mechanical ventilation for fresh air requirements.

11.706.7 Grid-interactive electric thermal storage system. A grid-interactive electric thermal storage system is installed.

(1) Grid-Interactive Water Heating System

(2) Grid-Interactive Space Heating and cooling System

(where points awarded in Section 706.7, points shall not be awarded in Section 706.3 and 706.9)

11.706.8 Electrical vehicle charging station. A Level 2 (208/240V 40-80 amp) or Level 3 electric vehicle charging station is installed on the building site. (Note: Charging station shall not be included in the building energy consumption.)

11.706.9 CNG vehicle fueling station. A CNG vehicle residential fueling appliance is installed on the building site. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance to the appliance manufacturer's installation instructions. (Note: The fueling appliance shall not be included in the building energy consumption.)

11.706.10 Automatic demand response. Automatic demand response system is installed that curtails energy usage upon a signal from the utility or an energy service provider is installed.

(where points awarded in Section 706.9, points shall not be awarded in Section 11.706.3 and 11.706.7)

11.706.11 Battery Storage System. A battery storage system of not less than 6 kWh of available capacity is installed that stores electric energy from an on-site renewable electric generation system or is grid-interactive or can perform both functions.

**11.706.12 Smart Ventilation.** A whole-building ventilation systems is installed with automatic ventilation controls to limit ventilation during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads and is in accordance with the specifications of Appendix B.

**11.706.13 Alternative Refrigerant.** Use of the following in mechanical space cooling systems for dwellings.

**11.706.14 Third-Party Utility Benchmarking Service.**

(1) For a multifamily building, the owner has contracted with a third-party utility benchmarking service with at least five (5) years of experience in utility data management and analysis to perform a monthly analysis of whole-building energy and water consumption for a minimum of 1 year.

(2) The building owner commits to reporting energy data using U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager for a minimum of three years

**11.706.15 Entryway Air Seal.** For multifamily buildings, where not required by the building or energy code, to slow the movement of unconditioned air from outdoors to indoors at the main building entrance, the following is installed:

- (1) Building entry vestibule
- (2) Revolving entrance doors

**11.801 Indoor and outdoor water use**

**11.801.0 Intent.** Implement measures that reduce indoor and outdoor water usage. Implement measures that include collection and use of alternative sources of water. Implement measures that treat water on site.

**801.1 Mandatory requirements.** The building shall comply with Section 802 (Prescriptive Path) and 803 (Innovative Practices) or Section 804 (Performance Path). Points from Section 804 (Performance Path) shall not be combined with points from Section 802 (Prescriptive Path) or Section 803 (Innovative Practices). The mandatory provisions of Section 802 (Prescriptive Path) and Section 803 (Innovative Practices) are not required when using the Water Rating Index of Section 804 (Performance Path) for Chapter 8 Water Efficiency compliance.

**11.802**

**PRESCRIPTIVE PATH**

**11.802.1 Indoor hot water usage.** Indoor hot water supply system is in accordance with one of the practices listed in items (1) through (5). The maximum water volume from the source of hot water to the termination of the fixture supply is determined in accordance with Tables 11.801.1(1) or 11.801.1(2). The maximum pipe length from the source of hot water to the termination of the fixture supply is 50 feet.

(Where more than one water heater is used or where more than one type of hot water supply system, including multiple circulation loops, is used, points are awarded only for the system that qualifies for the minimum number of points.)

(Systems with circulation loops are eligible for points only if pumps are demand controlled. Circulation systems with timers or aquastats and constant-on circulation systems are not eligible to receive points.)

(Points awarded only if the pipes are insulated in accordance with Section 11.705.6.3.)

## REMODELING

(1) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 128 ounces (1 gallon or 3.78 liters).

(2) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 64 ounces (0.5 gallon or 1.89 liters).

(3) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 32 ounces (0.25 gallon or 0.945 liters).

(4) A demand controlled hot water priming pump is installed on the main supply pipe of the circulation loop and the maximum volume from this supply pipe to the furthest fixture is 24 ounces (0.19 gallons or 0.71 liters).

(a) The volume in the circulation loop (supply) from the water heater or boiler to the branch for the furthest fixture is no more than 128 ounces (1 gallon or 3.78 liters).

(5) A central hot water recirculation system is implemented in multifamily buildings in which the hot water line distance from the recirculating loop to the engineered parallel piping system (i.e., manifold system) is less than 30 feet (9,144 mm) and the parallel piping to the fixture fittings contains a maximum of 64 ounces (1.89 liters) (115.50 cubic inches) (0.50 gallons).

(6) Tankless water heater(s) with at least 0.5 gallon (1.89 liters) of storage are installed, or a tankless water heater that ramps up to at least 110F within 5 seconds is installed. The storage may be internal or external to the tankless water heater.



**Table 801.1(1)**  
**Maximum Pipe Length Conversion Table<sup>a</sup>**

Nominal Pipe Size (inch)	Liquid Ounces per Foot of Length	Main, Branch, and Fixture Supply System Volume Category			Branch and Fixture Supply Volume from Circulation Loop
		128 ounces (1 gallons) [per 801.1(1)]	64 ounces (0.5 gallon) [per 801.1(2)]	32 ounces (0.25 gallon) [per 801.1(3)]	24 ounces (0.19 gallon) [per 801.1(4)]
		Maximum Pipe Length (feet)			
<u>1/4<sup>b</sup></u>	<u>0.33</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>
<u>5/16<sup>b</sup></u>	<u>0.5</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>48</u>
<u>3/8<sup>b</sup></u>	<u>0.75</u>	<u>50</u>	<u>50</u>	<u>43</u>	<u>32</u>
<u>1/2</u>	<u>1.5</u>	<u>50</u>	<u>43</u>	<u>21</u>	<u>16</u>
<u>5/8</u>	<u>2</u>	<u>50</u>	<u>32</u>	<u>16</u>	<u>12</u>
<u>3/4</u>	<u>3</u>	<u>43</u>	<u>21</u>	<u>11</u>	<u>8</u>
<u>7/8</u>	<u>4</u>	<u>32</u>	<u>16</u>	<u>8</u>	<u>6</u>
<u>1</u>	<u>5</u>	<u>26</u>	<u>13</u>	<u>6</u>	<u>5</u>
<u>1 1/4</u>	<u>8</u>	<u>16</u>	<u>8</u>	<u>4</u>	<u>3</u>
<u>1 1/2</u>	<u>11</u>	<u>12</u>	<u>6</u>	<u>3</u>	<u>2</u>
<u>2</u>	<u>18</u>	<u>7</u>	<u>4</u>	<u>2</u>	<u>1</u>

c. Maximum pipe length figures apply when the entire pipe run is one nominal diameter only. Where multiple pipe diameters are used, the combined volume shall not exceed the volume limitation in Section 801.1.

d. The maximum flow rate through 1/4 inch nominal piping shall not exceed 0.5 gpm. The maximum flow rate through 5/16 inch nominal piping shall not exceed 1 gpm. The maximum flow rate through 3/8 inch nominal piping shall not exceed 1.5 gpm.

**Table 801.1(2)**  
**Common Hot Water Pipe Internal Volumes**

**OUNCES OF WATER PER FOOT OF PIPE**

Size Nominal, Inch	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9	PP SDR 7.4 F2389	PP SDR 9 F2389
<u>3/8</u>	<u>1.06</u>	<u>0.97</u>	<u>0.84</u>	<u>N/A</u>	<u>1.17</u>	<u>N/A</u>	<u>0.64</u>	<u>0.63</u>	<u>0.64</u>	<u>N/A</u>	<u>N/A</u>
<u>1/2</u>	<u>1.69</u>	<u>1.55</u>	<u>1.45</u>	<u>1.25</u>	<u>1.89</u>	<u>1.46</u>	<u>1.18</u>	<u>1.31</u>	<u>1.18</u>	<u>1.72</u>	<u>1.96</u>
<u>3/4</u>	<u>3.43</u>	<u>3.22</u>	<u>2.90</u>	<u>2.67</u>	<u>3.38</u>	<u>2.74</u>	<u>2.35</u>	<u>3.39</u>	<u>2.35</u>	<u>2.69</u>	<u>3.06</u>
<u>1</u>	<u>5.81</u>	<u>5.49</u>	<u>5.17</u>	<u>4.43</u>	<u>5.53</u>	<u>4.57</u>	<u>3.91</u>	<u>5.56</u>	<u>3.91</u>	<u>4.41</u>	<u>5.01</u>
<u>1 1/4</u>	<u>8.70</u>	<u>8.36</u>	<u>8.09</u>	<u>6.61</u>	<u>9.66</u>	<u>8.24</u>	<u>5.81</u>	<u>8.49</u>	<u>5.81</u>	<u>6.90</u>	<u>7.83</u>
<u>1 1/2</u>	<u>12.18</u>	<u>11.83</u>	<u>11.45</u>	<u>9.22</u>	<u>13.2</u>	<u>11.38</u>	<u>8.09</u>	<u>13.88</u>	<u>8.09</u>	<u>10.77</u>	<u>12.24</u>
<u>2</u>	<u>21.08</u>	<u>20.58</u>	<u>20.04</u>	<u>15.79</u>	<u>21.88</u>	<u>19.11</u>	<u>13.86</u>	<u>21.48</u>	<u>13.86</u>	<u>17.11</u>	<u>19.43</u>

**11.802.2 Water-conserving appliances.** ENERGY STAR or equivalent water-conserving appliances are installed.

(1) clothes washer, or

(2) clothes washer with an Integrated Water Factor of 3.8 or less

**Multifamily Building Note:** *Washing machines are installed in individual units or provided in common areas of multifamily buildings.*

**11.802.3 Water Usage Metering.** Water meters are installed meeting the following:

(1) Single Family Buildings: Water Usage Metering.

(a) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site

(b) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered)

(2) Multi-Family Buildings: Water Usage Metering.

(a) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site

(b) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered)

**11.802.4 Showerheads.** Showerheads are in accordance with the following:

(1) The total maximum combined flow rate of all showerheads in a shower compartment with floor area of 1800 square inches or less is equal or less than 2.0 gpm. For each additional 1300 square inches of shower compartment floor area, an additional 2.0 gpm combined showerhead flow rate is allowed. Showerheads shall comply with ASME A112.18/CSA B125.1. Showerheads shall be served by an automatic compensating valve that complies with ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.

**(Points awarded per shower compartment. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**

(2) All shower compartments in the dwelling unit(s) or sleeping unit(s) and common areas meet the requirements of 801.3(1) and all showerheads are in accordance with one of the following:

(a) maximum of 1.8 gpm

(b) maximum of 1.5 gpm

(3) Any shower control that can shut off water flow without affecting temperature is installed.

**(Points awarded per shower control.)**

For SI: 1 gallon per minute = 3.785 L/m

**11.802.5 Faucets**

**11.802.5.1** Install water-efficient lavatory faucets with flow rates not more than 1.5 gpm (5.68 L/m), tested in compliance with ASME A112.18.1/CSA B125.1 and meeting the performance criteria of the EPA WaterSense High-Efficiency Lavatory Faucet Specification or equivalent:

(1) Flow rate  $\leq$  1.5 gpm

**(Points awarded for each bathroom. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**

(2) Flow rate  $\leq$  1.20 gpm

(3) Flow rate  $\leq$  1.5 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s)

(4) Flow rate  $\leq$  1.5 gpm for all lavatory faucets in the dwelling unit(s), and at least one bathroom has faucets with flow rates  $\leq$  1.20 gpm

(5) Flow rate  $\leq$  1.20 gpm for all lavatory faucets in the dwelling unit(s)

**11.802.5.2** Water-efficient kitchen faucets are installed in accordance with ASME A112.18.1/CSA B125.1. Kitchen faucets may temporarily increase the flow above the maximum rate but not to exceed 2.2 gpm.

(1) All kitchen faucets have a maximum flow rate of 1.8 gpm

(2) All residential kitchen faucets have a maximum flow rate of 1.5 gpm

**11.802.5.3** Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation.

**(Points awarded per fixture.)**

**11.802.6 Water closets and urinals.** Water closets and urinals are in accordance with the following:

**(Points awarded for 801.5(2) or 801.5(3), not both.)**

(1) Gold and emerald levels: All water closets and urinals are in accordance with Section 801.5.

(2) A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable. Tank-type water closets shall be in accordance with the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type Toilets.

**(Points awarded per fixture. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**

(3) All water closets are in accordance with Section 801.5(2).

(4) All water closets are in accordance with Section 801.5(2) and one or more of the following are installed:

(a) Water closets that have a flush volume of 1.2 gallons or less.

(Points awarded per toilet. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)

(b) One or more urinals with a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2/CSA B45.1.

(c) One or more composting or waterless toilets and/or nonwater urinals. Nonwater urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1.

### **11.802.7 Irrigation systems**

11.802.7.1 Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional as approved by Adopting Entity.

11.802.7.2 Irrigation sprinkler nozzles shall be tested according to ANSI standard ASABE/ICC 802-2014 Landscape Irrigation Sprinkler and Emitter Standard by an accredited third party laboratory and results are posted on manufacturers website or similar.

11.802.7.3 Drip irrigation is installed.

(1) Drip irrigation is installed for all landscape beds.

(2) Subsurface drip is installed for all turf grass areas.

(3) Drip irrigation zones specifications show plant type by name and water use/need for each emitter (Points awarded only if specifications are implemented.)

11.802.7.4 The irrigation system(s) is controlled by a smart controller or no irrigation is installed.

**(Points are not additive.)**

(1) Irrigation controllers are labeled by EPA WaterSense program

(2) No irrigation is installed and a landscape plan is developed in accordance with Section 503.5, as applicable.

### **11.802.7.5 Commissioning and Water Use Reduction for Irrigation Systems**

(1) All irrigation zones utilize pressure regulation so emission devices (sprinklers and drip emitters) operate at manufacturer's recommended operating pressure

(2) Where dripline tubing is installed, a filter with mesh size in accordance with the manufacturer's recommendation is installed on all drip zones.

(3) Utilize spray bodies that incorporate an in-stem or external flow shut-off device.

(4) For irrigation systems installed on sloped sites, either an in-stem or external check valve is utilized for each spray body.

(5) Where an irrigation system is installed, a flow sensing device is installed to monitor and alert the controller when flows are outside design range.

**11.802.8 Rainwater collection and distribution.** Rainwater collection and distribution is provided.

**11.802.8.1** Rainwater is used for irrigation in accordance with one of the following:

(1) Rainwater is diverted for landscape irrigation without impermeable water storage

(2) Rainwater is diverted for landscape irrigation with impermeable water storage in accordance with one of the following:

(a) 50 – 499 gallon storage capacity

(b) 500 – 2499 gallon storage capacity

(c) 2500 gallon or larger storage capacity (system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent)

(d) All irrigation demands are met by rainwater capture (documentation demonstrating the water needs of the landscape is provided and the system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent).

**11.802.8.2** Rainwater is used for indoor domestic demand as follows. The system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent.

(1) Rainwater is used to supply an indoor appliance or fixture for any locally approved use.

**(Points awarded per appliance or fixture.)**

(2) Rainwater provides for total domestic demand.

**11.802.9 Sediment filters.** Water filter is installed to reduce sediment and protect plumbing fixtures for the whole building or the entire dwelling unit or the sleeping unit.

**11.802.10 Water Treatment Devices.**

**11.802.10.1** Water Softeners shall not be installed where the supplied water hardness is less than 8.0 grains per gallon measured as total calcium carbonate equivalents. Water softeners shall be listed to NSF 44 and a rated salt efficiency of 3400 grains of total hardness per 1.0 pound of salt based on sodium chloride equivalency. Devices shall not discharge more than 4.0 gallons of water per 1000 grains of hardness removed during the service or recharge cycle.

(1) No water softener

(2) Water softener installed to supply softened water only to domestic water heater

**11.802.10.2** Reverse Osmosis (R/O) water treatment systems shall be listed to NSF 58 and shall include automatic shut-off valve to prevent water discharge when storage tank is full

(1) No R/O system

(2) Combined capacity of all R/O systems does not exceed 0.75 gallons

**11.802.11 Pools and Spas**

**11.802.11.1 Pools and Spas with water surface area greater than 36 square feet and connected to a water supply shall have a dedicated meter to measure the amount of water supplied to the pool or spa.**

(1) Automated motorized non-permeable pool cover that covers the entire pool surface.

**11.803 Innovation practices**

**11.803.1 Reclaimed, gray, or recycled water.** Reclaimed, gray, or recycled water is used as permitted by applicable code.

**(Points awarded for either Section 11.802.1(1) or 11.802.1(2), not both.)**  
**(Points awarded for either Section 11.802.6 or 11.802.1, not both.)**

(1) each water closet flushed by reclaimed, gray, or recycled water  
**(Points awarded per fixture or appliance.)**

(2) irrigation from reclaimed, gray, or recycled water on-site

**11.803.2 Reclaimed water, greywater or rainwater pre-piping.** Reclaimed, graywater, or rainwater systems are rough plumbed (and permanently marked, tagged or labeled) into buildings for future use.

**11.803.3 Automatic leak detection and control devices.** One of the following devices is installed. Where a fire sprinkler system is present, the device will be installed to not interfere with the operation of the fire sprinkler system.

(1) automatic water leak detection and control devices

(2) automatic water leak detection and shutoff devices

**11.803.4 Engineered biological system or intensive bioremediation system.** An engineered biological system or intensive bioremediation system is installed and the treated water is used on site. Design and implementation are approved by appropriate regional authority.

**11.803.5 Recirculating humidifier.** Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional “flow through” type.

**11.803.6 Advanced wastewater treatment system.** Advanced wastewater (aerobic) treatment system is installed and treated water is used on site.  
**(Points awarded for either Section 11.802.6 or 11.802.1, not both.)**

**11.804**

**PERFORMANCE PATH**

**11.804.1 Water Rating Index.** Water Rating Index (WRI) score is calculated in accordance with Appendix F or equivalent methodology.

**11.804.2 Water Efficiency Rating Levels.** In lieu of threshold levels for Chapter 8 in Table 303, rating levels for Section 804.1 are in accordance with Table 804.2.

Tables 804.2 Maximum WRI Scores for NGBS Certification in Chapter 8			
Bronze	Silver	Gold	Emerald
70	60	50	40

**11.804.3 Water Efficiency NGBS Points Equivalency.** The additional points for use with Table 303 from the Chapter 8 Water Efficiency Category are determined in accordance with equation 804.3.

$$\text{NGBS} = \text{WRI} \times (-2.29) + 181.7$$

**11.901  
POLLUTANT SOURCE CONTROL**

**11.901.0 Intent.** Pollutant sources are controlled.

**11.901.1 Space and water heating options**

**11.901.1.1** Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source, and is sealed and insulated to separate it from the conditioned space(s).  
**(Points are awarded only for buildings that use natural draft combustion space or water heating equipment.)**

**5**

**11.901.1.2** Air handling equipment or return ducts are not located in the garage, unless placed in isolated, air-sealed mechanical rooms with an outside air source.

**5**

**11.901.1.3** The following combustion space heating or water heating equipment is installed within conditioned space:

**(1)** all furnaces or all boilers

**(a)** power-vent furnace(s) or boiler(s)

**3**

**(b)** direct-vent furnace(s) or boiler(s)

**5**

**(2)** all water heaters

**(a)** power-vent water heater(s)

**3**

**(b)** direct-vent water heater(s)

**5**

**11.901.1.4** Newly installed gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units or sleeping units and direct heating equipment are vented to the outdoors. Alcohol burning devices and kerosene heaters are vented to the outdoors.

**Mandatory**

**11.901.1.5** Natural gas and propane fireplaces are direct vented have permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88/CSA 2.33 or CSA Z21.50/CSA 2.22.

**7**

**11.901.1.6** The following electric equipment is installed:

REMODELING

(1) heat pump air handler in unconditioned space	2
(2) heat pump air handler in conditioned space	5

**11.901.2 Solid fuel-burning appliances.**

<b>11.901.2.1</b> Newly installed solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:	<b>Mandatory</b>
(1) Site-built masonry wood-burning fireplaces are equipped with outside combustion air and a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.	
(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are <a href="#">an EPA certified or Phase 2 Emission Level Qualified Model</a> .	
(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).	
(4) Pellet (biomass) stoves and furnaces are in accordance with the requirements of ASTM E1509 or are EPA certified.	
(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC, Section 2112.1.	
(6) Removal of or rendering unusable an existing fireplace or fuel burning appliance that is not in accordance with 11.901.2.1 or replacement of each fireplace or appliance that is not in accordance with 11.901.2.1 with a compliant appliance.	
<b>11.901.2.2</b> Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.	<b>6</b>

**11.901.3 Garages.** Garages are in accordance with the following:

(1) Attached garage	
(a) Where installed in the common wall between the attached garage and conditioned space, the door is tightly sealed and gasketed.	<b>Mandatory 2</b>
(b) A continuous air barrier is provided between walls and ceilings separating the garage space from the conditioned living spaces.	<b>Mandatory 2</b>
(c) For one- and two-family dwelling units, a 100 cfm (47 L/s) or greater ducted, or 70 cfm (33 L/s) cfm or greater unducted wall exhaust fan is installed and vented to the outdoors, designed and installed for continuous operation, or has controls (e.g., motion detectors, pressure switches) that activate operation for a minimum of 1 hour when either human passage door or roll-up automatic doors are operated. For ducted exhaust fans, the fan airflow rating and duct sizing are in accordance with Appendix A.	<b>8</b>
(2) A carport is installed, the garage is detached from the building, or no garage is installed.	<b>10</b>

**11.901.4 Wood materials.** A minimum of 85 percent of newly installed material within a product group (i.e., wood structural panels, countertops, composite trim/doors, custom woodwork, and/or component closet shelving) is manufactured in accordance with the following:

(1) Structural plywood used for floor, wall, and/or roof sheathing is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.	<b>Mandatory</b>
---	------------------



<p><b>(2)</b> Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively. <b>(Points awarded per product group.)</b></p>	<b>2</b>
<p><b>(3)</b> Hardwood plywood in accordance with HPVA HP-1. <b>(Points awarded per product group.)</b></p>	<b>2</b>
<p><b>(4)</b> Particleboard, MDF, or hardwood plywood is in accordance with CPA 4. <b>(Points awarded per product group.)</b></p>	<b>3</b>
<p><b>(5)</b> Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the CARB <i>Composite Wood Air Toxic Contaminant Measure Standard</i>. <b>(Points awarded per product group.)</b></p>	<b>4</b>
<p><b>(6)</b> Non-emitting products. <b>(Points awarded per product group.)</b></p>	<b>4</b>

<p><b>11.901.5 Cabinets.</b> A minimum of 85 percent of newly installed cabinets are in accordance with one or both of the following: <b>(Where both of the following practices are used, only three points are awarded.)</b></p>	
<p><b>(1)</b> All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.</p>	<b>5</b>
<p><b>(2)</b> The composite wood used in wood cabinets are in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a program such as but not limited to, those in Appendix D.</p>	<b>3</b>

<p><b>11.901.6 Carpets.</b> Carpets are in accordance with the following:</p>	
<p><b>(1)</b> Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.</p>	<b>Mandatory</b>

<p><b>11.901.7 Floor materials.</b> The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D. <b>(Points are awarded for every 10% of conditioned floor space using one of the below materials.)</b></p>		<b>1 8 max</b>
<p><b>(1)</b> Hard surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:</p>		
<p><b>(a)</b> Ceramic tile flooring</p>		
<p><b>(b)</b> Organic-free, mineral-based flooring</p>		
<p><b>(c)</b> Clay masonry flooring</p>		
<p><b>(d)</b> Concrete masonry flooring</p>		
<p><b>(e)</b> Concrete flooring</p>		
<p><b>(f)</b> Metal flooring</p>		
<p><b>(g)</b> Glass</p>		
<p><b>(2)</b> Carpet and carpet cushion is installed.</p>		

**(When carpet cushion meeting the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.)**

**11.901.8 Wall coverings.** When at least 10 percent of the interior wall surfaces are covered, a minimum of 85 percent of wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

**4**

**11.901.9 Interior architectural coatings.** A minimum of 85 percent of newly applied interior architectural coatings are in accordance with either Section 11.901.9.1 or Section 11.901.9.3, not both. A minimum of 85 percent of architectural colorants are in accordance with Section 11.901.9.2.

**Exception:** Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.

**11.901.9.1** Site-applied interior architectural coatings, which are inside the waterproofing envelope, are in accordance with one or more of the following:

**5**

- (1)** Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)
- (2)** GreenSeal GS-11
- (3)** CARB *Suggested Control Measure for Architectural Coatings* (see Table 11.901.9.1)

**Table 11.901.9.1  
VOC Content Limits For Architectural Coatings<sup>a,b,c</sup>**

Coating Category	LIMIT <sup>d</sup> (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat - High Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420

Industrial Maintenance Coatings	250
Low Solids Coatings	120 <sup>e</sup>
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, □ Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
<b>Coating Category</b>	<b>LIMIT<sup>d</sup> (g/l)</b>
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

- a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
- b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
- c. Table 11.901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.
- d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
- e. Limit is expressed as VOC actual.

**11.901.9.2** Architectural coating colorant additive VOC content is in accordance with Table 11.901.9.2.

**1**

**(Points for 11.901.9.2 are awarded only if base architectural coating is in accordance with 11.901.9.1.)**

**Table 11.901.9.2  
VOC content limits for colorants**

<b>Colorant</b>	<b>LIMIT (g/l)</b>
Architectural Coatings, excluding IM Coatings	50
Solvent-Based IM	600
Waterborne IM	50

**11.901.9.3** Site-applied interior architectural coatings are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of

**8**

REMODELING

accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.	
---	--

<b>11.901.9.4</b> When the building is occupied during the remodel, a minimum of 85 percent of the newly applied interior architectural coatings are in accordance with either 11.901.9.1 or 11.901.9.3.	<b>Mandatory</b>
--	------------------

<b>11.901.10 Interior adhesives and sealants.</b> Interior low-VOC adhesives and sealants located inside the water proofing envelope: A minimum of 85 percent of newly applied site-applied products used within the interior of the building are in accordance with one of the following, as applicable.	
<b>(1)</b> The emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined when tested by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.	<b>8</b>
<b>(2)</b> GreenSeal GS-36	<b>5</b>
<b>(3)</b> SCAQMD Rule 1168 in accordance with Table 11.901.10(3), excluding products that are sold in 16 ounce containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulation.	<b>5</b>

**Table 11.901.10(3)  
Site Applied Adhesive and Sealants VOC Limits<sup>a,b</sup>**

ADHESIVE OR SEALANT	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer	
Non-porous	250
Porous	775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250

Structural wood member adhesive	140	
<p>a. VOC limit less water and less exempt compounds in grams/liter</p> <p>b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.</p>		
<p><b>11.901.11 Insulation.</b> Emissions of 85 percent of newly installed wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB. Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.</p>		<b>4</b>
<p><b>11.901.12 Carbon monoxide (CO) alarms.</b> A carbon monoxide (CO) alarm is provided in accordance with the IRC Section R315.</p>		<b>Mandatory</b>
<p><b>11.901.13 Building entrance pollutants control.</b> Pollutants are controlled at all main building entrances by one of the following methods:</p>		
(1) Exterior grilles or mats are installed in a fixed manner and may be removable for cleaning.	<b>1</b>	
(2) Interior grilles or mats are installed in a fixed manner and may be removable for cleaning.	<b>1</b>	
<p><b>11.901.14 Non-smoking areas.</b> Environmental tobacco smoke is minimized by one or more of the following:</p>		
(1) All interior common areas of a multifamily building are designated as non-smoking areas with posted signage.	<b>1</b>	
(2) Exterior smoking areas of a multifamily building are designated with posted signage and located a minimum of 25 feet from entries, outdoor air intakes, and operable windows.	<b>1</b>	
<p><b>11.901.15 Lead-safe work practices.</b> For buildings constructed before 1978, lead-safe work practices are used during the remodeling.</p>		<b>Mandatory</b>

**11.902  
POLLUTANT CONTROL**

<p><b>11.902.0 Intent.</b> Pollutants generated in the building are controlled.</p>		
<p><b>11.902.1 Spot ventilation</b></p>		
<p><b>11.902.1.1</b> Spot ventilation is in accordance with the following:</p>		
<p>(1) Bathrooms are vented to the outdoors. The minimum ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms. <b>(Points are awarded only if a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.)</b></p>	<b>Mandatory 1</b>	
<p>(2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.</p>	<b>Mandatory</b>	
<p>(3) Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.</p>	<b>8</b>	

REMODELING

<b>11.902.1.2</b> Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:	<b>11 Max</b>
(1) for first device	<b>5</b>
(2) for each additional device	<b>2</b>

<b>11.902.1.3</b> Kitchen range, bathroom, and laundry exhaust are verified to air flow specification. Ventilation airflow at the point of exhaust is tested to a minimum of:	<b>8</b>
(a) 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and	<b>6</b>
(b) 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry.	

<b>11.902.1.4</b> Exhaust fans are ENERGY STAR, as applicable.	<b>12 Max</b>
(1) ENERGY STAR, or equivalent, fans <b>(Points awarded per fan.)</b>	<b>2</b>
(2) ENERGY STAR, or equivalent, fans operating at or below 1 sone <b>(Points awarded per fan.)</b>	<b>3</b>

<b>11.902.1.5</b> Fenestration in spaces other than those identified in 902.1.1 through 902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:	<b>3</b>
(1) Operable windows, operable skylights, or sliding glass doors with a total area of at least 15 percent of the <a href="#">total</a> conditioned floor area are provided.	
(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.	
(3) A minimum of two operable windows or sliding glass doors are placed in adjacent or opposite walls. If there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.	

**11.902.2 Building ventilation systems**

<b>11.902.2.1</b> One of the following whole building ventilation systems is implemented and is in accordance with the specifications of Appendix B and an explanation of the operation and importance of the ventilation system is included in either 11.1001.1 or 11.1002.2.	<b>Mandatory where the maximum air infiltration rate is less than 5.0 ACH50</b>
(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls	<b>3</b>
(2) balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building	<b>6</b>
(3) heat-recovery ventilator	<b>7</b>
(4) energy-recovery ventilator	<b>8</b>
(5) <a href="#">Ventilation air is preconditioned by a system not specified above.</a>	

<b>11.902.2.2</b> Ventilation airflow is tested to achieve the design fan airflow <a href="#">at point of exhaust</a> in accordance with <a href="#">ANSI/RESNET/ICC 380 and</a> Section 11.902.2.1.	<b>4</b>
--	----------

<b>11.902.2.3</b> MERV filters 8 to13 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of MERV 8 to 13 filters.	<b>2</b>
--	----------

<b>11.902.2.4</b> MERV filters 14 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter used.	<b>3</b>
--	----------

<b>11.902.2.5</b> All HVAC filter locations are designed such that they are readily accessible to the occupant.	<b>3</b>
---	----------

<b>11.902.3 Radon <del>control</del>reduction measures.</b> Radon <del>control</del> reduction measures are in accordance with ICC IRC Appendix F <a href="#">or 11.902.3.2</a> . Zones are defined in Figure 9(1). This practice is not mandatory if the existing building has been tested for radon and is accordance with federal and local acceptable limits.	
---	--

<b>11.902.3.1 Radon reduction measures.</b> Radon reduction measures are Mandatory for Zone 1 as identified by the AHJ; or if the zone is not identified by the AHJ then as identified on the map (reference map). For all zones, the points are as follows:	
--	--

<b>(1)</b> Buildings located in Zone 1	<b>Mandatory</b>
<b>(a)</b> a passive radon system is installed	<b>7Mandatory</b>
<b>(b)</b> an active radon system is installed	<b>4012</b>
<b>(2)</b> Buildings located in Zone 2 or Zone 3	
<b>(a)</b> a passive or active radon system is installed	<b>7</b>
<b>(b)</b> <a href="#">An active radon system is installed</a>	<b>12</b>

<b>11.902.3.2 Radon reduction option.</b> This option requires section 902.3.2.1 through 902.3.2.7.
---

<b>11.902.3.2.1 Soil-gas barriers and base course.</b> A base course in accordance with Section 506.2.2 of the IRC shall be installed below slabs and foundations. There shall be a continuous gas-permeable base course under each soil-gas retarder that is separated by foundation walls or footings. Between slabs and the base course, damp proofing or water proofing shall be installed in accordance with Section 406 of the IRC. Punctures, tears and gaps around penetrations of the soil-gas retarder shall be repaired or covered with an additional soil-gas retarder. The soil-gas retarder shall be a continuous6-mil (0.15 mm) polyethylene or an approved equivalent.
--

<b>11.902.3.2.2 Soil gas collection.</b> There shall be an unobstructed path for soil gas flow between the void space installed in the base course and the vent through the roof. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than 4 inches (10 cm) and not less than 5 feet (1.5 m) in total length. A tee fitting or equivalent method shall provide two horizontal openings to the radon collection. The tee fitting shall be designed to prevent clogging of the radon collection path. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method
---

<b>11.902.3.2.3 Soil gas entry routes.</b> Openings in slabs, soil-gas retarders, and joints such as, but not limited to, plumbing, ground water control systems, soil-gas vent pipes, piping and structural supports, shall be sealed against air leakage at the penetrations. The sealant shall be a polyurethane caulk, expanding foam or other approved method. Foundation walls shall
--

REMODELING

comply with Section 103.2.3 of the IRC. Sumps shall be sealed in accordance with Section 103.2.2 of the IRC. Sump pits and sump lids intended for ground water control shall not be connected to the sub-slab soil-gas exhaust system

**11.902.3.2.4 Soil gas vent.** A gas-tight pipe vent shall extend from the soil gas permeable layer through the roof. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof. Exposed and visible interior vent pipes shall be identified with not less than one label reading "Radon Reduction System" on each floor and in habitable attics

**11.902.3.2.5 Vent pipe diameter.** The minimum vent pipe diameter shall be as specified in Table 11.902.3.2.5

TABLE 11.902.3.2.5 MAXIMUM VENTED FOUNDATION AREA	
Maximum area vented	Nominal pipe diameter
2,500 ft <sup>2</sup> (232 m <sup>2</sup> )	3 inch (7.6 cm)
4,000 ft <sup>2</sup> (372 m <sup>2</sup> )	4 inch (10 cm)
Unlimited	6 inch (15.2 cm)

**11.902.3.2.6 Multiple vented areas.** In dwellings where interior footings or other barriers separate the soil-gas permeable layer, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof

**11.902.3.2.7 Fan.** Each sub-slab soil-gas exhaust system shall include a fan, or dedicated space for the post-construction installation of a fan. The electrical supply for the fan shall be located within 6 feet (1.8 m) of the fan

**11.902.3.3 Radon testing.** Radon testing is mandatory for Zone 1

**Except:** testing is not mandatory where the authority having jurisdiction has defined the radon zone as Zone 2 or 3.

(1)	Testing specifications. Testing is performance as specified in (a) through (j)	<u>8</u>
	(a) Testing is performed after the residence passes its airtightness test.	
	(b) Testing is performed at the lowest level which will be occupied, even if the space is not finished.	
	(c) Testing is not performed in a closet, hallway, stairway, laundry room, furnace room or bathroom.	
	(d) Testing is performed with a commercially available test kit or with a radon monitor. Testing shall be in accordance with the manufacturer's instructions.	
	(e) Testing can be performed by the builder or a third party.	
	(f) Testing shall extend at least 48 hours or to the minimum specified by the manufacturer, which ever is longer. This initial testing can extend past occupancy.	
	(g) Test results shall be provided directly to the homeowner by the test lab or testing party. The test results are not required to be delivered before occupancy.	
	(h) An additional pre-paid test kit shall be provided to the homeowner to use when they choose. The test kit shall include mailing, or emailing the results from the testing lab to the homeowner. The homebuilder may also receive the test results.	
	(i) This section does not require a specific test result, rather it requires the test be performed and the results provided to the homeowner.	
	(j) The homeowner shall be informed prior to occupancy and in writing that "A radon test result of 4 pCi/L or above is the 'action level' set by EPA."	
(2)	Testing results. A radon test done in accordance with 11.902.3.1 and completed before occupancy receives a results of 2 pCi/L or less.	<u>6</u>



<p><b>11.902.4 HVAC system protection.</b> One of the following HVAC system protection measures is performed.</p>	<p><b>3</b></p>
<p>(1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.</p>	
<p>(2) Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.</p>	
<p>(3) <a href="#">If HVAC systems are to be operated, during construction, all return grilles have a temporary MERV 8 or higher filter installed in a manner ensuring no leakage around the filter.</a></p>	

<p><b>11.902.5 Central vacuum systems.</b> Central vacuum system is installed and vented to the outside.</p>	<p><b>3</b></p>
--	-----------------

<p><b>11.902.6 Living space contaminants.</b> The living space is sealed in accordance with Section 11.701.4.3.1 to prevent unwanted contaminants.</p>	<p><b>Mandatory</b></p>
--	-------------------------

**11.903  
MOISTURE MANAGEMENT: VAPOR, RAINWATER, PLUMBING, HVAC**

<p><b>11.903.0 Intent.</b> Moisture and moisture effects are controlled.</p>	
--	--

**11.903.1 Plumbing**

<p><b>11.903.1.1</b> Cold water pipes in unconditioned spaces are insulated to a minimum of R-4 with pipe insulation or other covering that adequately prevents condensation.</p>	<p><b>2</b></p>
---	-----------------

<p><b>11.903.1.2</b> Plumbing is not installed in unconditioned spaces.</p>	<p><b>5</b></p>
---	-----------------

**11.903.2 Duct insulation.** Ducts are in accordance with one of the following:

<p>(1) All HVAC ducts, plenums, and trunks in are conditioned space.</p>	<p><b>1</b></p>
--	-----------------

<p>(2) All HVAC ducts, plenums, and trunks in are conditioned space. All HVAC ducts are insulated to a minimum of R4.</p>	<p><b>3</b></p>
---	-----------------

<p><b>11.903.3 Relative humidity.</b> In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60 percent using one of the following:  <b>(Points not awarded in other climate zones.)</b></p>	<p><b>7</b></p>
--	-----------------

<p>(1) additional dehumidification system(s)</p>	
--	--

<p>(2) central HVAC system equipped with additional controls to operate in dehumidification mode</p>	
--	--

**11.904  
INDOOR AIR QUALITY**

<p><b>11.904.0 Intent.</b> IAQ is protected by best practices to control ventilation, moisture, pollutant sources and sanitation.</p>	
---	--

REMODELING

<b>11.904.1 Indoor Air Quality (IAQ) during construction.</b> Wood is dry before close-in (11.602.1.7.1(3)), materials comply with emission criteria (11.901.4- 11.901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible interior surfaces are dry and free of visible suspect growth (per ASTM D7338-10 section 6.3), and water damage (per ASTM D7338-10 section 7.4.3).	<b>2</b>
---	----------

<b>11.904.2 Indoor Air Quality (IAQ) post completion.</b> Verify there are no moisture, mold, and dust issues per 11.602.1.7.1(3), 11.901.4-11.901.11, ASTM D7388 Section 6.3, and ASTM D7338 Section 7.4.3.	<b>3</b>
--	----------

**11.905  
INNOVATIVE PRACTICES**

<b>11.905.1 Humidity monitoring system.</b> A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has a minimum of two remote sensor units. One remote unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space.	<b>2</b>
--	----------

<b>11.905.2 Kitchen exhaust.</b> A kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, and make-up air is provided.	<b>2</b>
--	----------

<b>11.905.3 Isolation of areas to be remodeled.</b> <u>To protect unrenovated spaces, meet one of the following</u>	<b>Max 3 ots</b>
<b>(1)</b> <u>Remodeled space is isolated from unrenovated space by masking of openings and hvac returns and providing strip doors</u>	<b>1</b>
<b>(2)</b> <u>Remodeled space is isolated from unrenovated space by masking of openings and hvac returns, and providing strip doors and the space is negatively pressurized by ducting exhaust to the exterior</u>	<b>3</b>
<b>(3)</b> <u>Remodeled space is isolated from unrenovated space by masking of openings and hvac returns, and providing strip doors and a dedicated HEPA filtration system is installed</u>	<b>3</b>

**11.906  
ADDITIONAL / NEW**

<b>11.906.1 Enhanced Air Filtration.</b> <u>Meet all of the following.</u>	<b>2</b>
<b>(1)</b> <u>Design for and install a secondary filter rack space for activated carbon filters.</u>	
<b>(2)</b> <u>Provide the manufacturer's recommended filter maintenance schedule to the homeowner or building manager.</u>	

<b>11.906.2 Sound Barrier.</b> <u>Provide room-to-room privacy between bedrooms and adjacent living spaces within dwelling units or homes by achieving an articulation index (AI) between 0 and 0.15 per the criteria below.</u>	<b>1 pt for single family</b>
<u>Articulation Index 0 to 0.05 = STC &gt; 55 (NIC &gt;47)</u>	<b>3 pts for multifamily</b>
<u>Articulation Index 0.05 to 0.15 = STC 52 – 55 (NIC 44 – 47)</u>	

<p><b>11.906.3 Ventilation for Multifamily Common Spaces.</b> Systems are implemented and are in accordance with the specifications of ASHRAE 62.1 and an explanation of the operation and importance of the ventilation system is included in 1002.1 and 1002.2 of NGBS</p>		
<p><b>11.906.4 Furniture and Furnishings.</b> In a multifamily building, all furniture in common areas shall have VOC emission levels in accordance with ANSI/BIFMA e3-Furniture Sustainability Standard sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1</p>		
<p><b>11.906.5 Evaporative Coil Mold Prevention.</b> For buildings with a mechanical system for cooling, ultraviolet lamps are installed on the cooling coils and drain pans of the mechanical system supplies. Lamps produce ultraviolet radiation at a wavelength of 254 nm so as not to generate ozone. Lamps have ballasts housed in a NEMA-rated enclosure.</p>	<p><u>2</u></p>	
<p><b>11.906.6 Microbial Growth &amp; Moisture Inspection and Remediation.</b> A visual inspection is performed to confirm the following:</p>		
<p><b>(1)</b></p>	<p>Verify that no visible signs of discoloration and microbial growth on ceilings, walls or floors, or other building assemblies</p>	<p><b>Mandatory</b></p>
	<p><b>Notes:</b> If minor microbial growth is observed (less than within a total area of 25 square feet) in homes or multifamily buildings, reference EPA Document 402-K-02-003 (A Brief Guide to Mold, Moisture, and Your Home) for guidance on how to properly remediate the issue. If microbial growth is observed, on a larger scale in homes or multifamily buildings (greater than 25 sq ft), reference EPA document 402-k-01-001 (Mold Remediation in Schools and Commercial Buildings) for guidance on how to properly remediate the issue.</p>	
<p><b>(2)</b></p>	<p>Verify that there are no visible signs of water damage or pooling. If signs of water damage or pooling are observed, verify that the source of the leak has been repaired, and that damaged materials are either properly dried or replaced as needed.</p>	<p><b>Mandatory</b></p>

**11.1001  
HOMEOWNER’S MANUAL AND TRAINING GUIDELINES FOR ONE- AND TWO-FAMILY DWELLINGS**

<p><b>11.1001.0 Intent.</b> Information on the building’s use, maintenance, and green components is provided.</p>		
<p><b>11.1001.1 Homeowner’s manual.</b> A homeowner’s manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable. <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b></p>	<p><b>1 8 Max</b></p>	
<p><b>(1)</b></p>	<p>A National Green Building Standard certificate with web link and completion document.</p>	<p><b>Mandatory</b></p>
<p><b>(2)</b></p>	<p>List of green building features (can include the national green building checklist).</p>	<p><b>Mandatory</b></p>
<p><b>(3)</b></p>	<p>Product manufacturer’s manuals or product data sheet for newly installed major equipment, fixtures, and appliances including product model numbers and serial numbers. If product data sheet is in the building owners’ manual, manufacturer’s manual may be attached to the appliance in lieu of inclusion in the building owners’ manual.</p>	<p><b>Mandatory</b></p>
<p><b>(4)</b></p>	<p>Maintenance checklist.</p>	

**REMODELING**

<b>(5)</b>	Information on local recycling and composting programs.
<b>(6)</b>	Information on available local utility programs that purchase a portion of energy from renewable energy providers.
<b>(7)</b>	Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.
<b>(8)</b>	A list of practices to conserve water and energy.
<b>(9)</b>	Information on the importance and operation of the home's fresh air ventilation system.
<b>(10)</b>	Local public transportation options.
<b>(11)</b>	A diagram showing the location of safety valves and controls for major building systems.
<b>(12)</b>	Where frost-protected shallow foundations are used, owner is informed of precautions including:
<b>(a)</b>	instructions to not remove or damage insulation when modifying landscaping.
<b>(b)</b>	providing heat to the building as required by the ICC IRC or IBC.
<b>(c)</b>	keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.
<b>(13)</b>	A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).
<b>(14)</b>	A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.
<b>(15)</b>	List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.
<b>(16)</b>	Information on organic pest control, fertilizers, deicers, and cleaning products.
<b>(17)</b>	Information on native landscape materials and/or those that have low-water requirements.
<b>(18)</b>	Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.
<b>(19)</b>	Instructions for inspecting the building for termite infestation.
<b>(20)</b>	Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of 5 feet away from foundation.
<b>(21)</b>	A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.
<b>(22)</b>	Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.
<b>(23)</b>	For buildings originally built before 1978, the EPA publications "Reducing Lead Hazards When Remodeling Your Home" and "Asbestos in Your Home: A Homeowner's Guide".
<b>(24)</b>	Explanation of and benefits from green cleaning in the home.
<b>(25)</b>	Retrofit energy calculator that provides baseline for future energy retrofits.

<b>11.1001.2 Training of initial building owners.</b> Initial building owners are familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies)	<b>Mandatory 8</b>
--	------------------------

regarding newly installed equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:	
(1) HVAC filters	
(2) thermostat operation and programming	
(3) lighting controls	
(4) appliances operation	
(5) water heater settings and hot water use	
(6) fan controls	
(7) Recycling and composting practices	
(8) <a href="#">Whole dwelling mechanical ventilation system</a>	

**11.1002  
CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR  
MULTIFAMILY BUILDINGS**

<b>11.1002.0 Intent.</b> Manuals are provided to the responsible parties (owner, management, tenant, and/or maintenance team) regarding the construction, operation, and maintenance of the building. Paper or digital format manuals are to include information regarding those aspects of the building’s construction, maintenance, and operation that are within the area of responsibilities of the respective recipient. One or more responsible parties are to receive a copy of all documentation for archival purposes.	
<b>11.1002.1 Building construction manual.</b> A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 11.1002.0. <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b>	<b>1</b>
(1) A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties’ manuals.	<b>Mandatory</b>
(2) A local green building program certificate as well as a copy of the <i>National Green Building Standard™</i> , as adopted by the Adopting Entity, and the individual measures achieved by the building.	<b>Mandatory</b>
(3) Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes.	<b>Mandatory</b>
(4) Record drawings of the building.	
(5) A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.	
(6) A diagram showing the location of safety valves and controls for major building systems.	
(7) A list of the type and wattage of light bulbs installed in light fixtures.	
(8) A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.	
<b>11.1002.2 Operations manual.</b> Operations manuals are created and distributed to the responsible parties in accordance with Section 11.1002.0. Among all of the operation manuals, five or more of the following options are included. <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b>	<b>1</b>

REMODELING

<p>(1) A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals.</p>	<p><b>Mandatory</b></p>
<p>(2) A list of practices to conserve water and energy (e.g., turning off lights when not in use, switching the rotation of ceiling fans in changing seasons, purchasing ENERGY STAR appliances and electronics).</p>	<p><b>Mandatory</b></p>
<p>(3) Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.</p>	
<p>(4) Information on opportunities to purchase renewable energy from local utilities or national green power providers and information on utility and tax incentives for the installation of on-site renewable energy systems.</p>	
<p>(5) Information on local and on-site recycling and hazardous waste disposal programs and, if applicable, building recycling and hazardous waste handling and disposal procedures.</p>	
<p>(6) Local public transportation options.</p>	
<p>(7) Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.</p>	
<p>(8) Information on native landscape materials and/or those that have low water requirements.</p>	
<p>(9) Information on the radon mitigation system, where applicable.</p>	
<p>(10) A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.</p>	
<p>(11) Information on the importance and operation of the building's fresh air ventilation system.</p>	
<p><b>11.1002.3 Maintenance manual.</b> Maintenance manuals are created and distributed to the responsible parties in accordance with Section 11.1002.0. Between all of the maintenance manuals, five or more of the following options are included. <b>(Points awarded per two items. Points awarded for non-mandatory items.)</b></p>	<p><b>1</b></p>
<p>(1) A narrative detailing the importance of maintaining a green building. This narrative is included in all responsible parties' manuals.</p>	<p><b>Mandatory</b></p>
<p>(2) A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).</p>	
<p>(3) User-friendly maintenance checklist that includes:</p>	
<p>(a) HVAC filters</p>	
<p>(b) thermostat operation and programming</p>	
<p>(c) lighting controls</p>	
<p>(d) appliances and settings</p>	
<p>(e) water heater settings</p>	
<p>(f) fan controls</p>	
<p>(4) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.</p>	
<p>(5) Information on organic pest control, fertilizers, deicers, and cleaning products.</p>	
<p>(6) Instructions for maintaining gutters and downspouts and the importance of diverting water a minimum of 5 feet away from foundation.</p>	
<p>(7) Instructions for inspecting the building for termite infestation.</p>	

<b>(8)</b>	A procedure for rental tenant occupancy turnover that preserves the green features.
<b>(9)</b>	An outline of a formal green building training program for maintenance staff.
<b>(10)</b>	A green cleaning plan which includes guidance on sustainable cleaning products.
<b>(11)</b>	<a href="#">A maintenance plan for active recreation and play spaces (e.g., playgrounds, ground markings, exercise equipment)</a>

<b>11.1002.4 Training of building owners.</b> Building owners are familiarized with the role of occupants in achieving green goals. On-site training is provided to the responsible party(ies) regarding newly installed equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:	<b>Mandatory 8 pts</b>
<b>(1)</b> HVAC filters	
<b>(2)</b> thermostat operation and programming	
<b>(3)</b> lighting controls	
<b>(4)</b> appliances operation	
<b>(5)</b> water heater settings and hot water use	
<b>(6)</b> fan controls	
<b>(7)</b> recycling and composting practices	
<b>(8)</b> <a href="#">Whole dwelling mechanical ventilation system</a>	

<b>11.1002.5 Multifamily occupant manual.</b> An occupant manual is compiled and distributed in accordance with Section 11.1002.0	<b>1 pt per two items</b>
<b><u>Points awarded for non-mandatory items</u></b>	
<b>(1)</b> <a href="#">NGBS certificate</a>	<b>Mandatory</b>
<b>(2)</b> <a href="#">List of green building features</a>	<b>Mandatory</b>
<b>(3)</b> <a href="#">Operations manuals for all appliances and occupant operated equipment including lighting and ventilation controls, thermostats, etc.</a>	<b>Mandatory</b>
<b>(4)</b> <a href="#">Information on recycling and composting programs</a>	
<b>(5)</b> <a href="#">Information on purchasing renewable energy from utility</a>	
<b>(6)</b> <a href="#">Information on energy efficient replacement lamps</a>	
<b>(7)</b> <a href="#">List of practices to save water and energy</a>	
<b>(8)</b> <a href="#">Local public transportation options</a>	
<b>(9)</b> <a href="#">Explanation of benefits of green cleaning</a>	

<b>11.1002.6 Training of multifamily occupants.</b> Prepare a training outline, video or website that familiarizes occupants with their role in maintaining the green goals of the project. Include all equipment that the occupant(s) is expected to operate including but not limited:	<b>1 pt per two items</b>
<b>(1)</b> <a href="#">Lighting controls</a>	
<b>(2)</b> <a href="#">Ventilation controls</a>	
<b>(3)</b> <a href="#">Thermostat operation and programming</a>	

REMODELING

<a href="#">(4) Appliances operation</a>
<a href="#">(5) Recycling and composting</a>
<a href="#">(6) HVAC filters</a>
<a href="#">(7) Water heater setting and hot water use</a>

**11.1003  
PUBLIC EDUCATION**

<b>11.1003.0 Intent.</b> Increase public awareness of the National Green Building Standard and projects constructed in accordance with National Green Building Standard to help increase demand for high-performance homes.	
---	--

<b>11.1003.1 Public Education.</b> One or more of the following is implemented:	<b>2 Max</b>
<b>(1) Signage.</b> Signs showing the project is designed and built in accordance with the National Green Building Standard are posted on the construction site.	<b>1</b>
<b>(2) Certification Plaques.</b> National Green Building Standard certification plaques with rating level attained are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of a multifamily building.	<b>1</b>
<b>(3) Education.</b> A URL for the National Green Building Standard is included on site signage, builder website (or property website for multifamily buildings), and marketing materials for homes certified under the National Green Building Standard.	<b>1</b>

**11.1005  
INNOVATIVE PRACTICES**

<b>11.1005.1 Appraisals.</b> <a href="#">One or more of the following is implemented: <del>(Reserved)</del></a>		
<a href="#">(1)</a>	<a href="#">Energy rating or usage data is posted by submitting rating or data to the RESNET registry, affixing the HERS or ERI data to a sticker in an appropriate location in the home, or an equivalent posting so that an appraiser can access the energy data for an energy efficiency property valuation</a>	<a href="#">2</a>
<a href="#">(2)</a>	<a href="#">An Appraisal Institute Form 820.05 “Residential Green and Energy Addendum” or Form 821 “Commercial Green and energy Efficient Addendum” that consider NGBS, LEED, ENERGY STAR certifications and equivalent programs, is completed for the appraiser by a qualified professional or builder to use in performing the valuation of the property</a>	<a href="#">2</a>
<a href="#">(3)</a>	<a href="#">NGBS certification information or one of the Appraisal Institute Forms cited in (2) above is uploaded to a multiple listing service (MLS) or equivalent database so that appraisers can access it to compare property valuations</a>	<a href="#">2</a>



## CHAPTER 12

# REMODELING OF FUNCTIONAL AREAS CERTIFIED COMPLIANCE PATH FOR SINGLE-FAMILY HOMES, TOWNHOMES, AND DUPLEXES

**1200 Substitution of practices .** The adopting entity shall be permitted to substitute one or more practices with alternatives that achieve the overall intent of this standard. The determination of intent and equivalency is in the purview of the adopting entity.

### 1201 LOT DEVELOPMENT

**1201.1 Floodplain.** Construction shall not occur in a floodplain or construction shall be elevated above the floodplain.

**1201.2 Lot Slope.** Finished grade at all sides of a building shall be sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), the final grade shall be sloped away from the edge of the building at a minimum slope of 2 percent.

**1201.3 Soil preparation for new plants.** Soil shall be tilled or new soil shall be added down 6" for new plants and 12" for new trees. Soil shall be amended with organic matter, such as mulch or compost, as needed. Long acting sources of nutrients shall be added if the soil is deficient.

**1201.4 Regionally Appropriate Vegetation.** When an Agency that has jurisdiction has developed a specification for planting, including non-invasive vegetation that is native or appropriate for local growing conditions, vegetation from that specification is selected for the landscaping plan and that landscaping is installed.

**1201.5 Soil preparation for new plants.** The landscaping plan shall incorporate the jurisdictional Department of Transportation (DOT) specifications (or equal) for soil preparation and amendment for landscape planning. If regional conditions provide an alternative for planting (for instance, in drought or water challenged areas) that alternative shall be REQUIRED as a part of the landscape plan.

**1201.6 Protection of Natural Resources:** Any trees or other natural resources that do not conflict with the home construction or finished grading and drainage of the lot and adjacent lots shall be properly protected during construction and all controls shall be removed following construction. The landscape plan shall contain details for the protection and instructions for incorporation of the trees/areas into the final landscape plan.

### 1202 RESOURCE EFFICIENCY (DURABILITY)

**1202.1 Capillary Break.** A capillary break and vapor retarder shall be installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3.

**1202.2 Foundation drainage.** Where required by the IRC for habitable and usable spaces below grade, exterior drain tile shall be installed.

**1202.3** Dampproof walls shall be provided below finished grade.

**1202.4 Sealed crawlspace.** 6-mil polyethylene sheeting, or other Class I vapor retarder shall be installed in accordance with Section 408.3 or Section 506 of the International Residential Code.

## REMODELING OF FUNCTIONAL AREAS

**1202.5 Dry Insulation.** Insulation in cavities shall be dry in accordance with manufacturer's instructions before enclosing (e.g., with drywall).

**1202.6 Water-resistive barrier.** A water-resistive barrier and/or drainage plane system shall be installed in accordance with IRC requirements behind exterior veneer and/or siding.

**1202.7 Flashing.** Flashing shall be provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details shall be provided in the construction documents and shall be in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional. Flashing shall be installed at the following locations, as applicable:

- (1) around exterior fenestrations, skylights, and doors
- (2) at roof valleys
- (3) at building-to-deck, -balcony, -porch, and -stair intersections
- (4) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets
- (5) at ends of and under masonry, wood, or metal copings and sills
- (6) above projecting wood trim
- (7) at built-in roof gutters
- (8) drip edge shall be installed at eave and rake edges
- (9) window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 or liquid applied flashing complying with AAMA 714-15 and installed in accordance with flashing fenestration or manufacturer's installation instructions
- (10) pan flashing is installed at sills of all exterior windows and doors
- (11) seamless, preformed kickout flashing, or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited to kickout and step flashing is commensurate with the anticipated service life of the roofing material
- (12) through-wall flashing is installed at transitions between wall cladding materials, or wall construction types

**1202.8 Tile backing materials.** Tile backing materials installed under tiled surfaces in wet areas shall be in accordance with ASTM C1178, C1278, C1288, or C1325. Tile shall not be installed over paper-faced drywall in wet areas.

**1202.9 Ice and water shield.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed in accordance with the IRC at roof eaves of pitched roofs and shall extend a minimum of 24 inches (610 mm) inside the exterior wall line of the building.

**1202.10 Architectural features.** Horizontal ledgers shall be sloped away to provide gravity drainage as appropriate for the application.

**1202.11 Visible Suspect Fungal Growth.** Building materials with visible suspect fungal growth shall not be installed, or shall be addressed in accordance with industry recognized guidelines such as ANSI/IICRC S520 Mold Remediation or EPA 402-K-01-001 Table 2: Mold Remediation Guidelines, prior to concealment and closing. Porous and semi-porous building materials should be stored in such a manner as to prevent excessive moisture content prior to installation or use. Relative humidity within the structure shall be controlled during construction so as to prevent the potential for microbial growth.

**1202.12 Exterior doors.** At least one entry at an exterior door assembly, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have either a storm door or a projection factor of 1.0 minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).

(a) installing a porch roof or awning

(b) extending the roof overhang

(c) recessing the exterior door

(d) installing a storm door

**1202.13 Roof overhangs.** Roof overhangs, in accordance with Table 602.1.12, are provided over a minimum of 90 percent of exterior walls to protect the building envelope.

**1202.14 Roof Water Discharge.** Gutters shall discharge 5' from building, onto paved surfaces, or into areas designed to infiltrate drainage into the ground or to water vegetation.

**1203 ENERGY EFFICIENCY**

**1203.1 Mandatory requirements.** The building shall comply with Section 701 AND 702 (Performance Path), Section 703 (Prescriptive Path), or Section 704 (HERS Index Target Path). Sampling shall not be permitted for this alternative compliance path.

**1203.2 Adopting entity review.** A review by the Adopting Entity or approved third party shall be conducted to verify design and compliance with these energy requirements.

**1203.3** Dampproof walls shall be provided below finished grade.

**1203.4 Duct testing (Mandatory).**

Ducts shall be pressure tested to determine air leakage by one of the following methods:

(1) Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.

(2) Post-construction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

Exceptions:

(1) A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.

(2) A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems.

A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

**1203.5 Radiant and hydronic space heating.** Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ACCA 5 QI-2010, or an accredited design professional's and manufacturer's recommendations).

**1203.6 Building Thermal Envelope Air Sealing.** The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for

**REMODELING OF FUNCTIONAL AREAS**

<u>differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material:</u>	
<b>(a)</b>	<u>All joints, seams and penetrations.</u>
<b>(b)</b>	<u>Site-built windows, doors, and skylights.</u>
<b>(c)</b>	<u>Openings between window and door assemblies and their respective jambs and framing.</u>
<b>(d)</b>	<u>Utility penetrations.</u>
<b>(e)</b>	<u>Dropped ceilings or chases adjacent to the thermal envelope.</u>
<b>(f)</b>	<u>Knee walls.</u>
<b>(g)</b>	<u>Walls and ceilings separating a garage from conditioned spaces.</u>
<b>(h)</b>	<u>Behind tubs and showers on exterior walls.</u>
<b>(i)</b>	<u>Common walls between dwelling units.</u>
<b>(j)</b>	<u>Attic access openings.</u>
<b>(k)</b>	<u>Rim joist junction.</u>
<b>(l)</b>	<u>Other sources of infiltration.</u>
<b>1203.7 Air sealing and insulation.</b> <u>Grade II and Grade III insulation shall not be permitted. Building envelope air tightness and insulation installation shall be verified to be in accordance with Section A and B.</u>	
<b>A</b>	<u>Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.</u>
<b>(a)</b>	<u>Exterior windows and doors, fireplace and stove doors are closed, but not sealed;</u>
<b>(b)</b>	<u>Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;</u>
<b>(c)</b>	<u>Interior doors are open;</u>
<b>(d)</b>	<u>Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;</u>
<b>(e)</b>	<u>Heating, cooling, and ventilation systems are turned off;</u>
<b>(f)</b>	<u>HVAC duct terminations are not sealed; and</u>
<b>(g)</b>	<u>Supply and return registers are not sealed.</u>
<b>B</b>	<u>Visual inspection. The air barrier and insulation items listed in Table 13.701.4.3.2(2) shall be field verified by visual inspection.</u>

**Table 701.4.3.2(2)  
AIR BARRIER AND INSULATION INSTALLATION**

<b>COMPONENT</b>	<b>AIR BARRIER CRITERIA</b>	<b>INSULATION INSTALLATION CRITERIA</b>
<u>General requirements</u>	<u>A continuous air barrier shall be installed in the building envelope.</u>	<u>Air-permeable insulation shall not be used as a sealing material.</u>
<u>Ceiling/attic</u>	<u>The exterior thermal envelope contains a continuous air barrier.</u>	<u>The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.</u>
<u>Walls</u>	<u>Breaks or joints in the air barrier shall be sealed.</u>	<u>Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum.</u>

<a href="#">Windows, skylights and doors</a>	<a href="#">The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed.</a>	<a href="#">Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.</a>
<a href="#">Rim joists</a>	<a href="#">Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.</a>	
<a href="#">Floors (including above garage and cantilevered floors)</a>	<a href="#">The junction of the foundation and sill plate shall be sealed.</a>	<a href="#">Rim joists shall be insulated.</a>
<a href="#">Crawl space walls</a>	<a href="#">The junction of the top plate and the top of exterior walls shall be sealed.</a>	<a href="#">Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.</a>
<a href="#">Shafts, penetrations</a>	<a href="#">Knee walls shall be sealed.</a>	<a href="#">Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.</a>
<a href="#">Narrow cavities</a>	<a href="#">The space between window/doorjamb and framing, and skylights and framing shall be sealed.</a>	
<a href="#">Garage separation</a>	<a href="#">Rim joists shall include the air barrier.</a>	<a href="#">Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.</a>
<a href="#">Recessed lighting</a>	<a href="#">The air barrier shall be installed at any exposed edge of insulation.</a>	
<a href="#">Plumbing and wiring</a>	<a href="#">Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.</a>	<a href="#">Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.</a>
<a href="#">Shower/tub on exterior wall</a>	<a href="#">Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.</a>	<a href="#">Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.</a>
<a href="#">Electrical/phone box on exterior walls</a>		<a href="#">Exterior walls adjacent to showers and tubs shall be insulated.</a>
<a href="#">HVAC register boots</a>	<a href="#">Air sealing shall be provided between the garage and conditioned spaces.</a>	
<a href="#">Concealed sprinklers</a>	<a href="#">Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.</a>	
<a href="#">a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.</a>		

<a href="#">1203.8 High-efficacy lighting.</a> A minimum of 90 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent.
<a href="#">1203.9 Appliances.</a> If installed, refrigerator, dishwasher, and/or washing machine shall be ENERGYSTAR or equivalent.
<a href="#">1203.10 Clothes washers.</a> Clothes washers rated with an IWF (integrated water factor), MEF (modified energy factor), or IMEF (integrated modified energy factor), shall be rated as follows:
<a href="#">1 Residential Clothes Washers, Front-loading, &gt; 2.5 cu-ft maximum IWF 3.2, minimum IMEF 2.76</a>
<a href="#">2 Residential Clothes Washers, Top-loading, &gt; 2.5 cu-ft maximum 4.3 IWF, minimum IMEF 2.06</a>

REMODELING OF FUNCTIONAL AREAS

<b>3</b> Residential Clothes Washers ( $\leq 2.5$ cu-ft) maximum 4.2 IWF, minimum IMEF 2.07
<b>1203.11 Energy performance pathway.</b>
<b>1203.11.1 IECC analysis.</b> Energy efficiency features are implemented to achieve energy cost or site energy or source energy performance that exceeds the IECC by 7.5 percent. A documented analysis using software in accordance with IECC, Section R405, is required.
<b>1203.11.2 Energy performance analysis.</b> Energy savings levels above the ICC IECC are determined through an analysis that includes improvements in building envelope, air infiltration, heating system efficiencies, cooling system efficiencies, duct sealing, water heating system efficiencies, lighting, and appliances.
<b>1203.12 Energy prescriptive pathway.</b>
<b>1203.12.1 UA Compliance.</b> The building thermal envelope complies with Section 13.703.1.1 or 13.703.1.2. Exception: 13.703.1 is not required for Tropical Climate Zone.
<b>1203.12.1.1</b> The total UA proposed and baseline calculations are documented. REScheck is deemed to provide UA calculation documentation. SHGC requirements of Table 402.1.2 shall be met.
<b>1203.12.1.2</b> R-values and fenestration requirements. The building thermal envelope is in accordance with the insulation and fenestration requirements of IECC Table R402.1.2. The SHGC is in accordance with the IECC requirements.

**TABLE 402.1.2  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR <sup>b</sup>	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.32	0.55	0.030	0.060	0.098	0.047	0.091 <sup>c</sup>	0.136
4 except Marine	0.32	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.30	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. Mass walls shall be in accordance with Section R402.2.5. Where more than half the insulation is on the interior, the mass wall U-factors shall not exceed 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.57 in Climate Zones 6 through 8

**1203.13 Space Heating and Cooling and Water Heating System Efficiencies.** The Space Heating and Cooling and Water Heating systems are in accordance with Table XX.703.2.

**TABLE XX.703.2**

Climate Zone	Space Cooling System	Space Heating System - select 1 option from below				Water Heating System - select 1 option from below		
		Gas Furnace	Gas Boiler	ASHP	GSHP or WSHP	Gas Tank WH	Gas Tankless WH	Elec Tank WH
	AC	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. UEF Req.	Min. UEF Req.	Min. UEF Req.
	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. UEF Req.	Min. UEF Req.	Min. UEF Req.

1	15 SEER**	NR	85%	NR	Any	0.78	>.93	>.92
2	15 SEER**	NR	85%	NANR	Any	0.78	>.93	>.92
3	15 SEER**	92%	85%	≥ 8.5 HSPF*	Any	0.78	>.93	>.92
4	15 SEER**	92%	85%	≥ 8.5 HSPF*	Any	0.78	>.93	>.92
5	14 SEER	95%	85%	≥ 8.5 HSPF*	Any	0.78	>.93	>.92
6	14 SEER	95%	85%	≥ 8.5 HSPF*	Any	0.78	>.93	>.92
7	14 SEER	95%	85%	≥ 8.5 HSPF*	Any	0.78	>.93	>.92
8	14 SEER	95%	85%	≥ 8.5 HSPF*	Any	¥	>.93	>.92

\* ≥ 8.2 HSPF for single package

\*\*zones 1-4 ≥12.5 EER for split; ≥12 EER for single package

NR = No requirement

**1203.14 Duct leakage.**

The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

- 1 Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.
- 2 Postconstruction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.

**1203.15 High-efficacy lighting.** A minimum of 95 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent.

**1203.16 HERS Index target pathway.**

**1203.16.1 HERS index target compliance.** Energy efficiency features are implemented to achieve a HERS Index performance that is 8 points less than the EPA HERS Index Target Procedure for Energy Star Qualified Homes version 3.0 as computed based on Steps “1a” through “1d” of the EPA HERS Index Target Procedure.

**1204 WATER EFFICIENCY**

**1204.1 Lavatory faucets.** Water-efficient lavatory faucets in bathrooms shall have a maximum flow rate of 1.5 gpm (5.68 L/m), tested at 60 psi (414 kPa) in accordance with ASME A112.18.1.

**1204.2** Water closets shall have an effective flush volume of 1.28 gallons or less and shall meet a minimum MaP threshold of 350 and/or shall be WaterSense.

**1204.3 Irrigation systems.** Where an irrigation system is installed, one of the following is met:

- (1) Drip irrigation is installed for all landscape beds and/or subsurface drip irrigation is installed for all turf grass areas.
- (2) Irrigation zones are organized by plant water needs.
- (3) The irrigation system(s) is controlled by a climate-based controller, soil moisture controller or no irrigation is installed.



**1204.4 Alternative Compliance Path.** Water Rating Index (WRI) needs to achieve set level 75.

**1205 INDOOR ENVIRONMENTAL QUALITY**

**1205.1** Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

**1205.2** Solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with one or more of the following requirements:

- (1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.
- (2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified or Phase 2 Qualified.
- (3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).
- (4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.
- (5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC Section 2112.1.
- (6) Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.

**1205.3 Garages.** Garages shall be in accordance with “a” or “b”:

**a** Attached garage

- (1) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed and;
- (2) A continuous air barrier is provided separating the garage space from the conditioned living spaces.

**b** A carport is installed, the garage is detached from the building, or no garage is installed.

**1205.4 Carpets.** Wall-to-wall carpeting shall not be installed adjacent to

- (a) water closets and bathing fixtures, and
- (b) exterior doors.

**1205.5 Carbon monoxide (CO) alarms.** A carbon monoxide (CO) alarm shall be provided in accordance with IRC Section R315 in any dwelling unit with a combustion fueled appliance or an attached garage with an opening that communicates with the dwelling unit.

**1205.6 Interior Architectural Coatings.** A minimum of 85 percent of the interior architectural coatings are in accordance with one or more of the following:

- (1) Zero VOC as determined by EPA method 24 (VOC content is below the detection limit for the method)
- (2) Green Seal GS-11
- (3) CARB Suggested Control Measure for Architectural Coatings (see Table 901.9.1).



**1205.7 Spot ventilation** shall be in accordance with the following:

- (1) Bathrooms are vented to the outdoors. The minimum tested ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms. Exhaust fans are ENERGY STAR, or equivalent, fans.
- (2) Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.
- (3) Bathroom and kitchen exhaust ventilation rates are tested to meet minimum ventilation rates or ducts are installed to meet the prescriptive requirements in IRC Table M1504.2.

**1205.8 Whole Dwelling Ventilation.** One of the following whole dwelling ventilation systems shall be implemented and shall be in accordance with the specifications of Appendix B. An explanation of the operation and importance of the ventilation system shall be included in the homeowner's manual practice.

- (1) exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air
- (2) exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air and with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads
- (3) Supply air ventilation system
- (4) supply air ventilation system equipped with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads
- (5) balanced air ventilation system with exhaust and supply fan(s) with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building
- (6) heat-recovery ventilator
- (7) balanced air ventilation system with exhaust and supply fan(s) with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads, and with intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back in to the building
- (8) energy-recovery ventilator

**1205.9 Radon control.** Radon control measures are installed in accordance with 802.3 for Zone 1 as defined in Figure 9(1).

- (a) a passive radon system is installed, or
- (b) an active radon system is installed

**1205.10 Kitchen exhaust.** If a kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, make-up air shall be provided.

**1205.11 MERV filters.** Minimum 8 MERV filters shall be installed on central forced air systems and are accessible.

**1205.12 HVAC system protection.** One of the following HVAC system protection measures shall be performed.

- (a) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.

**REMODELING OF FUNCTIONAL AREAS**

**(b)** Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.

**1206 HOMEOWNER OPERATION AND MAINTAINANCE**

**1206.1 Homeowner’s manual.** A homeowner’s manual shall be provided. The homeowner’s manual shall include all items below:

- (1)** A National Green Building Standard certificate with a web link and completion document.
- (2)** List of green building features (can include the National Green Building Standard checklist).
- (3)** Product manufacturer’s manuals or product data sheet for installed major equipment, fixtures, and appliances. If product data sheet is in the building owners’ manual, manufacturer’s manual may be attached to the appliance in lieu of inclusion in the building owners’ manual.
- (4)** Maintenance checklist.
- (5)** Information on the importance and operation of the home’s fresh air ventilation system.
- (6)** Provide information on regionally-appropriate vegetation from the local authority with jurisdiction.
- (7)** A narrative detailing the importance of maintenance and operation of the green building features from the National Green Building Standard checklist in retaining the attributes of a green-built home.
- (8)** Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.

**1206.2 Training of initial homeowners.** Initial homeowners shall be familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant role. These include:

- (1)** HVAC filters.
- (2)** Water heater settings.
- (3)** Whole-house ventilation systems.
- (4)** Operation of household equipment.

**GREEN BUILDING PRACTICES**

***Note:** Where applicable, section numbering in Chapter 12 parallels a corresponding practice in a previous chapter.*

**12.0  
REMODELING OF FUNCTIONAL AREAS**

## GREEN BUILDING PRACTICES

**12.0 Intent.** This chapter sets forth the mandatory green building practices for remodeling functional areas of buildings. The intent of Chapter 12 is to address the most common remodeling projects: complete kitchen, full bathroom, complete basement, attic conversion to habitable space, or an addition less than 50% of the existing original conditioned floor area not to exceed 800 square feet. Chapter 12 is not intended to be used for rating minor alterations.

**12.0.1 Applicability.** Each applicable practice in Section 12.1 shall be met for any of the remodeled functional areas included in Chapter 12. Additionally, the requirements of Sections 12.2, 12.3, 12.4, or 12.5 that are specific to each of the functional areas shall be met. Unless otherwise required, the requirements of Chapter 12 only apply to the remodeled functional area.

### 12.1 GENERAL

**12.1.601.2 Material usage.** Structural systems required for the remodel are designed or construction techniques are implemented that reduce and optimize material usage using at least one of the following methods

- (1) Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.
- (2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.
- (3) Performance-based structural design is used to optimize lateral force-resisting systems.

**12.1.602.1.7.1 Moisture control measures.** Moisture control measures for newly installed materials are in accordance with the following:

- (1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.
- (2) Insulation in cavities is dry in accordance with manufacturer's installation instructions when enclosed (e.g., with drywall).

**12.1.602.1.7.2 Moisture content.** Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied during the remodel.

**12.1.602.1.11 Tile backing materials.** Newly installed tile backing materials under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.

**12.1(A) Product or material selection.** At least two newly installed types of materials from Section 12.1(A) are used.

**12.1(A).601.7 Prefinished materials.** One or more of the prefinished building materials or assemblies listed below have no additional site-applied finishing material installed.

- (a) interior trim not requiring paint or stain
- (b) exterior trim not requiring paint or stain

**GREEN BUILDING PRACTICES**

~~(c) window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces:~~

~~i. exterior surfaces~~

~~ii. interior surfaces~~

~~(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application~~

~~(e) exterior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application~~

~~**12.1(A).603.2 Reused and salvaged materials.** Reclaimed and/or salvaged materials and components are used in the remodel.~~

~~**12.1(A).604.1 Recycled content.** Newly installed building materials with at least 25% recycled content are used for two components of the remodel.~~

~~**12.1(A).605.1 Construction waste management plan.** A construction waste management plan is developed, posted at the jobsite, and implemented diverting, through methods such as reuse, salvage, recycling, or manufacturer reclamation, a targeted amount (by weight) of nonhazardous construction and demolition materials from disposal in landfills and combustion, excluding energy and material recovery.~~

~~For remodeling projects, the waste management plan includes the recycling of 95 percent of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards) by a third-party certified E-Waste recycling facility~~

~~**Exceptions:** A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.~~

~~**12.1(A).606.1 Biobased products.** Two or more of the following biobased products are used in the remodel.~~

~~(a) certified solid wood in accordance with Section 12.1(A).606.2~~

~~(b) engineered wood~~

~~(c) bamboo~~

~~(d) cotton~~

~~(e) cork~~

~~(f) straw~~

~~(g) natural fiber products made from crops (soy-based, corn-based)~~

~~(h) other biobased materials with a minimum of 50 percent biobased content (by weight or volume)~~

~~**12.1(A).606.2 Wood-based products.** Wood or wood-based products installed during the remodel are certified to the requirements of one of the following recognized product programs:~~

~~(a) American Forest Foundation's American Tree Farm System® (ATFS)~~

~~(b) Canadian Standards Association's Sustainable Forest Management System Standards (CSA Z809)~~

~~(c) Forest Stewardship Council (FSC)~~

**GREEN BUILDING PRACTICES**

- (d) Program for Endorsement of Forest Certification Systems (PEFC)
- (e) Sustainable Forestry Initiative® Program (SFI)
- (f) National Wood Flooring Association’s Responsible Procurement Program (RPP)
- (g) other product programs mutually recognized by PEFC

~~12.1(A).608.1 Resource-efficient materials. One or more products containing fewer materials are used in the remodel to achieve the same end-use requirements as conventional products, including but not limited to:~~

- (a) lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more than 25 percent
- (b) engineered wood or engineered steel products
- (c) roof or floor trusses

~~12.1(A).609.1 Regional materials. One or more regional materials are used in the remodel for major and/or minor components of the building.~~

~~(For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category—75 percent or more of the stone veneer on a project must be sources regionally.)~~

~~12.1(A).610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or entire functional area in accordance with Section 12.1(A).610.1.1 or 12.1(A).610.1.2, respectively. Only one method of analysis or tool may be utilized. The reference service life is 60 years for any LCA tool. Results of the LCA are reported in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA.~~

~~12.1(A).610.1.1 Functional area life cycle assessment. An LCA is performed in conformance with ASTM E2921 for an entire functional area using ISO14044 compliant life cycle assessment.~~

- (1) Execute LCA at the functional area level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:
  - (a) primary energy use
  - (b) Global warming potential
  - (c) Acidification potential
  - (d) Eutrophication potential
  - (e) Ozone depletion potential
  - (f) Smog potential

**GREEN BUILDING PRACTICES**

- (2) ~~Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located.~~
- (3) ~~Execute full LCA, including use phase, through calculation of operating energy impacts (c)–(f) using local or regional emissions factors from energy supplier, utility, or EPA.~~

~~**12.1(A).610.1.2 Life cycle assessment for a product or assembly.** An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.~~

- (1) ~~Two or more products with the same intended use are compared based on LCA and the product with at least a 15% average improvement is selected. A minimum of four environmental impact measures are included in the comparison. The environmental impact measures to be considered are chosen from the following:~~
  - ~~(a) primary energy use~~
  - ~~(b) global warming potential~~
  - ~~(c) acidification potential~~
  - ~~(d) eutrophication potential~~
  - ~~(e) ozone depletion potential~~
  - ~~(f) smog potential~~
- (2) ~~An assembly with improved environmental impact measures that are on average at least 15% better than a comparable functionally assembly is selected. A minimum of four environmental impact measures are included in the comparison. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment includes all structural elements, insulation, and wall coverings of the assembly. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following functional building elements are eligible for points under this practice:~~
  - ~~(a) exterior walls~~
  - ~~(b) roof/ceiling~~
  - ~~(c) interior walls or ceilings~~
  - ~~(d) intermediate floors~~

~~The environmental impact measures to be considered are chosen from the following:~~

  - ~~(a) primary energy use~~
  - ~~(b) global warming potential~~
  - ~~(c) acidification potential~~
  - ~~(d) eutrophication potential~~

## GREEN BUILDING PRACTICES

- (e) ozone depletion potential
- (f) smog potential

~~**12.1(A).611.1 Manufacturer's environmental management system concepts.** For one or more products used in the remodel, the product's manufacturer's operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent.~~

~~**12.1(A).611.2 Sustainable products.** One or more of the following products are used. Certification third-party agency is ISO 17065 accredited.~~

- (1) ~~50% or more of carpet installed (by square feet) is third-party certified to NSF/ANSI 140.~~
- (2) ~~50% or more of resilient flooring installed (by square feet) is third-party certified to NSF/ANSI 332.~~
- (3) ~~50% or more of the insulation installed (by square feet) is third-party certified to EcoLogo CCD-016.~~
- (4) ~~50% or more of interior wall coverings installed (by square feet) is third-party certified to NSF/ANSI 342.~~
- (5) ~~50% or more of the gypsum board installed (by square feet) is third-party certified to UL 100.~~
- (6) ~~50% or more of the door leaves installed (by number of door leaves) is third-party certified to UL 102.~~
- (7) ~~50% or more of the tile installed (by square feet) is third-party certified to TCNA A138.1 Specifications for sustainable ceramic tiles, glass tiles and tile installation materials.~~

~~**12.1.605.0 Hazardous materials and waste.** All hazardous materials exposed during the remodel are removed or comply with federal and local regulations. All waste classified as hazardous shall be properly handled and disposed of.~~

~~**12.1.701.4.0 minimum energy efficiency requirements.** Additions, alterations, or renovations to an existing building, building system or portion thereof comply with the provisions of the International Energy Conservation Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the IECC as a single building.~~

~~**12.1.701.4.1.1 HVAC system sizing.** Newly installed or modified space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. New equipment is selected using ACCA Manual S or equivalent. Where existing equipment is used, Manual J is used to verify the capacity is appropriate for the remodel.~~

~~**12.1.701.4.2.1 Duct air sealing.** Newly installed or modified ducts or ducts that are exposed during the remodel are air sealed. All duct sealing materials are rated to UL 181A or UL 181B specifications and are used in accordance with manufacturer's instructions.~~

**GREEN BUILDING PRACTICES**

~~12.1.701.4.2.2 Ducts and plenums.~~ Building framing cavities are not used as ducts or plenums. Existing building cavities currently used as supply ducts exposed during the remodel are lined.

~~12.1.701.4.2.3 Duct system sizing.~~ New duct system is sized and designed in accordance with ACCA Manual D or equivalent.

~~12.1.701.4.3.1 Building thermal envelope air sealing.~~ The portions of the building thermal envelope that are exposed or created during the remodel are durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped, or otherwise sealed with an air barrier material, suitable film, or solid material:

- ~~(a) All joints, seams, and penetrations.~~
- ~~(b) Site-built windows, doors, and skylights.~~
- ~~(c) Openings between window and door assemblies and their respective jambs and framing.~~
- ~~(d) Utility penetrations.~~
- ~~(e) Dropped ceilings or chases adjacent to the thermal envelope.~~
- ~~(f) Knee walls.~~
- ~~(g) Walls and ceilings separating a garage from conditioned spaces.~~
- ~~(h) Behind tubs and showers on exterior walls.~~
- ~~(i) Common walls between dwelling units.~~
- ~~(j) Attic access openings.~~
- ~~(k) Rim joist junction.~~
- ~~(l) Other sources of infiltration.~~

~~12.1.701.4.3.2 Air sealing and insulation.~~ Grade II and III installation is not permitted for newly installed insulation. For the portions of the building envelope that are exposed or created during the remodel, air barrier and insulation items listed in Table 12.1.701.4.3.2(2) are field verified via visual inspection.

~~12.1.701.4.3.2.1~~ Grade I insulation installations are in accordance with the following:

**Mandatory**

- ~~(1) Grading applies to field-installed insulation products.~~
- ~~(2) Grading applies to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements and crawlspaces, except as specifically noted.~~
- ~~(3) Inspection is conducted before insulation is covered.~~
- ~~(4) Air permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate.~~



**GREEN BUILDING PRACTICES**

<del>(5)</del>	<del>Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).</del>
<del>(6)</del>	<del>Cavity insulation compression or incomplete fill amounts to 2 percent or less, presuming the compressed or incomplete areas are a minimum of 70 percent of the intended fill thickness; occasional small gaps are acceptable.</del>
<del>(7)</del>	<del>Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.</del>
<del>(8)</del>	<del>Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.</del>
<del>(9)</del>	<del>Exterior sheathing is not visible from the interior through gaps in the cavity insulation.</del>
<del>(10)</del>	<del>Faced batt insulation is permitted to have side-stapled tabs, provided the tabs are stapled neatly with no buckling, and provided the batt is compressed only at the edges of each cavity, to the depth of the tab itself.</del>
<del>(11)</del>	<del>Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with the Grade 1 insulation installation requirements.</del>

**Table 12.1.701.4.3.2(2)  
Air Barrier and Insulation Installation**

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. <del>Breaks or joints in the air barrier shall be sealed.</del>	Air permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop-down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjamb and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

**GREEN BUILDING PRACTICES**

**12.1.701.4.3.4 Fenestration air leakage.** Newly installed windows, skylights, and sliding glass doors (except site-built windows, skylights, and doors) have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m<sup>2</sup>), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m<sup>2</sup>), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory, and are listed and labeled.

**12.1.701.4.3.5 Recessed lighting.** Newly installed recessed luminaires installed in the building thermal envelope are sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires are IC-rated and labeled as meeting ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.

**12.1.701.4.4 High-efficacy lighting.** Lighting efficacy in dwelling units is in accordance with one of the following:

**Mandatory**

(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent

(2) Lighting power density, measured in watts/square foot, is 1.1 or less.

**12.1.701.4.5 Boiler supply piping.** Insulate all newly installed boiler supply piping in unconditioned space and insulate existing boiler supply piping in unconditioned space where accessible.

**12.1.701.4.6 Fenestration specifications.** The NFRC-certified U-factor and SHGC of newly installed windows, exterior doors, skylights, and tubular daylighting devices (TDDs) do not exceed the values in Table 703.2.5.1.

**12.1.701.4.7 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the NFRC-certified U-factor and SHGC of the replacement fenestration unit do not exceed the values in Table 703.2.5.1.

**12.1.703.6.2 Appliances.** All newly installed major appliances in the remodeled portion of the building are ENERGY STAR or equivalent:

**12.1.901.1.4 Gas-fired equipment.** Newly installed gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

**12.1.901.2.1 Solid fuel-burning appliances.** Newly installed solid fuel-burning fireplaces, inserts, stoves, and heaters are code compliant and are in accordance with the following requirements:

(1) Site-built masonry wood-burning fireplaces are equipped with outside combustion air and a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.

(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified or Phase 2 Qualified.

**GREEN BUILDING PRACTICES**

- ~~(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).~~
- ~~(4) Pellet (biomass) stoves and furnaces are in accordance with the requirements of ASTM E1509 or are EPA certified.~~
- ~~(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and IGC-IBC, Section 2112.1.~~

~~**12.1.901.3 Attached garages.** Newly installed door(s) in the common wall between the attached garage and conditioned space is tightly sealed and gasketed.~~

~~**12.1.901.4 Wood materials.** A minimum of 85 percent of newly installed wood structural panels is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.~~

~~**12.1.901.5 Cabinets.** A minimum of 85 percent of newly installed cabinets are in accordance with one or any combination of the following:~~

- ~~(1) All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.~~
- ~~(2) The composite wood used in wood cabinets are in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a third-party program such as but not limited to, those in Appendix D.~~

~~**12.1.901.6 Carpets.** Carpets in the remodeled portion of the building are in accordance with the following:~~

- ~~(1) Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.~~

~~**12.1.901.7 Floor materials.** The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.~~

- ~~(1) Hard surface flooring: Prefinished installed hard surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:
 
  - ~~(a) Ceramic tile flooring~~
  - ~~(b) Organic-free, mineral-based flooring~~
  - ~~(c) Clay masonry flooring~~
  - ~~(d) Concrete masonry flooring~~
  - ~~(e) Concrete flooring~~
  - ~~(f) Metal flooring~~
  - ~~(g) Glass~~~~
- ~~(2) Carpet and carpet cushion is installed~~

**GREEN BUILDING PRACTICES**

**12.1.901.8 Interior wall coverings.** At least 85 percent of newly installed interior wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

**12.1.901.9 Architectural coatings.** A minimum of 85 percent of newly applied architectural coatings in the remodeled portion of the building are in accordance with either Section 12.1.901.9.1 or Section 12.1.901.9.2.

**Exception:** Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air — Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.

**12.1.901.9.1** New site-applied interior architectural coatings, which are inside the water-proofing envelope, are in accordance with one or more of the following:

- (1) Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)
- (2) GreenSeal GS-11
- (3) CARB Suggested Control Measure for Architectural Coatings (see Table 12.1.901.9.1).

**Table 12.1.901.9.1  
VOC Content Limits For Architectural Coatings<sup>a,b,c</sup>**

Coating Category	LIMIT <sup>d</sup> (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat High-Gloss Coatings	150
<b>Specialty Coatings:</b>	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120 <sup>e</sup>
Magnesite Cement Coatings	450

**GREEN BUILDING PRACTICES**

Coating Category	LIMIT <sup>d</sup> (g/l)
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-color Coatings	250
Pre-treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-rich Primers	340

ii. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.  
 v. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.  
 v. Table 12.1.901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.  
 f. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.  
 ii. Limit is expressed as VOC actual.

**12.1.901.9.2** New site-applied interior architectural coatings are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1, footnote b in Table 4.1 does not apply (i.e., maximum allowable formaldehyde concentration is 16.5 µg/m<sup>3</sup> (13.5 ppb)). Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

**12.1.901.10 Adhesives and sealants.** Interior low-VOC adhesives and sealants located inside the waterproofing envelope: A minimum of 85 percent of newly applied site-applied adhesive and sealant products used within the interior of the building are in accordance with one of the following, as applicable.

- (1) The emission levels of CDPH/EHLB Standard Method v1.1 when tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.

**GREEN BUILDING PRACTICES**

(2) GreenSeal GS-36

OR

(3) SCAQMD Rule 1168 (see Table 12.1.901.10.(3)), excluding products that are sold in 16-ounce containers or less and are regulated by the California Air Resource Board (CARB) Consumer Products Regulation.

**Table 12.1.901.10.(3)  
Site Applied Adhesive and Sealants VOC Limits<sup>a,b</sup>**

ADHESIVE	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer	
Non-porous	250
Porous	775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
<p>e. VOC limit less water and less exempt compounds in grams/liter                      d. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.</p>	

**GREEN BUILDING PRACTICES**

**12.1.901.11 Insulation.** Emissions of newly installed wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

**12.1.901.15 Lead-safe work practices.** For buildings constructed before 1978, lead-safe work practices are used during the remodeling.

**12.1.902.1.1 Spot ventilation.** Spot ventilation is in accordance with the following:

- (1) Bathrooms are vented to the outdoors. The minimum ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms.
- (2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.

**12.1.902.4 HVAC system protection.** One of the following HVAC system protection measures is performed.

- (1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.
- (2) Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed, if necessary. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.

**12.1.903.2 Duct insulation.** All newly installed, exposed, or modified HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawlspaces are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.

**12.2  
KITCHEN REMODELS**

**12.2.0 Applicability.** In addition to the practices listed in Section 12.1, the following practices are mandatory for all kitchen remodels.

**12.2.607.1 Recycling and composting.** Recycling and composting by the occupants are facilitated by means of a built-in collection space in the kitchen or an aggregation/collection space in a garage, covered outdoor space, or other area for recycling containers.

**12.2.607.2 Food waste disposers.** Where allowed by local code, a food waste disposer is installed at each newly installed primary kitchen sink.

**12.2.801.4.1 Faucets.** Newly installed lavatory faucets have a maximum flow rate of 1.5 gpm (5.68 L/m) or less when tested at 60 psi (414 kPa) in accordance with ASME A112.18.1.



## GREEN BUILDING PRACTICES

### 12.3 BATHROOM REMODELS

**12.3.0 Applicability.** In addition to the practices listed in Section 12.1, the following practices are mandatory for all bathroom remodels.

**12.3.611.3 Universal design elements.** Where existing walls are exposed and where new walls are constructed, blocking or equivalent is installed to accommodate the future installation of grab bars at water closet(s) and bathing fixture(s).

**12.3.801.3 Showerheads.** The total maximum combined flow rate of all newly installed showerheads that are controlled by a single valve at any point in time in a shower compartment is 1.6 to less than 2.5 gpm. Maximum of two valves are installed per shower compartment. The flow rate is tested at 80 psi (552 kPa) in accordance with ASME A112.18.1. Showerheads are served by an automatic compensating valve that complies with ASSE 1016 or ASME A112.18.1 and specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.

**12.3.801.4.1 Faucets.** Newly installed lavatory faucets have a maximum flow rate of 1.5 gpm (5.68 L/m) or less when tested at 60 psi (414 kPa) in accordance with ASME A112.18.1.

**12.3.801.5 Water closets.** All newly installed water closets have an effective flush volume of 1.28 gallons (4.85 L) or less when tested in accordance with ASME A112.19.2 or ASME A112.19.14 as applicable, and is in accordance with EPA WaterSense Tank-Type Toilets.

### 12.4 BASEMENT REMODELS

**12.4.0 Applicability.** In addition to the practices listed in Section 12.1, the following practices are mandatory for all basement remodels.

**12.4.1 Moisture inspection.** Prior to any construction activity, the basement is inspected for evidence of moisture problems. Any identified moisture problems are corrected prior to covering any walls or floors.

**12.4.2 Kitchen.** When the basement remodel includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

**12.4.3 Bathroom.** When the basement remodel includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

**12.4.902.3 Radon control.** In Radon Zone 1, passive or active radon control system is installed in accordance with ICG IRC Appendix F.

**GREEN BUILDING PRACTICES**

**12.5**

**CONVERSION OF PREVIOUSLY UNCONDITIONED SPACE TO CONDITIONED SPACE**

**12.5.0 Applicability.** In addition to the practices listed in Section 12.1, the following practices are mandatory for all conversions of previously unconditioned spaces into conditioned spaces such as, but not limited to attics, garages, etc.

**12.5.1 Moisture inspection.** Prior to any construction activity, the space to be converted shall be inspected for evidence of moisture problems. Any identified moisture problems are corrected prior to covering any ceilings, walls, or floors.

**12.5.2 Kitchen.** When the space to be converted includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

**12.5.3 Bathroom.** When the space to be converted includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

**12.5.4 Knee walls.** When the space to be converted includes a knee wall, the remodel shall also comply with 12.1.701.4.3.1.

**12.6**

**ADDITIONS**

**12.6.0 Applicability.** In addition to the practices listed in Section 12.1, the following practices are mandatory for all addition remodels.

**12.6.1 Kitchen.** When the addition includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

**12.6.2 Bathroom.** When the addition includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

**12.6.503.5 Landscape plan.** Where the addition disturbs more than 1,000 square feet of the lot, a landscape plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated.

**12.6.602.1.1.1 Capillary break.** A capillary break and vapor retarder are installed at concrete slabs in the addition in accordance with IRC Sections R506.2.2 and R506.2.3 or IBC Sections 1910 and 1805.4.1.

**12.6.602.1.3.1 Exterior drain tile.** Where required by the ICC IRC or IBC for habitable and usable spaces of the addition below grade, exterior drain tile is installed.

**GREEN BUILDING PRACTICES**

**12.6.602.1.4.1 Crawlspace.** Vapor retarder in unconditioned-vented crawlspace for the addition is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.

- (1) Floors. Minimum 6-mil vapor retarder installed on the crawlspace floor, extended at least 6 inches up the wall, and attached and sealed to the wall.
- (2) Walls. Dampproof walls are provided below finished grade.

**12.6.602.1.8 Water-resistive barrier.** Where required by the ICC IRC or IBC, a water-resistive barrier and/or drainage-plane system is installed behind exterior veneer and/or siding of the addition.

**12.6.602.1.9 Flashing.** Flashing is provided for the addition and for the intersection where the addition joins the existing building, to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional. Flashing is installed at all of the following locations, as applicable:

- (a) around exterior fenestrations, skylights, and doors
- (b) at roof valleys
- (c) at all building-to-deck, -balcony, -porch, and -stair intersections
- (d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets
- (e) at ends of and under masonry, wood, or metal copings and sills
- (f) above projecting wood trim
- (g) at built-in roof gutters, and
- (h) drip edge is installed at eave and rake edges.

**12.6.602.1.13 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier is installed on the addition in accordance with the ICC IRC or IBC at roof eaves of pitched roofs and extends a minimum of 24 inches (610 mm) inside the exterior wall line of the building.

**12.6.602.1.14 Architectural features.** New architectural features that increase the potential for water intrusion are avoided:

- (1) No roof configurations that create horizontal valleys in roof design.
- (2) No recessed windows and architectural features that trap water on horizontal surfaces.
- (3) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.

**GREEN BUILDING PRACTICES**

~~**12.6.602.4.1 Finished grade.** Finished grade at all sides of the addition is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3,048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3,048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent.~~

~~**12.6.902.3 Radon control.** In Radon Zone 1, a passive or active radon control system is installed in accordance with ICC IRC Appendix F.~~

## CHAPTER 13

# COMMERCIAL SPACES NEW CONSTRUCTION

**1205.3 Garages.** Garages shall be in accordance with “a” or “b”:

**a** Attached garage

- (1) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed and;
- (2) A continuous air barrier is provided separating the garage space from the conditioned living spaces.

**b** A carport is installed, the garage is detached from the building, or no garage is installed.

**13.101.1 Intent.** This chapter shall provide green requirements for the non-residential portion(s) of a mixed-use building.

**13.101.2 Scope.** The provisions of this Chapter shall apply to the design, construction, addition, and alteration of non-residential portion(s) of a mixed-use building.

**13.102.1 Compliance.** The non-residential portion(s) of a mixed-use building shall comply with all of the provisions of this chapter as applicable. The provisions of this Chapter are mandatory to demonstrate compliance with this Chapter.

**13.102.1.1 Core and Shell compliance.** The exterior air barrier, insulation, air sealing, and fenestration, are verified to the requirements of this chapter at the time of certification.

**13.102.1.2 Full mixed-use building compliance.** Residential and non-residential spaces are verified to the requirements of this standard at the time of certification. The residential portions of the building are verified to the requirements of Chapters 5 through 10 of this standard. The non-residential portion(s) of the building must comply with the requirements of this chapter.

**13.102.1.3 Additions and alterations.** The provisions of this Chapter shall only apply to areas of the building that are exposed or created during the remodel of mixed-use building(s) complying with Section 305, Green Remodeling.

**13.102.1.4 Alternate compliance.** Non-residential portions of a building shall comply with Chapters 6 through 10 of the International Green Construction Code (IgCC).

**Exception:** Section 6.3.1 of the IgCC.

**13.103.1 Bicycle Parking.** Bicycle parking shall comply with section 103.1.1 through 103.1.2

**13.103.1.1 Minimum number of spaces.** The minimum number of required bicycle parking spaces shall be 4 parking spaces.

**Exceptions:**

- (1) The number of bicycle parking spaces shall be allowed to be reduced subject to Adopting Entity approval,
- (2) Bicycle parking shall not be required where the total non-residential conditioned space in the building is less than 1,000 square feet.

## REMODELING OF FUNCTIONAL AREAS

**(3)** The minimum number of spaces shall be permitted to be reduced by the authority having jurisdiction based on the occupants expected use of public transit or walking to the building.

**13.103.1.2 Location.** The bicycle parking must be located on the same building site or within the building. It must be located within 100 ft. of, and visible from the main entrance.

### **13.104 Resource efficiency**

#### **13.104.1 Enhanced Durability**

**13.104.1.1 Capillary Break.** A capillary break and vapor retarder shall be installed under the concrete slabs in accordance with ICC IBC Sections 1907, excluding exception #3 and 1805.2.1.

**13.104.1.2 Foundation drainage.** Where required by the ICC IBC for habitable and usable spaces below grade, exterior drain tile is installed.

**13.104.1.3 Dampproof walls.** Walls that retain earth, and encloses interior space are required to be dampproof per ICC IBC Section 1805.

**13.104.1.4 Water-resistive barrier.** Where required by the ICC IBC, a water-resistive barrier and/or drainage plane system is installed behind exterior cladding.

**13.104.1.5 Flashing.** Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

Flashing is installed at the following locations, as applicable unless in conflict with manufacturer's installation instructions:

- (1)** Around exterior fenestrations, skylights, and doors
- (2)** At roof valleys
- (3)** At all building-to-deck, -balcony, -porch, and -stair intersections
- (4)** At roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets
- (5)** At ends of and under masonry, wood, or metal copings and sills
- (6)** Above projecting wood trim
- (7)** At built-in roof gutters, and
- (8)** Drip edge is installed at eave and rake edges
- (9)** Window and door head and jamb flashing is either self-adhered or liquid applied
- (10)** Flashing is installed at exterior windows and doors
- (11)** Through-wall flashing is installed at transitions between wall cladding materials or wall construction types
- (12)** Flashing is installed at the expansion joint in stucco walls

**13.104.1.6 Tile backing materials.** Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325. Tile shall not be installed over paper-faced gypsum board in wet areas.

**13.104.1.7 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier is installed in accordance with the ICC IBC at

roof eaves of pitched roofs and extends a minimum of 24 inches (610 mm) inside the exterior wall line of the building.

**13.104.1.8 Architectural features.** Architectural features that increase the potential for water intrusion are avoided, and must comply with the following:

- (1) Horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.
- (2) No roof configurations that create horizontal valleys in roof design
- (3) No recessed windows and architectural features that trap water on horizontal surfaces

**13.104.1.10 Moisture control measures.** Moisture control measures for newly installed materials are in accordance with the following:

- (1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing
- (2) Insulation in cavities is dry in accordance with manufacturer's installation instructions when enclosed (e.g., with drywall)

**13.104.2 Construction material and waste management plan.** A written construction waste management plan is posted at the jobsite, and implemented.

**13.104.3 Core and shell material selection.** The core and shell of the non-residential portion of the building must contain similar green material selections of the residential portion of the building, and must comply with the additional provisions of this section.

**13.104.3.1 Material selection.** At least two types of the materials must be used from the following, and must comply with at least one of Sections of this standard that are listed below:

- (1) Bio-based products Section 606.1
- (2) Wood-based products Section 606.2
- (3) Manufacturing energy Section 606.3
- (4) Resource-efficient materials Section 608.1
- (5) Regional materials Section 609.1
- (6) Product LCA Section 610.1.2.1
- (7) Building assemble LCA Section 610.1.2.2
- (8) Manufacturer's environmental management system concepts Section 611.1
- (9) Sustainable products Section 611.2
- (10) Salvaged materials Section 603.2
- (11) Product declarations Section 611.4 and 611.4.2
- (12) Recycled content Section 604.1

### **13.105 Energy Efficiency**

**13.105.1 Building thermal envelope insulation.** The non-residential portion of the building must comply with the insulation requirements of Sections C402.1 through C402.3 of the ICC IECC as applicable, and Section 105.1.1. A UA tradeoff shall be allowed for sections 105.1 and 105.2 is equal to or less than the IECC UA.

**Maximum UA.** For IECC residential, the total building UA is less than or equal to the total maximum UA as computed by 2015 IECC Section R02.1.5. For IECC commercial, the total UA is less than or equal to the sum of the UA for 2015 IECC Tables C402.1.4 and C402.4,

including the U-factor times the area and C-factor or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.

**13.105.1.1 Insulation installation.** Insulation installed in the thermal envelope shall be visually inspected. Grade II and III insulation installation is not permitted.

**13.105.2 Building thermal envelope fenestration.** The non-residential portion of the building shall be in accordance with the requirements of Section C402.4 of the International Energy Conservation Code as applicable.

**13.105.3 Building thermal envelope air sealing.** The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material:

- (1)** All joints, seams and penetrations
- (2)** Site-built windows, doors and skylights
- (3)** Openings between window and door assemblies and their respective jambs and framing
- (4)** Utility penetrations
- (5)** Dropped ceilings or chases adjacent to the thermal envelope
- (6)** Knee walls
- (7)** Walls and ceilings separating the garage from conditioned spaces
- (8)** Behind tubs and showers on exterior walls
- (9)** Cantilevers
- (10)** Attic access openings
- (11)** Rim joists junction
- (12)** Other sources of infiltration

**13.105.3.1 Air barrier verification.** The air barrier shall be visually inspected to demonstrate compliance with Table 701.4.3.2(2) of this standard or the building *thermal envelope* shall be tested in accordance with ASTM E 779 at a pressure differential of 0.3 inch water gauge (75 Pa) or an equivalent method approved by the code official and deemed to comply with the provisions of this section when the tested air leakage rate of the building thermal envelope is not greater than 0.40 cfm/ft<sup>2</sup> (2.0 L/s • m<sup>2</sup>).

**13.105.4 Energy metering.** Energy metering shall be provided for each tenant individually for the non-residential portions of the building.  
**Exception:** non-residential spaces under 10,000 square feet.

**13.105.5 Efficiency of HVAC equipment.** HVAC equipment shall meet the minimum efficiency requirements listed in Tables C403.3.2(1) through C403.3.2(7) of the International Energy Conservation Code.

**13.105.6 Efficiency of Service Water Heating equipment.** Service Water Heating equipment shall meet the minimum efficiency requirements listed in ICC IECC Table C404.2

**13.105.7 Lighting.** The total interior lighting power allowance shall be less than the total lighting power allowance in accordance with Section C405.3.2 of the International Energy Conservation Code.

**13.105.8 Commissioning.**



**13.105.8.1 Mechanical and service water heating systems.** Mechanical and service water heating systems shall comply with ICC IECC Section C408.2.

**13.105.9 Calculation of heating and cooling loads.** Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure and using the design parameters specified in Chapter 3 of the ICC IECC. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook or an approved equivalent computational procedure.

**13.105.10 Duct air sealing.** Ductwork shall be constructed in accordance with the ICC IMC.

**13.105.11 Heated-water circulation and temperature maintenance.** Where installed, heated- water circulation systems shall be in accordance with Section 105.11.1. Heat trace temperature maintenance systems shall be in accordance with Section 105.11.2. Controls for hot water storage shall be in accordance with Section 105.11.3. Automatic controls, temperature sensors, and pumps shall be in a location that is accessible. Manual controls shall be in a location with ready access.

**13.105.11.1 Circulation systems.** Heated-water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe, or a cold water supply pipe. Gravity and thermos-syphon circulation systems shall be prohibited. Controls for circulation hot water system pumps shall start the pump based on the identification of a demand for hot water. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is not a demand for hot water.

**13.105.11.2 Heat trace systems.** Electric heat trace systems shall comply with IECC 505.1. Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy. Heat trace shall be arranged to be turned off automatically when there is not a demand for hot water.

**13.105.11.3 Controls for hot water storage.** The controls on pumps that circulate water between a water heater and a heated water storage tank shall limit the operation of the pump from the heating cycle startup to not greater than 5 minutes at the end of the cycle.

**13.105.12 Energy options.** Non-residential portions of the building shall comply with one of the three options below:

**13.105.12.1** Energy requirements shall be met if modeling in accordance with C407 shows a 10% reduction in energy from the IECC.

**13.105.12.2** Energy requirements shall be met if modeling in accordance with ASHRAE 90.1 Appendix G shows a 10% reduction in energy cost from the prescribed levels.

**13.105.12.3** Energy requirements shall be met if at least two options in IECC Section C406 are met.

### **13.106 Water Efficiency and Conservation**

**13.106.1 Fitting and fixture consumption.** Plumbing fixtures and fixture fittings shall comply with the maximum flow rates specified in Table 106.1. Plumbing fixtures and fixture fittings in Table 106.1 shall have a manufacturer's designation for flow rate.

**Exceptions:** The following fixtures and devices shall not be required to comply with the reduced flow rates in Table 106.1.

(1) Clinical sinks having a maximum water consumption of 4.5 gallons (17 L) per flush.

**REMODELING OF FUNCTIONAL AREAS**

- (2) [Service sinks, bath valves, pot fillers, laboratory faucets, utility faucets, and other fittings designed primarily for filling operations.](#)
- (3) [Fixtures, fittings, and devices whose primary purpose is safety.](#)

**TABLE 106.1 MAXIMUM FLOW RATES AND FLUSH VOLUMES  
FIXTURE OR FIXTURE FITTING TYPE MAXIMUM FLOW RATE OR FLUSH VOLUME**

<b>FIXTURE OR FIXTURE FITTING TYPE</b>	<b>MAXIMUM FLOW RATE OR FLUSH VOLUME</b>
Showerhead <sup>a</sup>	2.0 gpm at 80 psi
Lavatory faucet and bar sink-private	1.5 gpm at 60 psi
Lavatory faucet-public (metering)	0.25 gpc <sup>b</sup> at 60 psi
Lavatory faucet-public (non-metering)	0.5 gpm at 60 psi
Kitchen faucet-private	1.8 gpm at 60 psi
Kitchen and bar sink faucets in other than units and guest rooms	2.2 gpm at 60 psi
Urinal	0.5 gpf or nonwater urinal
Water closet	1.28 gpf <sup>c,d</sup>
Prerinse Spray Valves	1.3 gpm
Drinking Fountains (manual)	0.7 gpm <sup>e</sup>
Drinking Fountains (metered)	0.25 gpc <sup>b,e</sup>

- a. [Includes hand showers, body sprays, rainfall panels and jets.](#)
- b. [Gallons per cycle.](#)
- c. [Dual flush water closets in public bathrooms shall have a maximum full flush of 1.28.](#)
- d. [The flush volume for water closets that are located at least 30 feet upstream of other drain line connections or fixtures and having less than 1.5 fixture units upstream of the water closet's connection to the drain line shall be not more than 1.5 gpf.](#)
- e. [Bottle filling stations associated with drinking fountains shall not have limitations for flow rate.](#)<sup>ICC, IBC, SEP</sup>

**13.106.2 Once-through cooling for appliances and equipment.** [Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited.](#)

**13.106.3 Clothes washers.** [Clothes washers rated with an IWF \(integrated water factor\), MEF \(modified energy factor\), or IMEF \(integrated modified energy factor\), shall be rated as follows:](#)

- (1) [Residential Clothes Washers, Front-loading, > 2.5 cu-ft maximum IWF 3.2 minimum IMEF 2.76](#)
- (2) [Residential Clothes Washers, Top-loading, > 2.5 cu-ft maximum 4.3 IWF, minimum IMEF 2.06](#)
- (3) [Residential Clothes Washers \(≤ 2.5 cu-ft\) maximum 4.2 IWF, minimum IMEF 2.07](#)
- (4) [Commercial Clothes Washers maximum 4.0 IWF, minimum MEF 2.20](#)

**13.106.4 Food Service.**

**13.106.4.1 Dipper wells.** [The water supply to a dipper well shall have a shutoff valve and flow control valve. The maximum flow shall not exceed 1 gpm \(3.78 lpm\) at a supply pressure of 60 psi \(413.7 kPa\). The dipper well shall have a manufacturer's designation of flow rate.](#)

**13.106.4.2 Food waste disposal.** [The disposal of food wastes that are collected as part of preparing ware for one or more of the following shall accomplish washing:](#)

- (1) [A food strainer \(scraper\) basket that is emptied into a trash can.](#)

**(2)** Agarbage grinder where the water flow into the food waste disposer is controlled by a load sensing device such that the water flow does not exceed 1 gpm under no-load operating conditions and 8 gpm under full-load operating conditions.

**(3)** A pulper or mechanical strainer that uses not more than 2 gpm of potable water.

**13.106.4.3 Pre-rinse spray heads.** Food service pre-rinse spray heads shall have a manufacturers designation of flow rate, shall comply with the maximum flow rate in Table 1305.1, and shall shut off *automatically* when released.

**13.106.4.4 Hand washing faucets.** Faucets for hand washing sinks in food service preparation and serving areas shall be of the self-closing type.

**13.106.5. Water softeners.** Water softeners shall comply with Sections 106.5.1 through 106.5.3.

**13.106.5.1 Demand initiated regeneration.** Water softeners shall be equipped with demand- initiated regeneration control systems. Such control systems shall automatically initiate the regeneration cycle after determining the depletion, or impending depletion of softening capacity.

**13.106.5.2 Water consumption.** Water softeners shall have a maximum water consumption during regeneration of 5 gal (18.9 L) per 1000 grains of hardness removed as measured in accordance with NSF 44.

**13.106.5.3 Waste connections.** Waste water from water softener regeneration shall not discharge to *reclaimed, gray water* or rainwater *water* collection systems and shall discharge in accordance with the *International Plumbing Code*.

**13.106.6 Heat exchangers.** Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited. Heat exchangers shall be connected to a recirculating water system such as a chilled water loop, cooling tower loop, or similar recirculating system.

**13.107 Indoor Air Quality**

**13.107.1 Carpets.** Carpeting is not installed adjacent to water closets and bathing and or shower fixtures.

**13.107.1.1 Entry.** The primary entryway from the outdoors shall include one of the following:

**(1)** Permanent walk-off mat that allows access for cleaning (e.g., grating with catch basin); or

**(2)** Roll-out mat that will be maintained on a weekly basis by a contracted service.

**13.107.2 Prohibited materials.** The use of the following materials shall be prohibited:

**(1)** Asbestos-containing materials

**(2)** Urea-formaldehyde foam insulation

**13.107.3 Pollutant source control products or material selection.** At least two types of the materials must be used from the following, and must comply with at least one of the Sections of this standard that are listed below:

**(1)** Wood materials Section 901.4

**(2)** Cabinets Section 901.5

**(3)** Floor materials Section 901.7

**(4)** Wall coverings Section 901.8

**(5)** Interior architectural coatings Section 901.9

(6) Interior adhesives and sealants Section 901.10

(7) Insulation Section 901.11

**13.107.4 Fireplaces and appliances.** Where located within buildings, fireplaces, solid fuel-burning appliances, vented decorative gas appliances, vented gas fireplace heaters and decorative gas appliances for installation in fireplaces shall comply with Sections 107.4.1 through 107.4.5.

**13.107.4.1 Venting and combustion air.** Fireplaces and fuel-burning appliances shall be vented to the outdoors and shall be provided with combustion air provided from the outdoors in accordance with the International Mechanical Code and the International Fuel Gas Code. Solid-fuel-burning fireplaces shall be provided with a means to tightly close off the chimney flue and combustion air openings when the fireplace is not in use.

**13.107.4.2 Wood-fired appliances.** Wood stoves and wood-burning fireplace inserts shall be listed and, additionally, shall be labeled in accordance with these requirements.

- (1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.
- (2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127.
- (3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482.

**13.107.4.3 Biomass appliances.** Biomass fireplaces, stoves and inserts shall be listed and labeled in accordance with ASTM E 1509 or UL 1482. Biomass furnaces shall be listed and labeled in accordance with CSA B366.1 or UL 391. Biomass boilers shall be listed and labeled in accordance with CSA B366.1 or UL 2523.

**13.107.4.4 Gas-fireplaces.** Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

**13.107.4.5 Unvented.** Unvented room heaters and unvented decorative appliances, including alcohol burning, shall be prohibited.

**13.107.5 Protection of HVAC system openings.** HVAC supply and return duct and equipment openings shall be protected during dust-producing operations of construction.

**13.107.6 Garages.** Attached garages are in accordance with the following:

- (1) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed.
- (2) A continuous air barrier is provided separating the garage space from the conditioned spaces.

**13.107.7 Spot Ventilation.** Exhaust systems shall be provided in accordance with Chapter 5 of the ICC IMC or ASHRAE 62.1.

**13.107.8 Building Ventilation Systems.**

**13.107.8.1 Building Ventilation.** Ventilation shall be provided to non-residential spaces in accordance with Chapter 4 of the ICC IMC or ASHRAE 62.1.

**13.107.8.2 Air filters.** Air filters with a minimum MERV rating of 6 are installed on central forced air systems and are accessible.

<b>13.107.9 Radon system.</b> Radon reduction measures are in accordance with ICC IRC Appendix F or Section 902.3.1. Radon Zones as identified by the AHJ or, if the zone is not identified by the AHJ, as defined by Figure 9(1).	
<b>(1) Buildings located in Zone 1</b>	
<b>(a) a passive radon system is installed</b>	<b>Mandatory</b>
<b>(b) an active radon system is installed</b>	<b>12</b>
<b>(2) Buildings located in Zone 2 or Zone 3</b>	
<b>(a) a passive radon system is installed</b>	<b>8</b>
<b>(b) an active radon system is installed</b>	<b>12</b>

<b>13.108 Operation, Maintenance, and Building Owner Education</b>	
<b>13.108.1 OPERATION AND MAINTENANCE MANUALS FOR TENANTS.</b> Manuals are provided to the initial tenants of the non-residential space regarding the operation, and maintenance of the building. Paper or digital format manuals are to include information regarding those aspects of the building’s maintenance, and operation that are within the area of responsibilities of the respective tenant. One or more responsible parties are to receive a copy of all documentation for archival purposes.	
<b>(1)</b>	<u>A narrative detailing the importance of operating in a green building. This narrative is included in all responsible parties’ manuals.</u>
<b>(2)</b>	<u>A list of practices to conserve water and energy which require maintenance.</u>
<b>(3)</b>	<u>Information on opportunities to purchase renewable energy from local utilities or national green power providers.</u>
<b>(4)</b>	<u>Information on local and on-site recycling and hazardous waste disposal programs.</u>
<b>(5)</b>	<u>Local public transportation options for employees.</u>
<b>13.108.2 TENANT FINISH OUT MANUAL.</b> Manuals are provided to the tenants of the non-residential space prior to the start of construction regarding the design and construction of the non-residential portion of the building. Paper or digital format manuals are to include information regarding those aspects of the design and construction that are within the area of responsibilities of the respective tenant. One or more responsible parties are to receive a copy of all documentation for archival purposes.	
<b>(1)</b>	<u>Provisions of this Chapter verified at the time of building Certification for the respective space that shall be maintained as part of the Tenant Finish Out.</u>
<b>(2)</b>	<u>Provisions of this Chapter NOT verified at the time of building Certification for the respective space that shall be included in the Tenant Finish Out Construction Documents.</u>
<b>(3)</b>	<u>A list of minimum green building material specifications that are to be included in the Tenant Finish Out Construction Documents based on the materials that were installed in the residential portion of the building.</u>

~~Chapter 13~~ CHAPTER 14

## REFERENCED DOCUMENTS

### 1301 GENERAL

**1301.1** This chapter lists the codes, standards, and other documents that are referenced in various sections of this Standard. The codes, standards, and other documents are listed herein indicating the promulgating agency of the document, the document identification, the effective date and title, and the section or sections of this Standard that reference the document. Unless indicated otherwise, the first printing of the document is referenced.

**1301.2** The application of the referenced documents shall be as specified in Section 102.2.

### 1302 REFERENCED DOCUMENTS

<b><u>ACCA</u></b>		<i>Air Conditioning Contractors of America</i> (703) 575-4477 2800 Shirlington Road, Suite 300 Arlington, VA 22206 <a href="http://www.acca.org">www.acca.org</a>	
Manual D	<del>2014</del> 2016	Residential Duct Systems	701.4.2.3, 11.701.4.2.3, 12.1.701.4.2.3
Manual J	<del>2014</del> 2016	Residential Load Calculation, Eighth Edition, Version 2.1	701.4.1.1, 701.4.1.2, 703.3.0, 11.701.4.1.1, 11.701.4.1.2, 12.1.701.4.1.1
Manual S	2014	Residential Equipment Selection	701.4.1.1, 703.3.0, 11.701.4.1.1, 12.1.701.4.1.1
5 QI	<del>2010</del> 2015	HVAC Quality Installation Specification	701.4.1.2, 703.3.3, 703.3.4, 703.3.5, 703.3.6, 705.6.2.2(1), 705.6.2.2(2), 11.701.4.1.2

<b><u>AFF</u></b>		<i>American Forest Foundation, Inc.</i> (202) 463-2462 1111 Nineteenth Street, NW Suite 780 Washington, DC 20036 <a href="http://www.forestfoundation.org">www.forestfoundation.org</a>	
2010-2015 AFF Standards	2010	American Tree Farm System Standards for Sustainability for Forest Certification, including Performance Measures and Field Indicators	606.2(a), 11.606.2(a), 12.1(A).606.2(a)

<b><u>AAMA</u></b>		<i>American Architectural Manufacturers Association</i> 1827 Walden Office Square, Suite 550 Schaumburg, Illinois 60173-4268 <a href="http://www.aamanet.org/">http://www.aamanet.org/</a>	(847) 303-5664
711	2013	The Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products	602.1.9(2), 11.602.1.9(2)
714	2015	Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings	602.1.9(2), 11.602.1.9(2)
AAMA/WDMA/CSA 101/I.S.2/A440 UP3	2008		701.4.3.4, 11.701.4.3.4, 12.1.701.4.3.4

<b><u>AHRI</u></b>		<i>Air-Conditioning, Heating, and Refrigeration Institute (AHRI)</i> 2111 Wilson Blvd, Suite 500 Arlington, VA 22201 <a href="http://www.ahrinet.org">www.ahrinet.org</a>	(703) 524-8800
I=B=R	2009	Heat Loss Calculation Guide	701.4.1.2, 11.701.4.1.2

<b><u>ASCE</u></b>		<i>American Society of Civil Engineers</i> 1801 Alexander Bell Drive Reston, VA 20191 <a href="http://www.asce.org">www.asce.org</a>	(800) 548-2723
32-01	2001	Design and Construction of Frost-Protected Shallow Foundations	202

<b><u>ASHRAE</u></b>		<i>American Society of Heating, Refrigeration, Air-conditioning Engineers</i> 1791 Tullie Circle, N.E. Atlanta, GA 30329 <a href="http://www.ashrae.org">www.ashrae.org</a>	<a href="tel:(800)527-4723">(800) 527-4723</a>
<a href="#">ASHRAE 62.1</a>	<a href="#">2016</a>	<a href="#">Ventilation for Acceptable Indoor Air Quality</a>	
<a href="#">ASHRAE/ACCA 183</a>	<a href="#">2007 (RA 2017)</a>	<a href="#">Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential</a>	



REFERENCED DOCUMENTS

<b><u>ASME</u></b>		<i>American Society of Mechanical Engineers</i> (800) 843-2763 Three Park Avenue New York, NY 10016 <a href="http://www.asme.org">www.asme.org</a>	
A112.18.1	2012	Plumbing Supply Fittings	801.3(1), 801.4.1, 12.2.801.5.1, 12.3.801.4, 12.3.801.5.1
A112.19.2/CSA B45.1	2013	Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals	801.5(2), 801.5(4)b, 12.3.801.6
A112.19.14	2013	Six-Liter Water Closets Equipped with a Dual Flushing Device	801.5(2), 12.3.801.6

<b><u>ASSE</u></b>		<i>American Society of Sanitary Engineering</i> (440) 835-3040 901 Canterbury, Suite A Westlake, OH 44145 <a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>	
1016	2011	Automatic Compensation Valves for Individual Showers and Tub/Shower Combinations	801.3(1), 12.3.801.4

<b><u>ASTM</u></b>		<i>ASTM International, Inc.</i> (610) 832-9500 100 Barr Harbor Drive, PO Box C700 West Conshohocken, PA 19428 <a href="http://www.astm.org">www.astm.org</a>	
C1178	2013	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel	602.1.11, 11.602.1.11, 12.1.602.1.11
C1278 – 07a/1278M – 07a	2011	Standard Specification for Fiber-Reinforced Gypsum Panel	602.1.11, 11.602.1.11, 12.1.602.1.11
C1288	2010	Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets	602.1.11, 11.602.1.11, 12.1.602.1.11
C1325-08b	2008	Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units	602.1.11, 11.602.1.11, 12.1.602.1.11
C1371	2010	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers	703.2.3
D7338	2010	Standard Guide for Assessment Of Fungal Growth in Buildings	904.1, 904.2, 11.904.1, 11.904.2
<a href="#">D7612</a>	<a href="#">2015</a>	<a href="#">Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources</a>	



E283	2012	Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	701.4.3.5, 11.701.4.3.5, 12.1.701.4.3.5
E779	2010	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	705.6.2.1
E1509	2012	Standard Specification for Room Heaters, Pellet Fuel-Burning Type	901.2.1(4), 11.901.2.1(4), 12.1.901.2.1(3)
E1602	2010	Standard Guide for Construction of Solid Fuel Burning Masonry Heaters	901.2.1(5), 11.901.2.1(5), 12.1.901.2.1(3)
E1827	2011	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door	705.6.2.1
E1980	2011	Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low Sloped Opaque Surfaces	505.2(1)b, 602.2(3), 11.505.2(1)b, 11.602.2(3)
E2273	2011	Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies	602.1.9(5)b, 11.602.1.9(5)b
E2921	2013	Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems	610.1.1, 610.1.1(1)a, 11.610.1.1, 11.610.1.1(1)a, 12.1(A).610.1.1, 12.1(A).610.1.1(1)a

<b><u>BOMA</u></b>		<i>Building Owners and Managers Association International</i> 1101 15th St., NW Suite 800 Washington, DC 20005 <a href="http://www.boma.org">www.boma.org</a>	(202) 408-2662
Z65.4	2010	Multi-Unit Residential Buildings: Standard Methods of Measurement	601.1, 11.601.1

REFERENCED DOCUMENTS

<b><u>CARB</u></b>		California Air Resources Board 1001 "I" Street P.O. Box 2815 Sacramento, CA 95812 <a href="http://www.arb.ca.gov">www.arb.ca.gov</a>	(916) 322-2990
	2007	Composite Wood Air Toxic Contaminant Measure Standard	901.4(5), 901.5(2), 11.901.4(5), 11.901.5(2), 12.1.901.5
	2008	Suggested Control Measure for Architectural Coatings	901.9.1(3), 11.901.9.1(3), 12.1.901.9.1(3)
	2011	The California Consumer Products Regulations	901.10(3), 11.901.10(3), 12.1.901.10(3)

<b><u>CDPH</u></b>		California Department of Public Health 850 Marina Bay Parkway Richmond, CA 94804 <a href="http://www.cdph.ca.gov">www.cdph.ca.gov</a>	(510) 620-2864
	2010	Standard Method For The Testing And Evaluation Of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers Version 1.1.	901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.901.6(2), 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.11.901.10(1), 12.1.901.11

<b><u>CPA</u></b>		Composite Panel Association 18922 Premiere Court Gaithersburg, MD 20879-1574 <a href="http://www.pbmdf.com">www.pbmdf.com</a>	(301) 670-0604
A208.1	2009	Particleboard Standard	901.4(2), 11.901.4(2)
A208.2	2009	MDF Standard	901.4(2), 11.901.4(2)
CPA 4	2011	The Eco-Certified Composite™ (ECC) Standard	901.4(4), 11.901.4(4)


<b><u>CSA</u></b>		<i>CSA International</i> (216) 524-4990 8501 East Pleasant Valley Road Cleveland, OH 44131-5575 <a href="http://www.csa-international.org">www.csa-international.org</a>	
6.19	2011	Residential Carbon Monoxide Alarming Devices	
ANSI Z21.50/CSA 2.22	2014	Vented Gas Fireplaces w/ Addenda b	901.1.5, 11.901.1.5
ANSI Z21.88/CSA 2.33	2014	Vented Gas Fireplace Heaters	901.1.5, 11.901.1.5
Z809	2013	Sustainable Forest Management Requirements and Guidance (SFM)	606.2(b), 11.606.2(b), 12.1(A).606.2(b)
<a href="#">B366.1</a>	<a href="#">2007</a>	<a href="#">Solid-Fuel-Fired Central Heating Appliances</a>	

<b><u>DOC/NIST</u></b>		<i>United States Department of Commerce</i> (301) 975-2000 <i>National Institute of Standards and Technology</i> 100 Bureau Drive Stop 3460 Gaithersburg, MD 20899-3460 <a href="http://www.nist.gov">www.nist.gov</a>	
PS 1-09	2010	Construction and Industrial Plywood	901.4(1), 11.901.4(1), 12.1.901.4
PS 2-10	2011	Performance Standard for Wood-based Structural-use Panels	901.4(1), 11.901.4(1), 12.1.901.4

<b><u>DOE</u></b>		<i>U.S. Department of Energy</i> 800-345-3363 1000 Independence Ave., SW Washington, DC 20585 <a href="http://www.energy.gov">www.energy.gov</a>	
v. 4.6.1	2015	RESCheck	703.1.1, 703.2.1
v. 4.4.0	2015	COMCheck	703.1.1, 703.2.1

<b><u>EcoLogo</u></b>		<i>The EcoLogo Program</i> (800) 478-0399 171 Nepean Street, Suite 400 Ottawa, ON, K2P 0B4, CANADA	
CCD-016	2005	Thermal Insulation Materials	611.2(3), 11.611.2(3), 12.1(A).611.2(3)

REFERENCED DOCUMENTS

		<i>Environmental Protection Agency 1200 Pennsylvania Avenue, NW Washington, DC 20460 <a href="http://www.epa.gov">www.epa.gov</a></i>	<i>(202) 564-4700</i>
EPA 747-K-97-001	1997	Reducing Lead Hazards When Remodeling Your Home	11.1001.1(23)
Method 24	2000	Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings	901.9.1(1), 11.901.9.1(1), 12.1.901.9.1(1)
	1990	Asbestos in the Home: A Homeowner's Guide	11.1001.1(23)
<b>ENERGY STAR® Documents</b>			
	June 1, 2013	ENERGY STAR Certified Homes, Version 3 (Rev. 08) HERS Index Target Procedure for National Program Requirements	701.1, 701.1.3, 704.1, 704.2
	August 29, 2013	ENERGY STAR for Homes Version 3.0 Guidelines	701.1.4
	April 13, 2015	ENERGY STAR for Homes Version 3.1 Guidelines	701.1.4
	January 1, 2015	ENERGY STAR Multifamily High Rise Version 1 (Rev 03)	701.1.4
	January 1, 2014	ENERGY STAR Program Requirements for Clothes Washers, Version 7.0	703.6.2(3), 801.2(2), 801.2(3)
	January 20, 2013	ENERGY STAR Program Requirements for Dishwashers, Version 5.2	703.6.2(2), 801.2(1)
	December 1, 2009	ENERGY STAR Program Requirements for Geothermal Heat Pumps – Eligibility Criteria Version 3.1	703.2.5
	April 1, 2012	ENERGY STAR Program Requirements for Luminaires, Version 1.2	703.5.1(1), 703.6.1(1)
	April 28, 2014	ENERGY STAR Program Eligibility Criteria for Residential Refrigerators and/or Freezers, Version 5	703.6.2(1)
	April 1, 2012	ENERGY STAR Program Requirements for Residential Ceiling Fans – Eligibility Criteria Version 3.0	703.3.7
	April 1, 2012	ENERGY STAR Program Requirements for Residential Ventilating Fans – Eligibility Criteria Version 3.2	902.1.4(1), 902.1.4(2), 11.902.1.4(1), 11.902.1.4(2)
	January 17, 2014	ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Eligibility Criteria Version 6.0	703.2.5.2.1, 703.7.1(3),(4),(5),(6)a
	2012	ENERGY STAR Program Requirements for Roof Products – Eligibility Criteria Version 2.3	602.2(1), 11.602.2(1)

<b>WaterSense Documents</b>			
	May 20, 2014	WaterSense Specification for Tank-Type Toilets, Version 1.2	801.6(2), 12.3.801.6
	November 3, 2011	WaterSense Specification for Weather-Based Irrigation Controllers, Version 1.0	801.6.4(2)
	October 27, 2014	WaterSense: Professionals in System Design, Installation & Maintenance, and System Auditing Version 1.1	801.6.3
	December 9, 2014	WaterSense Water Budget Approach Version 1.02	403.6(4), 503.5(4), 11.503.5(4)

<b><u>FSC</u></b>		<i>Forest Stewardship Council FSC International Center Charles-de-Gaulle 5 53113 Bonn, Germany <a href="http://www.fsc.org">www.fsc.org</a></i>	49 228 367 66 0
FSC-STD-01-001 (Version 4-0) EN	2013	FSC Principles and Criteria for Forest Stewardship v5	606.2(c), 11.606.2(c), 12.1(A).606.2(c)

<b><u>GS</u></b>		<i>Green Seal 1001 Connecticut Avenue, NW Suite 827 Washington, DC 20036 <a href="http://www.greenseal.org">www.greenseal.org</a></i>	(202) 872-6400
GS-11	2013	Paints and Coatings 3.1	901.9.1(2), 11.901.9.1(2), 12.1.901.9.1(2)
GS-36	2013	Adhesives for Commercial Use 2.1	901.10(2), 11.901.10(2), 12.1.901.10(2)

<b><u>HPVA</u></b>		<i>Hardwood Plywood Veneer Association 1825 Michael Faraday Drive Reston, VA 20190 <a href="http://www.hpva.org">www.hpva.org</a></i>	(703) 435-2900
HP-1	2009	American National Standard for Hardwood and Decorative Plywood	901.4(3), 11.901.4(3)

REFERENCED DOCUMENTS


<b><u>HUD</u></b>		<i>U.S. Department of Housing and Urban Development 451 7th Street SW Washington, DC 20410 <a href="http://www.hud.gov">www.hud.gov</a></i>	<i>(202) 708-1112</i>
24 CFR, Part 3280	2014	Manufactured Home Construction and Safety Standards	202

<b><u>ICC</u></b>		<i>International Code Council 500 New Jersey Ave, NW, 6<sup>th</sup> Floor Washington, DC 20001 <a href="http://www.iccsafe.org">www.iccsafe.org</a></i>	<i>(888) 422-7233</i>
<a href="#">A117.1</a>	<a href="#">2017</a>	<a href="#">Accessible and Usable Buildings and Facilities</a>	<a href="#">611.3</a>
IBC	<del>2015</del> <a href="#">2018</a>	International Building Code	202, 602.1.1.1, 602.1.3.1, 602.1.8, 602.1.13, 901.2.1(5), 1001.1(12)b, 11.602.1.1.1, 11.602.1.3.1, 11.602.1.8, 11.602.1.13, 11.901.2.1(5), 11.1001.1(12)b, 12.1.901.2.1(3), 12.6.602.1.1.1, 12.6.602.1.3.1, 12.6.602.1.8, 12.6.602.1.13,
ICC-400	2012	Standard on the Design and Construction of Log Structures	Table 701.4.3.2(2)
IECC	<del>2015</del> <a href="#">2018</a>	International Energy Conservation Code	610.1.1(2), 701.1.4, 701.4.3.3, 702.2.1, 702.2.2, 702.2.3, 703.1.1.1, 703.1.1.2, 703.1.2, 703.1.3, 703.2.1, 705.6.2.1, 705.6.2.3(1), 705.6.2.3(2), 705.6.3, 11.610.1.1(2), 11.701.4.0, 11.701.4.3.3, 12.1.610.1.1(2), 12.1.701.4.0

IFGC	<a href="#">2015/2018</a>	International Fuel Gas Code	901.1.4, 11.901.1.4, 12.1.901.1.4
<a href="#">IgCC</a>	<a href="#">2018</a>	<a href="#">International Green Construction Code</a>	<a href="#">304.2</a>
IMC	<a href="#">2015/2018</a>	International Mechanical Code	705.6.1(1)
IRC	<a href="#">2015/2018</a>	International Residential Code	202, 602.1.1.1, 602.1.3.1, 602.1.4.2(1), 602.1.4.2(2), 602.1.8, 602.1.13, 602.1.14, 705.6.1(1), 901.12, 902.1.1(1) 902.3, 1001.1(12)b, 11.602.1.1.1, 11.602.1.3.1, 11.602.1.4.2(1), 11.602.1.4.2(2), 11.602.1.8, 11.602.1.13, 11.901.12, 11.902.1.1(1) 11.902.3, 11.1001.1(12)b, 12.4.902.3, 12.6.602.1.1.1, 12.6.602.1.3.1, 12.6.602.1.8, 12.6.602.1.13, 12.6.902.3
<a href="#">IWUIC</a>	<a href="#">2018</a>	<a href="#">International Wildlife Urban Interface Code</a>	

<a href="#">IA</a>	IRRIGATION ASSOCIATION & AMERICAN SOCIETY OF IRRIGATION CONSULTANTS 8280 Willow Oaks Corporate Drive, Suite 400 Fairfax, VA 22031 <a href="http://www.irrigation.org">www.irrigation.org</a>		(703) 536-7080
	2014	Landscape Irrigation Best Management Practices	403.6(14)

REFERENCED DOCUMENTS

		<i>International Organization for Standardization</i> 1, ch. de la Voie-Creuse, Case postale 56 CH-1211 Geneva 20, Switzerland <a href="http://www.iso.org">www.iso.org</a>	41 22 749 01 11
14025	2006	Environmental labels and declarations – Type III environmental declarations – Principles and procedures	611.4.1, 611.4.2, 11.611.4.1, 11.611.4.2
14044	2006	Environmental management – Life cycle assessment – Requirements and guidelines	610.1.1, 610.1.2, 11.610.1.1, 11.610.1.2, 12.1(A).610.1.1, 12.1(A).610.1.2
14001	2004	Environmental management systems – Requirements with guidance for use	611.1, 11.611.1, 12.1(A).611.1
16000-23	2009	Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials	901.9, 11.901.9, 12.1.901.9
17025	2005	General requirements for the competence of testing and calibration laboratories	901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.1.901.10(1), 12.1.901.11
17065	2012	Conformity assessment – Requirements for bodies certifying products, processes and services	611.2, 901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.611.2, 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1(A).611.2, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.1.901.10(1), 12.1.901.11
21930	2007	Sustainability in building construction – Environmental declaration of building products	611.4.1, 611.4.2, 11.611.4.1, 11.611.4.2



<b><u>Home Innovation</u></b>		<i>Home Innovation Research Labs 400 Prince George's Boulevard Upper Marlboro, MD 20774 <a href="http://www.homeinnovation.com">www.homeinnovation.com</a></i>	<i>(800) 638-8556</i>
Z765	2013	Single-Family Residential Buildings - Square Footage - Method for Calculating	601.1, 11.601.1

<b><u>KCMA</u></b>		<i><a href="http://www.kcma.org">Kitchen Cabinet Manufacturers Association</a> <a href="http://www.kcma.org">1899 Preston White Drive</a> <a href="http://www.kcma.org">Reston, VA 20191</a> <a href="http://www.kcma.org">www.kcma.org</a></i>	<i><a href="tel:7032641690">(703) 264-1690</a></i>
<a href="http://www.kcma.org">ANSI/KCMA A161.1</a>	<a href="http://www.kcma.org">2012</a>	<a href="http://www.kcma.org">Performance and Construction Standard for Kitchen and Vanity Cabinets</a>	<a href="http://www.kcma.org">602.1.15</a>

<b><u>NFPA</u></b>		<i>National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169 <a href="http://www.nfpa.org">www.nfpa.org</a></i>	<i>(617) 770-3000</i>
54	2012	National Fuel Gas Code	901.1.4, 11.901.1.4, 12.1.901.1.4

<b><u>NFRC</u></b>		<i>National Fenestration Rating Council 6305 Ivy Lane, Suite 140 Greenbelt, MD 20770 <a href="http://www.nfrc.org">http://www.nfrc.org</a></i>	<i>(301) 589-1776</i>
400	2010	Procedure for Determining Fenestration Product Air Leakage	701.4.3.4, 11.701.4.3.4, 12.1.701.4.3.4

<b><u>NSF</u></b>		<i>NSF International P.O. Box 130140 789 N. Dixboro Road Ann Arbor, MI 48113-0140, USA <a href="http://www.nsf.org">www.nsf.org</a></i>	<i>(800) 673-6275</i>
NSF/ANSI 140	2013	Sustainable Carpet Assessment	611.2(1), 11.611.2(1), 12.1(A).611.2(1)

REFERENCED DOCUMENTS

NSF/ANSI 332	2012	Sustainability Assessment for Resilient Floor Coverings	611.2(2), 11.611.2(2), 12.1(A).611.2(2)
NSF/ANSI 342	2012	Sustainability Assessment for Wallcovering Products	611.2(4), 11.611.2(4), 12.1(A).611.2(4)
<b><u>NWFA</u></b>		<i>National Wood Flooring Association</i> 111 Chesterfield Industrial Boulevard Chesterfield, Missouri 63005 <a href="http://www.nwfa.org">http://www.nwfa.org</a>	(800) 422-4556
	2011	Responsible Procurement Program	606.2(f), 11.606.2(f), 12.1(A).606.2(f)

<b><u>PEFC</u></b>		<i>Pan European Forest Council</i> 2ème Etage 17 Rue des Girondins Merl-Hollerich L - 1626 Luxembourg <a href="http://www.pefc.org">www.pefc.org</a>	352 26 25 90 59
GL 2	2011	PEFC Council Minimum Requirements Checklist	606.2(d) & (g), 11.606.2(d) & (g), 12.1(A).606.2(d) & (g)

<b><u>RESNET</u></b>		<a href="http://www.resnet.us">Residential Energy Services Network</a> <a href="http://www.resnet.us">P.O. Box 4561</a> <a href="http://www.resnet.us">Oceanside, CA 62052</a> <a href="http://www.resnet.us">www.resnet.us</a>	<a href="tel:(800)836-7057">(800) 836-7057</a>
<a href="http://www.resnet.us">ANSI/RESNET/ICC 380</a>	<a href="http://www.resnet.us">2018</a>	<a href="http://www.resnet.us">Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems</a>	

<b><u>SAE</u></b>		<a href="https://www.sae.org">SAE International</a> <a href="https://www.sae.org">400 Commonwealth Dr</a> <a href="https://www.sae.org">Warrendale, PA 15096</a> <a href="https://www.sae.org">https://www.sae.org</a>	<a href="tel:(724)776-4841">(724) 776-4841</a>
<a href="http://www.sae.org">J1772_201001</a>	<a href="http://www.sae.org">2010</a>	<a href="http://www.sae.org">Electric Vehicle and Plug in Hybrid Vehicle Conductive Charge Coupler</a>	<a href="http://www.sae.org">505.6</a>

<b><u>SCAQMD</u></b>		<i>South Coast AQMD</i> 21865 Copley Dr Diamond Bar, CA 91765	(909) 396-2000
----------------------	--	---	----------------

Rule 1168	2011	Adhesive and Sealant Applications	901.10(3), 11.901.10(3), 12.1.901.10(3)
-----------	------	-----------------------------------	---

<b><u>SRCC</u></b>	<i>Solar Rating and Certification Corporation</i> <i>c/o FSEC</i> <i>1679 Clearlake Road</i> <i>Cocoa, FL 32922-5703</i> <a href="http://www.solar-rating.org">www.solar-rating.org</a>		(321) 638-1537
--------------------	---	--	----------------

OG 300	2014	Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems	703.5.5
--------	------	---	---------

<b><u>SFI</u></b>	<i>Sustainable Forestry Initiative, Inc.</i> <i>1600 Wilson Boulevard, Su</i> <a href="http://www.sfiprogram.org">www.sfiprogram.org</a>		(703) 875-9500
-------------------	--	--	----------------

2010-2014 Standard	2010	Sustainable Forestry Initiative Standard (SFIS)	606.2(e), 11.606.2(e), 12.1(A).606.2(e)
--------------------	------	---	---

<b><u>TCIA</u></b>	<i>Tree Care Industry Association</i> <i>3 Perimeter Road, Unit 1</i> <i>Manchester, NH 03103</i> <a href="http://www.tcia.org">www.tcia.org</a>		(603) 314-5380
--------------------	---	--	----------------

<u>A300</u>	2001	Standards for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices	503.1(6), 11.503.1(6)
-------------	------	---	-----------------------

<b><u>TCNA</u></b>	<i>Tile Council of North America</i> <i>100 Clemson Research Blvd.</i> <i>Anderson, SC 29625</i> <a href="http://www.tileusa.com">http://www.tileusa.com</a>		(864) 646-8453
--------------------	---	--	----------------

A138.1	2011	Green Squared: American National Standard Specifications for Sustainable Ceramic Tiles, Glass Tiles, and Tile Installation Materials	611.2(7), 11.611.2(7), 12.1(A).611.2(7)
--------	------	--	---

<b><u>UL</u></b>	<i>Underwriters Laboratories Inc.</i> <i>333 Pfingsten Road</i> <i>Northbrook, IL 60062-2096</i> <a href="http://www.ul.com">www.ul.com</a>		(877) 854-3577
------------------	--	--	----------------

REFERENCED DOCUMENTS

127	2011	Factory-Built Fireplaces	901.2.1(2), 11.901.2.1(2), 12.1.901.2.1(2)
181	2013	The Standard for Safety for Factory-Made Air Ducts and Air Connectors	701.4.2.1, 11.701.4.2.1, 12.1.701.4.2.1
1482	2011	Solid-Fuel Type Room Heaters	901.2.1(3), 11.901.2.1(3), 12.1.901.2.1(3)
100	2012	Interim Sustainability Requirements for Gypsum Boards and Panels	611.2(5), 11.611.2(5), 12.1(A).611.2(5)
102	2012	Standard for Sustainability for Door Leafs	611.2(6), 11.611.2(6), 12.1(A).611.2(6)
<a href="#">2985</a>	<a href="#">2015</a>	<a href="#">Sustainability Outline for Thermal Insulation</a>	
<a href="#">391</a>	<a href="#">2010</a>	<a href="#">Standard for Solid-Fuel and Combination Fuel Central and Supplementary Furnaces</a>	
<a href="#">2523</a>	<a href="#">2009</a>	<a href="#">Standard for Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters, and Boilers</a>	

<b><u>USDA</u></b>		<i>U.S. Department of Agriculture</i> 1400 Independence Ave., SW Washington, DC 20250 <a href="http://www.usda.gov">www.usda.gov</a>	(202) 720-2791
7 CFR Part 2902	2014	Designation of Biobased Items for Federal Procurement; Final Rule	606.1(h)
<b><u>WSL</u></b>		<i>Washington State Legislature</i> 106 Legislative Building Olympia, WA 98504-0600 <a href="http://www.leg.wa.gov">www.leg.wa.gov</a>	(360) 786-7573
WAC 173-433-100(3)	2014	Solid Fuel Burning Devices - Emission Performance Standards	901.2.1(3), 11.901.2.1(3) 12.1.901.2.1(3)

THIS PAGE INTENTIONALLY LEFT BLANK

## APPENDIX A

# DUCTED GARAGE EXHAUST FAN SIZING CRITERIA

### A100 SCOPE AND APPLICABILITY

**A101.1 Applicability of Appendix A.** Appendix A is part of this Standard.

**A101.2 Scope.** The provisions contained in Appendix A provide the criteria necessary for complying with Section 901.3(1)(c) for the installation of ducted exhaust fans in garages. To receive points for implementing Practice 901.3(1)(c), the fan airflow rating and duct sizing for ducted exhaust fans are to be in accordance with the applicable criteria of Appendix A.

**A101.3 Acknowledgment.** The text of Appendix A, Section A200 and related Table are extracted from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, Section 7.3 and Table 7.1, respectively, and is used with the permission of ASHRAE. The referenced Section and Table numbers within the extracted text are modified to be applicable to Appendix A of this Standard.

### A200 AIR FLOW RATING

**A201.1 Airflow rating.** The airflows required by this standard refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measuring device. Alternatively, the airflow rating at a pressure of 0.25 in. w.c. (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of Table A201 or manufacturers' design criteria.

**TABLE A201**  
**Prescriptive Duct Sizing**

Fan Rating	Duct Type							
	Flex Duct				Smooth Duct			
cfm @ 0.25 in. w.g. (L/s @ 62.5 Pa)	50 (25)	80 (40)	100 (50)	125 (65)	50 (25)	80 (40)	100 (50)	125 (65)
Diameter, in. (mm)	Maximum Length, ft (m)							
3 (75)	X	X	X	X	5 (2)	X	X	X
4 (100)	70 (27)	3 (1)	X	X	105 (35)	35 (12)	5 (2)	X
5 (125)	NL	70 (27)	35 (12)	20 (7)	NL	135 (45)	85 (28)	55 (18)
6 (150)	NL	NL	125 (42)	95 (32)	NL	NL	NL	145 (48)
7 (175) and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 ft (5 m) of allowable duct length for each elbow.

NL = no limit on duct length of this size.

X = not allowed, any length of duct of this size with assumed turns and fitting will exceed the rated pressure drop.

THIS PAGE INTENTIONALLY LEFT BLANK

## APPENDIX B

# WHOLE BUILDING VENTILATION SYSTEM SPECIFICATIONS

### B100 SCOPE AND APPLICABILITY

**B101.1 Applicability of Appendix B.** Appendix B is part of this Standard.

**B101.2 Scope.** The provisions contained in Appendix B provide the specifications necessary for complying with Section 902.2.1 for the installation of whole building ventilation systems. To receive points for implementing Practice 902.2.1, the chosen whole building ventilation system is to be in accordance with the applicable specifications of Appendix B.

**B101.3 Acknowledgment.** The text of Appendix B, Section B200 and related Tables are extracted from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) Standard 62.2-2010 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, Section 4, and is used with the permission of ASHRAE. The referenced Section and Table numbers within the extracted text are modified to be applicable to Appendix B of this Standard. “\*\*” indicates added reference to ICC or ASHRAE 62.2 to provide clarity.

### B200 WHOLE-BUILDING VENTILATION

**B201.1 Ventilation Rate.** A mechanical exhaust system, supply system, or combination thereof shall be installed for each dwelling unit to provide whole-building ventilation with outdoor air each hour at no less than the rate specified in Tables B201.1a and B201.1b or, equivalently, Equations B201.1a and B201.1b, based on the floor area of the conditioned space and number of bedrooms.

**Exceptions:** Whole-building mechanical systems are not required provided that at least one of the following conditions is met:

- (a) the building has no mechanical cooling and is in zone 1 or 2 of the ICC\* IECC Climate Zone Map (see ASHRAE 62.2\*, Figure 8.2), or
- (b) the building is thermally conditioned for human occupancy for less than 876 hours per year,

and if the authority having jurisdiction determines that window operation is a locally permissible method of providing ventilation.

**B201.1.1 Different Occupant Density.** Tables B201.1a and B201.1b and Equations B201.1a and B201.1b assume two persons in a studio or one-bedroom dwelling unit and an additional person for each additional bedroom. Where higher occupant densities are known, the rate shall be increased by 7.5 cfm (3.5 L/s) for each additional person. When approved by the authority having jurisdiction, lower occupant densities may be used.

**B201.1.2 Alternative Ventilation.** Other methods may be used to provide the required ventilation rates (of Tables B201.1a and B201.1b) when approved by a licensed design professional.



**B201.1.3 Infiltration Credit.** Section B201.1 includes a default credit for ventilation provided by infiltration of 2 cfm/100 ft<sup>2</sup> (10 L/s per 100 m<sup>2</sup>) of occupiable floor space. For buildings built prior to the application of this standard, when excess infiltration has been measured using *ANSI/ASHRAE Standard 136, A Method of Determining Air Change Rates in Detached Dwellings*,<sup>1</sup> the rates in Section B201.1 may be decreased by half of the excess of the rate calculated from Standard 136 that is above the default rate. No increase to the rate in Section B201.1 is required if measured infiltration in accordance with Standard 136 is lower than the default rate.

**Equation B201.1a**

$$Q_{fan} = 0.01A_{floor} + 7.5(N_{br} + 1)$$

where

- $Q_{fan}$  = fan flow rate, cfm
- $A_{floor}$  = floor area, ft<sup>2</sup>
- $N_{br}$  = number of bedrooms; not to be less than one

**Equation B201.1b**

$$Q_{fan} = 0.05A_{floor} + 3.5(N_{br} + 1)$$

where

- $Q_{fan}$  = fan flow rate, L/s
- $A_{floor}$  = floor area, m<sup>2</sup>
- $N_{br}$  = number of bedrooms; not to be less than one

**TABLE B201.1a (I-P)**  
**Ventilation Air Requirements, cfm**

Floor Area (ft <sup>2</sup> )	Bedrooms				
	0–1	2–3	4–5	6–7	>7
<1500	30	45	60	75	90
1501–3000	45	60	75	90	105
3001–4500	60	75	90	105	120
4501–6000	75	90	105	120	135
6001–7500	90	105	120	135	150
>7500	105	120	135	150	165

**TABLE B201.1b (SI)**  
**Ventilation Air Requirements, L/s**

Floor Area (m <sup>2</sup> )	Bedrooms				
	0–1	2–3	4–5	6–7	>7
<139	14	21	28	35	42
139.1–279	21	28	35	42	50
279.1–418	28	35	42	50	57
418.1–557	35	42	50	57	64
557.1–697	42	50	57	64	71
>697	50	57	64	71	78

<sup>1</sup> *ANSI/ASHRAE Standard 136-1993 (RA 2006), A Method of Determining Air Change Rates in Detached Dwellings.* American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA.

©ASHRAE, www.ashrae.org. Used with permission from ASHRAE Standard 62.2-2007. This material may not be copied nor distributed in either paper or digital form without ASHRAE's permission.

**B201.2 System Type.** The whole-house ventilation system shall consist of one or more supply or exhaust fans and associated ducts and controls. Local exhaust fans shall be permitted to be part of a mechanical exhaust system. Outdoor air ducts connected to the return side of an air handler shall be permitted as supply ventilation if manufacturers' requirements for return air temperature are met. See ASHRAE 62.2\*, Appendix B for guidance on selection of methods.

**B201.3 Airflow Measurement.** The airflow required by this section is the quantity of outdoor ventilation air supplied and/or indoor air exhausted by the ventilation system as installed and shall be measured using a flow hood, flow grid, or other airflow measuring device. Ventilation airflow of systems with multiple operating modes shall be tested in all modes designed to meet this section.

**B201.4 Control and Operation.** The “fan on” switch on a heating or air-conditioning system shall be permitted as an operational control for systems introducing ventilation air through a duct to the return side of an HVAC system. Readily accessible override control must be provided to the occupant. Local exhaust fan switches and “fan on” switches shall be permitted as override controls. Controls, including the “fan-on” switch of a conditioning system, must be appropriately labeled.

**Exception:** An intermittently operating, whole-house mechanical ventilation system may be used if the ventilation rate is adjusted, according to the exception to Section B201.5. The system must be designed so that it can operate automatically based on a timer. The intermittent mechanical ventilation system must operate at least once per day and must operate at least 10 percent of the time.

**B201.5 Delivered Ventilation.** The delivered ventilation rate shall be calculated as the larger of the total supply or total exhaust and shall be no less than specified in Section B201.1 during each hour of operation.

**Exception:** The effective ventilation rate of an intermittent system is the combination of its delivered capacity, its daily fractional on-time, cycle time, and the ventilation effectiveness from Table B201.2. The fan flow rate required to achieve an effective ventilation rate that is equivalent to the continuous ventilation requirement shall be calculated from the following equation:

**Equation B201.5**

$$Q_f = Q_r / (\epsilon f)$$

where

- $Q_f$  = fan flow rate during the on-cycle
- $Q_r$  = ventilation air requirement (from Table B201.1a or B201.1b)
- $T_{cyc}$  = fan cycle time, defined as the total time for one on-cycle and one off-cycle (used in Table B201.5)
- $\epsilon$  = ventilation effectiveness (from Table B201.5)
- $f$  = fractional on time, defined as the on-time for one cycle divided by the cycle time

**TABLE B201.5**  
**Ventilation Effectiveness for Intermittent Fans**

Fractional On-Time, <i>f</i>	Cycle Time, <i>T<sub>cyc</sub></i> (h)			
	0-4	8	12	24
0.1	1.00	0.79	*	*
0.2	1.00	0.84	0.56	*
0.3	1.00	0.89	0.71	*
0.4	1.00	0.92	0.81	0.20
0.5	1.00	0.94	0.87	0.52
0.6	1.00	0.97	0.92	0.73
0.7	1.00	0.98	0.96	0.86
0.8	1.00	0.99	0.98	0.94
0.9	1.00	1.00	1.00	0.99
1.0	1.00	1.00	1.00	1.00

See Chapter 10 of Guideline 24 for an example of this calculation.

For values not listed, use the next higher value for cycle time or the next lower value for Fractional On-Time. Linear interpolation is allowed for intermediate Fractional On-Times. The maximum allowed Cycle Time is 24 hours and the minimum allowed Fractional On-Time is 0.1.

**B201.6 Restrictions on System Type.** Use of certain ventilation strategies is restricted in specific climates as follows.

**B201.6.1 Hot, Humid Climates.** In hot, humid climates, whole-house mechanical net exhaust flow shall not exceed 7.5 cfm per 100 ft<sup>2</sup> (35 L/s per 100 m<sup>2</sup>). (See ASHRAE 62.2\*, Section 8 for a listing of hot, humid US climates.)

**B201.6.2 Very Cold Climates.** Mechanical supply systems exceeding 7.5 cfm per 100 ft<sup>2</sup> (35 L/s per 100 m<sup>2</sup>) shall not be used in very cold climates. (See ASHRAE 62.2\*, Section 8 for a listing of very cold US climates.)

**Exception:** These ventilation strategies are not restricted if the authority having jurisdiction approves the envelope design as being moisture resistant.

## APPENDIX C

# CLIMATE ZONES

### C100 SCOPE AND APPLICABILITY

**C101.1 Applicability of Appendix C.** Appendix C is part of this Standard. Text identified as “User Note” is not considered part of this Standard.

**C101.2 Scope.** The provisions contained in Appendix C provide the criteria necessary for complying with the climate-specific provisions of this Standard.

### C200 CLIMATE ZONES

**TABLE C200**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID**  
**DESIGNATIONS BY STATE, COUNTY AND TERRITORY**

**Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (\*) indicates a warm-humid location.**

<b>ALABAMA</b>	3A Elmore*	3A Morgan	7 Haines	<b>ARIZONA</b>
3A Autauga*	3A Escambia*	3A Perry*	7 Juneau	5B Apache
2A Baldwin*	3A Etowah	3A Pickens	7 Kenai Peninsula	3B Cochise
3A Barbour*	3A Fayette	3A Pike*	7 Ketchikan	5B Coconino
3A Bibb	3A Franklin	3A Randolph	Gateway	4B Gila
3A Blount	3A Geneva*	3A Russell*	7 Kodiak Island	3B Graham
3A Bullock*	3A Greene	3A Shelby	7 Lake and Peninsula	3B Greenlee
3A Butler*	3A Hale	3A St. Clair	7 Matanuska-Susitna	2B La Paz
3A Calhoun	3A Henry*	3A Sumter	8 Nome	2B Maricopa
3A Chambers	3A Houston*	3A Talladega	8 North Slope	3B Mohave
3A Cherokee	3A Jackson	3A Tallapoosa	8 Northwest Arctic	5B Navajo
3A Chilton	3A Jefferson	3A Tuscaloosa	7 Prince of Wales-Outer Ketchikan	2B Pima
3A Choctaw*	3A Lamar	3A Walker	7 Sitka	2B Pinal
3A Clarke*	3A Lauderdale	3A Washington*	7 Skagway-Hoonah Angoon	3B Santa Cruz
3A Clay	3A Lawrence	3A Wilcox*	8 Southeast Fairbanks	4B Yavapai
3A Cleburne	3A Lee	3A Winston	7 Yakutat	2B Yuma
3A Coffee*	3A Limestone		8 Valdez-Cordova	
3A Colbert	3A Lowndes*	<b>ALASKA</b>	7 Wade Hampton	<b>ARKANSAS</b>
3A Conecuh*	3A Macon*	7 Aleutians East	7 Wrangell-Petersburg	3A Arkansas
3A Coosa	3A Madison	7 Aleutians West	4A Baxter	3A Ashley
3A Covington*	3A Marengo*	7 Anchorage	4A Benton	4A Boone
3A Crenshaw*	3A Marion	8 Bethel	3A Bradley	
3A Cullman	3A Marshall	7 Bristol Bay	3A Calhoun	
3A Dale*	2A Mobile*	7 Denali		
3A Dallas*	3A Monroe*	8 Dillingham		
3A DeKalb	3A Montgomery*	8 Fairbanks North Star		

(continued)

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

4A Carroll	3A Perry	3C Marin	5B Boulder	6B Rio Blanco
3A Chicot	3A Phillips	4B Mariposa	5B Broomfield	7 Rio Grande
3A Clark	3A Pike	3C Mendocino	6B Chaffee	7 Routt
3A Clay	3A Poinsett	3B Merced	5B Cheyenne	6B Saguache
3A Cleburne	3A Polk	5B Modoc	7 Clear Creek	7 San Juan
3A Cleveland	3A Pope	6B Mono	6B Conejos	6B San Miguel
3A Columbia*	3A Prairie	3C Monterey	6B Costilla	5B Sedgwick
3A Conway	3A Pulaski	3C Napa	5B Crowley	7 Summit
3A Craighead	3A Randolph	5B Nevada	6B Custer	5B Teller
3A Crawford	3A Saline	3B Orange	5B Delta	5B Washington
3A Crittenden	3A Scott	3B Placer	5B Denver	5B Weld
3A Cross	4A Searcy	5B Plumas	6B Dolores	5B Yuma
3A Dallas	3A Sebastian	3B Riverside	5B Douglas	
3A Desha	3A Sevier*	3B Sacramento	6B Eagle	<b>CONNECTICUT</b>
3A Drew	3A Sharp	3C San Benito	5B Elbert	5A (all)
3A Faulkner	3A St. Francis	3B San Bernardino	5B El Paso	
3A Franklin	4A Stone	3B San Diego	5B Fremont	<b>DELAWARE</b>
4A Fulton	3A Union*	3C San Francisco	5B Garfield	4A (all)
3A Garland	3A Van Buren	3B San Joaquin	5B Gilpin	
3A Grant	4A Washington	3C San Luis Obispo	7 Grand	<b>DISTRICT OF</b>
3A Greene	3A White	3C San Mateo	7 Gunnison	<b>COLUMBIA</b>
3A Hempstead*	3A Woodruff	3C Santa Barbara	7 Hinsdale	4A (all)
3A Hot Spring	3A Yell	3C Santa Clara	5B Huerfano	
3A Howard		3C Santa Cruz	7 Jackson	<b>FLORIDA</b>
3A Independence	<b>CALIFORNIA</b>	3B Shasta	5B Jefferson	2A Alachua*
4A Izard	3C Alameda	5B Sierra	5B Kiowa	2A Baker*
3A Jackson	6B Alpine	5B Siskiyou	5B Kit Carson	2A Bay*
3A Jefferson	4B Amador	3B Solano	7 Lake	2A Bradford*
3A Johnson	3B Butte	3C Sonoma	5B La Plata	2A Brevard*
3A Lafayette*	4B Calaveras	3B Stanislaus	5B Larimer	1A Broward*
3A Lawrence	3B Colusa	3B Sutter	4B Las Animas	2A Calhoun*
3A Lee	3B Contra Costa	3B Tehama	5B Lincoln	2A Charlotte*
3A Lincoln	4C Del Norte	4B Trinity	5B Logan	2A Citrus*
3A Little River*	4B El Dorado	3B Tulare	5B Mesa	2A Clay*
3A Logan	3B Fresno	4B Tuolumne	7 Mineral	2A Collier*
3A Lonoke	3B Glenn	3C Ventura	6B Moffat	2A Columbia*
4A Madison	4C Humboldt	3B Yolo	5B Montezuma	2A DeSoto*
4A Marion	2B Imperial	3B Yuba	5B Montrose	2A Dixie*
3A Miller*	4B Inyo		5B Morgan	2A Duval*
3A Mississippi	3B Kern	<b>COLORADO</b>	4B Otero	2A Escambia*
3A Monroe	3B Kings	5B Adams	6B Ouray	2A Flagler*
3A Montgomery	4B Lake	6B Alamosa	7 Park	2A Franklin*
3A Nevada	5B Lassen	5B Arapahoe	5B Phillips	2A Gadsden*
4A Newton	3B Los Angeles	6B Archuleta	7 Pitkin	2A Gilchrist*
3A Ouachita	3B Madera	4B Baca	5B Prowers	2A Glades*
		5B Bent	5B Pueblo	

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

(continued)

2A Gulf*	2A Washington*	2A Decatur*	3A Lee*	3A Taylor*
2A Hamilton*		3A DeKalb	2A Liberty*	3A Telfair*
2A Hardee*	<b>GEORGIA</b>	3A Dodge*	3A Lincoln	3A Terrell*
2A Hendry*	2A Appling*	3A Dooly*	2A Long*	2A Thomas*
2A Hernando*	2A Atkinson*	3A Dougherty*	2A Lowndes*	3A Tift*
2A Highlands*	2A Bacon*	3A Douglas	4A Lumpkin	2A Toombs*
2A Hillsborough*	2A Baker*	3A Early*	3A Macon*	4A Towns
2A Holmes*	3A Baldwin	2A Echols*	3A Madison	3A Treutlen*
2A Indian River*	4A Banks	2A Effingham*	3A Marion*	3A Troup
2A Jackson*	3A Barrow	3A Elbert	3A McDuffie	3A Turner*
2A Jefferson*	3A Bartow	3A Emanuel*	2A McIntosh*	3A Twiggs*
2A Lafayette*	3A Ben Hill*	2A Evans*	3A Meriwether	4A Union
2A Lake*	2A Berrien*	4A Fannin	2A Miller*	3A Upson
2A Lee*	3A Bibb	3A Fayette	2A Mitchell*	4A Walker
2A Leon*	3A Bleckley*	4A Floyd	3A Monroe	3A Walton
2A Levy*	2A Brantley*	3A Forsyth	3A Montgomery*	2A Ware*
2A Liberty*	2A Brooks*	4A Franklin	3A Morgan	3A Warren
2A Madison*	2A Bryan*	3A Fulton	4A Murray	3A Washington
2A Manatee*	3A Bulloch*	4A Gilmer	3A Muscogee	2A Wayne*
2A Marion*	3A Burke	3A Glascock	3A Newton	3A Webster*
2A Martin*	3A Butts	2A Glynn*	3A Oconee	3A Wheeler*
1A Miami-Dade*	3A Calhoun*	4A Gordon	3A Oglethorpe	4A White
1A Monroe*	2A Camden*	2A Grady*	3A Paulding	4A Whitfield
2A Nassau*	3A Candler*	3A Greene	3A Peach*	3A Wilcox*
2A Okaloosa*	3A Carroll	3A Gwinnett	4A Pickens	3A Wilkes
2A Okeechobee*	4A Catoosa	4A Habersham	2A Pierce*	3A Wilkinson
2A Orange*	2A Charlton*	4A Hall	3A Pike	3A Worth*
2A Osceola*	2A Chatham*	3A Hancock	3A Polk	
2A Palm Beach*	3A Chattahoochee*	3A Haralson	3A Pulaski*	<b>HAWAII</b>
2A Pasco*	4A Chattooga	3A Harris	3A Putnam	1A (all)*
2A Pinellas*	3A Cherokee	3A Hart	3A Quitman*	
2A Polk*	3A Clarke	3A Heard	4A Rabun	<b>IDAHO</b>
2A Putnam*	3A Clay*	3A Henry	3A Randolph*	5B Ada
2A Santa Rosa*	3A Clayton	3A Houston*	3A Richmond	6B Adams
2A Sarasota*	2A Clinch*	3A Irwin*	3A Rockdale	6B Bannock
2A Seminole*	3A Cobb	3A Jackson	3A Schley*	6B Bear Lake
2A St. Johns*	3A Coffee*	3A Jasper	3A Screven*	5B Benewah
2A St. Lucie*	2A Colquitt*	2A Jeff Davis*	2A Seminole*	6B Bingham
2A Sumter*	3A Columbia	3A Jefferson	3A Spalding	6B Blaine
2A Suwannee*	2A Cook*	3A Jenkins*	4A Stephens	6B Boise
2A Taylor*	3A Coweta	3A Johnson*	3A Stewart*	6B Bonner
2A Union*	3A Crawford	3A Jones	3A Sumter*	6B Bonneville
2A Volusia*	3A Crisp*	3A Lamar	3A Talbot	6B Boundary
2A Wakulla*	4A Dade	2A Lanier*	3A Taliaferro	6B Butte
2A Walton*	4A Dawson	3A Laurens*	2A Tattall*	6B Camas

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

		<i>(continued)</i>		
5B Canyon	4A Clay	4A Marion	<b>INDIANA</b>	5A Lake
6B Caribou	4A Clinton	5A Marshall	5A Adams	5A La Porte
5B Cassia	5A Coles	5A Mason	5A Allen	4A Lawrence
6B Clark	5A Cook	4A Massac	5A Bartholomew	5A Madison
5B Clearwater	4A Crawford	5A McDonough	5A Benton	5A Marion
6B Custer	5A Cumberland	5A McHenry	5A Blackford	5A Marshall
5B Elmore	5A DeKalb	5A McLean	5A Boone	4A Martin
6B Franklin	5A De Witt	5A Menard	4A Brown	5A Miami
6B Fremont	5A Douglas	5A Mercer	5A Carroll	4A Monroe
5B Gem	5A DuPage	4A Monroe	5A Cass	5A Montgomery
5B Gooding	5A Edgar	4A Montgomery	4A Clark	5A Morgan
5B Idaho	4A Edwards	5A Morgan	5A Clay	5A Newton
6B Jefferson	4A Effingham	5A Moultrie	5A Clinton	5A Noble
5B Jerome	4A Fayette	5A Ogle	4A Crawford	4A Ohio
5B Kootenai	5A Ford	5A Peoria	4A Daviess	4A Orange
5B Latah	4A Franklin	4A Perry	4A Dearborn	5A Owen
6B Lemhi	5A Fulton	5A Piatt	5A Decatur	5A Parke
5B Lewis	4A Gallatin	5A Pike	5A De Kalb	4A Perry
5B Lincoln	5A Greene	4A Pope	5A Delaware	4A Pike
6B Madison	5A Grundy	4A Pulaski	4A Dubois	5A Porter
5B Minidoka	4A Hamilton	5A Putnam	5A Elkhart	4A Posey
5B Nez Perce	5A Hancock	4A Randolph	5A Fayette	5A Pulaski
6B Oneida	4A Hardin	4A Richland	4A Floyd	5A Putnam
5B Owyhee	5A Henderson	5A Rock Island	5A Fountain	5A Randolph
5B Payette	5A Henry	4A Saline	5A Franklin	4A Ripley
5B Power	5A Iroquois	5A Sangamon	5A Fulton	5A Rush
5B Shoshone	4A Jackson	5A Schuyler	4A Gibson	4A Scott
6B Teton	4A Jasper	5A Scott	5A Grant	5A Shelby
5B Twin Falls	4A Jefferson	4A Shelby	4A Greene	4A Spencer
6B Valley	5A Jersey	5A Stark	5A Hamilton	5A Starke
5B Washington	5A Jo Daviess	4A St. Clair	5A Hancock	5A Steuben
	4A Johnson	5A Stephenson	4A Harrison	5A St. Joseph
<b>ILLINOIS</b>	5A Kane	5A Tazewell	5A Hendricks	4A Sullivan
5A Adams	5A Kankakee	4A Union	5A Henry	4A Switzerland
4A Alexander	5A Kendall	5A Vermilion	5A Howard	5A Tiptecanoe
4A Bond	5A Knox	4A Wabash	5A Huntington	5A Tipton
5A Boone	5A Lake	5A Warren	4A Jackson	5A Union
5A Brown	5A La Salle	4A Washington	5A Jasper	4A Vanderburgh
5A Bureau	4A Lawrence	4A Wayne	5A Jay	5A Vermillion
5A Calhoun	5A Lee	4A White	4A Jefferson	5A Vigo
5A Carroll	5A Livingston	5A Whiteside	4A Jennings	5A Wabash
5A Cass	5A Logan	5A Will	5A Johnson	5A Warren
5A Champaign	5A Macon	4A Williamson	4A Knox	4A Warrick
4A Christian	4A Macoupin	5A Winnebago	5A Kosciusko	4A Washington
5A Clark	4A Madison	5A Woodford	5A Lagrange	5A Wayne



**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

(continued)

5A Wells	6A Hancock	5A Tama	4A Franklin	4A Pottawatomie
5A White	6A Hardin	5A Taylor	4A Geary	4A Pratt
5A Whitley	5A Harrison	5A Union	5A Gove	5A Rawlins
	5A Henry	5A Van Buren	5A Graham	4A Reno
<b>IOWA</b>	6A Howard	5A Wapello	4A Grant	5A Republic
5A Adair	6A Humboldt	5A Warren	4A Gray	4A Rice
5A Adams	6A Ida	5A Washington	5A Greeley	4A Riley
6A Allamakee	5A Iowa	5A Wayne	4A Greenwood	5A Rooks
5A Appanoose	5A Jackson	6A Webster	5A Hamilton	4A Rush
5A Audubon	5A Jasper	6A Winnebago	4A Harper	4A Russell
5A Benton	5A Jefferson	6A Winneshiek	4A Harvey	4A Saline
6A Black Hawk	5A Johnson	5A Woodbury	4A Haskell	5A Scott
5A Boone	5A Jones	6A Worth	4A Hodgeman	4A Sedgwick
6A Bremer	5A Keokuk	6A Wright	4A Jackson	4A Seward
6A Buchanan	6A Kossuth		4A Jefferson	4A Shawnee
6A Buena Vista	5A Lee	<b>KANSAS</b>	5A Jewell	5A Sheridan
6A Butler	5A Linn	4A Allen	4A Johnson	5A Sherman
6A Calhoun	5A Louisa	4A Anderson	4A Kearny	5A Smith
5A Carroll	5A Lucas	4A Atchison	4A Kingman	4A Stafford
5A Cass	6A Lyon	4A Barber	4A Kiowa	4A Stanton
5A Cedar	5A Madison	4A Barton	4A Labette	4A Stevens
6A Cerro Gordo	5A Mahaska	4A Bourbon	5A Lane	4A Sumner
6A Cherokee	5A Marion	4A Brown	4A Leavenworth	5A Thomas
6A Chickasaw	5A Marshall	4A Butler	4A Lincoln	5A Trego
5A Clarke	5A Mills	4A Chase	4A Linn	4A Wabaunsee
6A Clay	6A Mitchell	4A Chautauqua	5A Logan	5A Wallace
6A Clayton	5A Monona	4A Cherokee	4A Lyon	4A Washington
5A Clinton	5A Monroe	5A Cheyenne	4A Marion	5A Wichita
5A Crawford	5A Montgomery	4A Clark	4A Marshall	4A Wilson
5A Dallas	5A Muscatine	4A Clay	4A McPherson	4A Woodson
5A Davis	6A O'Brien	5A Cloud	4A Meade	4A Wyandotte
5A Decatur	6A Osceola	4A Coffey	4A Miami	
6A Delaware	5A Page	4A Comanche	5A Mitchell	<b>KENTUCKY</b>
5A Des Moines	6A Palo Alto	4A Cowley	4A Montgomery	4A (all)
6A Dickinson	6A Plymouth	4A Crawford	4A Morris	
5A Dubuque	6A Pocahontas	5A Decatur	4A Morton	<b>LOUISIANA</b>
6A Emmet	5A Polk	4A Dickinson	4A Nemaha	2A Acadia*
6A Fayette	5A Pottawattamie	4A Doniphan	4A Neosho	2A Allen*
6A Floyd	5A Poweshiek	4A Douglas	5A Ness	2A Ascension*
6A Franklin	5A Ringgold	4A Edwards	5A Norton	2A Assumption*
5A Fremont	6A Sac	4A Elk	4A Osage	2A Avoyelles*
5A Greene	5A Scott	5A Ellis	5A Osborne	2A Beauregard*
6A Grundy	5A Shelby	4A Ellsworth	4A Ottawa	3A Bienville*
5A Guthrie	6A Sioux	4A Finney	4A Pawnee	3A Bossier*
6A Hamilton	5A Story	4A Ford	5A Phillips	3A Caddo*



**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

2A Calcasieu*	3A Tensas*	4A Howard	5A Hillsdale	7 Schoolcraft
3A Caldwell*	2A Terrebonne*	4A Kent	7 Houghton	5A Shiawassee
2A Cameron*	3A Union*	4A Montgomery	6A Huron	5A St. Clair
3A Catahoula*	2A Vermilion*	4A Prince George's	5A Ingham	5A St. Joseph
3A Claiborne*	3A Vernon*	4A Queen Anne's	5A Ionia	5A Tuscola
3A Concordia*	2A Washington*	4A Somerset	6A Iosco	5A Van Buren
3A De Soto*	3A Webster*	4A St. Mary's	7 Iron	5A Washtenaw
2A East Baton Rouge*	2A West Baton Rouge*	4A Talbot	6A Isabella	5A Wayne
3A East Carroll		4A Washington	5A Jackson	6A Wexford
2A East Feliciana*	3A West Carroll	4A Wicomico	5A Kalamazoo	
2A Evangeline*	2A West Feliciana*	4A Worcester	6A Kalkaska	<b>MINNESOTA</b>
3A Franklin*	3A Winn*		5A Kent	7 Aitkin
3A Grant*		<b>MASSACHUSETTS</b>	7 Keweenaw	6A Anoka
2A Iberia*	<b>MAINE</b>	5A (all)	6A Lake	7 Becker
2A Iberville*	6A Androscoggin		5A Lapeer	7 Beltrami
3A Jackson*	7 Aroostook	<b>MICHIGAN</b>	6A Leelanau	6A Benton
2A Jefferson*	6A Cumberland	6A Alcona	5A Lenawee	6A Big Stone
2A Jefferson Davis*	6A Franklin	6A Alger	5A Livingston	6A Blue Earth
2A Lafayette*	6A Hancock	5A Allegan	7 Luce	6A Brown
2A Lafourche*	6A Kennebec	6A Alpena	7 Mackinac	7 Carlton
3A La Salle*	6A Knox	6A Antrim	5A Macomb	6A Carver
3A Lincoln*	6A Lincoln	6A Arenac	6A Manistee	7 Cass
2A Livingston*	6A Oxford	7 Baraga	6A Marquette	6A Chippewa
3A Madison*	6A Penobscot	5A Barry	6A Mason	6A Chisago
3A Morehouse	6A Piscataquis	5A Bay	6A Mecosta	7 Clay
3A Natchitoches*	6A Sagadahoc	6A Benzie	6A Menominee	7 Clearwater
2A Orleans*	6A Somerset	5A Berrien	5A Midland	7 Cook
3A Ouachita*	6A Waldo	5A Branch	6A Missaukee	6A Cottonwood
2A Plaquemines*	6A Washington	5A Calhoun	5A Monroe	7 Crow Wing
2A Pointe Coupee*	6A York	5A Cass	5A Montcalm	6A Dakota
2A Rapides*		6A Charlevoix	6A Montmorency	6A Dodge
3A Red River*	<b>MARYLAND</b>	6A Cheboygan	5A Muskegon	6A Douglas
3A Richland*	4A Allegany	7 Chippewa	6A Newaygo	6A Faribault
3A Sabine*	4A Anne Arundel	6A Clare	5A Oakland	6A Fillmore
2A St. Bernard*	4A Baltimore	5A Clinton	6A Oceana	6A Freeborn
2A St. Charles*	4A Baltimore (city)	6A Crawford	6A Ogemaw	6A Goodhue
2A St. Helena*	4A Calvert	6A Delta	7 Ontonagon	7 Grant
2A St. James*	4A Caroline	6A Dickinson	6A Osceola	6A Hennepin
2A St. John the Baptist*	4A Carroll	5A Eaton	6A Oscoda	6A Houston
2A St. Landry*	4A Cecil	6A Emmet	6A Otsego	7 Hubbard
2A St. Martin*	4A Charles	5A Genesee	5A Ottawa	6A Isanti
2A St. Mary*	4A Dorchester	6A Gladwin	6A Presque Isle	7 Itasca
2A St. Tammany*	4A Frederick	7 Gogebic	6A Roscommon	6A Jackson
2A Tangipahoa*	5A Garrett	6A Grand Traverse	5A Saginaw	7 Kanabec
	4A Harford	5A Gratiot	6A Sanilac	6A Kandiyohi

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

<i>(continued)</i>				
7 Kittson	7 Wadena	3A Lafayette	3A Yalobusha	4A Henry
7 Koochiching	6A Waseca	3A Lamar*	3A Yazoo	4A Hickory
6A Lac qui Parle	6A Washington	3A Lauderdale		5A Holt
7 Lake	6A Watonwan	3A Lawrence*	<b>MISSOURI</b>	4A Howard
7 Lake of the Woods	7 Wilkin	3A Leake	5A Adair	4A Howell
6A Le Sueur	6A Winona	3A Lee	5A Andrew	4A Iron
6A Lincoln	6A Wright	3A Leflore	5A Atchison	4A Jackson
6A Lyon	6A Yellow Medicine	3A Lincoln*	4A Audrain	4A Jasper
7 Mahanomen		3A Lowndes	4A Barry	4A Jefferson
7 Marshall	<b>MISSISSIPPI</b>	3A Madison	4A Barton	4A Johnson
6A Martin	3A Adams*	3A Marion*	4A Bates	5A Knox
6A McLeod	3A Alcorn	3A Marshall	4A Benton	4A Laclede
6A Meeker	3A Amite*	3A Monroe	4A Bollinger	4A Lafayette
7 Mille Lacs	3A Attala	3A Montgomery	4A Boone	4A Lawrence
6A Morrison	3A Benton	3A Neshoba	5A Buchanan	5A Lewis
6A Mower	3A Bolivar	3A Newton	4A Butler	4A Lincoln
6A Murray	3A Calhoun	3A Noxubee	5A Caldwell	5A Linn
6A Nicollet	3A Carroll	3A Oktibbeha	4A Callaway	5A Livingston
6A Nobles	3A Chickasaw	3A Panola	4A Camden	5A Macon
7 Norman	3A Choctaw	2A Pearl River*	4A Cape Girardeau	4A Madison
6A Olmsted	3A Claiborne*	3A Perry*	4A Carroll	4A Maries
7 Otter Tail	3A Clarke	3A Pike*	4A Carter	5A Marion
7 Pennington	3A Clay	3A Pontotoc	4A Cass	4A McDonald
7 Pine	3A Coahoma	3A Prentiss	4A Cedar	5A Mercer
6A Pipestone	3A Copiah*	3A Quitman	5A Chariton	4A Miller
7 Polk	3A Covington*	3A Rankin*	4A Christian	4A Mississippi
6A Pope	3A DeSoto	3A Scott	5A Clark	4A Moniteau
6A Ramsey	3A Forrest*	3A Sharkey	4A Clay	4A Monroe
7 Red Lake	3A Franklin*	3A Simpson*	5A Clinton	4A Montgomery
6A Redwood	3A George*	3A Smith*	4A Cole	4A Morgan
6A Renville	3A Greene*	2A Stone*	4A Cooper	4A New Madrid
6A Rice	3A Grenada	3A Sunflower	4A Crawford	4A Newton
6A Rock	2A Hancock*	3A Tallahatchie	4A Dade	5A Nodaway
7 Roseau	2A Harrison*	3A Tate	4A Dallas	4A Oregon
6A Scott	3A Hinds*	3A Tippah	5A Daviess	4A Osage
6A Sherburne	3A Holmes	3A Tishomingo	5A DeKalb	4A Ozark
6A Sibley	3A Humphreys	3A Tunica	4A Dent	4A Pemiscot
6A Stearns	3A Issaquena	3A Union	4A Douglas	4A Perry
6A Steele	3A Itawamba	3A Walthall*	4A Dunklin	4A Pettis
6A Stevens	2A Jackson*	3A Warren*	4A Franklin	4A Phelps
7 St. Louis	3A Jasper	3A Washington	4A Gasconade	5A Pike
6A Swift	3A Jefferson*	3A Wayne*	5A Gentry	4A Platte
6A Todd	3A Jefferson Davis*	3A Webster	4A Greene	4A Polk
6A Traverse	3A Jones*	3A Wilkinson*	5A Grundy	4A Pulaski
6A Wabasha	3A Kemper	3A Winston	5A Harrison	5A Putnam

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

5A Ralls	5B Lander	(continued)	6A Clinton	6A Tompkins
4A Randolph	5B Lincoln	<b>NEW MEXICO</b>	5A Columbia	6A Ulster
4A Ray	5B Lyon	4B Bernalillo	5A Cortland	6A Warren
4A Reynolds	5B Mineral	5B Catron	6A Delaware	5A Washington
4A Ripley	5B Nye	3B Chaves	5A Dutchess	5A Wayne
4A Saline	5B Pershing	4B Cibola	5A Erie	4A Westchester
5A Schuyler	5B Storey	5B Colfax	6A Essex	6A Wyoming
5A Scotland	5B Washoe	4B Curry	6A Franklin	5A Yates
4A Scott	5B White Pine	4B DeBaca	6A Fulton	
4A Shannon		3B Dona Ana	6A Genesee	<b>NORTH</b>
5A Shelby	<b>NEW HAMPSHIRE</b>	3B Eddy	5A Greene	<b>CAROLINA</b>
4A St. Charles	6A Belknap	4B Grant	6A Hamilton	4A Alamance
4A St. Clair	6A Carroll	4B Guadalupe	6A Herkimer	4A Alexander
4A Ste. Genevieve	5A Cheshire	5B Harding	6A Jefferson	5A Alleghany
4A St. Francois	6A Coos	3B Hidalgo	4A Kings	3A Anson
4A St. Louis	6A Coos	3B Lea	6A Lewis	5A Ashe
4A St. Louis (city)	6A Grafton	4B Lincoln	5A Livingston	5A Avery
4A Stoddard	5A Hillsborough	5B Los Alamos	6A Madison	3A Beaufort
4A Stone	6A Merrimack	3B Luna	5A Monroe	4A Bertie
5A Sullivan	5A Rockingham	5B McKinley	6A Montgomery	3A Bladen
4A Taney	5A Strafford	5B Mora	4A Nassau	3A Brunswick*
4A Texas	6A Sullivan	3B Otero	4A New York	4A Buncombe
4A Vernon		4B Quay	5A Niagara	4A Burke
4A Warren	<b>NEW JERSEY</b>	5B Rio Arriba	6A Oneida	3A Cabarrus
4A Washington	4A Atlantic	4B Roosevelt	5A Onondaga	4A Caldwell
4A Wayne	5A Bergen	5B Sandoval	5A Ontario	3A Camden
4A Webster	4A Burlington	5B San Juan	5A Orange	3A Carteret*
5A Worth	4A Camden	5B San Miguel	5A Orleans	4A Caswell
4A Wright	4A Cape May	5B Santa Fe	5A Oswego	4A Catawba
	4A Cumberland	4B Sierra	6A Otsego	4A Chatham
	4A Essex	4B Socorro	5A Putnam	4A Cherokee
<b>MONTANA</b>	4A Gloucester	5B Taos	4A Queens	3A Chowan
6B (all)	4A Hudson	5B Tarrant	5A Rensselaer	4A Clay
	5A Hunterdon	4B Union	4A Richmond	4A Cleveland
<b>NEBRASKA</b>	5A Mercer	4B Valencia	5A Rockland	3A Columbus*
5A (all)	4A Middlesex		5A Saratoga	3A Craven
	4A Monmouth	<b>NEW YORK</b>	5A Schenectady	3A Cumberland
<b>NEVADA</b>	5A Morris	5A Albany	6A Schoharie	3A Currituck
5B Carson City (city)	4A Ocean	6A Allegany	6A Schuyler	3A Dare
5B Churchill	5A Passaic	4A Bronx	5A Seneca	3A Davidson
3B Clark	4A Salem	6A Broome	6A Steuben	4A Davie
5B Douglas	5A Somerset	6A Cattaraugus	6A St. Lawrence	3A Duplin
5B Elko	5A Sussex	5A Cayuga	4A Suffolk	4A Durham
5B Esmeralda	4A Union	5A Chautauqua	6A Sullivan	3A Edgecombe
5B Eureka	5A Warren	5A Chemung	5A Tioga	4A Forsyth
5B Humboldt		6A Chenango		

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

(continued)

4A Franklin	3A Rowan	6A LaMoore	4A Clermont	5A Morgan
3A Gaston	4A Rutherford	6A Logan	5A Clinton	5A Morrow
4A Gates	3A Sampson	7 McHenry	5A Columbiana	5A Muskingum
4A Graham	3A Scotland	6A McIntosh	5A Coshocton	5A Noble
4A Granville	3A Stanly	6A McKenzie	5A Crawford	5A Ottawa
3A Greene	4A Stokes	7 McLean	5A Cuyahoga	5A Paulding
4A Guilford	4A Surry	6A Mercer	5A Darke	5A Perry
4A Halifax	4A Swain	6A Morton	5A Defiance	5A Pickaway
4A Harnett	4A Transylvania	7 Mountrail	5A Delaware	4A Pike
4A Haywood	3A Tyrrell	7 Nelson	5A Erie	5A Portage
4A Henderson	3A Union	6A Oliver	5A Fairfield	5A Preble
4A Hertford	4A Vance	7 Pembina	5A Fayette	5A Putnam
3A Hoke	4A Wake	7 Pierce	5A Franklin	5A Richland
3A Hyde	4A Warren	7 Ramsey	5A Fulton	5A Ross
4A Iredell	3A Washington	6A Ransom	4A Gallia	5A Sandusky
4A Jackson	5A Watauga	7 Renville	5A Geauga	4A Scioto
3A Johnston	3A Wayne	6A Richland	5A Greene	5A Seneca
3A Jones	4A Wilkes	7 Rolette	5A Guernsey	5A Shelby
4A Lee	3A Wilson	6A Sargent	4A Hamilton	5A Stark
3A Lenoir	4A Yadkin	7 Sheridan	5A Hancock	5A Summit
4A Lincoln	5A Yancey	6A Sioux	5A Hardin	5A Trumbull
4A Macon		6A Slope	5A Harrison	5A Tuscarawas
4A Madison	<b>NORTH DAKOTA</b>	6A Stark	5A Henry	5A Union
3A Martin	6A Adams	7 Steele	5A Highland	5A Van Wert
4A McDowell	7 Barnes	7 Stutsman	5A Hocking	5A Vinton
3A Mecklenburg	7 Benson	7 Towner	5A Holmes	5A Warren
5A Mitchell	6A Billings	7 Traill	5A Huron	4A Washington
3A Montgomery	7 Bottineau	7 Walsh	5A Jackson	5A Wayne
3A Moore	6A Bowman	7 Ward	5A Jefferson	5A Williams
4A Nash	7 Burke	7 Wells	5A Knox	5A Wood
3A New Hanover*	6A Burleigh	7 Williams	5A Lake	5A Wyandot
4A Northampton	7 Cass		4A Lawrence	
3A Onslow*	7 Cavalier	<b>OHIO</b>	5A Licking	<b>OKLAHOMA</b>
4A Orange	6A Dickey	4A Adams	5A Logan	3A Adair
3A Pamlico	7 Divide	5A Allen	5A Lorain	3A Alfalfa
3A Pasquotank	6A Dunn	5A Ashland	5A Lucas	3A Atoka
3A Pender*	7 Eddy	5A Ashtabula	5A Madison	4B Beaver
3A Perquimans	6A Emmons	5A Athens	5A Mahoning	3A Beckham
4A Person	7 Foster	5A Auglaize	5A Marion	3A Blaine
3A Pitt	6A Golden Valley	5A Belmont	5A Medina	3A Bryan
4A Polk	7 Grand Forks	4A Brown	5A Meigs	3A Caddo
3A Randolph	6A Grant	5A Butler	5A Mercer	3A Canadian
3A Richmond	7 Griggs	5A Carroll	5A Miami	3A Carter
3A Robeson	6A Hettinger	5A Champaign	5A Monroe	3A Cherokee
4A Rockingham	7 Kidder	5A Clark	5A Montgomery	3A Choctaw

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

		<i>(continued)</i>		
4B Cimarron	3A Ottawa	4C Marion	5A Huntingdon	3A Allendale*
3A Cleveland	3A Pawnee	5B Morrow	5A Indiana	3A Anderson
3A Coal	3A Payne	4C Multnomah	5A Jefferson	3A Bamberg*
3A Comanche	3A Pittsburg	4C Polk	5A Juniata	3A Barnwell*
3A Cotton	3A Pontotoc	5B Sherman	5A Lackawanna	3A Beaufort*
3A Craig	3A Pottawatomie	4C Tillamook	5A Lancaster	3A Berkeley*
3A Creek	3A Pushmataha	5B Umatilla	5A Lawrence	3A Calhoun
3A Custer	3A Roger Mills	5B Union	5A Lebanon	3A Charleston*
3A Delaware	3A Rogers	5B Wallowa	5A Lehigh	3A Cherokee
3A Dewey	3A Seminole	5B Wasco	5A Luzerne	3A Chester
3A Ellis	3A Sequoyah	4C Washington	5A Lycoming	3A Chesterfield
3A Garfield	3A Stephens	5B Wheeler	6A McKean	3A Clarendon
3A Garvin	4B Texas	4C Yamhill	5A Mercer	3A Colleton*
3A Grady	3A Tillman		5A Mifflin	3A Darlington
3A Grant	3A Tulsa		5A Monroe	3A Dillon
3A Greer	3A Wagoner	<b>PENNSYLVANIA</b>	4A Montgomery	3A Dorchester*
3A Harmon	3A Washington	5A Adams	5A Montour	3A Edgefield
3A Harper	3A Washita	5A Allegheny	5A Northampton	3A Fairfield
3A Haskell	3A Woods	5A Armstrong	5A Northumberland	3A Florence
3A Hughes	3A Woodward	5A Beaver	5A Perry	3A Georgetown*
3A Jackson		5A Bedford	4A Philadelphia	3A Greenville
3A Jefferson	<b>OREGON</b>	5A Berks	5A Pike	3A Greenwood
3A Johnston	5B Baker	5A Blair	6A Potter	3A Hampton*
3A Kay	4C Benton	5A Bradford	5A Schuylkill	3A Horry*
3A Kingfisher	4C Clackamas	4A Bucks	5A Snyder	3A Jasper*
3A Kiowa	4C Clatsop	5A Butler	5A Somerset	3A Kershaw
3A Latimer	4C Columbia	5A Cambria	5A Sullivan	3A Lancaster
3A Le Flore	4C Coos	6A Cameron	6A Susquehanna	3A Laurens
3A Lincoln	5B Crook	5A Carbon	6A Tioga	3A Lee
3A Logan	4C Curry	5A Centre	5A Union	3A Lexington
3A Love	5B Deschutes	4A Chester	5A Venango	3A Marion
3A Major	4C Douglas	5A Clarion	5A Warren	3A Marlboro
3A Marshall	5B Gilliam	6A Clearfield	5A Washington	3A McCormick
3A Mayes	5B Grant	5A Clinton	6A Wayne	3A Newberry
3A McClain	5B Harney	5A Columbia	5A Westmoreland	3A Oconee
3A McCurtain	5B Hood River	5A Crawford	5A Wyoming	3A Orangeburg
3A McIntosh	4C Jackson	5A Cumberland	4A York	3A Pickens
3A Murray	5B Jefferson	5A Dauphin		3A Richland
3A Muskogee	4C Josephine	4A Delaware	<b>RHODE ISLAND</b>	3A Saluda
3A Noble	5B Klamath	6A Elk	5A (all)	3A Spartanburg
3A Nowata	5B Lake	5A Erie		3A Sumter
3A Okfuskee	4C Lane	5A Fayette	<b>SOUTH</b>	3A Union
3A Oklahoma	4C Lincoln	5A Forest	<b>CAROLINA</b>	3A Williamsburg
3A Okmulgee	4C Linn	5A Franklin	3A Abbeville	3A York
3A Osage	5B Malheur	5A Fulton	3A Aiken	
		5A Greene		



**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

*(continued)*

<b>SOUTH DAKOTA</b>	6A McPherson	4A Dickson	4A Overton	2A Bexar*
6A Aurora	6A Meade	3A Dyer	4A Perry	3A Blanco*
6A Beadle	5A Mellette	3A Fayette	4A Pickett	3B Borden
5A Bennett	6A Miner	4A Fentress	4A Polk	2A Bosque*
5A Bon Homme	6A Minnehaha	4A Franklin	4A Putnam	3A Bowie*
6A Brookings	6A Moody	4A Gibson	4A Rhea	2A Brazoria*
6A Brown	6A Pennington	4A Giles	4A Roane	2A Brazos*
6A Brule	6A Perkins	4A Grainger	4A Robertson	3B Brewster
6A Buffalo	6A Potter	4A Greene	4A Rutherford	4B Briscoe
6A Butte	6A Roberts	4A Grundy	4A Scott	2A Brooks*
6A Campbell	6A Sanborn	4A Hamblen	4A Sequatchie	3A Brown*
5A Charles Mix	6A Shannon	4A Hamilton	4A Sevier	2A Burleson*
6A Clark	6A Spink	4A Hancock	3A Shelby	3A Burnet*
5A Clay	6A Stanley	3A Hardeman	4A Smith	2A Caldwell*
6A Codrington	6A Sully	3A Hardin	4A Stewart	2A Calhoun*
6A Corson	5A Todd	4A Hawkins	4A Sullivan	3B Callahan
6A Custer	5A Tripp	3A Haywood	4A Sumner	2A Cameron*
6A Davison	6A Turner	3A Henderson	3A Tipton	3A Camp*
6A Day	5A Union	4A Henry	4A Trosdale	4B Carson
6A Deuel	6A Walworth	4A Hickman	4A Unicoi	3A Cass*
6A Dewey	5A Yankton	4A Houston	4A Union	4B Castro
5A Douglas	6A Ziebach	4A Humphreys	4A Van Buren	2A Chambers*
6A Edmunds		4A Jackson	4A Warren	2A Cherokee*
6A Fall River	<b>TENNESSEE</b>	4A Jefferson	4A Washington	3B Childress
6A Faulk	4A Anderson	4A Johnson	4A Wayne	3A Clay
6A Grant	4A Bedford	4A Knox	4A Weakley	4B Cochran
5A Gregory	4A Benton	3A Lake	4A White	3B Coke
6A Haakon	4A Bledsoe	3A Lauderdale	4A Williamson	3B Coleman
6A Hamlin	4A Blount	4A Lawrence	4A Wilson	3A Collin*
6A Hand	4A Bradley	4A Lewis		3B Collingsworth
6A Hanson	4A Campbell	4A Lincoln	<b>TEXAS</b>	2A Colorado*
6A Harding	4A Cannon	4A Loudon	2A Anderson*	2A Comal*
6A Hughes	4A Carroll	4A Macon	3B Andrews	3A Comanche*
5A Hutchinson	4A Carter	3A Madison	2A Angelina*	3B Concho
6A Hyde	4A Cheatham	4A Marion	2A Aransas*	3A Cooke
5A Jackson	3A Chester	4A Marshall	3A Archer	2A Coryell*
6A Jerauld	4A Claiborne	4A Maury	4B Armstrong	3B Cottle
6A Jones	4A Clay	4A McMinn	2A Atascosa*	3B Crane
6A Kingsbury	4A Cocke	3A McNairy	2A Austin*	3B Crockett
6A Lake	4A Coffee	4A Meigs	4B Bailey	3B Crosby
6A Lawrence	3A Crockett	4A Monroe	2B Bandera	3B Culberson
6A Lincoln	4A Cumberland	4A Montgomery	2A Bastrop*	4B Dallam
6A Lyman	4A Davidson	4A Moore	3B Baylor	3A Dallas*
6A Marshall	4A Decatur	4A Morgan	2A Bee*	3B Dawson
6A McCook	4A DeKalb	4A Obion	2A Bell*	4B Deaf Smith

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

*(continued)*

3A Delta	2A Hays*	3A Llano*	3B Reeves	2B Webb
3A Denton*	3B Hemphill	3B Loving	2A Refugio*	2A Wharton*
2A DeWitt*	3A Henderson*	3B Lubbock	4B Roberts	3B Wheeler
3B Dickens	2A Hidalgo*	3B Lynn	2A Robertson*	3A Wichita
2B Dimmit	2A Hill*	2A Madison*	3A Rockwall*	3B Wilbarger
4B Donley	4B Hockley	3A Marion*	3B Runnels	2A Willacy*
2A Duval*	3A Hood*	3B Martin	3A Rusk*	2A Williamson*
3A Eastland	3A Hopkins*	3B Mason	3A Sabine*	2A Wilson*
3B Ector	2A Houston*	2A Matagorda*	3A San Augustine*	3B Winkler
2B Edwards	3B Howard	2B Maverick	2A San Jacinto*	3A Wise
3A Ellis*	3B Hudspeth	3B McCulloch	2A San Patricio*	3A Wood*
3B El Paso	3A Hunt*	2A McLennan*	3A San Saba*	4B Yoakum
3A Erath*	4B Hutchinson	2A McMullen*	3B Schleicher	3A Young
2A Falls*	3B Irion	2B Medina	3B Scurry	2B Zapata
3A Fannin	3A Jack	3B Menard	3B Shackelford	2B Zavala
2A Fayette*	2A Jackson*	3B Midland	3A Shelby*	
3B Fisher	2A Jasper*	2A Milam*	4B Sherman	<b>UTAH</b>
4B Floyd	3B Jeff Davis	3A Mills*	3A Smith*	5B Beaver
3B Foard	2A Jefferson*	3B Mitchell	3A Somervell*	6B Box Elder
2A Fort Bend*	2A Jim Hogg*	3A Montague	2A Starr*	6B Cache
3A Franklin*	2A Jim Wells*	2A Montgomery*	3A Stephens	6B Carbon
2A Freestone*	3A Johnson*	4B Moore	3B Sterling	6B Daggett
2B Frio	3B Jones	3A Morris*	3B Stonewall	5B Davis
3B Gaines	2A Karnes*	3B Motley	3B Sutton	6B Duchesne
2A Galveston*	3A Kaufman*	3A Nacogdoches*	4B Swisher	5B Emery
3B Garza	3A Kendall*	3A Navarro*	3A Tarrant*	5B Garfield
3A Gillespie*	2A Kenedy*	2A Newton*	3B Taylor	5B Grand
3B Glasscock	3B Kent	3B Nolan	3B Terrell	5B Iron
2A Goliad*	3B Kerr	2A Nueces*	3B Terry	5B Juab
2A Gonzales*	3B Kimble	4B Ochiltree	3B Throckmorton	5B Kane
4B Gray	3B King	4B Oldham	3A Titus*	5B Millard
3A Grayson	2B Kinney	2A Orange*	3B Tom Green	6B Morgan
3A Gregg*	2A Kleberg*	3A Palo Pinto*	2A Travis*	5B Piute
2A Grimes*	3B Knox	3A Panola*	2A Trinity*	6B Rich
2A Guadalupe*	3A Lamar*	3A Parker*	2A Tyler*	5B Salt Lake
4B Hale	4B Lamb	4B Parmer	3A Upshur*	5B San Juan
3B Hall	3A Lampasas*	3B Pecos	3B Upton	5B Sanpete
3A Hamilton*	2B La Salle	2A Polk*	2B Uvalde	5B Sevier
4B Hansford	2A Lavaca*	4B Potter	2B Val Verde	6B Summit
3B Hardeman	2A Lee*	3B Presidio	3A Van Zandt*	5B Tooele
2A Hardin*	2A Leon*	3A Rains*	2A Victoria*	6B Uintah
2A Harris*	2A Liberty*	4B Randall	2A Walker*	5B Utah
3A Harrison*	2A Limestone*	3B Reagan	2A Waller*	6B Wasatch
4B Hartley	4B Lipscomb	2B Real	3B Ward	3B Washington
3B Haskell	2A Live Oak*	3A Red River*	2A Washington*	5B Wayne

**TABLE C200 – Continued**  
**CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS**  
**BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.  
 Asterisk (\*) indicates a warm-humid location.

(continued)

5B Weber	4C Whatcom	5A Raleigh	6A Juneau	<b>WYOMING</b>
	5B Whitman	5A Randolph	6A Kenosha	6B Albany
<b>VERMONT</b>	5B Yakima	4A Ritchie	6A Kewaunee	6B Big Horn
6A (all)		4A Roane	6A La Crosse	6B Campbell
	<b>WEST VIRGINIA</b>	5A Summers	6A Lafayette	6B Carbon
<b>VIRGINIA</b>	5A Barbour	5A Taylor	7 Langlade	6B Converse
4A (all)	4A Berkeley	5A Tucker	7 Lincoln	6B Crook
	4A Boone	4A Tyler	6A Manitowoc	6B Fremont
<b>WASHINGTON</b>	4A Braxton	5A Upshur	6A Marathon	5B Goshen
5B Adams	5A Brooke	4A Wayne	6A Marinette	6B Hot Springs
5B Asotin	4A Cabell	5A Webster	6A Marquette	6B Johnson
5B Benton	4A Calhoun	5A Wetzel	6A Menominee	6B Laramie
5B Chelan	4A Clay	4A Wirt	6A Milwaukee	7 Lincoln
4C Clallam	5A Doddridge	4A Wood	6A Monroe	6B Natrona
4C Clark	5A Fayette	4A Wyoming	6A Oconto	6B Niobrara
5B Columbia	4A Gilmer		7 Oneida	6B Park
4C Cowlitz	5A Grant	<b>WISCONSIN</b>	6A Outagamie	5B Platte
5B Douglas	5A Greenbrier	6A Adams	6A Ozaukee	6B Sheridan
6B Ferry	5A Hampshire	7 Ashland	6A Pepin	7 Sublette
5B Franklin	5A Hancock	6A Barron	6A Pierce	6B Sweetwater
5B Garfield	5A Hardy	7 Bayfield	6A Polk	7 Teton
5B Grant	5A Harrison	6A Brown	6A Portage	6B Uinta
4C Grays Harbor	4A Jackson	6A Buffalo	7 Price	6B Washakie
4C Island	4A Jefferson	7 Burnett	6A Racine	6B Weston
4C Jefferson	4A Kanawha	6A Calumet	6A Richland	
4C King	5A Lewis	6A Chippewa	6A Rock	<b>U.S. TERRITORIES</b>
4C Kitsap	4A Lincoln	6A Clark	6A Rusk	
5B Kittitas	4A Logan	6A Columbia	6A Sauk	<b>AMERICAN SAMOA</b>
5B Klickitat	5A Marion	6A Crawford	7 Sawyer	1A (all)*
4C Lewis	5A Marshall	6A Dane	6A Shawano	
5B Lincoln	4A Mason	6A Dodge	6A Sheboygan	<b>GUAM</b>
4C Mason	4A McDowell	6A Door	6A St. Croix	1A (all)*
6B Okanogan	4A Mercer	7 Douglas	7 Taylor	
4C Pacific	5A Mineral	6A Dunn	6A Trempealeau	<b>NORTHERN</b>
6B Pend Oreille	4A Mingo	6A Eau Claire	6A Vernon	<b>MARIANA ISLANDS</b>
4C Pierce	5A Monongalia	7 Florence	7 Vilas	1A (all)*
4C San Juan	4A Monroe	6A Fond du Lac	6A Walworth	
4C Skagit	4A Morgan	7 Forest	7 Washburn	<b>PUERTO RICO</b>
5B Skamania	5A Nicholas	6A Grant	6A Washington	1A (all)*
4C Snohomish	5A Ohio	6A Green	6A Waukesha	
5B Spokane	5A Pendleton	6A Green Lake	6A Waupaca	<b>VIRGIN ISLANDS</b>
6B Stevens	4A Pleasants	6A Iowa	6A Waushara	1A (all)*
4C Thurston	5A Pocahontas	7 Iron	6A Winnebago	
4C Wahkiakum	5A Preston	6A Jackson	6A Wood	
5B Walla Walla	4A Putnam	6A Jefferson		



**TABLE C200 – Continued  
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS  
BY STATE, COUNTY AND TERRITORY**

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (\*) indicates a warm-humid location.

<b>C201.1 Tropical Climate Zone.</b> <u>The tropical climate zone shall be defined as:</u>	
<b>(1)</b>	<u>Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands</u>
<b>(2)</b>	<u>Islands in the area between the Tropic of Cancer and the Tropic of Capricorn</u>

**C300  
INTERNATIONAL CLIMATE ZONES**

**C301 International climate zones.** The climate zone for any location outside the United States shall be determined by applying Table C301(1) and then Table C301(2).

**TABLE C301(1)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS**

<b>MAJOR CLIMATE TYPE DEFINITIONS</b>	
Marine (C) Definition – Locations meeting all four criteria: <ol style="list-style-type: none"> <li>1. Mean temperature of coldest month between -3°C (27°F) and 18°C (65°F)</li> <li>2. Warmest month mean &lt;22°C (72°F)</li> <li>3. At least four months with mean temperatures over 10°C (50°F)</li> <li>4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.</li> </ol>	
Dry (B) Definition—Locations meeting the following criteria: Not marine and $P_{in} < 0.44 \times (TF - 19.5)$ $[P_{cm} < 2.0 \times (TC + 7)$ in SI units] where: $P_{in}$ = Annual precipitation in inches (cm) $T$ = Annual mean temperature in °F (°C)	
Moist (A) Definition – Locations that are not marine and not dry.	
Warm-humid Definition – Moist (A) locations where either of the following wet-bulb temperature conditions shall occur during the warmest six consecutive months of the year: <ol style="list-style-type: none"> <li>1. 67°F (19.4°C) or higher for 3,000 or more hours; or</li> <li>2. 73°F (22.8°C) or higher for 1,500 or more hours</li> </ol>	

For SI: °C = [(°F)-32]/1.8; 1 inch = 2.54 cm.

**TABLE C301(2)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS**

<b>ZONE NUMBER</b>	<b>THERMAL CRITERIA</b>	
	<b>IP Units</b>	<b>SI Units</b>
1	9000 <CDD50°F	5000 < CDD10°C
2	6300 < CDD50°F ≤ 9000	3500 < CDD10°C ≤ 5000
3A and 3B	4500 < CDD50°F ≤ 6300 AND HDD65°F ≤ 5400	2500 < CDD10°C ≤ 3500 AND HDD18°C ≤ 3000
4A and 4B	CDD50°F ≤ 4500 AND HDD65°F ≤ 5400	CDD10°C ≤ 2500 AND HDD18°C ≤ 3000

**APPENDIX C – CLIMATE ZONES**

3C	HDD65°F ≤ 3600	HDD18°C ≤ 2000
4C	3600 < HDD65°F ≤ 5400	2000 < HDD18°C ≤ 3000
5	5400 < HDD65°F ≤ 7200	3000 < HDD18°C ≤ 4000
6	7200 < HDD65°F ≤ 9000	4000 < HDD18°C ≤ 5000
7	9000 < HDD65°F ≤ 12600	5000 < HDD18°C ≤ 7000
8	12600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F)-32]/1.8

## APPENDIX D

# EXAMPLES OF THIRD-PARTY PROGRAMS FOR INDOOR ENVIRONMENTAL QUALITY

### D100 SCOPE AND APPLICABILITY

**D101.1 Applicability of Appendix D.** Appendix D is not part of this Standard.

**D101.2 Scope.** Appendix D provides examples of third-party programs for indoor environmental quality that can be used to demonstrate compliance with the applicable provisions of this Standard.

### D200 CONFORMANCE

**TABLE D200(1)**  
**Examples of Third-party Certification Programs**

Related Section of Standard	Examples of Third-party Certification Programs Compliant with the Corresponding Section
901.5 Cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)
901.6 Carpets	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
901.7 Hard-surface flooring	UL GREENGUARD Gold Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
901.8 Wall coverings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program
901.9 Architectural coatings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program Green Seal-11 Standard for Paints and Coatings UL 2768
901.10 Adhesives and sealants	UL GREENGUARD Scientific Certifications Systems (SCS) Indoor Advantage Gold Program Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program Green Seal-36 Standard for Adhesives for Commercial Use
901.11 Insulation	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program

<b>TABLE D200(2)</b> <b>Contact Information for the Example Third-party Certification Programs</b>	
<b>Third-party Certification Program</b>	<b>Contact Information for the Program Administrator</b>
Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)	<i>Kitchen Cabinet Manufacturers Association 1899 Preston White Drive Reston, VA 20191 <a href="http://www.kcma.org">www.kcma.org</a> (703) 264-1690</i>
Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program	<i>Carpet and Rug Institute 730 College Drive Dalton, Georgia 30720 United States of America <a href="http://www.carpet-rug.org">http://www.carpet-rug.org</a> (706) 278-3176</i>
UL GREENGUARD Gold	<i>Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 <a href="http://www.ul.com">www.ul.com</a> (877) 854-3577</i>
Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program	<i>Resilient Floor Covering Institute 115 Broad Street, Suite 201 LaGrange, Georgia 30240 <a href="http://www.rfci.com">http://www.rfci.com</a></i>
Scientific Certification Systems (SCS) Indoor Advantage Gold Program	<i>Scientific Certification Systems 2000 Powell Street, Suite 600 Emeryville, California 94608 <a href="http://www.scs-certified.com">http://www.scs-certified.com</a> (510) 452-8000</i>
Green Seal-11 Standard for Paints and Coatings	<i>Green Seal 1001 Connecticut Avenue, NW, Suite 827 Washington, DC 20036-5525 <a href="http://www.green-seal.org/">http://www.green-seal.org/</a> (202) 872-6400</i>
UL 2768	<i>Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 <a href="http://www.ul.com">www.ul.com</a> (877) 854-3577</i>

## APPENDIX E

# ACCESSORY STRUCTURES

### E100 SCOPE AND APPLICABILITY

**E101.1 Applicability of Appendix E.** Appendix E is part of this Standard. Text identified as “User Note” is not considered part of this Standard.

**E101.2 Scope.** The provisions contained in Appendix E provide the criteria necessary for complying with Section 306 for accessory structures.

### E201 CONFORMANCE

**E201.1 Conformance.** Accessory structures that meet all applicable requirements of Appendix E shall be designated as *conforming*. The *conforming* designation for the accessory structure is separate from the rating achieved by the residential buildings located on the same site or lot. Where residential buildings located on the same lot have not achieved a rating in accordance with this Standard, the accessory structures shall not be eligible for designation under this Appendix. Each accessory structure shall seek a separate designation of *conforming* based on the rules established by the Adopting Entity in accordance with Section E202. The residential building shall not receive points for any practices implemented only for the accessory structure.

### E202 CONFORMANCE CRITERIA

**E202 Conformance Criteria.** Accessory structures shall implement practices from Chapters 5 through 10 in accordance with Sections E202.1 through E202.7.

**E202.1** The practices that are mandatory for the residential building shall also be mandatory for the accessory structure unless these practices are exempt under Sections E202.5 or E202.7.

**E202.2** All land development practices associated with construction of the accessory structure shall comply with the land development practices for the residential building located on the same lot.

**E202.3** For the accessory structures that use the same basic construction and mechanical systems as the residential buildings, the design and construction of the accessory structures shall meet the practices or the intent of the practices implemented to achieve compliance for the residential building located on the same site or lot.

**E202.4** For the accessory structures that use basic construction or mechanical systems that are different from the residential buildings, the design and construction of the accessory structures shall meet the intent of the practice implemented to achieve compliance for the residential building located on the same site or lot.

**E202.5** Where the residential buildings located on the same site or lot include construction methods or systems that do not have functionally equivalent methods or systems as part of the accessory structure, the accessory structure does not need to comply with any of the practices implemented for the residential building with regard to such construction methods or systems.

**User note:** *Examples of the practices that may be exempt from implementation in accessory structures include, but are not limited to:*

- 1) *Section 601.1 Conditioned floor area.*
- 2) *Section 601.5 Prefabricated components – accessory structure is not required to be modular if the residential building is modular.*
- 3) *Section 601.6 Stacked stories – accessory structures are not required to have more than one story if the residential building is more than one story.*
- 4) *Section 602.2 Roof surfaces – if the residential building has a landscaped roof, the accessory structure is not required to have a landscaped roof.*
- 5) *Chapter 7 Energy efficiency – unconditioned spaces in the accessory structure are not required to comply with Chapter 7.*
- 6) *Section 902.3 Radon control except for habitable space.*

**E202.6** Where the accessory structure includes construction methods or systems that do not have functionally equivalent counterparts as part of the residential buildings located on the same site or lot, the Adopting Entity shall review such construction methods and systems and shall establish an approach for meeting the overall intent of the Standard with regard to the minimum acceptable threshold.

**E202.7** Where the use of the accessory structure does not necessitate the implementation of a specific practice in the same manner as the practice applies to the residential building, such practice for the accessory structure may be exempted by the Adopting Entity.

**User note:** *Examples of the practices that may be exempted from implementation in accessory structures include, but are not limited to:*

- 1) *Section 602.1.14 Ice barrier – if the accessory structure does not contain conditioned space, ice barrier is not required.*

## APPENDIX F

# WATER RATING INDEX

**F101.1 Intent.** Provide a flexible method to quantify home water use efficiency as a single number.

**F101.2 Scope.** The Water Rating Index (WRI) is a performance calculation for water use efficiency, including both indoor and outdoor water use.

**F101.3 Capabilities.** The WRI calculation shall include the following capabilities:

- (1) Both new and existing construction.
- (2) The following building types:
  - (a) One and two family dwellings.
  - (b) Townhouses not more than three stories above grade in height.
  - (c) Multifamily buildings as a whole building; or individual dwelling units provided each unit has a separate water meter.
- (3) Three types of WRI rating reports shall be available:
  - (a) Preliminary reports with WRI from plans
  - (b) Final reports with WRI with field verification. The final reports shall be formatted to be compared side-by-side with the preliminary reports.
  - (c) Existing dwellings WRI with field-verified existing conditions.
- (4) Building water use shall be reduced based on the water capture and reuse. Where a specific type of water capture and reuse would violate local laws or ordinances, the amount of water capture and reuse for that specific type shall be zero.
  - (a) The water types for capture and reuse shall be:
    - (i) Rainwater, which is natural precipitation that falls on a structure.
    - (ii) Sitewater, which is natural precipitation that falls on the ground, softscapes, and hardscapes.
    - (iii) Greywater, which is untreated wastewater that has not come into contact with toilet waste, kitchen sink waste, dishwasher waste or similarly contaminated sources:
      - (1) Only wastewater from bathtubs, showers, lavatories, and clothes washers shall be used in the greywater offset calculation.
      - (2) If no filtration/purification system and properly sized tank is present, then Greywater shall only be used outdoors as subsurface irrigation.
    - (iv) Blackwater, which is the liquid and waterborne waste that would be permitted without special treatment into either the public sewer or a private sewage disposal system.
  - (b) Water offset credit for rainwater, sitewater and greywater use indoors shall require filtration, purification and properly sized tanks. Blackwater shall not offset indoor water.

**F101.4 Process.** The following shall be required as part of a WRI implementation:

- (1) Trained WRI Verifiers shall provide field verifications, ratings and the associated reports
- (2) At minimum training shall include

- (a) Confirmation of contract documents including building drawings, site drawings, landscape drawings, specifications, cut sheets, and approved final submittals.
- (b) Visual confirmation of installed site material, fixtures, and equipment.
- (c) Physical field testing of installed fixtures and equipment.
- (d) Ability to utilize a tool that incorporates this WRI calculation.

**F101.5 Compute Water Rating Index.** The WRI is an overall rating for the home on an annual basis. The WRI shall be computed as a percentage of the combined indoor and outdoor water use in relation to the combined indoor and outdoor water baseline

$$\text{WRI} = 100 * (\text{IndoorUse} + \text{OutdoorUse}) / (\text{IndoorBaseline} + \text{OutdoorBaseline})$$

This Appendix specifies which parameters input to the WRI shall be verified from plans and/or field inspection. Variables with the subscript "verified" shall be verified

**F101.6 Indoor Water.** The WRI

(1) Indoor water calculations for annual Baseline and annual Use shall be as follows

$$\text{IndoorBaseline} = [\text{ToiletWater}_{(\text{baseline})} + \text{ShowerWater}_{(\text{baseline})} + \text{BathtubWater}_{(\text{baseline})} + \text{LavatoryWater}_{(\text{baseline})} + \text{FaucetWater}_{(\text{baseline})} + \text{DishWasherWater}_{(\text{baseline})} + \text{ClothesWasherWater}_{(\text{baseline})} + \text{StructuralWasteWater}_{(\text{baseline})} + \text{OtherWaterUse}_{(\text{baseline})}] * 365 \text{ days/year}$$

$$\text{IndoorUse} = [\text{ToiletWater}_{(\text{verified})} + \text{ShowerWater}_{(\text{verified})} + \text{BathtubWater}_{(\text{verified})} + \text{LavatoryWater}_{(\text{verified})} + \text{FaucetWater}_{(\text{verified})} + \text{DishWasherWater}_{(\text{verified})} + \text{ClothesWasherWater}_{(\text{verified})} + \text{StructuralWasteWater}_{(\text{verified})} + \text{OtherWaterUse}_{(\text{verified})}] - \text{IndoorWaterReuseCredit}_{(\text{verified})}$$

(2) NumOccupants = bedrooms + 1

(3) Baseline water for each device in Table 1 shall be:

(a) Baseline<sub>(device)</sub> = VolumePerOccupant<sub>(device)</sub> \* NumOccupants

(b) For dishwasher and clothes washer, if it is verified that there is no hookup  
Baseline<sub>(device)</sub> = 0

(4) Verified use for each device in Table 1 shall be:

(a) Verified<sub>(device)</sub> = VerifiedFlowRate<sub>(device)</sub> \* UseFactor \* NumOccupants

(b) A thermostatic control value (TSV) on all showerheads shall be verified, otherwise the shower shall assume no TSV for all showerheads

(c) For bathtub, dishwasher and clothes washer, if it is verified that there is no hookup  
Verified<sub>(device)</sub> = 0

**TABLE 1. WATER USE FOR BASELINE AND VERIFIED DEVICES**

<u>Device</u>	<u>Baseline VolumePerOccupant gallons / day / occupant</u>	<u>Uses for Verified Devices and units</u>
<u>Toilet</u>	<u>8</u>	<u>5 uses / day / occupant</u>
<u>Shower</u>	<u>13.455</u>	<u>5.382 or 4.7035 with TSVs minutes / day / occupant at device flow rate</u>
<u>Bathtub</u>	<u>1.414</u>	<u>same as the baseline gallons / day / occupant</u>
<u>Lavatory</u>	<u>2.75</u>	<u>1.25 minutes / day / occupant at device flow rate</u>



Faucet	8.8	4 minutes / day / occupant at device flow rate
Dishwasher	1.69	0.26 uses / day / occupant
Clothes Washer	7.41	0.78 uses / day / occupant

- (5) Structural waste, which is the water volume in the pipe between the hot water source and the plumbing fixture or appliance plus the extra volume needed to heat the pipe as hot water is delivered to its use.
- (a) VerifiedStructuralWaste (gallons), shall be field measured as the water volume collected until the temperature of the water equals 100°F at the furthest fixture for a domestic hot water system.
- (i) This test shall be performed before any other tests in order to avoid preheating the pipes. This test shall use an apparatus with a thermometer and water container.
- (ii) If there is more than one domestic hot water system, all systems shall be tested for structural waste with the worst performing system entered into the calculation.
- (b) BaselineStructuralWaste (gallons/day) is approximated based on the house size and configuration. The pipe length is estimated as a horizontal length plus a vertical length.
- (i) EstimatedHorizontalPipe = SQRT(HouseFootprint) \* 2  
which is the pipe length estimated as the distance between two opposite corners of square with same area as house, assuming the pipe went along the length and width of the square.
- (ii) EstimatedVerticalPipe = NumberOfFloors \* FloorHeight  
Except:
- (1) Add half floor height for one story house with crawlspace and water heater on first floor or in garage
- (2) Add half floor height for 1 story with slab
- (3) Subtract 1 floor height for 2 story slab on grade
- (iii) EstimatedTotalPipe = EstimatedHorizontalPipe + EstimatedVerticalPipe
- (iv) BaselineStructuralWaste = EstimatedTotalPipe \* WaterVolumePerPipeLength  
Variables
- (1) HouseFootprint - sf of the exterior conditioned space on the ground floor  
(a) Exception: the attached garage's sf shall be included if a water heater is located in the garage
- (2) FloorToFloorHeight, average floor to floor height (ft) WaterVolumePerPipeLength is gallons per ft pipe from Table 2, based on the predominate type of pipe. For existing homes the value of 0.025 shall be used when the predominant type of pipe is not known

**TABLE 2. GALLONS OF WATER PER FOOT OF PIPE**

<u>Pipe Material</u>	<u>3/8"</u>	<u>1/2"</u>	<u>3/4"</u>	<u>1"</u>
<u>K (fat wall copper)</u>	<u>0.007</u>	<u>0.011</u>	<u>0.023</u>	<u>0.040</u>
<u>L (medium wall copper)</u>	<u>0.008</u>	<u>0.012</u>	<u>0.025</u>	<u>0.043</u>
<u>M (skinny wall copper)</u>	<u>0.008</u>	<u>0.013</u>	<u>0.027</u>	<u>0.045</u>
<u>CPVC</u>	<u>N/A</u>	<u>0.010</u>	<u>0.021</u>	<u>0.035</u>
<u>PEX</u>	<u>0.005</u>	<u>0.009</u>	<u>0.019</u>	<u>0.031</u>

- (c) PreliminaryStructuralWaste (gallons) is the estimated structural waste volume for a building when there is no built construction to verify but a preliminary estimate is necessary to create a comparison to the baseline. This estimate shall be the same as BaselineStructuralWaste, except that the EstimatedHorizontalPipe shall be replaced with the PreliminaryHorizontalPipe computed as:

PreliminaryHorizontalPipe = horizontal measurement of the straight-line distance from the water heater to the furthest hot-water-using fixture on the plans

- (6) Other types of water use. OtherWaterUse (gallons/day)- other water fixture use for fixtures verified to be present
  - (a) The baseline is zero, when device is not present
  - (b) OtherWaterUse sums the water use for fixtures that are present
  - (c) OtherWaterUse includes
    - (i) Water use per manufacturer (gallons/day)
      - (1) Water softeners
      - (2) Humidifiers
      - (3) Evaporative coolers
      - (4) Water filters, except reverse osmosis
    - (ii) Reverse osmosis water use shall be as specified by the manufacturer or shall default to a water waste of 4 times the water consumption
    - (iii) Fountains and spas – water loss (gallons/day) = pan evaporation rate \* area
    - (iv) VerifiedLeaks shall be included as a direct use item. The baseline is no leaks. Leaks are included in both baseline and actual if verified as present for existing or final ratings
    - (v) Where there are multiple fixtures or appliances of the same type, the baseline fixtures and appliances shall be assumed to all be of the same type, flow rate and water use rate
- (7) Master bath adjustment. This item shall apply where there is a master bath. If the flow rate of the individual toilet, lavatory, or shower devices varies, then water use in the master bath and outside the master bath shall be computed separately
  - (a) For each device type, average the device-type flow rates. Compute two separate device-type-averages, one average for the master bath and one average for outside the master bath
  - (b) Device-type uses are divided as follows
    - (i) For each device the total number of uses shall be as given in Table 1, with the uses divided between the master bath and outside the master bath
    - (ii) For master bath toilets and lavatories assume 2 uses each for 2 occupants, for a total of 4 uses per day. For master bath showers assume 1 use each for 2 occupants for a total of 2 uses per day
    - (iii) Assume the remaining uses in Table 1 are outside the master bath
  - (c) For both the master bath and outside the master bath compute water use as the device-type average times the number of uses
  - (d) Add the device water use to ToiletWater, LavatoryWater and ShowerWater as appropriate in the IndoorUse equation in item #1
- (8) Other appliances. For other appliances: If there is more than one of a specific type of appliance, then the worst-case appliance water use shall be used in the ApplianceFlowRate<sub>(device)</sub>. Defaults - If cut sheets or internet information is available for either dishwashers or clothes washers, that information shall supersede these defaults.

**TABLE 4. DEFAULTS FOR CLOTHES WASHERS AND DISHWASHERS**

Clothes Washer	9.5 IWF, 4 CF (ft <sup>2</sup> )
Dishwasher	6.5 gallon/cycle

**F101.7 Water Capture for Potential Reuse.** This calculates the water available for reuse for each month.

(1) RainwaterCapture, GreywaterCapture, and BlackwaterCapture shall be computed for each month

(a) RainwaterCapture<sub>(month)</sub> - gallons/month, includes roofwater and sitewater.  
= [(RoofwaterArea \* RoofSurfaceCapture) + (SitewaterArea \* SiteSurfaceCapture)] \* 0.623  
(gallons/sq ft of 1 in of rain) \* DaysInMonth<sub>(month)</sub>

- (i) RainwaterArea<sub>(roof)</sub> and RainwaterArea<sub>(site)</sub> – Verified Rainwater capture areas for the roof and site in sq ft. Where there is no rainwater capture, these areas shall be zero
- (ii) SiteSurfaceCapture – Site surface affects water capture as specified in Table 6. Site surface shall be verified. Where there are multiple site surface types, the area-weighted average shall be used

**TABLE 6. SITE SURFACE FRACTION CAPTURED**

Surface	Capture
Asphalt	0.83
Concrete	0.88
Brick	0.78
Patios, stone or other pavers	0.88
Unknown (also default)	0.50

- (iii) RoofSurfaceCapture –Roof surface affects water capture as specified in Table 7. Roof surface shall be verified. Where there are multiple roof surface types, the area-weighted average shall be used

**TABLE 7. ROOF SURFACE FRACTION CAPTURED**

Surface	Capture
Asphalt/sloped	0.90
Concrete or Tile/sloped	0.90
Metal/sloped	0.95
Tar & Gravel/sloped	0.80
Membrane/sloped	0.90
Concrete or Tile/flat	0.81
Foam & Gravel/flat	0.62
Foam/flat	0.90
Membrane/flate	0.90
Unknown (also default)	0.50

(b) GreywaterCapture<sub>(month)</sub> - in gallons/month  
= (ShowerWater<sub>(verified)</sub> + BathtubWater<sub>(verified)</sub> + LavatoryWater<sub>(verified)</sub> +  
ClothesWasherWater<sub>(verified)</sub>) \* DaysInMonth<sub>(month)</sub>

(c) BlackwaterCapture<sub>(month)</sub> - in gallons/month  
= (ToiletWater<sub>(verified)</sub> + FaucetWater<sub>(verified)</sub>) \* DaysInMonth<sub>(month)</sub>

(d) To get credit for reuse of captured rainwater, greywater and blackwater

- (i) Tank size shall be 90% of nominal size to provide a safety factor
- (ii) Capture systems shall include filtration and purification for reuse indoors or above ground irrigation
- (iii) Capture water credit for each month shall be no more than the tank size or the captured water available - whichever is less
- (iv) Any remaining unused captured water can be carried over to the following month but not in excess of the tank size
- (v) Reuse of rainwater, greywater and blackwater shall not receive credit in violation of ordnances or other regulations

**F101.8 Outdoor Calculations.** The annual outdoor water use shall be calculated as follows

	<p><u>OutdoorUse = LandscapeWaterUse + NonLandscapeWaterUse</u></p> <p><u>OutdoorBaseline<sub>(month)</sub> = Evapotraspiration<sub>(month)</sub> * LandscapeWaterArea<sub>(total)</sub> * 0.623 (gallons/sq ft of 1 in of rain) where LandscapeWaterArea<sub>(total)</sub> is the total of all the areas that are planted, irrigated, hand-watered or have a water feature like a pool.</u></p>																							
(1)	<p><u>LandscapeWaterUse – Is the annual outdoor water use for landscaping. It sums the monthly water use for each landscape zone into the LandscapeWaterUse</u></p>																							
	(a)	<u>Water use shall be increased for an IrrigationEfficiency of less than 100%, as specified in Table 8</u>																						
	(b)	<u>Water use shall be adjusted based on the irrigation controller, as some controllers conserve water by adjusting for weather or soil conditions</u>																						
	<p><u>LandscapeWaterUse =</u>  <u>For each month that is a water month and for each landscape zone sum</u>  <u>( [Evapotraspiration<sub>(month)</sub> * PlantFractionEvapotraspiration<sub>(zone)</sub> ] - EffectiveRainfall<sub>(month)</sub> ) *</u>  <u>LandscapeArea<sub>(zone)</sub> * (1- IrrigationControllerReduction)<sub>(zone)</sub> / IrrigationEfficiency<sub>(zone)</sub></u></p>																							
	(a)	<u>Multiple physical zones with the same values for Evapotraspiration, IrrigationEfficiency and IrrigationControllerReduction shall be permitted to be combined into one zone with LandscapeArea being the sum of the areas of those zones</u>																						
(2)	<p><u>Months shall be water-months as follows based on approved long-term climate data which includes frost days and average last frost</u></p>																							
	(a)	<u>To define the watering months take the number of frost days in a year, divide by twelve, and round to the nearest whole month</u>																						
	(b)	<u>The month with the average last frost is the beginning of the watering months</u>																						
(3)	<p><u>If an irrigation system is installed, the verifiers shall verify that the irrigation emitters and zones are operational</u></p>																							
(4)	<p><u>Variables:</u></p>																							
	(a)	<u>LandscapeArea<sub>(zone)</sub> - verified landscape zone(s) with specific verified area</u>																						
	(b)	<u>Defaults – If the landscaping cannot be verified then the verifier shall use an automatic minimum of 10% of the LandscapeWaterArea<sub>(total)</sub>. Where the plants cannot be verified, the verifier shall assume plants with the highest water requirements and no irrigation</u>																						
	(c)	<u>IrrigationEfficiency<sub>(zone)</sub> – The efficiency of a specific type of irrigation, a number between 0 and 1</u>																						
		<p><b>TABLE 8. IRRIGATION EFFICIENCY</b></p> <table border="1"> <tr><td>No irrigation</td><td>0</td></tr> <tr><td>Drip – standard</td><td>.7</td></tr> <tr><td>Drip – micro</td><td>.8</td></tr> <tr><td>Drip – press comp</td><td>.9</td></tr> <tr><td>Fixed spray</td><td>.65</td></tr> <tr><td>Micro spray</td><td>.7</td></tr> <tr><td>Rotor</td><td>.7</td></tr> <tr><td>Rotary nozzle</td><td>.75</td></tr> <tr><td>Spray</td><td>.55</td></tr> <tr><td>Flood</td><td>1</td></tr> <tr><td>Direct injection/root</td><td>1</td></tr> </table>	No irrigation	0	Drip – standard	.7	Drip – micro	.8	Drip – press comp	.9	Fixed spray	.65	Micro spray	.7	Rotor	.7	Rotary nozzle	.75	Spray	.55	Flood	1	Direct injection/root	1
No irrigation	0																							
Drip – standard	.7																							
Drip – micro	.8																							
Drip – press comp	.9																							
Fixed spray	.65																							
Micro spray	.7																							
Rotor	.7																							
Rotary nozzle	.75																							
Spray	.55																							
Flood	1																							
Direct injection/root	1																							
	(d)	<u>IrrigationControllerReduction<sub>(zone)</sub> is irrigation water reduction based on a verified weather-based irrigation controller:</u>																						
	(i)	<u>An irrigation controller that integrates rain sensors shall be a 10% IrrigationControllerReduction</u>																						

	(ii)	<a href="#">An irrigation controller that integrates daily weather tracking shall be a 10% IrrigationControllerReduction</a>																
	(iii)	<a href="#">Both i and ii, which shall be a 20% IrrigationControllerReduction</a>																
(5)	<a href="#">Evapotranspiration(month) - Monthly evapotranspiration (ETo)</a>																	
	(a)	<a href="#">Approved long-term evapotranspiration data with a least a monthly resolution shall be used to define monthly evapotranpiration rates for specific locations</a>																
	(b)	<a href="#">PlantFractionEvapotranspiration(zone) – which is from the highest water using plant in that zone</a>																
	(c)	<a href="#">For purposes of identifying plant water demand an approved resource shall be used to identify plant type</a>																
		<p><b>TABLE 9. RELATIVE WATER USE BY PLANT TYPE</b></p> <table border="1"> <thead> <tr> <th><a href="#">Plant Type</a></th> <th><a href="#">Plant Fraction of Evapotranspiration</a></th> </tr> </thead> <tbody> <tr> <td><a href="#">Turf, cool season grasses adapted to temperatures from 65° to 75° F.</a></td> <td><a href="#">0.8</a></td> </tr> <tr> <td><a href="#">Turf, warm season grasses adapted to temperatures between 80° &amp; 95° F</a></td> <td><a href="#">0.6</a></td> </tr> <tr> <td><a href="#">Annual flowers</a></td> <td><a href="#">0.8</a></td> </tr> <tr> <td><a href="#">Woody plants and herbaceous perennials, wet plants adapted to ≥20 in. of annual precipitation</a></td> <td><a href="#">0.7</a></td> </tr> <tr> <td><a href="#">Woody plants and herbaceous perennials, dry plants adapted to 10 to 20 in. of annual precipitation</a></td> <td><a href="#">0.5</a></td> </tr> <tr> <td><a href="#">Desert plants plants adapted to &lt;10 in. of annual precipitation</a></td> <td><a href="#">0.3</a></td> </tr> <tr> <td><a href="#">Home food crops</a></td> <td><a href="#">1.0</a></td> </tr> </tbody> </table>	<a href="#">Plant Type</a>	<a href="#">Plant Fraction of Evapotranspiration</a>	<a href="#">Turf, cool season grasses adapted to temperatures from 65° to 75° F.</a>	<a href="#">0.8</a>	<a href="#">Turf, warm season grasses adapted to temperatures between 80° &amp; 95° F</a>	<a href="#">0.6</a>	<a href="#">Annual flowers</a>	<a href="#">0.8</a>	<a href="#">Woody plants and herbaceous perennials, wet plants adapted to ≥20 in. of annual precipitation</a>	<a href="#">0.7</a>	<a href="#">Woody plants and herbaceous perennials, dry plants adapted to 10 to 20 in. of annual precipitation</a>	<a href="#">0.5</a>	<a href="#">Desert plants plants adapted to &lt;10 in. of annual precipitation</a>	<a href="#">0.3</a>	<a href="#">Home food crops</a>	<a href="#">1.0</a>
<a href="#">Plant Type</a>	<a href="#">Plant Fraction of Evapotranspiration</a>																	
<a href="#">Turf, cool season grasses adapted to temperatures from 65° to 75° F.</a>	<a href="#">0.8</a>																	
<a href="#">Turf, warm season grasses adapted to temperatures between 80° &amp; 95° F</a>	<a href="#">0.6</a>																	
<a href="#">Annual flowers</a>	<a href="#">0.8</a>																	
<a href="#">Woody plants and herbaceous perennials, wet plants adapted to ≥20 in. of annual precipitation</a>	<a href="#">0.7</a>																	
<a href="#">Woody plants and herbaceous perennials, dry plants adapted to 10 to 20 in. of annual precipitation</a>	<a href="#">0.5</a>																	
<a href="#">Desert plants plants adapted to &lt;10 in. of annual precipitation</a>	<a href="#">0.3</a>																	
<a href="#">Home food crops</a>	<a href="#">1.0</a>																	
(6)	<a href="#">NonLandscapeWaterUse shall be the sum of outdoor exposed pools, spas, and fountains, if any</a>																	
	(a)	<a href="#">The water requirement for outdoor uncovered pools, spas, or fountains is 70% of the evapotranspiration (ETo). The water demand is the same covered or uncovered Exception: Pools with motorized covers shall use 40% of the evapotranspiration</a>																
	(b)	<a href="#">The baseline assumes uncovered pools, spas or fountains only if present for the proposed</a>																

<b>F101.9 Water Cost Calculations.</b> <a href="#">Where water costs are calculated the water cost shall be as provided by the jurisdiction having authority.</a>	
(1)	<a href="#">All indoor and outdoor water use shall be included in the water cost calculation. This includes items for which there is no industry accepted baseline efficiency as specified in the Indoor Calculations section of this appendix</a>
(2)	<a href="#">Water cost inputs shall include:</a>
	(a) <a href="#">Billing unit</a>
	(b) <a href="#">Straight or tiered costs per billing unit</a>
	(c) <a href="#">Peak and off-peak costs if applicable</a>
	(d) <a href="#">Indoor and outdoor costs, if separated</a>
	(e) <a href="#">Service charges</a>

|

# INDEX

## A

Accessory Structures ..... 306, Appendix E  
Addition ..... 12.6  
Adhesive Interior ..... 901.10, 12.1.901.10  
Adopting Entity ..... 103.1  
Advanced Framing ..... 601.2(1), 11.601.2(1), 12.1.601.2(1)  
Air Barrier Installation ..... Table 701.4.3.2(2),  
Table 11.701.4.3.2(2), Table 12.1.701.4.3.2(2)  
Air Conditioner ..... Table 703.3.4(1), 706.3(6)  
Air Sealing ..... 701.4.3, 11.701.4.3, 12.1.701.4.2.1,  
12.1.701.4.3.1, 12.1.701.4.3.2  
**Appliance** ..... 703.6, 12.1.703.6.2  
Clothes Dryer ..... 902.1.1(2), 11.902.1.1(2)  
Direct Vent ..... 901.1.3, 901.1.5, 11.901.1.3, 11.901.1.5  
Dishwasher ..... 703.6.2(2), 801.2(1)  
Refrigerator ..... 703.6.2(1)  
Smart Clothes Dryer ..... 706.3(4)  
Smart Clothes Washer ..... 706.3(5)  
Smart Dishwasher ..... 706.3(3)  
Smart Freezer ..... 706.3(2)  
Smart Hot Water Heating System ..... 706.3(8)  
Smart HVAC System ..... 706.3(7)  
Smart Refrigerator ..... 706.3(1)  
Smart Room Air Conditioner ..... 706.3(6)  
Solid Fuel-Burning ..... 605.2(c), 901.2, 11.605.3(c),  
11.901.2, 12.1.901.2.1  
Washing Machine ..... 703.6.2(3), 801.2(2), 801.2(3)  
Architectural Coating ..... 901.9, 11.901.9, 12.1.901.9  
Automatic Demand Response ..... 706.9

## B

Bicycle Parking ..... 11.501.2(5)  
Bicycle Rack ..... 11.501.2(5)  
Biobased Material ..... 606.1, 11.606.1, 12.1(A).606.1  
Boiler ..... 701.4.5, 901.1.1, 901.1.3(1), 11.701.4.5,  
11.901.1.1, 11.901.1.3(1), 12.1.701.4.5  
Boiler Efficiency ..... 703.3.2  
Building Construction Manual ..... 1002.1, 11.1002.1  
Building Orientation ..... 403.2

## C

Cabinet ..... 901.5, 11.901.5, 12.1.901.5  
Capillary Break ..... 602.1.1, 11.602.1.1, 12.6.602.1.1.1  
Carbon Monoxide Alarm ..... 901.12, 11.901.12  
Carpet ..... 611.2(1), 901.6, 901.7(2),  
11.611.2(1), 11.901.6, 11.901.7(2),  
12.1(A).611.2(1), 12.1.901.6, 12.901.7(2)  
Ceiling Fan ..... 703.3.7  
Central Vacuum System ..... 902.5, 11.902.5  
Climate Zones ..... Figure 6(1)  
Coating ..... 901.9, 11.901.9, 12.1.901.9  
Common Area ..... 304.1, 305.3.3, 403.6, 405.6, 503.1(7),  
703.6.1(3), 705.2.1.3, 801.3(2), 901.14(1),  
11.503.1(7), 11.901.14  
Composting ..... 607.1, 11.607.1, 12.2.607.1  
Conditioned Floor Area ..... 601.1, 11.601.1  
Cooling Efficiency ..... 703.3.4  
Crawlspace ..... 602.1.4, 11.602.1.4, 12.6.602.1.4.1  
Cross-Ventilation ..... 902.1.5, 11.902.1.5

## D

Demolition ..... 403.11, 503.8  
Desuperheater ..... 703.5.2  
Documentation ..... 102.3  
Door ..... 602.1.10, 11.602.1.10  
Downspout ..... 602.3, 1002.3(6), 11.602.3, 11.1002.3(6)  
Drain Water Heat Recovery System ..... 703.5.3  
Driveway ..... 405.1, 503.2(3), 505.1,  
11.503.2(3), 11.503.4(3), 11.505.1  
**Duct System** ..... 701.4.2, 703.4, 901.1.2, 11.701.4.2,  
11.901.1.2, 12.1.701.4.2.2, 12.1.701.4.2.3  
Insulation ..... 903.2, 11.903.2, 12.1.903.2  
Space Cooling ..... 703.4.2  
Space Heating ..... 703.4.1  
Testing ..... 703.1.3, 705.6.2.3  
Leakage ..... 703.1.2, 703.4.4

## INDEX

### E

Electric Vehicle Charge Station .....505.6, 706.8, 11.505.6  
Energy Consumption Control..... 706.1  
Energy-recovery Ventilator .....902.2.1(4),11.902.2.1(4)  
Engineered Biological System ..... 802.4  
Envelope Leakage .....703.1.2, 703.2.4  
Environmentally Sensitive Areas ...403.12, 503.7, 11.503.7  
EPA WaterSense Water Budget Tool..... 403.6(4),  
503.5(4), 11.503.5(4)  
**Exhaust Fan** ..... 902.1.4, 902.2.1(1), 902.2.1(2),  
11.902.1.4, 11.902.2.1(1), 11.902.2.1(2)  
    Bathroom ..... 902.1.2, 902.1.3, 11.902.1.2, 11.902.1.3  
    Kitchen.....902.1.3, 905.2, 11.902.1.3, 11.905.2  
    Laundry Room .902.1.2, 902.1.3, 11.902.1.2, 11.902.1.3  
    Range .....902.1.3, 11.902.1.3  
Exterior Door .....602.1.10, 11.602.1.10

### F

**Fenestration** ..... 601.7(c), 703.2.5, 902.1.5,  
11.601.7(c), 11.701.4.6, 11.701.4.7,  
11.902.1.5, 12.1.701.4.6, 12.1.701.4.7  
    Air Leakage.....701.4.3.4, 11.701.4.3.4, 12.1.701.4.3.4  
    Dynamic Glazing .....703.2.5.1.1, 703.2.5.2.1  
    Shading.....703.7.2  
    SHGC.....703.1.1.2, 703.2.5.1  
    U-Factor .....703.2.5.1  
Finished Grade .....602.4, 11.602.4, 12.6.602.4.1  
Fire Sprinkler ..... 802.3  
Fireplace.....901.1.4, 901.1.5, 901.2.1, 901.2.2,  
11.901.1.4, 11.901.1.5, 11.901.2.1,  
11.901.2.2, 12.1.901.1.4, 12.1.901.2.1  
Flashing .....602.1.9, 11.602.1.9, 12.6.602.1.9  
Floor Material.....606.2, 901.7, 11.901.7, 12.1.901.7  
Food Waste Disposer .....607.2, 11.607.2, 12.2.607.2  
**Foundation** .... 601.8, 1001.1(12), 11.601.8, 11.1001.1(12)  
    Drainage .....602.1.3, 11.602.1.3  
    Frost-Protected Shallow..... 601.8, 1001.1(12),  
11.601.8, 11.1001.1(12)  
    Waterproofing .....602.1.2, 11.602.1.2  
Furnace ..... 703.3.2, 901.1.1, 901.1.3(1),  
11.901.1.1, 11.901.1.3(1)

### G

Garage.....901.3, 11.901.3, 12.1.901.3  
Glazing ..... 703.2.5, 703.7, 11.701.4.7, 12.1.701.4.7  
Gray Water ..... 403.6(16), 802.1, 802.2  
Grid-interactive Electric Thermal Storage ..... 706.7  
Ground Source Heat Pump .....703.3.6  
Gutter..... 602.3, 1002.3(6), 11.602.3, 11.1002.3(6)

### H

Hard Wired Lighting.....703.6.1  
Hazardous Waste ..... 11.605.1  
Heat Island ..... 505.2, 11.505.2  
Heat Pump .....901.1.6, 11.901.1.6  
Heat Pump Efficiency .....703.3.3  
Heat-Recovery Ventilator ..... 902.2.1(3), 11.902.2.1(3)  
HERS Index.....701.1.3, 704  
High-Efficacy Lighting..... 701.4.4, 11.701.4.4, 12.1.701.4.4  
Historic Buildings .....101.2  
Homeowner Manual ..... 1001.1, 11.1001.1  
**Hot Water**  
    Insulation .....704.5.3  
    Recirculation System ..... 801.1(5)  
    Usage .....801.1  
Humidifier .....802.5  
**HVAC System**.....701.4.1, 705.5, 902.4, 11.701.4.1,  
11.902.4, 12.1.701.4.1.1, 12.1.701.4.2.1  
    Combo Sysyem.....703.3.1  
    Efficiency .....703.3  
    Leakage Testing .....705.6.2  
    Multiple Sysyem.....703.3.0  
    Return Duct.....705.4  
Hydrozoning .....403.6(9), 503.5(6), 11.503.5(6)

### I

Ice Barrier ..... 602.1.13, 11.602.1.13, 12.6.602.1.13  
ICF..... 701.4.3.2.1(11), 11.701.4.3.2.1(11),  
12.1.701.4.3.2.1(11)  
Indoor Air Quality.....904, 11.904  
Induction Cooktop.....705.3  
Infill ..... 401.1, 501.1(2)(a), 501.2(5), 11.501.2(4)  
**Insulation** ..... 701.4.3, 901.11, 11.701.4.3, 11.901.11,  
12.1.701.4.3.2, 12.1.901.11  
    Grade I..... 701.4.3.2.1, 11.701.4.3.2.1, 12.1.701.4.3.2.1  
    Installation.....701.4.3.2.1, Table 701.4.3.2(2),  
11.701.4.3.2.1, Table 11.701.4.3.2(2),  
Table 12.1.701.4.3.2(2)  
Intensive Bioremediation System .....802.4  
Invasive Plants ..... 503.5(11), 503.5(12),  
11.503.5(11), 11.503.5(12)

### Irrigation

    Drip .....801.6.2  
    Smart Controller.....801.6.4  
    System.....801.6  
    Water ..... 403.6(7), 403.6(8)  
    Zone.....801.6.5





## INDEX

### Soil

Disturbance.....	403.4, 404.3, 503.3, 504.3, 11.503.3, 11.504.3
Erosion.....	403.4, 404.3, 503.3, 504.3, 11.503.3, 11.504.3
Space Heating.....	11.901.1
Spot Ventilation .....	902.1, 11.902.1, 12.1.902.1.1
Sprinkler Nozzle .....	801.6.1
Stack Effect .....	902.1.5, 11.902.1.5
Stacked Stories .....	601.6, 11.601.6
Stormwater Management .....	403.5, 503.4, 11.503.4, 1001.1(22), 1002.1(5), 11.1001.1(22), 11.1002.1(5)
Street Width.....	405.2
Subdivisions .....	302
Submetering .....	705.7
Sump Pump.....	706.4.2
Sun-tempered Design.....	703.7.1
Sustainable Products.....	611.2, 11.611.2, 12.1(A).611.2

### T

### Termite

Barrier .....	602.1.5, 11.602.1.5
Infestation Probably Map .....	Figure 6(3)
Resistant Materials.....	602.1.6, 11.602.1.6
Testing.....	701.4.3.2, 703.1.3, 705.6.2, 11.701.4.3.2
Thermal Mass.....	703.7.3(5), 703.7.4
Training.....	402.2, 1001.2, 1002.4, 11.1001.2, 11.1002.4
Transfer Grille.....	705.4
Tubular Daylight Device.....	705.2.2

### U

<b>UA</b> .....	703.2.1
Compliance .....	703.1.1
Maximum .....	703.1.1.1
Unconditioned Space.....	12.5
Universal Design .....	611.3, 11.611.3, 12.3.611.3
Urinal .....	801.5

### V

Vapor Retarder.....	11.602.1.4
Vegetation .....	404.2, 504.2, 11.504.2
<b>Ventilation</b> ....	701.4.3.2(1), 703.2.4, 706.6, 902.1.3, 902.2, 1001.1(9), 1001.2(11), 11.701.4.3.2(1), 11.902.1.3, 11.902.2, 11.1001.1(8), 11.1002.2(11), Appendix B
Cross .....	902.1.5, 11.902.1.5
Spot .....	902.1, 11.902.1, 12.1.902.1.1
Whole Building.....	902.2, 11.902.2
VOC.....	901.9.1, 901.9.2, 901.10, 11.901.9.1, 11.901.9.2, 11.901.10, 12.1.901.9.1, 12.1.901.10

### W

Wall Covering.....	901.8, 11.901.8, 12.1.901.8
Waste Management Plan ...	605.1, 11.605.2, 12.1(A).605.1
Wastewater Treatment System .....	802.6
Water Closet.....	801.5, 12.3.801.5
<b>Water Heater</b> .....	901.1.1, 901.1.3(2), 11.901.1
Solar .....	703.5.5
Tankless .....	801.1(6)
Water Heating System.....	703.5
Water Heating System Energy Factor .....	703.5.1
Water Source Cooling and Heating .....	703.3.5
Water-Resistive Barrier .....	602.1.8, 11.602.1.8, 12.602.1.8
Wetlands .....	405.5
Whole Building Ventilation.....	902.2, 11.902.2
Whole Dwelling Unit Fan .....	703.3.8
Wildlife Habitat.....	403.7, 404.4, 503.6, 11.503.6
Window Shading.....	703.7.1(7), 703.7.2, 703.7.3(1), 703.7.3(2)
Wood-based Materials....	606.2, 901.4, 11.606.2, 11.901.4, 12.1(A).606.2, 12.1.901.4

