

Public Proposal Report Attachments

September 28, 2018

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P008 – Sleeping Units

ADD NEW DEFINITION:

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.

RELEVANT CHANGES:

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.

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.

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.

ENERGY MONITORING DEVICE. A device installed within a building or dwelling unit or sleeping unit that can provide near real-time data on whole building, ~~or~~ dwelling unit or sleeping unit energy consumption.

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.

MULTIFAMILY BUILDING. A building containing multiple dwelling units or sleeping units and classified as R-2 under the ICC IBC.

PROGRAMMABLE COMMUNICATING THERMOSTAT. A whole building or whole dwelling unit/sleeping unit thermostat that can be monitored and controlled remotely.

REMODELING. The process of restoring or improving an existing building, dwelling unit, sleeping unit, or property.

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 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 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 units, as applicable. Where application of a prescribed practice allows for a different number of points for different units in a multifamily building, the fewer number of points shall be awarded, unless noted that a weighted average is used.

305.3 Whole-building rating criteria

305.3.1 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.

305.3.1.1 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.

305.3.5.1 Energy consumption reduction. The reduction in energy consumption resulting from the remodel shall be based on the estimated annual energy cost 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:

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

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.

305.3.6.1 Water consumption reduction. Water consumption shall be based on the estimated annual use as determined by 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:

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

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/[sleeping units](#) and common areas.

400.0 Intent. This section applies to land development for the eventual construction of buildings or additions thereto that contain dwelling units/[sleeping units](#). 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.

405.7 Density. The average density on a net developable area basis is:

- | | |
|--|----|
| (1) 7 to less than 14 dwelling units/ sleeping units per acre (per 4,047 m ²) | 5 |
| (2) 14 to less than 21 dwelling units/ sleeping units per acre (per 4,047 m ²) | 7 |
| (3) 21 or greater dwelling units/ sleeping units per acre (per 4,047 m ²) | 10 |

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](#).

505.3 Density. The average density on the lot on a net developable area basis is:

- | | |
|--|---|
| (1) 7 to less than 14 dwelling units/ sleeping units per acre (per 4,047 m ²) | 4 |
| (2) 14 to less than 21 dwelling units/ sleeping units per acre (per 4,047 m ²) | 5 |
| (3) 21 to less than 35 dwelling units/ sleeping units per acre (per 4,047 m ²) | 6 |
| (4) 35 to less than 70 dwelling units/ sleeping units per acre (per 4,047 m ²) | 7 |
| (5) 70 or greater dwelling units/ sleeping units per acre (per 4,047 m ²) | 8 |

601.1 Conditioned floor area. Finished floor area of a dwelling unit [or sleeping unit](#) 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.

611.2 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.

701.4.3.1 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: Mandatory

- (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 [or sleeping units](#).
- (j) Attic access openings.
- (k) Rim joist junction.
- (l) Other sources of infiltration.

701.4.3.2 Air sealing and insulation. Grade II and III insulation installation is not permitted. Building envelope air tightness and insulation installation is verified to be in accordance with Section 701.4.3.2(1) and 701.4.3.2(2). Testing. 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:

- (a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;
- (b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;
- (c) Interior doors are open;
- (d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;
- (e) Heating and cooling systems are turned off;
- (f) HVAC duct terminations are not sealed; and
- (g) Supply and return registers are not sealed.

Multifamily Building Note: Testing by dwelling units, [sleeping units](#), groups of dwelling units, [groups of sleeping units](#), or the building as a whole is acceptable.

Visual inspection. The air barrier and insulation items listed in Table 701.4.3.2(2) are field verified by visual inspection.

701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units [or sleeping units](#) is in accordance with one of the following:

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 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.

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 703.3.8 for these specific climate zones, points shall not be awarded in Section 703.3.7)

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 703.3.8
Whole dwelling unit fan**

Climate Zone		
1-3, Tropical	4-6	7-8
POINTS		
4	3	0

703.7.1 Sun-tempered design.

Multifamily Building Note: The site is designed such that at least 40 percent of the multifamily dwelling 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.

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:

50 percent to less than 75 percent of lighting fixtures.

A minimum of 75 percent of lighting fixtures.

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.

705.6.2.1 Air leakage validation of building or dwelling units [or sleeping units](#). 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.

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

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.

programmable communicating thermostat with the capability to be controlled remotely

energy-monitoring device or system

energy management control system

programmable thermostat with control capability based on occupant presence or usage pattern

706.5 On-site renewable energy system. An on-site renewable energy system(s) is 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 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.)

Multifamily Building Note: Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.

2 points per kW Divided by number of dwelling units or sleeping units

801.3 Showerheads. Showerheads are in accordance with the following:

The total maximum combined flow rate of all showerheads 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.

(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.)

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)** 2.0 to less than 2.5 gpm
- (b)** 1.6 to less than 2.0 gpm
- (c)** Less than 1.6 gpm

Any shower control that can shut off water flow without affecting temperature is installed.

(Points awarded per shower control.)

801.4.1 Water-efficient lavatory faucets with 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, are installed:

a bathroom (all faucets in a bathroom are in compliance)

(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.)

all lavatory faucets in the dwelling unit(s) or sleeping unit(s)

801.5 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.)

Gold and emerald levels: All water closets and urinals are in accordance with Section 801.5.

A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less and meets the flush performance criteria when tested in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable.

(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.)

All water closets are in accordance with Section 801.5(2).

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.

(c) One or more composting or waterless toilets and/or urinals.

801.8 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](#).

901.1.4 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.

11.505.3 Density. The average density on the lot on a net developable area basis is:

7 to less than 14 dwelling units/[sleeping units](#) per acre (per 4,047 m²)

14 to less than 21 dwelling units/[sleeping units](#) per acre (per 4,047 m²)

21 to less than 35 dwelling units/[sleeping units](#) per acre (per 4,047 m²)

35 to less than 70 dwelling units/[sleeping units](#) per acre (per 4,047 m²)

70 or greater dwelling units/[sleeping units](#) per acre (per 4,047 m²)

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.

Less than or equal to 700 square feet (65 m²)

less than or equal to 1,000 square feet (93 m²)

less than or equal to 1,500 square feet (139 m²)

less than or equal to 2,000 square feet (186 m²)

less than or equal to 2,500 square feet (232 m²)

greater than 4,000 square feet (372 m²)

(For every 100 square feet (9.29 m²) over 4,000 square feet (372 m²), one point is to be added the threshold points shown in Table 305.3.7 for each rating level.)

Multifamily Building Note: For a multifamily building, a weighted average of the individual unit sizes is used for this practice.

11.611.2 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 sleeping unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065.

- 50% or more of carpet installed (by square feet) is certified to NSF 140.
- 50% or more of resilient flooring installed (by square feet) is certified to NSF 332.
- 50% or more of the insulation installed (by square feet) is certified to EcoLogo CCD-016.
- 50% or more of interior wall coverings installed (by square feet) is certified to NSF 342
- 50% or more of the gypsum board installed (by square feet) is certified to UL 100.
- 50% or more of the door leafs installed (by number of door leafs) is certified to UL 102.
- 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.

11.701.4.3.1 Building thermal envelope air sealing. 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:

- (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 or sleeping units.
- (j) Attic access openings.
- (k) Rim joist junction.
- (l) Other sources of infiltration.

11.701.4.3.2 Air sealing and insulation. Grade II and III insulation installation is not permitted. Building envelope air tightness and insulation installation is verified to be in accordance with Section 11.701.4.3.2(1) and 11.701.4.3.2(2).

Testing. 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:

- Exterior windows and doors, fireplace and stove doors are closed, but not sealed;
- Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft, and flue dampers;
- Interior doors are open;
- Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;
- Heating and cooling system(s) is turned off;

HVAC ducts terminations are not sealed; and

Supply and return registers are not sealed.

Multifamily Building Note: Testing by dwelling units, [sleeping units](#), groups of dwelling units, [groups of sleeping units](#), or the building as a whole is acceptable.

Visual inspection. The air barrier and insulation items listed in Table 11.701.4.3.2(2) are field verified by visual inspection.

11.701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units [or sleeping units](#) is in accordance with one of the following:

A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent

Lighting power density, measured in watts/square foot, is 1.1 or less.

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.

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:

All joints, seams, and penetrations.

Site-built windows, doors, and skylights.

Openings between window and door assemblies and their respective jambs and framing.

Utility penetrations.

Dropped ceilings or chases adjacent to the thermal envelope.

Knee walls.

Walls and ceilings separating a garage from conditioned spaces.

Behind tubs and showers on exterior walls.

Common walls between dwelling units [or sleeping units](#).

Attic access openings.

Rim joist junction.

Other sources of infiltration.

12.1.701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units [or sleeping units](#) is in accordance with one of the following:

A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent

Lighting power density, measured in watts/square foot, is 1.1 or less.

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 [or sleeping units](#) and direct heating equipment are vented to the outdoors.

APPENDIX B

WHOLE BUILDING VENTILATION SYSTEM SPECIFICATIONS

P042 – Certified Compliance Path for SF Homes, Townhomes, and Duplexes

Submitter: Michelle Foster, Aaron Gary, Bill Sanderson, Matt Dobson, Jerud Martin, Matt Cooper

Consensus Committee Action: Approved as Modified

Consensus Committee Reason Statement: To address the issues and concerns brought up by the original proposal; e.g., name of certification, water heater efficiencies, details in site provisions.

New CHAPTER XX: Certified Compliance Path for SF Homes, Townhomes, and Duplexes

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.

303.2 Green Buildings (remains the same)

- (1) Xx
- (2) Xx
- (3) xx

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

XX.00 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.

LOT DEVELOPMENT

Floodplain. Construction shall not occur in a floodplain or construction shall be elevated above the floodplain.

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.

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.

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.

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.

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.

RESOURCE EFFICIENCY (Durability)

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.

Foundation drainage. Where required by the IRC for habitable and usable spaces below grade, exterior drain tile shall be installed.

Dampproof walls shall be provided below finished grade.

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.

Dry Insulation. Insulation in cavities shall be dry in accordance with manufacturer’s instructions before enclosing (e.g., with drywall).

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.

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 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.

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.

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.

Architectural features. Horizontal ledgers shall be sloped away to provide gravity drainage as appropriate for the application.

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.

XX.602.1.10 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

XX.602.1.12 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.

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.

ENERGY EFFICIENCY

XX.701.0 Mandatory requirements. The building shall comply with Section XX.701 AND XX.702.0 (Performance Path), Section 13.703.0 (Prescriptive Path), or Section 13.704.0 (HERS Index Target Path). Sampling shall not be permitted for this alternative compliance path.

XX.701.1 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.

XX.701.2 HVAC system sizing. Lot-specific 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 and Manual D; or equivalent.

XX.701.3 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. Postconstruction 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*.

XX.701.4 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).

XX.701.5 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:

- (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.

XX.701.6 Air sealing and insulation. 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.

- A. **Testing.** Building envelope tightness shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zone 1 or 2 and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E-779 or ASTM 1827 or RESNET/ICC 380 using a blower door at a test pressure of 1.04 psf (50 Pa). Testing shall be conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. Testing shall be conducted under the following conditions:
 - a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;
 - b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;
 - c) Interior doors are open;
 - d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;
 - e) Heating, cooling, and ventilation systems are turned off;
 - f) HVAC duct terminations are not sealed; and
 - g) Supply and return registers are not sealed.
- B. **Visual inspection.** The air barrier and insulation items listed in Table 13.701.4.3.2(2) shall be field verified by visual inspection.

Table 701.4.3.2(2)
AIR BARRIER AND INSULATION INSTALLATION

<u>COMPONENT</u>	<u>AIR BARRIER CRITERIA</u>	<u>INSULATION INSTALLATION CRITERIA</u>
<u>General requirements</u>	<u>A continuous air barrier shall be installed in the building envelope.</u> <u>The exterior thermal envelope contains a continuous air barrier.</u> <u>Breaks or joints in the air barrier shall be sealed.</u>	<u>Air-permeable insulation shall not be used as a sealing material.</u>
<u>Ceiling/attic</u>	<u>The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed.</u> <u>Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.</u>	<u>The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.</u>
<u>Walls</u>	<u>The junction of the foundation and sill plate shall be sealed.</u> <u>The junction of the top plate and the top of exterior walls shall be sealed.</u> <u>Knee walls 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> <u>Exterior thermal envelope insulation for framed walls shall be installed in substantial</u>

		<u>contact and continuous alignment with the air barrier.</u>
<u>Windows, skylights and doors</u>	<u>The space between window/doorjamb and framing, and skylights and framing shall be sealed.</u>	
<u>Rim joists</u>	<u>Rim joists shall include the air barrier.</u>	<u>Rim joists shall be insulated.</u>
<u>Floors (including above garage and cantilevered floors)</u>	<u>The air barrier shall be installed at any exposed edge of insulation.</u>	<u>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.</u>
<u>Crawl space walls</u>	<u>Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.</u>	<u>Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.</u>
<u>Shafts, penetrations</u>	<u>Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.</u>	
<u>Narrow cavities</u>		<u>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.</u>
<u>Garage separation</u>	<u>Air sealing shall be provided between the garage and conditioned spaces.</u>	
<u>Recessed lighting</u>	<u>Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.</u>	<u>Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.</u>
<u>Plumbing and wiring</u>		<u>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.</u>
<u>Shower/tub on exterior wall</u>	<u>The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.</u>	<u>Exterior walls adjacent to showers and tubs shall be insulated.</u>
<u>Electrical/phone box on exterior walls</u>	<u>The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.</u>	
<u>HVAC register boots</u>	<u>HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.</u>	
<u>Concealed sprinklers</u>	<u>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.</u>	

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

XX.701.7 High-efficacy lighting. A minimum of 90 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent.

XX.701.8 Appliances. If installed, refrigerator, dishwasher, and/or washing machine shall be ENERGYSTAR or equivalent.

XX.701.9 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)

XX.702.0 Energy performance pathway.

XX.702.1 IECC analysis. 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.

XX.702.2 Energy performance analysis. 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.

XX.703.0 Energy prescriptive pathway

XX.703.1 UA Compliance. 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

XX.703.1.1 Maximum UA. The total building UA is less than or equal to the total maximum UA as computed by IECC Section R402.1.5. 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.

XX.703.1.2 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^b	SKYLIGHT^b U-FACTOR	GLAZED FENESTRATION SHGC^{b, c}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUEⁱ	FLOOR R-VALUE	BASEMENT WALL U-FACTOR	SLAB^d R-VALUE & DEPTH	CRAWL SPACE^e WALL R-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.32	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.32	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.30	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	20+5 ^h or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
7 and 8	0.30	0.55	NR	49	20+5 ^h or 13+10 ^h	19/21	38 ^g	15/19	10, 4 ft	15/19

NR = Not Required. For SI: 1 foot = 304.8 mm.

- a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
- c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
- d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
- e. There are not SHGC requirements in the Marine Zone.
- f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.
- g. Alternatively, insulation sufficient to fill the framing cavity and providing not less than an R-value of R-19.
- h. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- i. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall

R402.1.4 U-factor alternative.

An assembly with a U-factor equal to or less than that specified in Table R402.1.4 shall be an alternative to the R-value in Table R402.1.2.

**TABLE R402.1.4
EQUIVALENT U-FACTORS**

<u>CLIMATE ZONE</u>	<u>FENESTRATION U-FACTOR</u>	<u>SKYLIGHT U-FACTOR</u>	<u>CEILING U-FACTOR</u>	<u>FRAME WALL U-FACTOR</u>	<u>MASS WALL U-FACTOR^b</u>	<u>FLOOR U-FACTOR</u>	<u>BASEMENT WALL U-FACTOR</u>	<u>CRAWL SPACE WALL U-FACTOR</u>
<u>1</u>	<u>0.50</u>	<u>0.75</u>	<u>0.035</u>	<u>0.084</u>	<u>0.197</u>	<u>0.064</u>	<u>0.360</u>	<u>0.477</u>
<u>2</u>	<u>0.40</u>	<u>0.65</u>	<u>0.030</u>	<u>0.084</u>	<u>0.165</u>	<u>0.064</u>	<u>0.360</u>	<u>0.477</u>
<u>3</u>	<u>0.32</u>	<u>0.55</u>	<u>0.030</u>	<u>0.060</u>	<u>0.098</u>	<u>0.047</u>	<u>0.091^c</u>	<u>0.136</u>
<u>4 except Marine</u>	<u>0.32</u>	<u>0.55</u>	<u>0.026</u>	<u>0.060</u>	<u>0.098</u>	<u>0.047</u>	<u>0.059</u>	<u>0.065</u>
<u>5 and Marine 4</u>	<u>0.30</u>	<u>0.55</u>	<u>0.026</u>	<u>0.060</u>	<u>0.082</u>	<u>0.033</u>	<u>0.050</u>	<u>0.055</u>
<u>6</u>	<u>0.30</u>	<u>0.55</u>	<u>0.026</u>	<u>0.045</u>	<u>0.060</u>	<u>0.033</u>	<u>0.050</u>	<u>0.055</u>
<u>7 and 8</u>	<u>0.30</u>	<u>0.55</u>	<u>0.026</u>	<u>0.045</u>	<u>0.057</u>	<u>0.028</u>	<u>0.050</u>	<u>0.055</u>

- 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

XX.703.2 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

<u>Climate Zone</u>	<u>Space Cooling System</u>	<u>Space Heating System - select 1 option from below</u>				<u>Water Heating System - select 1 option from below</u>		
	<u>AC</u>	<u>Gas Furnace</u>	<u>Gas Boiler</u>	<u>ASHP</u>	<u>GSHP or WSHP</u>	<u>Gas Tank WH</u>	<u>Gas Tankless WH</u>	<u>Elec Tank WH</u>
	<u>Min. Req.</u>	<u>Min. Req.</u>	<u>Min. Req.</u>	<u>Min. Req.</u>	<u>Min. Req.</u>	<u>Min. UEF Req.</u>	<u>Min. UEF Req.</u>	<u>Min. UEF Req.</u>
<u>1</u>	<u>15 SEER**</u>	<u>NR</u>	<u>85%</u>	<u>NR</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>2</u>	<u>15 SEER**</u>	<u>NR</u>	<u>85%</u>	<u>NANR</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>3</u>	<u>15 SEER**</u>	<u>92%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>4</u>	<u>15 SEER**</u>	<u>92%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>5</u>	<u>14 SEER</u>	<u>95%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>6</u>	<u>14 SEER</u>	<u>95%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>7</u>	<u>14 SEER</u>	<u>95%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>0.78</u>	<u>>.93</u>	<u>>.92</u>
<u>8</u>	<u>14 SEER</u>	<u>95%</u>	<u>85%</u>	<u>> 8.5 HSPF*</u>	<u>Any</u>	<u>⚡</u>	<u>>.93</u>	<u>>.92</u>

* > 8.2 HSPF for single package

**zones 1-4 >12.5 EER for split; >12 EER for single package

NR = No requirement

XX.703.3 Duct leakage.

The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

- 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 m²) 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 m²) of conditioned floor area.
- 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 m²) of conditioned floor area.

XX.703.4 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.

XX.705.0 HERS Index target pathway

XX.705.1 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.

WATER EFFICIENCY

XX.803 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.

XX.805 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.

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.

Alternative Compliance Path: Water Rating Index (WRI) needs to achieve set level 75.

INDOOR ENVIRONMENTAL QUALITY

XX.901.1.4 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.

XX.901.2 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.

XX.902 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.

XX.903 Carpets. Wall-to-wall carpeting shall not be installed adjacent to

- (a) water closets and bathing fixtures, and
- (b) exterior doors.

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.

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)

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

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

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

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

MERV filters. Minimum 8 MERV filters shall be installed on central forced air systems and are accessible.

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.
- 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.

HOMEOWNER OPERATION AND MAINTAINANCE

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.

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

P044 – Non-Residential New Construction

101.1 Intent. This chapter shall provide green requirements for the non-residential portion(s) of a mixed-use building.

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.

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.

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.

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.

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.

102.1.4 Alternate compliance. Non-residential portions of a building shall comply with Chapters 6 through 10 of the International Green Construction Code.

Exception: Section 6.3.1 of the International Green Construction Code.

103.1 Bicycle Parking. Bicycle parking shall comply with section 103.1.1 through 103.1.2

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.
- 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.

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.

104 Resource efficiency

104.1 Enhanced Durability

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.

104.1.2 Foundation drainage. Where required by the ICC IBC for habitable and usable spaces below grade, exterior drain tile is installed.

104.1.3 Dampproof walls. Walls that retain earth, and encloses interior space are required to be dampproof per ICC IBC Section 1805.

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.

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:

- (13) around exterior fenestrations, skylights, and doors
- (14) at roof valleys
- (15) at all building-to-deck, -balcony, -porch, and -stair intersections
- (16) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets
- (17) at ends of and under masonry, wood, or metal copings and sills
- (18) above projecting wood trim
- (19) at built-in roof gutters, and
- (20) drip edge is installed at eave and rake edges.
- (21) Window and door head and jamb flashing is either self-adhered or liquid applied.
- (22) Flashing is installed at exterior windows and doors
- (23) Through-wall flashing is installed at transitions between wall cladding materials or wall construction types.
- (24) Flashing is installed at the expansion joint in stucco walls.

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.

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.

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.

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)

104.2 Construction material and waste management plan. A written construction waste management plan is posted at the jobsite, and implemented.

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.

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. Biobased 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

105 Energy Efficiency

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 ~~that includes both the opaque envelop and fenestration~~ 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.

105.1.1 Insulation installation. Insulation installed in the thermal envelope shall be visually inspected. Grade II and III insulation installation is not permitted.

105.2 Building thermal envelope fenestration. The non-residential portion of the building ~~must contain the equivalent fenestration values utilized in the residential portion~~ shall be in accordance with the requirements of Section C402.4 of the International Energy Conservation Code as applicable.

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.

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/ft² (2.0 L/s • m²).

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.

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.

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

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.

105.8 Commissioning.

105.8.1 Mechanical and service water heating systems. Mechanical and service water heating systems shall comply with ICC IECC Section C408.2.

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.

105.10 Duct air sealing. Ductwork shall be constructed in accordance with the ICC IMC.

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.

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.

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.

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.

105.12 Energy options. Non-residential portions of the building shall comply with one of the three options below:

105.12.1 Energy requirements shall be met if modeling in accordance with C407 shows a 10% reduction in energy from the IECC.

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.

105.12.3 Energy requirements shall be met if at least two options in IECC Section C406 are met.

106 Water efficiency and conservation.

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.
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**

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE OR FLUSH VOLUME
Showerhead ^a	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 ^b 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 dwelling units and guest rooms	2.2 gpm at 60 psi
Urinal	0.5 gpf or nonwater urinal
Water closet	1.28 gpf ^{c,d}
Prerinse Spray Valves	1.3 gpm
Drinking Fountains (manual)	0.7 gpm ^e
Drinking Fountains (metered)	0.25 gpc ^{b,e}

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

- d. 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.

106.2 Once-through cooling for appliances and equipment. Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited.

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:

4. Residential Clothes Washers, Front-loading, > 2.5 cu-ft maximum IWF 3.2 minimum IMEF 2.76
5. Residential Clothes Washers, Top-loading, > 2.5 cu-ft maximum 4.3 IWF, minimum IMEF 2.06
6. Residential Clothes Washers (≤ 2.5 cu-ft) maximum 4.2 IWF, minimum IMEF 2.07
7. Commercial Clothes Washers maximum 4.0 IWF, minimum MEF 2.20

106.4 Food Service.

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.

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. A garbage 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.

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.

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.

106.5. Water softeners. Water softeners shall comply with Sections 106.5.1 through 106.5.3.

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.

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.

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*.

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.

107 Indoor air quality

107.1 Carpets. Carpeting is not installed adjacent to water closets and bathing and or shower fixtures.

107.1.1 Entry. The primary entryway from the outdoors shall include one of the following:

1. Permanent walk-off mat that is at least 4 foot (1.2 meters) long and allows access for cleaning (e.g., grating with catch basin); or
2. Roll-out mat that is at least 6 foot (1.8 meters) long and will be maintained on a weekly basis by a contracted service.

107.2 Prohibited materials. The use of the following materials shall be prohibited:

1. Asbestos-containing materials
2. Urea-formaldehyde foam insulation

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

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.

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.

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.

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.

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.

107.4.5 Unvented. Unvented room heaters and unvented decorative appliances, including alcohol burning, shall be prohibited.

107.5 Protection of HVAC system openings. HVAC supply and return duct and equipment openings shall be protected during dust-producing operations of construction.

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.

107.7 Spot Ventilation. Exhaust systems shall be provided in accordance with Chapter 5 of the ICC IMC or ASHRAE 62.1.

107.8 Building Ventilation Systems.

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.

107.8.2 Air filters. Air filters with a minimum MERV rating of 6 are installed on central forced air systems and are accessible.

107.9 Radon system. [SAME AS RESIDENTIAL SECTION]

107.9 Radon testing. Section x shall apply to radon zone 1 as defined in Figure 9(1).

~~Exceptions: Section x shall not be required where the authority having jurisdiction has defined the radon zone as Zone 2 or 3. Section x shall not be required where the occupied has no ground contact.~~

~~Radon testing shall be performed as specified in (a) through (j). This section does not require a specific test result, rather it requires the test be performed and the results provided to the registered design professional or owner.~~

~~(a) Testing is performed after the building meets its air tightness requirements.~~

~~(b) If there is a radon control system, testing is performed after the radon control system installation is complete. If the system has an active fan the building shall be tested with the fan operating.~~

~~(c) Testing is performed at the lowest level that will be occupied, even if the space is not finished. Spaces that are physically separated and covered by different HVAC systems shall be tested separately.~~

~~Exception – Section x shall not be required where the occupied space has no ground contact.~~

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

~~(e) Testing is performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing with test kits shall include two tests, which are averaged. Testing shall be in accordance with the testing device manufacturer's instructions.~~

~~(f) Testing shall be performed by the builder, a registered design professional or approved third party.~~

~~(g) Testing shall extend at least 48 hours or to the minimum specified by the testing device manufacturer, which ever is longer. This initial testing shall be permitted to extend past occupancy.~~

~~(h) Test results shall be provided directly to the owner by the test lab or testing party. The test results shall be delivered before or after occupancy.~~

~~(i) An additional pre-paid test kit shall be provided to the owner to use when they choose. The test kit shall include mailing, or emailing the results from the testing lab to the owner. The builder shall also be permitted to receive the test results.~~

~~(j) The registered design professional or owner 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. EPA recommends radon reduction measures to lower radon levels below 4 pCi/L." Or "For a radon test result of 4 pCi/L or above [name of builder or jurisdiction having authority] recommends radon reduction measures to lower radon levels below 4 pCi/L."~~

108 Operation, maintenance, and building owner education

108.1 OPERATION AND MAINTENANCE MANUALS FOR TENANTS. 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.

- 1) A narrative detailing the importance of operating in a green building. This narrative is included in all responsible parties' manuals.
- 2) A list of practices to conserve water and energy which require maintenance.
- 3) Information on opportunities to purchase renewable energy from local utilities or national green power providers.
- 4) Information on local and on-site recycling and hazardous waste disposal programs.
- 5) Local public transportation options for employees.
- 7) ~~Information on organic pest control and green cleaning products.~~

108.2 TENANT FINISH OUT MANUAL. 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.

- 1) 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.
- 2) 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.
- 3) 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.

CHAPTER 13

NON-RESIDENTIAL NEW CONSTRUCTION

101.2 Scope. This chapter shall apply to the non-residential portions of buildings. Occupancy classifications shall be determined in accordance with the *International Building Code*.

101.2.1 Exempt buildings and systems. This chapter shall not apply to temporary structures approved under Section 108 or Section 3103 of the *International Building Code*.

101.3 Unoccupied spaces. Specific requirements of this chapter for the inside space shall be satisfied if the requirements are specified in the construction documents, even if the non-residential inside construction is not complete provided:

- 1) The residential space has received occupancy permit(s) or has progressed to the point to receive an ICC 700 certification,
- 2) In the judgment of the authority having jurisdiction for ICC 700, it not practical to implement that specific requirement prior to the residential building receiving an occupancy permit or ICC 700 certification. The non-residential occupancy class being unknown and that specific requirement applying to some, but not all, occupancy classes is a valid reason for that specific requirement being impractical.

The requirements for the thermal envelop and items outside the building shall be met before certification of the building.

105.6 Approved programs and standards. The authority having jurisdiction shall be permitted to deem a national, state or local program or standard to meet or exceed this chapter. Approval for a specified application, limited scope or specific locale shall be permitted. Such programs or standards are not administered under ICC 700. Buildings approved in writing by such a program shall be considered in compliance with this chapter.

401 SITE DEVELOPMENT AND LAND USE

401.1 Intent. Develop and maintain building sites to minimize negative environmental impacts and to protect, restore and enhance the natural features and environmental quality of the site.

402.1 Protected areas. Construction shall comply with jurisdictional, state and Federal regulation concerning park lands, agricultural lands, flood hazard areas, conservation areas, greenfields, brownfields, sites adjacent to surface water bodies and wetlands. Construction documents shall show the location of the protected areas on, or adjacent to the building site. Construction documents shall show any required buffer zones around protected areas.

402.1.1 Flood hazard areas. New construction shall not be permitted in *flood hazard areas*. Where permitted, building site improvements shall comply with this chapter.

402.1.2 Surface water protection. Construction and site improvements shall not occur within the ordinary high-water mark of seas, lakes, rivers and streams. Approved construction in the protected area, including any required mitigation, shall be permitted where the improvements are related to the use of the associated body of water.

Exception: Buildings and associated site improvements permitted under a national wetlands permitting program or otherwise permitted by the authority having jurisdiction.

402.2 Site assessment. An assessment of the *building site* shall:

Where *preferred plant species* are defined by the jurisdiction, identify *preferred plant species* on the site. Determine the location of any areas protected by applicable zoning or environmental regulations that are located on, or adjacent to the *building site*;

402.3 Vegetation and soil protection. *Construction documents* shall identify existing vegetation and soils on a *building site* to be preserved and protected. Protected areas and plants with undisturbed soils shall be provided a physical barrier, such as temporary fencing or other physical barrier. Perimeters around trees shall be identified as a circle with a radius of not less than 1 foot (305 mm) for every inch (25.4 mm) of tree diameter, with a minimum radius of 5 feet (1524 mm). Perimeters around shrubs shall be not less than twice the radius of the shrub.

Exception: *Approved* alternative perimeters appropriate to the location and the species of the trees and shrubs shall be permitted.

402.4. Topsoil protection. *Topsoil* that could be damaged by construction or equipment shall be removed and stockpiled for future reuse. *Topsoil* stockpiles shall be protected with temporary or permanent soil stabilization measures to prevent erosion or compaction.

402.5 Soil reuse and restoration. Soils that are being reused shall be prepared, amended and placed to establish or restore the ability of the soil to support the planned vegetation.

402.6 Pervious and permeable pavement. Pervious and permeable pavements including open grid paving systems and open-graded aggregate systems shall be permitted where they do not interfere with access and egress of fire and emergency vehicles or personnel; utilities; or telecommunications lines.

402.6 Stormwater. Stormwater management for the *building site* or complex of building sites *within the development* shall address the potential increase in runoff that would occur resulting from construction and shall either:

1. Manage rainfall on-site to retain, use or infiltrate at a minimum, the volume of a single storm which is equal to the *95th percentile rainfall event*; or
 2. Improve, maintain or restore the pre-development stable runoff of the site in an approved manner.
- Runoff rate and volume shall not exceed predevelopment rates.

402.6.1. Rainwater catchment. Where allowed by the jurisdiction, rainwater catchment shall be permitted to be used as part of stormwater management.

402.6.2. Site infiltration. Infiltration into the site or development shall be permitted to be used as part of stormwater management. Site infiltration includes drainage of impermeable surfaces onto vegetated areas, rain gardens or permeable hardscapes.

402.6.3. Adjoining lots. The stormwater management system shall not cause increased erosion or other drainage related damage to adjoining *lots* or public property.

402.7 Plant selection. Plants selected for use on the building site shall comply with the following:

To the extent defined by the jurisdiction, *preferred plant species* shall be used in accordance with the guidelines established by the jurisdiction.

Invasive plant species, as defined by the jurisdiction, are prohibited. Existing *invasive plant species* on the site shall be contained or removed based on either the jurisdiction's recommendations or guidance by a qualified professional.

402.8 Building site waste management. Land-clearing debris shall be reused or otherwise diverted from landfill or other disposal. Land-clearing debris include rock, trees, stumps and associated vegetation. Land-clearing debris may be temporarily stockpiled on the site until reused. Storage of site waste shall be in compliance with the combustible waste material requirements of Section 304 of the International Fire Code. **Exception:** Section 402.8 shall not be required where not in compliance with jurisdictional, state or Federal regulation; or deemed impractical by the authority having jurisdiction.

403.1 Walkways and bicycle paths. Walkways and bicycle paths shall connect to existing paths or sidewalks, and shall be designed to connect to planned future paths. Walkways and bicycle paths shall be designed to support stormwater management. Walkways and bicycle paths shall not interfere with fire and emergency apparatus, vehicle or personnel access.

403.2 Bicycle parking. *Bicycle parking* shall comply with 403.2.1 through 403.2.3.

403.2.1 Number of spaces. Bicycle parking spaces shall be at least one per hundred occupant load, with a minimum of four bicycle parking spaces. Occupant load shall be determined based upon Section 1004 of the *International Building Code*. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exception: *Bicycle parking* shall not be required where the conditioned space is less than 1,000 square feet (232 m²).

Bicycle parking spaces for multiple buildings shall be permitted to be combined, provided that the spaces are sufficient for the combined occupant load of the buildings.

403.2.2 Description of spaces. *Bicycle parking* spaces shall comply with the following:

1. Shall be provided with illumination of not less than 1 footcandle at the parking surface;
2. Shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) per bicycle;
3. Shall be provided with a rack or other facility for locking or securing each bicycle.

403.2.3 Location of spaces. The location of bicycle parking shall be designated on the site plan. Vehicle parking spaces, other than those required for local zoning requirements and the accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of *bicycle parking* spaces. Bicycle parking shall comply with both of the following:

1. Bicycle parking spaces shall be located within 200 feet of the main building entrance and visible from the main entrance.
2. Bicycle parking shall be located at the same grade as the sidewalk, or at a location reachable by ramp or accessible route.

Exception: With location signage at the main *building* entrances, *bicycle parking* shall be permitted to be located inside a *building* or other locations not visible from the main entrance.

404.1 Site Hardscape. In climate zones 1 through 4 not less than 50 percent of the site *hardscape* shall have a minimum initial *Solar Reflectance* of 0.30 when determined in accordance with the *CRRC-1 Standard*. Alternately shading shall be provided by structures or trees based on the projected peak sun angle on the summer solstice. Construction documents shall show solar reflectance and shading used to comply with this section.

404.2.2 Shading structures. Shading shall be permitted to be provided by elements of a building or structure. Shading includes areas covered by *solar photovoltaic* arrays or *solar thermal* collectors. Open trellis-type free standing structures with vegetation shall be permitted to provide shading based on the coverage of mature vegetation.

404.2.3 Shade by trees. Where shading is provided by trees, *construction documents* shall show the planting location and anticipated ten year canopy growth of the trees. Shading by existing trees to be retained shall be permitted to be included in the shading provided by trees. The contribution to hardscape shading by trees shall include only the *hardscape* areas beneath the tree canopy.

500 MATERIAL RESOURCE CONSERVATION AND EFFICIENCY

501.1 Intent. Materials are conserved, resources are used efficiently and negative environmental impacts are reduced.

502.1 Construction waste amount. Construction waste shall meet one of the following criteria:

- 1) Construction waste sent to disposal shall not exceed 3 lb/ft² of *gross floor area*. The materials sent to disposal shall be documented.
- 2) Not less than fifty percent of the construction waste shall be diverted from disposal by reuse, recycle, salvage, donation, or sale. The fifty percent shall be determined by weight or volume, but not both. The materials diverted from disposal and the materials sent to disposal shall be documented. Both sorting and diversion on site and storage of waste materials for sorting and diversion at another location shall be permitted.

501.1.2 Hazardous waste. Hazardous waste shall be handled in accordance with laws, rules and ordinances applicable in the *jurisdiction*.

501.1.2 Waste storage. Storage of construction waste shall be in compliance with the combustible waste material requirements of Section 304 of the *International Fire Code*.

503.1.1 Used materials and components. Salvaged or reused materials and components shall comply with the provisions for such materials in accordance with the applicable code, or shall be approved by the authority having jurisdiction. Reuse of materials and components from other projects shall be treated as a reduction in the construction waste of this project.

503.1.2 Concrete, asphalt and base materials. The use of aggregate, fly ash, slag, and the like in concrete; reuse of asphalt and aggregate to make asphalt; and the reuse of recovered materials as base materials shall be treated as reused material, and shall be treated as a reduction in the construction waste of this project.

503.1.3 Materials and components from other sources. Salvage and reuse of materials and components from other projects shall be treated as a reduction in the construction waste of this project.

A402.1 Construction phase moisture control. Porous or fibrous materials and other materials subject to moisture damage shall be protected from moisture during the construction. Material damaged by moisture or visibly colonized by fungi either prior to delivery or during the construction shall be cleaned and dried, or where damage cannot be corrected, shall be removed and replaced.

600 ENERGY EFFICIENCY AND RENEWABLES

601.2 Intent. This section promotes the effective use of energy and on-site renewable generation.

601.3 Energy calculations. Where used in Section 600, energy costs shall be calculated in accordance with Section C407 of the *International Energy Conservation Code*.

601.3.1 Alternative energy calculations. The energy costs shall be permitted to be calculated in accordance with Appendix G to ASHRAE Standard 90.1. Energy costs shall not include plug loads.

601.3.2 End uses and renewables. The energy costs shall include only the following specific end uses: heating, cooling, service water heating, ventilation including fans, and lighting. On-site energy production from renewable, waste, and recovered energy shall be permitted to be included as a reduction in energy use.

601.4 Electric vehicle charging. Plug-in electric vehicle charging capability shall be provided for at least 2 percent of the parking stalls. The number of charging stations is rounded to the nearest even number. Electrical capacity in main electric panels supports Level 2 charging (208/240V-40 amp). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V-40 amp) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (208/240V-40 amp) or Level 2 charging stations (240V/40A) by a third party charging station.

A Level 3 charger with 208V with 3 phase AC shall be permitted to substitute for 8 Level 2 chargers.

602 ENERGY COMPLIANCE ALTERNATIVES

602.1 Compliance options. Buildings shall comply with at least one of the following:

- 1) Section 602.2, or
- 2) Section 602.3, or
- 3) Section 605.

602.2 Prescriptive options. Buildings in compliance with at least 3 items in Table 602.2 shall be deemed to be in compliance with this Section. Items used to comply with the *International Energy Conservation Code* shall not be counted towards the 3 required items.

TABLE 602.2 PRESCRIPTIVE OPTIONS

Measure	Description
Heating and cooling equipment efficiency	-Exceed the equipment efficiency requirements listed in Tables C403.2.3(1) through C403.2.3(7) of the IECC by 10%. A ground source heat pump shall be deemed to meet this requirement. 15% or more of the non-res space that is not heated or cooled, such as outdoor restaurant seating, shall meet this requirement. -Equipment shall be sized and HVAC design loads shall be determined in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure. -Equipment shall be commissioned.
Lighting efficiency	Meet lighting power density (LPD) maximum of 90 percent of the lighting power values specified in IECC Table C405.4.2(1). Or 90% of lighting fixtures or lamps over 15w have an efficacy of at least 60 lumens/watt.
Renewable energy	Provide not less than 0.50 watts per square foot (5.4 W/m ²) of conditioned floor area as renewable energy. Renewables shall be assigned to residential or non-residential, but not both.
UA reduction	Reduce the total building UA by 15% from that specified in the IECC. The total building UA shall be computed as sum of the U-factor times the area for each building thermal envelope component for which a U-factor is specified in IECC Tables C402.1.2 and C402.3. The areas of the envelope components, including windows, shall be as in the building constructed.
Day lighting	Provide day lighting with automated controls for at least 70% of the floor area.
Increased water heating efficiency	For buildings in the <i>water intensive use group</i> , water heating efficiency that complies with Sections 607.1 and 607.2.
Other energy savings	Decrease energy costs by 4% using any approved energy saving measure(s) beyond IECC compliance. The additional 4% shall not count other items selected from this table, or any minimum requirements in this section.

602.3 Compliance based on 10% energy savings. Buildings with projected energy costs at least 10% less than a building complying with the International Energy Conservation Code shall deemed to be in compliance with this section.

605 PRESCRIPTIVE [the rest of energy is in 605]

605.1 HVAC Equipment efficiency. HVAC equipment shall meet the following:

1) a) the HVAC equipment shall exceed the minimum efficiency requirements listed in IECC Tables C403.2.3(1) through C403.2.3(7) by 10 percent. A ground source heat pump shall meet this requirement. 15% or more of the non-res space that is not heated or cooled, such as outdoor restaurant seating, shall meet this requirement.

Equipment shall be sized and HVAC design loads shall be determined in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure. Equipment shall be commissioned.

605.1 Air barriers. The air barrier requirements in IECC section C402.5.1.2 or [insert commercial air tightness test]; or R402.4.1, and shall apply to climate zones 3 through 8.

605.7 Lighting. 90% of the lighting fixtures or lamps over 15w shall have an efficacy of at least 60 lumens/watt. Alternately, the building shall meet the lighting power density (LPD) maximum of 90 percent of the lighting power values specified in IECC Table C405.4.2(1).

607.1 Service water heating equipment efficiency. Service water heating for *water intensive use group buildings* shall be provided by one of the following:

1. Natural gas, propane, or oil water heater with a minimum of an 0.80 energy factor, or with a minimum of an 0.90 thermal efficiency;
2. Electric water heater with a minimum of a 2.0 energy factor;
3. Ground source heat pump;
4. Desuperheater on a vapor compression air conditioner, heat pump, or ground source heat pump projected to supply a minimum of 30% of the energy required for service hot water.
5. Solar water heating system projected to supply a minimum of 30% of the service hot water energy use.
6. Tankless coil with a boiler with a minimum of 85 AFUE.
7. Waste heat recovery projected to provide a minimum of 30% of the energy required by water heating.
8. Any combination of the above projected to provide at least 30% of the service water heating energy.

Definition: Water Intensive Use Groups, as listed in IECC Section C406.7

1. Group R-1: Boarding houses, hotels or motels.
2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2: Buildings with residential occupancies.
6. Group A-3: Health clubs and spas.

607.2 Drain water heat exchangers. The specified functions shall be provided with drain water heat exchangers that are projected to recover at least 25 percent of the temperature difference between the incoming cold water and the drain water.

1. Group F, Laundries, washing machines;
2. Group R-1, Boarding houses (transient), Hotels (transient), Motels (transient); washing machines that use both hot and cold water,
3. Group R-2 *buildings*, shared shower facilities, shared washing machines
4. Group A-3, Health Clubs and Spas; showers, washing machines that use both hot and cold water,
5. Group I-2, Hospitals, Mental hospitals and Nursing homes; washing machines that use both hot and cold water, staff showers, patient showers if long-term care

Exceptions: The following shall not require drain water heat exchangers:

1. Where the functions are located on the lowest floor of the building and the authority having jurisdiction determines it is not practical to install a drain water heat exchanger.
2. Where washing machines are piped only with cold water and space is provided to add a future drain water heat exchanger.
3. In applications that produce *grease-laden waste* or are required to have grease or oil separators in accordance with Section 1003 of the *International Plumbing Code*.

607.5 Circulating hot water system controls. Controls that allow continuous, timer, or water temperature-initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosyphon circulation loops are prohibited. Pumps on circulating hot and tempered water systems shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:

A normally-open, momentary contact switch.

Motion sensors that make contact when motion is sensed. After the signal is sent, the sensor shall go into a lock out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.

A flow switch.

A door switch.

The controls for the pump shall shut off the pump with a rise in temperature. The controls shall have a lock-out to prevent operation exceeding 105°F degrees in the event of failure of the device that senses temperature rise. The controls shall have a lock out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.

700 WATER CONSERVATION AND EFFICIENCY

701.1 Intent. This section is intended to conserve water, protect water quality, provide for safe water consumption and protect water resources.

702.1 Fitting and fixture consumption. Plumbing fixtures and fixture fittings shall comply with the maximum flow rates specified in Table 702.1. Plumbing fixtures and fixture fittings in Table 702.1 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 702.1.

Clinical sinks having a maximum water consumption of 4.5 gallons (17 L) per flush.

Service sinks, bath valves, pot fillers, laboratory faucets, utility faucets, and other fittings designed primarily for filling operations.

Fixtures, fittings, and devices whose primary purpose is safety.

TABLE A602.1(1)
MAXIMUM FLOW RATES AND FLUSH VOLUMES

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE OR FLUSH VOLUME
Showerhead ^a	2.0 gpm at 80 psi
Lavatory faucet and bar sink-private	1.6 gpm at 60 psi
Lavatory faucet-public (metering)	0.25 gpc ^b at 60 psi
Lavatory faucet-public (non-metering)	0.5 gpm at 60 psi
Kitchen faucet-private	2.2 gpm 1.8 gpm at 60 psi ^f
Kitchen and bar sink faucets in other than dwelling units and guest rooms	2.2 gpm at 60 psi
Urinal	0.5 gpf or nonwater urinal
Water closet	1.28 gpf ^{c,d}
Prerinse Spray Valves	1.3 gpm
Drinking Fountains (manual)	0.7 gpm ^e
Drinking Fountains (metered)	0.25 gpc ^{b,e}

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 1.6 gpf.
- e. Bottle filling stations associated with drinking fountains shall not have limitations for flow rate.^[1]_{SEP}
- f. Where a faucet has a pot filler mode, the flow shall not exceed 2.2 gpm at 60 psi. Such faucets shall automatically return to 1.8 gpm when the pot filler mode activation mechanism is released or when the faucet flow is turned off.

702.2 Multiple water outlet showers. For showers with multiple water outlets, the maximum shower flow rate shall apply to the combined flow of all water outlets that are capable of being operated simultaneously. Multiple water outlet showers shall comply with at least one of the following flow rate limits:

- Shower compartment - 2.0 gpm, or 2.0 gpm per 2600 in² of shower compartment floor area.
- Gang shower - 2.0 gpm per shower position
- Shower compartment complying with Chapter 11 of *International Building Code* - 4.0 gpm or 4.0 gpm / 2600 in² of shower compartment floor area.

702.6.1 Once-through cooling for appliances and equipment. Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited.

702.6.2 Clothes washers. Clothes washers rated with a Water Factor (IWF) shall have [insert values from Energy Star 8.0 version 2 for Water Factor (IWF), energy factor (IMEF or MEF J2)].

702.6.3 Food Service.

702.6.3.1 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.

702.6.3.2 Food waste disposal. The disposal of food wastes that are collected as part of preparing ware for washing shall be accomplished by one or more of the following:

- A food strainer (scrapper) basket that is emptied into a trash can.
- A garbage 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
- A pulper or mechanical strainer that uses not more than 2 gpm of potable water.

702.6.3.3 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 702.1, and shall shut off *automatically* when released.

702.6.3.4 Hand washing faucets. Faucets for hand washing sinks in food service preparation and serving areas shall be of the self-closing type.

703.1 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.

703.2 Humidification systems. Except where greater humidity is required for medical, agricultural, archival or scientific research purposes, humidification systems shall be capable of limiting humidification to times when the relative humidity in the space is less than 55 percent.

704.1 Water softeners. Water softeners shall comply with Sections 704.1.1 through 704.1.4.

704.1.1 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.

704.1.2 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.

704.1.3 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*.

800 INDOOR ENVIRONMENTAL QUALITY AND COMFORT

801.1 Intent. Improve the interior environment's impact on human health and well-being.

802.2 Duct protection during construction. Duct and other air distribution component openings shall be covered with tape, plastic, sheet metal or other *approved* method from the time of rough-in installation until startup of the heating and cooling equipment. Dust and debris shall be cleaned from duct openings prior to *building* occupancy.

802.3 Sealed air handler. Air handlers with a flow rate less than 3000 cfm shall have a manufacturer's designation of air leakage. The air handler air leakage shall be not more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.

802.4 Air handling system access. Air handlers, air filters, fans, coils and condensate pans shall be provided with access for purposes of cleaning, *repair*, and replacement.

802.5 Filters. Filters for air conditioning systems shall be rated at MERV 11 or higher and system equipment shall be designed to be compatible. The air handling system design shall account for the pressure drop across the filter. The pressure drop across clean MERV 11 filters shall be not greater than 0.45 in. wc. at 500 FPM filter face velocity. Filter performance shall be shown on the filter manufacturer's data sheet.

803.1 Venting and combustion air. *Fireplaces* and fuel-burning appliances shall be vented to the outdoors and shall be provided with combustion air from the outdoors in accordance with the *International Mechanical Code and the International Fuel Gas Code*. Solid-fuel-burning *fireplaces* shall be provided with combustion air directly from the outdoors and shall be provided with a means to tightly close off the chimney flue and combustion air outlets when the *fireplace* is not in use.

803.2 Unvented combustion. Permanently installed unvented combustion devices fueled by gas, alcohol or kerosene shall be prohibited.

804 Radon testing. Radon testing shall be performed for Radon Zone 1. Radon zones are as defined by Figure 9(1).

Exception: testing is not required where the authority having jurisdiction has defined the radon zone as Zone 2 or 3.

Testing shall be performed as specified in (a) through (h).

(a) Testing is performed after the building passes its air tightness 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, bathroom or kitchen.

(d) Testing is performed with commercially available test kits or continuous radon monitors that can be calibrated. Testing with test kits shall include two tests, which are averaged. 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. Testing can extend past occupancy.

(g) The results shall be retained as part of construction documentation.

(h) This section does not require a specific test result, rather it requires the test be performed and the results retained as part of construction documentation.

Chapter 14

NON-RESIDENTIAL EXISTING BUILDINGS

A101.1 Scope. This chapter shall apply to the *alteration, addition, and change of occupancy* of existing *buildings and structures*. Existing relocatable modular buildings shall comply with this section.

A101.2 Building materials, assemblies and systems. *Building* materials shall comply with the requirements of this section.

A101.2.1 Existing systems. Except where specifically noted in this Section, materials, assemblies, and systems already in use in a *building* in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined to be dangerous to life, health or safety. Where determined to be dangerous, they shall be mitigated or made safe.

A101.2.2 New and replacement systems. Except as otherwise required or permitted by code, materials, assemblies and systems permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs* and *alterations* provided that a hazard to life, health or property is not created. Hazardous materials shall not be used where the code for new construction would not *permit* their use in a similar occupancy, purpose and location.

101.3 Waste. Site development and construction waste shall be as specified in Chapter 13, Non-residential New Construction.

105.6 Approved programs and standards. The authority having jurisdiction shall be permitted to deem a national, state or local program or standard to meet or exceed this chapter. Approval for a specified application, limited scope or specific locale shall be permitted. Such programs or standards are not administered under ICC 700. Buildings approved in writing by such a program shall be considered in compliance with this chapter.

A102.1 Flood hazard areas. *Additions* shall not be permitted to *buildings and structures* that are located in *flood hazard areas*.

Exception: Where an existing *building* or *structure* is located such that all habitable space is located not less than 1 foot above the flood elevation, *additions* located not less than 1 foot above the flood elevation shall be permitted.

A103.2 Energy, HVAC and water equipment. Energy, HVAC and water equipment shall comply with the following:

Exception: Where the requirements are determined by the *AHJ* to be infeasible based upon the existing configuration of spaces, unless those spaces will be reconfigured as part of the alteration project.

Non-functioning thermostats shall be repaired or replaced.

Leaking accessible supply air and return ducts shall be sealed. Although existing duct tape shall not be deemed in noncompliance where a duct is not leaking, duct tape shall not be an acceptable seal.

Outside air dampers, damper controls and linkages controlled by HVAC units shall be in good repair and adjustment.

Leaks of hot water and steam leaks, defective steam traps and radiator control, relief, and vent valves in accessible piping shall be repaired or replaced.

Leaking accessible chilled water lines and equipment shall be repaired or replaced.

Furnace combustion units shall have been cleaned and tuned within one year prior to the alteration, or shall be cleaned and tuned. Filters shall be replaced in accordance with the furnace manufacturer's recommendations.

Chiller and boiler systems shall have been cleaned and tuned within one year prior to the alteration, or shall be cleaned and tuned.

For motor-driven systems and equipment, filters shall be cleaned or replaced, and belts and other coupling systems shall be repaired.

HVAC piping and ducts outside conditioned space or located above suspended ceilings, shall be insulated to *R-values* in accordance with the IECC.

Exceptions: Additional insulation shall not be required:

- 1) for piping that is already insulated and the insulation is in good condition
- 2) where the insulation cannot be installed without structural *alteration*.

Where a building cavity or framing space is too small to accommodate the duct or pipe insulation, the minimum insulation thickness shall be the thickness that cavity or framing can accommodate, but shall not be less than 1/2-inch thick.

A103.2.2 Service water systems. Defective hot- and cold-water piping and equipment within service water systems shall be repaired or replaced.

A103.2.3 Motor-driven equipment. Leaks in compressed air or pumped water systems shall be repaired or the equipment replaced.

A103.3.1 Energy audit. A *building* energy audit shall be conducted by an approved party. The audit shall indicate the improvements that the auditor recommends. The report shall be completed prior to certification of the building.

Exception: An energy audit and report shall not be required where an energy audit and report was completed within 24 months prior to the *alteration*.

A103.3.2 Water audit. For buildings in the *water intensive use group* a water audit shall be performed. The water audit shall indicate the improvements that the auditor recommends. The report shall be completed prior to certification of the building.

Exception: A water audit and report shall not be required where a water audit and report was done within 24 months prior to the *alteration*

A103.3.5 Service water systems. Service water systems and equipment shall be in accordance with the following:

1. Water heater and hot water *storage tanks* shall have a combined minimum total of external and internal insulation value of R-16, or shall comply with the minimum efficiency in Section 606.1.
2. Accessible hot supply and *distribution pipes* shall be insulated to *R-values* as specified in this code. The insulation shall not be required to extend beyond the building thermal envelope.
3. In Seismic Design Categories D, E and F, as established in accordance with the *International Building Code*, water heater and water *storage tanks* with a tank capacity of thirty gallons or greater shall be strapped or otherwise secured to a wall, floor, ceiling, or other object that itself is secured to a wall, floor, or ceiling. Water, gas and overflow pipes connected to water tanks shall be similarly secured.
4. Gas water heaters shall have a flexible gas line entering the appliance.
5. Circulating pump systems for hot water supply purposes other than comfort heating shall be controlled as specified in Section 504.6 of the IECC.
6. Showerhead and faucet flow rates shall be in accordance with Table 702.1 of this Chapter 13.
6. Replacement toilet and urinal flow rates shall be in accordance with Table 702.1 of this Chapter 13.

A103.3.6 Replacement lighting. 90% of the lighting fixtures or lamps over 15w shall have an efficacy of at least 60 lumens/watt. Alternately, the building shall meet the lighting power density (LPD) maximum of 90 percent of the lighting power values specified in IECC Table C405.4.2(1).

A103.3.7 Commercial refrigeration equipment. Commercial refrigeration equipment shall be cleaned and tuned for efficiency, including, but not limited to, cleaning of condenser coils and evaporators, and replacement of defective or worn door gaskets and seals.

A103.3.8 Swimming pools and spas. Swimming pools and spas and their equipment shall be in accordance with the following:

Heated swimming pools and spas shall be equipped with a cover for unoccupied hours.

Pool and spa recirculation pumps shall be under time clock control. **Exception:** Filtration pumps where the public health standard requires 24-hour pump operation.

Heaters shall be cleaned and tuned for efficiency, or such cleaning shall have occurred within one year prior to certification.

A104.1 Change of occupancy. Where a change in occupancy of a *building* or tenant space places it in a different division of the same group of occupancy or in a different group of occupancies, as determined in accordance with the *International Building Code*, compliance with Section A103.2 shall be required.

A105.1 Historic buildings. Individual provisions of this chapter shall not be mandatory for *historic buildings* for the following conditions:

Where a provision requires a visible change not consistent with the *building's* historic nature, or

2. Where a provision conflicts with a *building* function fundamental with the historic nature of the *building*.

A106.1 Changes to hardscapes and parking. Where existing *hardscapes* and outdoor parking that do not conform to the requirements of Chapter are altered, the *alterations* shall comply with the provisions for hardscape in Chapter 13, New Non-residential construction.

Exception: Where less than 20% of the hardscape and surface parking is altered, materials and assemblies shall be at least the equivalent of those being replaced.

A107 DECONSTRUCTION AND DEMOLITION

A107.1 Deconstruction and demolition. Where *buildings, structures* or portions thereof are *deconstructed* or demolished, a minimum of 50 percent of materials shall be diverted from disposal and incineration.

Documentation of the total materials in *buildings, structures* and portions thereof to be *deconstructed* or demolished and materials to be diverted, and evidence of diversion, shall be provided. Material quantities shall be indicated and calculated by weight or volume, but not by both.

[Add to **Chapter 3 of ICC 700-**

Buildings with non-residential portions shall meet both the residential and non-residential requirements for items outside the building, including but not limited to, site development, parking, bike spaces, landscaping, water management and hardscape.]