**15-047 - C**

**1. State Building Code to be Amended:**

International Building Code  State Energy Code

ICC ANSI A117.1 Accessibility Code  International Mechanical Code

International Existing Building Code  International Fuel Gas Code

International Residential Code  NFPA 54 National Fuel Gas Code

International Fire Code  NFPA 58 Liquefied Petroleum Gas Code

Uniform Plumbing Code  Wildland Urban Interface Code

Washington Administrative Code

**International Residential Code:**

**Section(s):**

* Appendix U

**Title:**

* Solar-Ready Provisions – Detached One-and Two-Family Dwellings, Multiple Single-Family Dwellings (Townhouses)

**Washington Administrative Code**

**Section(s):**

* WAC 51-51-0102, Section R102.5

**Title:**

* Applicability

**2. Proponent Name (Specific local government, organization or individual):**

**Proponent:**

Regional Code Collaboration (RCC)

Washington Association of Building Officials (WABO)

**Title:**

**Date:** 3-1-2015

**3. Designated Contact Person:**

**Name:** Kathleen Petrie

**Title:** Sustainable Codes Analyst

**Address:** City of Seattle, Department of Planning and Development, 700 Fifth Avenue, Suite 1800, P.O. Box 34019, Seattle WA, 98124-4019

**Office Phone:** 206-615-0541

**Cell:**

**E-Mail address:** kathleen.petrie@seattle.gov

**4. Proposed Code Amendment**. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code additional pages may be attached. (Examples on the SBCC [website](https://fortress.wa.gov/ga/apps/sbcc/Page.aspx?nid=191))

**Code(s)** International Residential Code, **Section(s)** (IRC) Appendix U

Washington Administrative Code WAC 51-51-0102, Section R102 - Applicability

Amend WAC 51-51-0102, Section R102 - Applicability to read as follows:

**R102.5 Appendices.** Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. Except for Appendix S, Fire Sprinklers and Appendix U, Solar-Ready Provisions – Detached One-and Two-Family Dwellings, Multiple Single-Family Dwellings (Townhouses);~~,~~ an appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW [19.27.060](http://app.leg.wa.gov/RCW/default.aspx?cite=19.27.060) (1)(a). The state building code council has determined that a local ordinance requiring fire sprinklers in accordance with Appendix S and Solar-Ready Provisions – Detached One-and Two-Family Dwellings, Multiple Single-Family Dwellings (Townhouses) in accordance with Appendix U of this chapter may be adopted by any local government upon notification of the council.

Appendix F, Radon Control Methods, Appendix G, Swimming Pools, Spas and Hot Tubs, and Appendix R, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

Amend IRC, Appendix U to read as follows:

**APPENDIX U**

**SOLAR-READY PROVISIONS – DETACHED ONE-AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES)**

*(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)*

**SECTION U101**

**SCOPE**

**U101.1 General.** These provisions shall be applicable for new construction where solar-ready provisions are required.

**SECTION U102**

**GENERAL DEFINITIONS**

**SOLAR-READY ZONE.** A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar ~~thermal~~ water heating system.

**SECTION U103**

**SOLAR-READY ZONE**

**U103.1 General.** New detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m2) of roof area oriented between ~~110~~ 90 degrees and 270 degrees of true north shall comply with sections U103.2 through U103.~~8~~10.

**Exceptions:**

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building ~~with a solar-ready zone that is shaded~~ where all areas of the roof that would otherwise meet the requirements of Section U103 are in full or partial shade for more than 70 percent of daylight hours annually.

**U103.2 Construction document requirements for solar-ready zone.** Construction documents shall indicate the solar-ready zone.

**U103.3 Solar-ready zone area.** The total *solar-ready* *zone* area shall be not less than 300 square feet (27.87 m2) exclusive of mandatory access or set back areas as required by this code ~~the~~ *~~International Fire Code~~*. New multiple single-family dwellings (townhouses) three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m2) per dwelling shall have a *solar-ready zone* area of not less than 150 square feet (13.94 m2). The *solar-ready zone* shall be composed of areas not less than 5 feet (1.52 m2) in width and not less than 80 square feet (7.44 m2) exclusive of access or set back areas as required by this code or the applicable provisions of the *International Fire Code*. No portion of the *solar zone* shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north.

**U103.4 Obstructions.** *Solar-ready zones* shall be free from obstructions, including but not limited to vents, *chimneys*, and roof-mounted equipment.

**U103.5 Shading.** The *solar-ready zone* shall be set back from any existing or new permanently affixed object on the building or site that is located south, east, or west of the *solar zone* a distance at least two times the object’s height above the nearest point on the roof surface. Such objects include but are not limited to taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

**U103.6** **Capped roof penetration sleeve**. A capped roof penetration sleeve shall be provided adjacent to the solar zone of 2:12 or less. The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter not less than 1 ¼ inches.

**U103.~~5~~7 Roof load documentation.** The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

**U103.~~6~~8 Interconnection pathway.** Construction documents shall indicate pathways for routing of conduit or plumbing from the *solar-ready zone* to the electrical service panel or service hot water system.

**U103.~~7~~9 Electrical service reserved space.** The main electrical service or feeder panel for each dwelling unit shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled “For Future Solar Electric”. The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

**U103.~~8~~10 Construction documentation certificate.** A permanent certificate, indicating the *solar-ready zone* and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

1. **Briefly explain your proposed amendment, including the purpose, benefits and problems addressed.** Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

We are proposing a Washington State pre-approve Appendix U so local jurisdictions have the option to apply solar-ready provisions to buildings designed to the International Residential Code if they so choose. This proposal is not intended to be inserted as a mandatory appendix for state-wide adoption.

This proposal promotes non-carbon emission energy generation, thereby making it easier for building owners to move toward solar photovoltaic and solar water heating systems. This proposal also supports the 2006 renewable portfolio law which requires large utilities in the State of Washington to obtain 15% of their electricity from new renewable resources such as solar and wind by 2020.

With the help of incentives and as the sales price for photovoltaic (PV) and solar water heating systems fall and as technology becomes more efficient, the use of on-site energy generation becomes increasingly appealing. The cost to retrofit an existing roof for the installation of renewables is more costly than preparing it at the time of new construction. If a building has been built to the requirements of this section, solar energy systems can be installed without upgrades to the structural or electrical systems being required.

The 2015 International Fire Code does not regulate solar photovoltaic design for buildings constructed to the IRC. The 2015 IRC has a new Section R324 which regulates the installation of photovoltaics. Proposed Appendix U will not conflict with Section R324 if Washington State decides to include it in the amended 2015 IRC.

If adopted by a local jurisdiction, this proposal will not increase enforcement efforts. Reviewers currently verify the structural design values used by Architects and Engineers, and both roof framing and penetration seals are checked during standard building inspections.

This proposal is similar to Appendix S of the IRC regarding Fire Sprinklers, in that the state has preapproved the appendix for adoption by any local jurisdiction deeming the requirement appropriate for their community. Those jurisdictions wanting to encourage the use of renewable energy systems without actually mandating installation in small residential construction will now have a tool to do so. The advantage for the building owner is that small and inexpensive considerations during the early design and construction process will save significant costs at the time of a future installation. A new Appendix N on Solar Readiness is also being proposed as a 2015 IBC Washington State amendment that is similar to this appendix.

1. **Specify what criteria this proposal meets.** You may select more than one.

The amendment is needed to address a critical life/safety need.

The amendment is needed to address a specific state policy or statute.

The amendment is needed for consistency with state or federal regulations.

The amendment is needed to address a unique character of the state.

The amendment corrects errors and omissions.

1. **Is there an economic impact:**  Yes      No

Explain:

If there is an economic impact, use the Table below to estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance. If preferred, you may submit an alternate cost benefit analysis.

**Cost Impact Overview**

**Construction Document preparation:**

* No additional cost anticipated

**Material cost for roofing system:**

* No additional cost expected. The factor of safety used to design roof trusses creates capacity in the roof system to withstand typical panel loads. Similar logic was used to support the exceptions of Section M2302 of the state amendment to the IRC (WAC 51-51-2300, Photovoltaic solar energy systems); in particular, exception #3, which determines that the existing roof system is capable of handling a total additional dead load of 4 pounds per square foot.

**Material and installation costs for a capped roof penetration sleeve:**

* $100

**Jurisdiction Review and Inspection:**

* No additional staff impact anticipated. Building plans examiners are already verifying design loads and building inspectors are conducting roof inspections.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Building Type | Construction[[1]](#footnote-1) | | Enforcement[[2]](#footnote-2) | | Operations & Maintenance[[3]](#footnote-3) | |
| Costs | Benefits[[4]](#footnote-4) | Costs | Benefits4 | Costs | Benefits4 |
| Residential |  |  |  |  |  |  |
| Single family | $100 | Less costly to address  Solar readiness at the  time of initial construction | None |  | None |  |
| Multi-family |  |  |  |  |  |  |
| Commercial/Retail |  |  |  |  |  |  |
| Industrial |  |  |  |  |  |  |
| Institutional |  |  |  |  |  |  |

Please send your completed proposal to: [sbcc@ga.wa.gov](mailto:sbcc@ga.wa.gov)

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.

1. $ / square foot of floor area or other cost. Attach data. **Construction** costs are costs prior to occupancy, and include both design and direct construction costs

   that impact the total cost of the construction to the owner/consumer. [↑](#footnote-ref-1)
2. Cost per project plan. Attach data. **Enforcement** costs include governmental review of plans, field inspection, and other action required for enforcement. [↑](#footnote-ref-2)
3. Cost to building owner/tenants over the life of the project. [↑](#footnote-ref-3)
4. Measurable benefit. [↑](#footnote-ref-4)