## REPI-144-21

*Add new Definition as follows:*

**EXTERIOR WALL ENVELOPE.** A system or assembly of exterior wall components, including exterior wall finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

**WORK AREA.** That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.

*Modify the Section as follows:*

**R502.3 Prescriptive compliance.** Additions shall comply with Sections R502.3.1 through ~~R502.3.4~~ R502.3.5.

*Add new Section as follows:*

**R502.3.5 Additional Efficiency Packages.** *Additions* shall comply with Section R506. *Alterations* to the existing building that are not part of the *addition*, but permitted with the *addition*, shall be permitted to be used to achieve this requirement.

**Exceptions:**

1. *Additions* that increase the *building*’s total *conditioned floor area* by less than 25 percent.
2. *Additions* that do not include the addition or replacement of equipment covered in Sections R403.5 or R403.7.
3. *Additions* that do not contain *conditioned space*.
4. Where the *addition* alone or the existing building and *addition* together comply with Section R405 or R406.

*Modify the Section as follows:*

**SECTION R503**

**ALTERATIONS**

**R503.1 General.** Alterations to any building or structure shall comply with the requirements of the code for new construction, without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall be such that the existing building or structure is not less conforming to the provisions of this code than the existing building or structure was prior to the alteration.

Alterations shall not create an unsafe or hazardous condition or overload existing building systems. Alterations shall be such that the existing building or structure does not use more energy than the existing building or structure prior to the alteration. Alterations to existing buildings shall comply with Sections R503.1.1 through ~~R503.1.4~~ R503.1.5.

*Add new Sections as follows:*

**R503.1.5 Additional Efficiency Packages.** *Alterations* shall comply with Section R506 where the *alteration* contains replacement of two or more of the following:

* 1. HVAC unitary systems or HVAC central heating or cooling equipment serving the *work area* of the *alteration*.
  2. Water heating equipment serving the *work area* of the *alteration.*
  3. 50% or more of the lighting fixtures in the *work area* of the *alteration*.
  4. 50% or more of the area of interior surfaces of the *thermal envelope* in the *work area* of the *alteration.*
  5. 50% or more of the area of the *building’s* *exterior wall envelope*

**Exceptions:**

1. *Alterations* that are permitted with an addition complying with section R502.3.5.
2. *Alterations* that comply with Section R405 or R406.

**SECTION R506**

**ADDITIONAL EFFICIENCY PACKAGE OPTIONS**

**R506.1 General.** Where required in Section R502 or R503, the *building* shall comply with one or more additional efficiency package options in accordance with the following:

1. Enhanced envelope performance in accordance with Section R408.2.1.
2. More efficient HVAC equipment performance in accordance with R408.2.2
3. Reduced energy use in service water-heating in accordance with R408.2.3
4. More efficient duct thermal distribution system in accordance with R408.2.4
5. Improved air sealing and efficient ventilation system in accordance with R408.2.5

## Revisions and Reasons

**Additions**

The additions section has received a minor editorial change for clarity. This proposal works with existing requirements for additions. The code currently includes three paths for demonstrating compliance for additions:

1. The addition complies on its own
2. The addition and the existing building comply together
3. The addition does not increase the total energy usage of the existing building with the addition

The existing prescriptive path for additions was the least stringent compliance path since all other paths require the either the existing building be effectively code compliant or be improved enough to offset the energy use of the addition. By increasing the stringency of the prescriptive path for large additions, this proposal closes the gap between the prescriptive and other compliance options. As long as other proposals for R406 do not weaken these three compliance paths, this proposal should be just as compatible with them as the current code requirements.

**Alterations**

The revised proposal provides a clearer threshold to ensure that the requirements only apply to substantial alterations. Only alterations that include two of more items from the list would be subject to the requirements. Each of these items are themselves substantial alterations of the major energy systems in a home. 50% was chosen as the threshold for the replacement of luminaires, replacement of the interior surfaces of the thermal envelope and replacement of the exterior wall area because it is a generally used threshold in the I-Codes. For example, a work area that exceeds 50% of the building area is used as the area threshold for Level 3 alterations in the IEBC.

The proposal also introduces two terms. “Work area” from the IEBC is used to clearly define that these thresholds are 50% of just the area of the alteration and not the whole building. “Exterior wall envelope” from the IBC to define re-siding alteration projects.

This approach was chosen over the Level 1-3 approach in the IEBC because those thresholds are not well-tuned to the energy systems. Those thresholds are focused on the impact of the work on the whole building and not just the energy systems. The thresholds for the different levels also reveal an understandable focus on alterations with egress and accessibility implications. A building could be completely gutted and completely reskinned, with all lighting, space conditioning and water heating equipment replaced and still only be considered a Level 1 alteration as long as no door or windows were moved/added and the equipment replacements did not include additional equipment. Conversely, an alteration might be considered Level 3 because it includes substantial space reconfigurations but include only minimal impacts to energy systems.