



# ENERGY STAR Single-Family New Homes ENERGY STAR Multifamily New Construction Guidance for Homes and Buildings Undergoing Gut Rehabilitation

While primarily intended for new construction, existing homes and buildings (e.g., those undergoing a gut rehabilitation) are also eligible to participate in the ENERGY STAR Single-Family New Homes (SNFH) and ENERGY STAR Multifamily New Construction (MFNC) program.

While EPA does not mandate the scope of work for existing projects, it has identified key components that may be needed to meet the ENERGY STAR program requirements. These include the following:

1. Remove exterior cladding and the outer surface of the roof to install and/or verify the requirements of the Thermal Enclosure System section of the applicable SFNH or MFNC Rater Field Checklist and either the SFNH National Water Management System Builder Requirements or MFNC National Water Management System Requirements.
2. Replace or expose most systems, equipment, or components (e.g., HVAC and ducts, windows, insulation).
3. Grade the site and / or provide drains/swales.
4. Implement below-grade moisture management strategies.

EPA does recognize that some of the current program requirements present unique challenges for existing homes and buildings, even those undergoing a gut rehabilitation. To help mitigate these challenges, EPA has developed alternative compliance options. These options are for specific items on the ENERGY STAR Rater Field Checklists, the SFNH National Water Management System Builder Requirements, and MFNC National Water Management System Requirements, and have been incorporated directly into the program documents since 2013. As a resource for stakeholders, EPA has consolidated the alternative compliance options in this document, with SFNH options shown first and MFNC options shown second.

EPA acknowledges that additional alternatives, increased flexibility, and alternative assessment protocols would expand the number of existing homes and buildings able to earn the ENERGY STAR. EPA is committed to including additional alternatives as they become available to ease certification without sacrificing performance.

## ENERGY STAR Single-Family New Homes Program Alternative Compliance Options

### Slab insulation

Section 3 of the National Rater Design Review Checklist and Item 3.2 of the National Rater Field Checklist require that homes in Climate Zones 4-8 with a slab on grade floor (i.e., with a floor surface less than 12 inches below grade) have 100% of the slab edge insulated to  $\geq R-5$  at the depth specified by the 2009 IECC and aligned with the thermal boundary of the walls.

An alternative compliance option is contained in the Footnote referenced by this Section and Item:

Alternatively, the thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).

While both new and existing homes are eligible to use this option, it is particularly relevant to existing homes, which would otherwise be required to excavate around the slab.

### Gaskets under sill plates

Item 4.3 of the National Rater Field Checklist requires that above-grade sill plates adjacent to conditioned space be sealed to the foundation or sub-floor, and that a gasket also be placed beneath above-grade sill plates if resting atop concrete or masonry and adjacent to conditioned space.

An alternative compliance option is contained in the Footnote referenced by this Item:

Existing sill plates (e.g., in a home undergoing a gut rehabilitation) on the interior side of structural masonry or monolithic walls are exempt from this Item. In addition, other existing sill plates resting atop concrete or masonry and adjacent to conditioned space are permitted, in lieu of using a gasket, to be sealed with caulk, foam, or equivalent material at both the interior seam between the sill plate and the subfloor and the seam between the top of the sill plate and the sheathing.

### Capillary break beneath slabs

Item 1.3 of the National Water Management System Builder Requirements generally requires that a capillary break be included beneath all slabs (e.g., slab on grade, basement slab) except crawlspace slabs using either:  $\geq 6$  mil polyethylene sheeting, lapped 6-12 in., or  $\geq 1$  in. extruded polystyrene insulation with taped joints.

An alternative compliance option is contained in the Footnote referenced by this Item:



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For an existing slab (e.g., in a home undergoing a gut rehabilitation), in lieu of a capillary break beneath the slab, a continuous and sealed Class I or Class II Vapor Retarder (per Footnote 7 [of the National Water Management System Builder Requirements]) is permitted to be installed on top of the entire slab. In such cases, up to 10% of the slab surface is permitted to be exempted from this requirement (e.g., for sill plates). In addition, for existing slabs in occupiable space, the Vapor Retarder shall be, or shall be protected by, a durable floor surface. If Class I Vapor Retarders are installed, they shall not be installed on the interior side of air permeable insulation or materials prone to moisture damage.

## Moisture protection on exterior surfaces of below grade walls

Item 1.5 of the National Water Management System Builder Requirements requires that the exterior surface of below-grade walls of basements and unvented crawlspaces be finished as follows:

- a) Poured concrete, masonry, and insulated concrete forms be finished with damp-proofing coating.
- b) Wood framed walls be finished with polyethylene and adhesive or other equivalent waterproofing

An alternative compliance option is contained in the Footnote referenced by this Item:

Interior surface of an existing below-grade wall (e.g., in a home undergoing a gut rehab.) listed in Item 1.5a is permitted to be finished by:

- Installing a continuous and sealed drainage plane, capillary break, Class I Vapor Retarder (per Footnote 8 [of the National Water Management System Builder Requirements]) and air barrier that terminates into a foundation drainage system as specified in Item 1.8; OR
- If a drain tile is not required as specified in Footnote 9 [of the National Water Management System Builder Requirements], adhering a capillary break and Class I Vapor Retarder (per Footnote 8 [of the National Water Management System Builder Requirements]) directly to the wall with the edges taped/sealed to make it continuous.

## Drain tiles

Item 1.8 of the National Water Management System Builder Requirements requires that drain tiles be installed at basement and crawlspace walls, with the top of the drain tile pipe below the bottom of the concrete slab or crawlspace floor. The drain tile must be surrounded with  $\geq 6$  in. of  $\frac{1}{2}$  to  $\frac{3}{4}$  in. washed or clean gravel and with the gravel layer fully wrapped with fabric cloth. In addition, the drain tile must be level or sloped to discharge to outside grade (daylight) or to a sump pit with a pump. If the drain tile is on interior side of footing, then a channel must be provided through the footing to the exterior side.

An alternative compliance option is contained in the Footnote referenced by this Item:

In an existing home (e.g., in a home undergoing a gut rehab.) a drain tile installed only on the interior side of the footing without a channel is permitted. Additionally, a drain tile is not required when a certified hydrologist, soil scientist, or engineer has determined that a crawlspace foundation, or an existing basement foundation (e.g., in a home undergoing a gut rehab.), is installed in Group I Soils (i.e., well-drained ground or sand-gravel mixtures), as defined by 2009 IRC Table R405.1.

## Drainage system for structural masonry walls

Item 2.1 of the National Water Management System Builder Requirements requires flashing at the bottom of exterior walls, with weep holes included for anchored stone / masonry veneer and weep screed for adhered stone / masonry veneer or stucco cladding, or an equivalent drainage system.

Item 2.2 of the National Water Management System Builder Requirements requires a fully sealed continuous drainage plane behind exterior cladding that laps over the flashing in Item 2.1 and is fully sealed at all penetrations. An additional bond-break drainage plane layer also must be provided behind all adhered stone / masonry veneer or stucco cladding.

An exemption is contained in the Footnote referenced by these Items:

These Items not required for existing structural masonry walls (e.g., in a home undergoing a gut rehabilitation). Note this exemption does not extend to existing wall assemblies with adhered or anchored stone / masonry veneers.



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## ENERGY STAR Multifamily New Construction Program Alternative Compliance Options

### Slab insulation

Section 3 of the National Rater Design Review Checklist and Item 3.4 of the National Rater Field Checklist require that buildings in Climate Zones 4-8 with a slab on grade floor (i.e., with a floor surface less than 12 inches below grade) have 100% of the slab edge insulated to  $\geq R-5$  at the depth specified by Table 502.2(1) in the 2009 IECC and aligned with the thermal boundary of the walls.

An alternative compliance option is contained in the Footnote referenced by this Section and Item:

Alternatively, the thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).

While both new and existing buildings are eligible to use this option, it is particularly relevant to existing buildings, which would otherwise be required to excavate around the slab.

### Continuous exterior wall insulation

Item 3.7.1 of the National Rater Field Checklist is one option to reduce thermal bridging in exterior walls. This option requires buildings to install continuous rigid insulation, insulated siding, or a combination of the two that is  $\geq R-3$  in CZ 1-4 and  $\geq R-5$  in CZ 5-8.

An alternative compliance option is contained in the Footnote referenced by this Item:

In a building undergoing a gut rehabilitation, continuous interior insulation may be used in lieu of continuous exterior rigid insulation or insulated siding. This alternative does not require continuous interior insulation where a floor intersects an exterior wall, it only requires it from floor to ceiling. Continuous interior insulation is required where the demising wall intersects the exterior wall; however, it may be exempted per Footnote 24 [of the National Rater Field Checklist].

Footnote 24 states, in part, that:

Up to 10% of the total exterior wall surface area is exempted from the reduced thermal bridging requirements to accommodate intentional designed details.

### Gaskets under sill plates

Item 5.1.9 of the National Rater Design Review Checklist recommends, but does not require, that above-grade sill plates adjacent to conditioned space be sealed to the foundation or sub-floor, and that a gasket also be placed beneath above-grade sill plates if resting atop concrete or masonry and adjacent to conditioned space.

An alternative compliance option is contained in the Footnote referenced by this Item:

Existing sill plates (e.g., in a building undergoing a gut rehabilitation) on the interior side of structural masonry or monolithic walls may not be able to complete this Item. In addition, other existing sill plates resting atop concrete or masonry and adjacent to conditioned space can in lieu of using a gasket, be sealed with caulk, foam, or equivalent material at both the interior seam between the sill plate and the subfloor and the seam between the top of the sill plate and the sheathing.

### Capillary break beneath slabs

Item 1.3 of the National Water Management System Requirements generally requires that a capillary break be included beneath all slabs (e.g., slab on grade, basement slab) except crawlspace slabs using either:  $\geq 6$  mil polyethylene sheeting, lapped 6-12 in., or  $\geq 1$  in. extruded polystyrene insulation with taped joints.

An alternative compliance option is contained in the Footnote referenced by this Item:

For an existing slab (e.g., in a building undergoing a gut rehabilitation), in lieu of a capillary break beneath the slab, a continuous and sealed Class I or Class II Vapor Retarder (per Footnote 8 [of the National Water Management System Requirements]) is permitted to be installed on top of the entire slab. In such cases, up to 10% of the slab surface is permitted to be exempted from this requirement (e.g., for sill plates). In addition, for existing slabs in occupiable space, the Vapor Retarder shall be, or shall be protected by, a durable floor surface. If Class I Vapor Retarders are installed, they shall not be installed on the interior side of air permeable insulation or materials prone to moisture damage.



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- a) Poured concrete, masonry, and insulated concrete forms be finished with damp-proofing coating.
- b) Wood framed walls be finished with polyethylene and adhesive or other equivalent waterproofing

An alternative compliance option is contained in the Footnote referenced by this Item:

Interior surface of an existing below-grade wall (e.g., in a building undergoing a gut rehab.) listed in Item 1.5a is permitted to be finished by:

- Installing a continuous and sealed drainage plane, capillary break, Class I Vapor Retarder (per Footnote 8 [of the National Water Management System Requirements]) and air barrier that terminates into a foundation drainage system as specified in Item 1.8; OR
- If a drain tile is not required as specified in Footnote 9 [of the National Water Management System Requirements], adhering a capillary break and Class I Vapor Retarder (per Footnote 8 [of the National Water Management System Requirements]) directly to the wall with the edges taped/sealed to make it continuous.

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An alternative compliance option is contained in the Footnote referenced by this Item:

In an existing building (e.g., in a building undergoing a gut rehab.) a drain tile installed only on the interior side of the footing without a channel is permitted. Additionally, a drain tile is not required when a certified hydrologist, soil scientist, or engineer has determined that a crawlspace foundation, or an existing basement foundation (e.g., in a building undergoing a gut rehab.), is installed in Group I Soils (i.e., well-drained ground or sand-gravel mixtures), as defined by 2009 IRC Table R405.1.

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Item 2.2 of the National Water Management System Requirements requires a fully sealed continuous drainage plane behind exterior cladding that laps over the flashing in Item 2.1 and is fully sealed at all penetrations. An additional bond-break drainage plane layer also must be provided behind all adhered stone / masonry veneer or stucco cladding.

An exemption is contained in the Footnote referenced by these Items:

These Items not required for existing structural masonry walls (e.g., in a building undergoing a gut rehabilitation). Note this exemption does not extend to existing wall assemblies with adhered or anchored stone / masonry veneers.