Garage Conversions

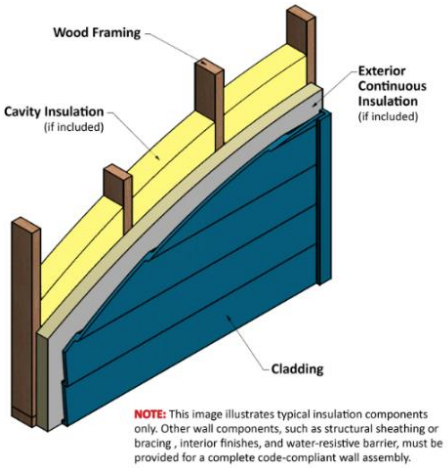
This Tip Sheet reflects code requirements of the 2021 International Residential Code (IRC) and Washington State Energy Code (WSEC), with Washington State Amendments.

General Requirements

Converting your existing garage (or a portion of it) into living space requires that the project meet the **same requirements as for new construction**. Below is a list of general requirements:

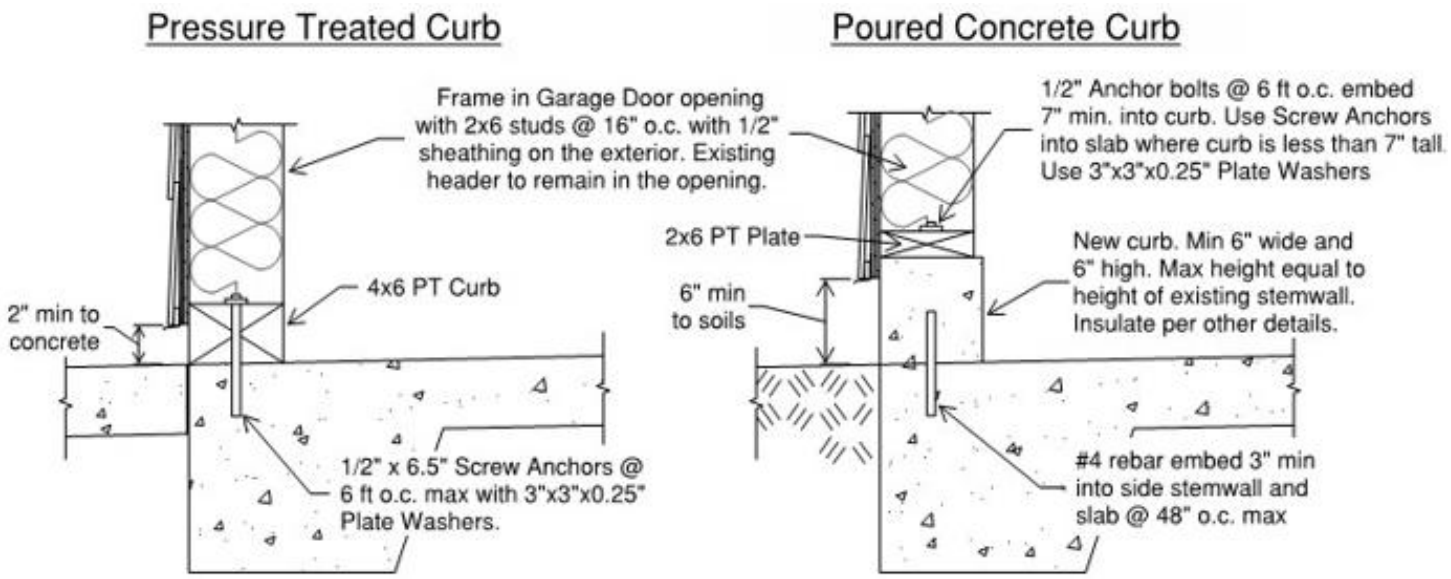
- ☐ Permits and plans are required:
  - Floor plans that show proposed work, use of space, existing and proposed walls, windows, doors, smoke and carbon monoxide alarm locations, exhaust fans, stairs and any proposed plumbing fixtures.
  - Detailed cross section(s) indicating floor, wall and roof construction, materials, insulation and ceiling height.
- ☐ Check with your local land use/planning department to see if you need to provide parking for the spots you are displacing.
- ☐ New conditioned (heated) area must be fully insulated (ceiling, walls, foundation walls and floor) to the same insulation values required for new construction.
- ☐ Additional "Energy Credits" must be selected (based on square footage of converted space) and plans must show required information (see page 6).
- ☐ Bedrooms require egress windows or doors (see tip sheet #10) and cannot have openings (like windows) directly into a garage.
- ☐ If your driveway slopes towards the garage, water may leak into the new living space (see curb detail on page 2), so discuss your options with your local jurisdiction.

NOTE: Walls require continuous insulation (insulation not interrupted by framing members) when following the R-value pathway. To eliminate continuous insulation, please visit the WSU Energy Program website for information about the U-factor pathway and Code Compliance Calculator at https://www.energy.wsu.edu (click on Energy Code) or consult a design professional (such as an energy code specialist or architect).



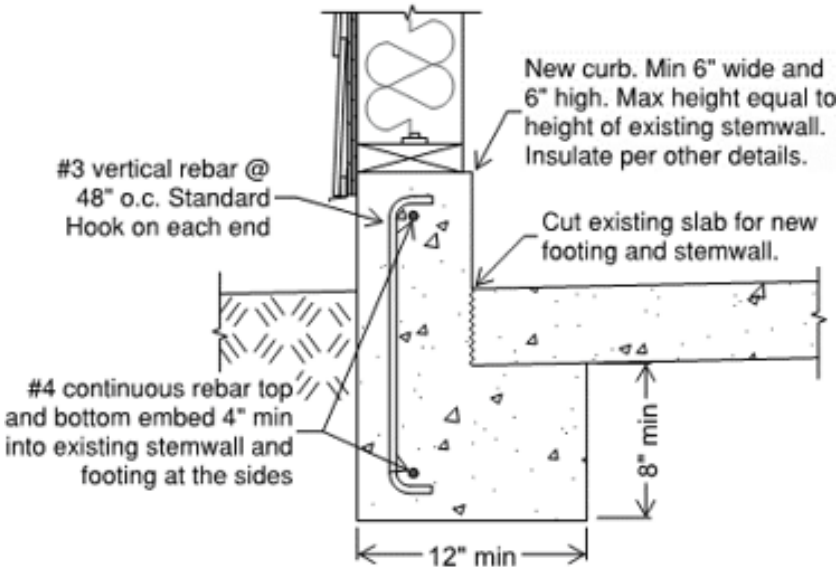
Creating a Curb in the Garage Door Opening

When infilling the garage door with a wall, a curb is required for anchoring the bottom of the wall:



Creating a New Footing under the Slab

Some existing garage slabs will not have a thickened footing that runs beneath the slab in the garage door opening. In these cases, it is often required to dig under the slab and add a footing to support the new wall above. The figure below shows one way in which this can be done. For other options speak to your jurisdiction. Excavation may be required to verify the existing slab thickness.



Energy Code Requirements

Windows and Exterior Doors

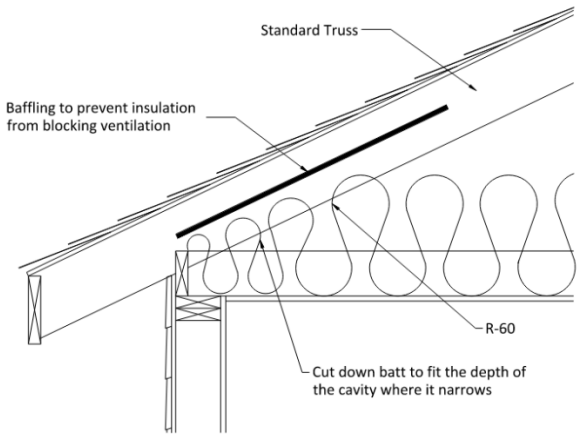
Windows and exterior doors located in the newly conditioned space must have a maximum U-factor of 0.30. Replacement of existing windows and doors may be required.

Roof Insulation and Ventilation

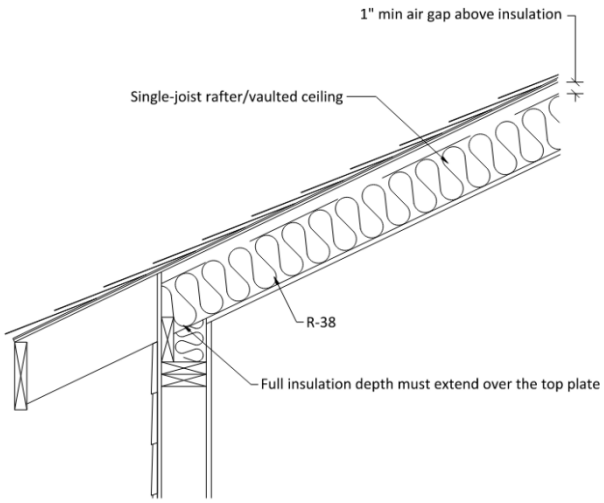
The attic space above the newly conditioned area is required to have minimum R-60 insulation and be ventilated with a minimum vent area of 1 square foot for every 150 square feet of attic area (or 1 square foot for every 300 square feet if 40%-50% of the vents are within 3 feet vertically of the ridge). Attics with a height of 30 inches (or more) and an area of 30 square feet (or more) must have an access opening (22 inches by 30 inches minimum).

Single rafter/joist-vaulted ceilings require minimum R-38 insulation. Insulation cannot be compressed.

Standard or Scissor Truss R-Value



Single Rafter/Joist-vault R-Value



Exterior Walls

Walls must be fully insulated, including the foundation stem wall. The wood-framed portion of the wall has different requirements than the foundation wall, but you can mix and match the various options. See figures below (not all options are illustrated). Insulation values listed are the minimums required.

Framed walls have two options for insulation:

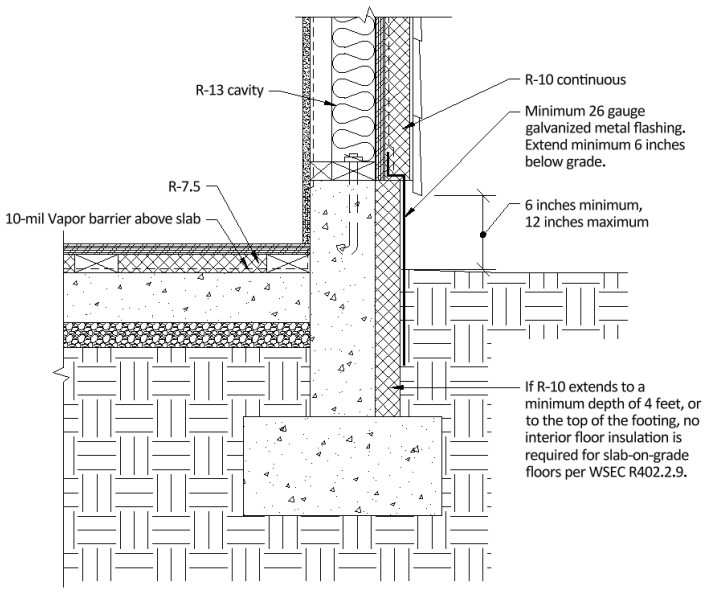
- R-20 cavity plus R-5 continuous insulation, **or**
- R-13 cavity plus R-10 continuous.

The continuous insulation may be installed on either the interior **or** exterior.

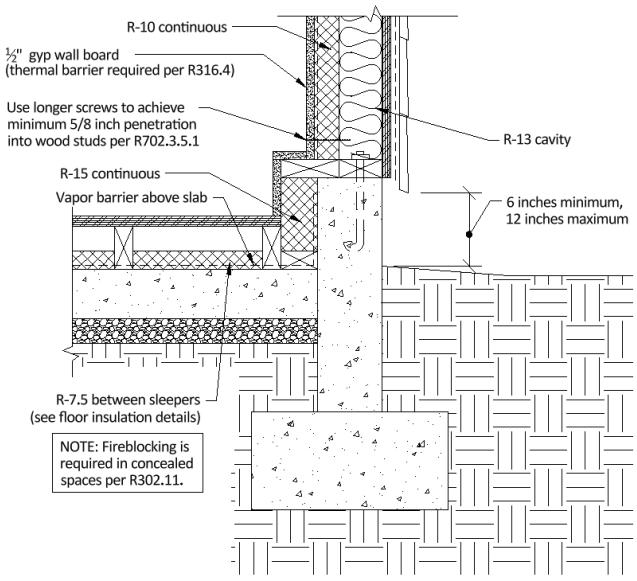
Foundation walls are required to be insulated above *and* below grade with one of the following options:

- R-10 continuous insulation on the exterior,
- R-15 continuous on the interior,
- R-21 cavity, **or**
- R-13 cavity plus R-5 continuous (at interior or exterior).

Exterior Continuous Insulation



Interior Continuous Insulation

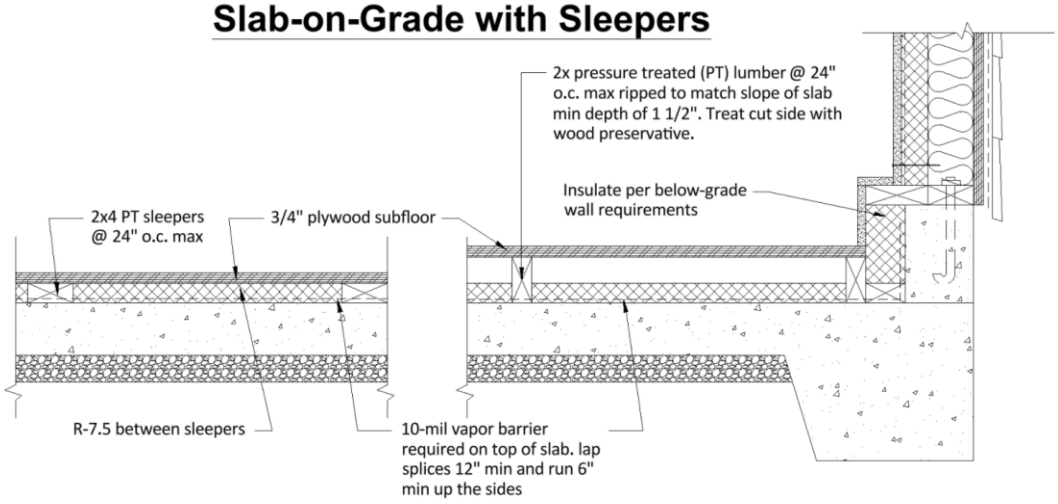


Floor Insulation

The floor of the newly conditioned area is required to be insulated. While the energy code requires minimum R-10 insulation under the slab at the perimeter, we realize that removing and replacing portions of the slab is difficult. The figures below depict two approved insulation options above the slab that are equivalent to under-slab perimeter insulation.

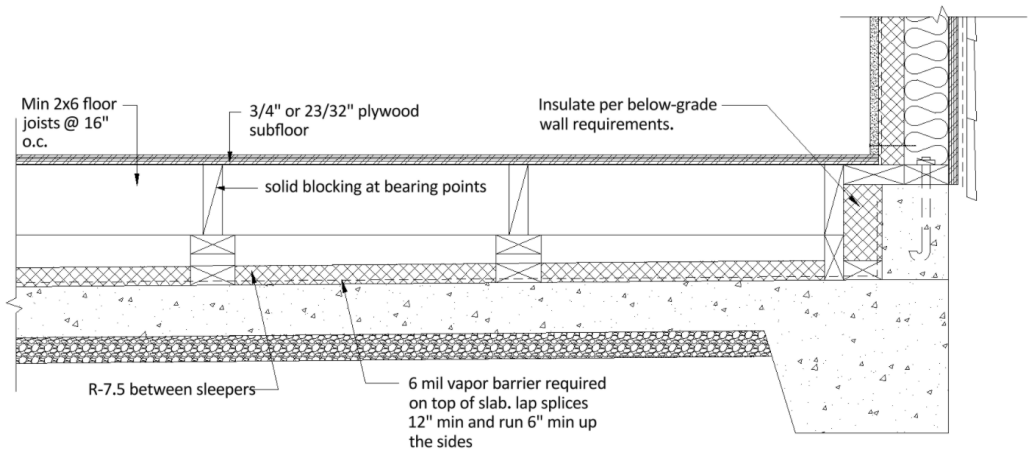
Note: If batt insulation is to be used in raised framing without the R-7.5 rigid insulation indicated below, the minimum value is R-30 (or higher depending on selected Energy Credit), and the space below the floor joists will either need to be ventilated or filled to capacity with insulation.

Slab-on-Grade with Sleepers



Or:

Slab-on-Grade with Framed Floor



Note: If you select an energy credit that requires minimum R-10 “under entire slab,” then you must install minimum R-10 above the slab, across all of it. The above example with R-7.5 is only equivalent to R-10 at the *perimeter*, not the entire slab. See page 6 for Energy Credit information.

Energy Credits

The energy code requires additional Energy Credits when adding/converting 150 square feet or more of conditioned space to a dwelling. This is additional, required work above and beyond just insulating this area, such as installing better windows and insulation, or high-efficiency mechanical equipment.

The number of credits required is based on the square footage of the new conditioned space being added only (NOT including the existing dwelling). For example, 2.0 credits are required for adding/converting 150 to 500 square feet, and 5.0 credits for adding 501 to 1,500 square feet. See WSEC Section R406 for a complete list of options and their detailed requirements.

Common options chosen are:

- ☐ Option 1.2 (1.0 credit) – Window U-factor 0.25. Insulation increased to: Floor R-38, basement walls R-21 plus R-5 c.i., ceiling and single rafter or joist-vaulted R-60 advanced, slab-on-grade R-10 under the entire slab (R-10 above an existing slab is also acceptable).
- ☐ Option 3.1 (1.0 credit) – Energy Star gas or propane furnace with a minimum AFUE of 95%.
- ☐ Option 3.5 (1.5 credits) – Ductless mini-split heat pump system with a minimum HSPF of 10.0 providing heat to the largest zone of the housing unit (which may not be the project area).
- ☐ Option 5.4 (1.0 credit) – Energy Star rated gas or propane water heater with a minimum UEF of 0.91.

Your plans must list which credits you are selecting, any specific information required by the credit, and must show that the proposed work will meet the selected credits. For example, if you select credit 1.2, the plans for the converted garage to living space would indicate windows with a U-factor of 0.25 or better/lower will be installed, not the standard 0.30, and R-60 roof insulation - even in a single-joist/vaulted ceiling.

Building inspectors will verify that work was done to meet all of your selected energy credits.

Forms and additional information can be found on the WSU Energy Program website: https://www.energy.wsu.edu/BuildingEfficiency/EnergyCode/CodeForms.aspx