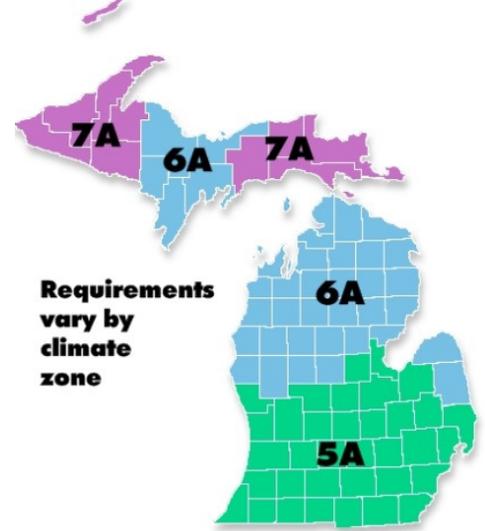


Builder's Guide to The 2009 Michigan Uniform Energy Code



Step 1: Know the Requirements and Choose a Path to Compliance

- Requirements vary by zone, so check the map to determine your zone and review the prescriptive requirements in the table below
- In addition to the values in the table below, there are many mandatory requirements which must be met regardless of the compliance path chosen. Several are listed below, but check the full code to review all mandatory requirements
- Choose a path to compliance:
 - **Prescriptive Path** - Simply follow the letter of the code
 - **Overall Ua Path** – Overall R-values must meet or exceed the overall values of the code reference house
 - **Performance Path** – Overall performance of the house as designed is compared to the performance of the code reference house. If the house as designed is equal to or better than the overall performance of the code reference house, then the house will meet the code. Note that mandatory requirements (see below) still apply to all paths, including the performance path
- The Prescriptive and Overall Ua paths can both be calculated using the free software tool [REScheck](#), which can be used to print the compliance certificates and inspection checklists
- The Performance path requires that you work with a home performance professional to calculate compliance BEFORE applying for permits and beginning construction. The home will need to be tested at final in order to receive the certificate of occupancy.

Some Mandatory Requirements

- All wall insulation must be contained within an air-barrier material. This includes attic knee walls and walls behind tubs, showers, fireplaces, and stairwells
- If the airtightness of the home is lower than 5 ACH50, *automatic mechanical ventilation is required*
- **The foundation MUST be insulated!** Regardless of the compliance path you choose, there is not enough performance tradeoff anywhere in the house to make up for an uninsulated foundation
- Slab on grade construction requires under slab or perimeter insulation
- Duct sealing is mandatory and the duct system may be required to be tested

TABLE R402.1.1 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b, e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c 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	0.35	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10 /13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10 ^h	19/21	38 ^g	15/19	10, 4 ft	15/19

Step 2:

Compliance Documents for Permit Application

- Your HERS Rater or other performance professional will need to model the house in special software to calculate all the tradeoffs and performance factors.
- Send the building plans to your HERS Rater along with details about the proposed home's energy related features including:
 1. Street address of the home
 2. Orientation of the home on the property (front faces N/S/E/W?)
 3. Window U-Factor and SHGC specifications
 4. Proposed heating and cooling system efficiencies
 5. Proposed water heating equipment
 6. Foundation, above-grade wall, and attic insulation strategy
 7. Planned automatic mechanical ventilation system
 8. Any other details affecting the energy use of the house
- If you don't have all those details yet, your rater can make some assumptions, but will need the final details to be most accurate with the rating and to print compliance documents to bring to the final testing
- Your rater will provide you with several documents, the most important of which is the Code Compliance Certificate. Review the specs to confirm accuracy
- Review the Projected Compliance Certificate and submit it with your building permit application to your local code office



Step 3: Build and Inspect

- During the build, if there are any major changes which will affect the energy use of the house, inform your rater who will review the changes to make sure they do not push the house out of compliance.
- The code REQUIRES that insulation and air sealing be verified by one of two methods:
 1. **Testing option;** receive a blower door test to verify less than 7 ACH50
 2. **Visual Inspection;** where required by the code official, an approved third party shall inspect the insulation and air barriers
- If the insulation inspection is required but not completed, you are then REQUIRED to conduct a blower door test.
- If you are not planning to test, you must schedule your insulation inspection AFTER INSULATION but BEFORE DRYWALL.

Step 4:

Final Testing and Compliance Confirmation



□ **Prescriptive or Overall Ua Path**

- REScheck can print a code inspection checklist for your local inspector
- Code also requires that you place a sticker on the electric panel with the insulation levels of various components and efficiencies of heating, cooling, and water heating systems. Your code officials may have these stickers and apply them after final building inspection.

□ **Performance Path**

- When the house is complete, contact your rater to schedule the final inspection and testing. The final testing is typically done about the time the house is being cleaned and painters are touching up, right before final walk-thru and close.
- Make sure the following last minute items are complete:
 - Final doors and weather-stripping installed, thresholds adjusted
 - Attic access hatch has insulation attached to the lid and a gasket around the opening
 - Plumbing and electrical penetrations in the bond are sealed with caulk or foam
 - Water has been turned on and plumbing fixtures are set with traps filled
 - Electricity is turned on to the house
 - All flooring is installed and HVAC registers are in place
 - Final HVAC has been completed and the systems are all operating as they will be at occupancy
- Final testing and inspection can take about 2 hours. During part of the testing, the rater will need to have all windows and doors remain closed.
- The rater will conduct the following tests:
 - Blower door test to measure air infiltration
 - Duct leakage test to measure leakage to outdoors and indoors
 - Other tests for building performance but which do not affect the Rating
- The results of the tests will be known immediately. In most cases, compliance documentation can be completed during the final testing visit. Your rater or other performance testing professional may require payment at the conclusion of site testing.

New Code on the Horizon

A new version of the MUEC will go into effect in May of 2016. The primary change is that performance testing (blower door) will be required. To find a professional to help, visit www.michiganblowerdoor.com