

Michigan Energy Code Training and Implementation Program

1.0 Hour Advanced Program Course Number 16199

Residential Energy Additions, Alterations, Renovations, and Repairs



MICHIGAN STATE
UNIVERSITY



**School of Planning, Design
& Construction**

Michigan State University
East Lansing, Michigan

Presenters

Residential Energy Additions, Alterations, Renovations,
and Repairs:

Tim Mrozowski, A.I.A., LEED® AP

Instructor # 1455

Course Number: 16199

Marcus Metoyer

Instructor # 1540

1 Hour Specialty:

*BI, MI, or registrants
with only BO/PR but no
inspector registration*

William Bezdek, P.E.

Instructor # 1616

Acknowledgement and Disclaimer

Acknowledgement:

- This material is based upon work supported by the Department of Energy under Award Number(s) *DE-EE0000753*.

Disclaimer:

- This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Project Support

Prepared by the **School of Planning, Design and Construction at Michigan State University**. Oversight provided by MSU faculty and the **Center for Construction Project Performance Assessment and Improvement (C2P2ai)**.

Funding provided by Michigan Department of Energy, Labor & Economic Growth, U.S. Department of Energy and the American Recovery and Reinvestment Act of 2009 with assistance from the Michigan Bureau of Energy Systems (BES) and Bureau of Construction Codes (BCC)



MICHIGAN STATE
UNIVERSITY



MEEA
Midwest Energy Efficiency Alliance



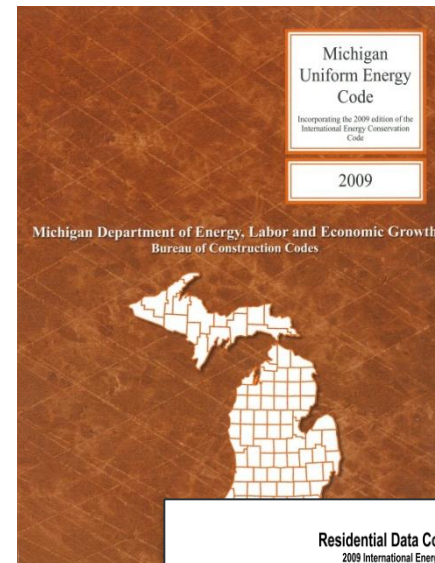
Project Objectives

To train **building officials, inspectors, home builders, subcontractors, suppliers, engineers and architects** in the requirements for additions, alterations, renovations, and repairs in the Michigan energy code for the purpose of:

1. Increasing understanding
2. Improving compliance
3. Reducing administrative time
4. Improving customer relationships

Presentation Overview

- Requirements for Additions, Alterations, Renovations and Repairs
- Compliance Using REScheck



Residential Data Collection Checklist
2009 International Energy Conservation Code
Climate Zone 3

Date: _____ Name of Evaluator(s): _____

Building Name & Address: _____ Conditioned Floor Area: _____ ft²

Building Contact: Name: _____ Phone: _____ Email: _____

Compliance Approach: ☐ Prescriptive (402.1.2 or 402.1.3) ☐ UA Trade-Off (402.1.4) ☐ Building Performance (405)

State: _____ Jurisdiction: _____

Building Type: 1- and 2-Family, Detached: ☐ Single Family
Multifamily: ☐ Apartment

Project Type: ☐ New Construction ☐ Addition to existing building

Item Number ¹	Pre-Inspection/Plan Review	Code Value	Verified Value
PR1 [103.2]	Construction drawings and documentation submitted and available. Documentation sufficiently demonstrates energy code compliance.		
PR2 [403.6]	HVAC loads calculations: Heating system size(s): Cooling system size(s):		kBtu/h kBtu/h

Additional Comments: _____

Pre-Inspection/Plan Review
Documentation. Determine if a complete set of plans/construction drawings, specifications, and energy code compliance documentation is available in the building department. If there is no building department or the locality does not conduct plan review, this information should be obtained from the registered design professional or builder having responsibility for the project. If documentation indicating a trade-off or performance approach is not provided, a prescriptive approach must be assumed for verifying compliance. Construction documents should sufficiently demonstrate energy code compliance, including but not limited to the following information:

- The location and R-values of insulation materials
- U-factors and SHGC values for windows, doors, skylights, and other fenestration products
- Information related to duct and piping location, insulation type and R-value, and means of sealing

Under the assumption that only state or local government with a responsible enforcement and/or permitting agency are included in compliance evaluations, plans and documentation are expected to be held by the responsible agency. If this is not the case, mark this code requirement and the next (PR1 and PR2) as non-compliant, unless there is another entity responsible for enforcement identified (e.g., utility, contractor licensing board, etc.) in which case they should be contacted to review PR1 and PR2 information.

HVAC Load Calculations. Verify that HVAC load calculations have been completed and submitted. Verify the methodology used in the load calculations. List the resultant heating and/or cooling loads as applicable in the Verified Value column.

Building Energy Codes Program

Date visited: 3/14/2011

[ABOUT BECP](#) | [WHY BUILDING ENERGY CODES](#) | [RELATED LINKS](#)Search [energycodes.gov](#)[EERE Information Center](#)[Take Our Website Survey](#)

POWER TOOLS

[Status](#) [Helpline](#)

Desktop Tools

[REScheck](#) [COMcheck](#)

Online Tools

[REScheck](#) [COMcheck](#)

RECENT UPDATES

2010 Building Energy Codes Annual
Report Released
posted 03.04.2011Store + Score Application Released
posted 03.04.2011DOE proposed changes to IgCC PV
2.0
revised 03.10.2011

CODES IN THE NEWS

Notice of Public Meeting: Presenting
and Receiving Comments to DOE
Proposed Changes to the IgCC
posted 03.10.2011A Chance Encounter with the
Massachusetts Stretch Energy
Code
Source: New Buildings Institute, 03.02.2011Energy Efficiency key to Zero
Energy Commercial Buildings
Source: Energy Saving Association,
02.21.2011

Less Energy. Less Cost. Less Carbon.



DOWNLOAD THE CODE:
Digital copies of the
ASHRAE Standard
90.1-2007 (I-P Edition)
and the 2009 International
Energy Conservation Code®
are now available!

[Get Your Copy Now!](#)
[» Learn More](#)

1 2 3 4 5

To learn more about a featured item, click on the corresponding image.

[Status of Energy Codes](#)[Solutions & Help Center](#)[Software & Tools](#)[Building Energy
Codes University](#)

LEARN MORE ABOUT...

[Measuring Compliance](#)[Compliance Evaluation](#)

BROWSE...

[Publications](#)[Events Calendar](#)[Job/Internship Opportunities](#)

QUICKLINKS FOR...

[Architects/Engineers
/Designers](#)[Builders/Contractors](#)[Code Enforcement Officials](#)[State & Local Code Adopters](#)[Codes Advocates](#)[Students](#)

FOLLOW US!



2009 MUEC Residential Additions, Alterations, Renovations, and Repairs *Training Module*



MICHIGAN STATE
UNIVERSITY



**School of Planning, Design
& Construction**

Michigan State University
East Lansing, Michigan

Applicability (*Section 101.4*)

Determine if the project must comply with the 2009 MUEC requirements.

The following **MUST** comply:

- New construction
- **Additions, alterations, renovations, or repairs** (new/altered portion only with 10 specified exceptions) (*Section 101.4.3*)
- **Change in occupancy** or use that increases fossil fuel or electrical energy demand (*Section 101.4.4*)
- **Change in space conditioning** (*Section 101.4.5*)
- Residential portions of mixed occupancy buildings (*Section 101.4.6*)

Applicability (*Section 101.4*)

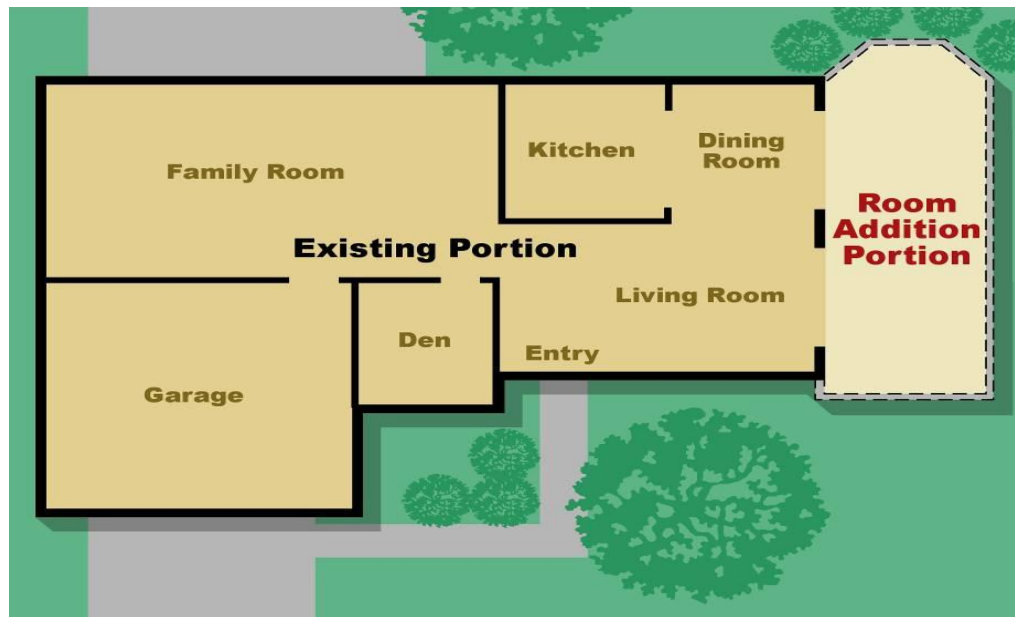
Determine if the project must comply with the 2009 MUEC requirements.

The following need not comply:

- Existing buildings (*Section 101.4.1*)
- Historic buildings (*Section 101.4.2*)
 - Listed in State or National Register of Historic Places
 - Designated historic by local or state jurisdiction
 - Eligible to be listed in State or National Register of Historic Places
- Low energy buildings (peak design rate less than 3.4 Btu/hr·ft² or 1.0 W/ft²) (*Section 101.5.2*)
- Unconditioned buildings (*Section 101.5.2*)

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

- Conform as relates to new construction
- Unaltered portions do not need to comply
- Additions can comply alone or in combination with existing building



Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Storm windows over existing fenestration
 - Neither the storm window nor the existing fenestration need to comply

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Glass only replacements
 - In an existing sash and frame, new glazing need not comply
 - Example: baseball through a window

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Exposed existing ceiling, wall, or floor cavities if already filled with insulation
 - Regardless of the R-value, previously filled cavities need not comply

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Existing roof, wall, or floor cavity is not exposed

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Reroofing for roofs where neither sheathing nor insulation exposed
 - If there is no insulation and either the sheathing or insulation is exposed, the roof insulation must be brought up to code
 - Can be insulated either above or below the sheathing

Presenter's note: maximum of two layers allowed without requiring a tear-off

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Replacement of existing doors in building thermal envelope will not require a vestibule or revolving door, assuming an existing one will not be removed

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Replacement of less than 50% of luminaires in a space
 - Must not increase the interior lighting power

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Replacement of only the bulb and ballast in existing luminaries
 - Must not increase the interior lighting power

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Existing, unaltered 1- and 2-family dwellings
 - Replacement fenestration is not exempt as stated in Section 402.3.6 (entire window units)

Additions, Alterations, Renovations, and Repairs (*Section 101.4.3*)

Exceptions (assuming no net increase in energy use):

- Detached 1- and 2-family dwellings moved from one jurisdiction to another
 - Premanufactured homes delivered from the location of production for initial installation on a building site is not considered “moved”

Additions, Alterations, Renovations, and Repairs

Changes in occupancy or use (*Section 101.4.4*)

- Must comply if it would result in increased demand for fossil fuel or electrical energy

Change in space conditioning (*Section 101.4.5*)

- Non-conditioned spaces altered to become conditioned must comply

Example – garage turned into a bedroom

Fire Repair Example

As for any repair, the following must be brought up to code:

- Exposed, un-insulated cavities including walls, ceilings, and floors
- Any replacement fenestration (entire fenestration assemblies)
- Replacement of luminaries in a “space” if 50% or more are being replaced
- New HVAC ducts must comply
- HVAC equipment must meet Federal standards
- All applicable mandatory provisions must be met

Local Jurisdictional Authority

From the 2009 Michigan Residential Code:

- General duties and powers of the building official (*R104.1*)
 - Allows local building officials to render interpretations of codes and to adopt policies and procedures
 - Must conform with the intent of the code

Local Jurisdictional Authority

From the 2009 Michigan Residential Code:

- Modifications (*R104.10*)
 - When practical difficulties of meeting the code arise, the building official can grant modifications
 - Individual cases only
 - Modification must conform with the intent of the code

Required Permits

From the 2009 Michigan Residential Code:

- Emergency repairs (*R105.2.1*)
 - Equipment replacement and repairs only
 - Permit application can be submitted within the next working business day
- Repairs (*R105.2.2*)
 - Not required for ordinary repairs, lamp replacements, or connection of approved portable electrical equipment to permanent receptacles
 - Ordinary repairs do NOT include additions, alterations, replacement, or relocation of plumbing, electrical, or mechanical items

Submittal Documents (*Section 103.1*)

Construction documents, special inspection programs, structural programs, and other data shall be:

- Submitted in 1 or more sets for permit application
- Prepared by or under the supervision of a registered design professional (when required by 1980 PA 299, MCL 339.101 to 339.2721)

Building Officials may require additional documents to be prepared by a registered design professional.

Information on Documents (*Section 103.2*)

Construction documents must:

- Be drawn to scale
- Be drawn upon suitable material (Code Official approval needed for submittal of electronic drawings)
- Clearly show the location, nature, and extent of the proposed work



ANSI/ASHRAE/IESNA Standard 90.1-2007. U. S. DOE Building Energy Codes Program.

<http://www.energycodes.gov/becu/trainers.stm> Date visited: 6/28/2011

Information on Documents (*Section 103.2*)

Construction documents must detail:

- Locations and types of insulation materials and R-values
- Locations and details of fenestration including U-factors and air infiltration rates
- Area weighted U-factors calculations
- Mechanical system equipment type, size, and efficiency and the supporting design criteria
- Service water heating system equipment type, size, and efficiencies
- Economizer descriptions
- Equipment and system controls
- Fan motor horsepower (hp) and controls
- Duct location, sealing, and insulation information
- Pipe insulation and locations
- Lighting fixture schedule including wattage and control information
- Air sealing methods

Mandatory Provisions

These must be met for ALL compliance methods!

These provisions include:

- General requirements (*Section 401*)
- Air leakage (*Section 402.4*)
- Maximum fenestration U-factor (*Section 402.5*)
- System controls (*Section 403.1*)
- Duct sealing (*Section 403.2.2*)
- Building cavities as ducts (*Section 403.2.3*)
- Mechanical system piping insulation (*Section 403.3*)
- Circulating hot water systems (*Section 403.4*)
- Mechanical ventilation (*Section 403.5*)
- Equipment Sizing (*Section 403.6*)
- Systems serving multiple dwelling units (*Section 403.7*)
- Snow melt system controls (*Section 403.8*)
- Pools (*Section 403.9*)

Determine Compliance

Prescriptive

Trade-off

Performance

“Prescriptive
Packages
Approach”

“Trade-off
Approach”
(UA)

“Performance
Approach”

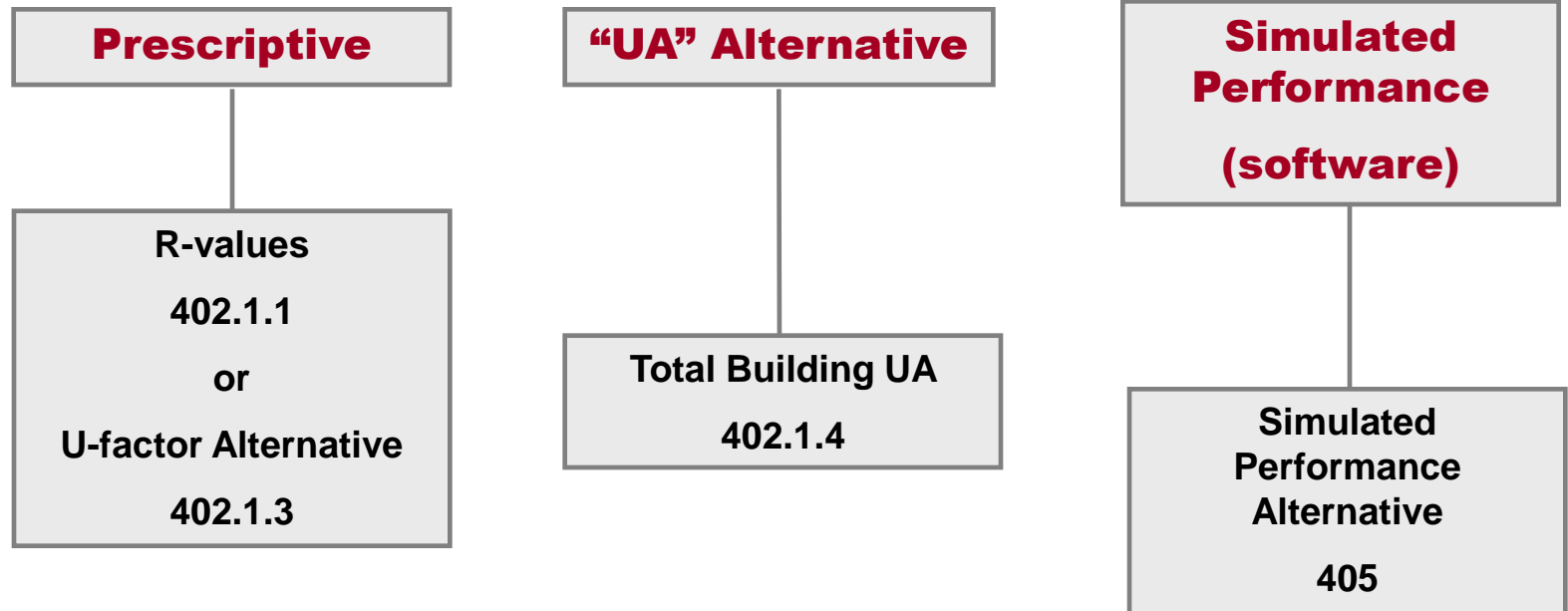
Residential Data Collection Checklist 2009 International Energy Conservation Code Climate Zone 3									
Date: _____ Name of Evaluator(s): _____									
Building Name & Address: _____ Conditioned Floor Area: _____ sq'									
Building Contact: Name: _____ Phone: _____ Email: _____									
Compliance Approach: <input type="checkbox"/> Prescriptive (IECC 1.2 or IECC 1.3) <input type="checkbox"/> UA Trade-Off (IECC 1.4) <input type="checkbox"/> Building Performance (IECC 1.5)									
State: _____ Jurisdiction: _____									
Building Type: <input type="checkbox"/> 1- and 2-Family Detached <input type="checkbox"/> Single-Family Attached <input type="checkbox"/> Multifamily <input type="checkbox"/> Other: _____									
Item Number	Item Description	Code Value	Verified Value	Y	N	NA	Complies		
F01	Slab edge insulation R-value installed per manufacturer's instructions.	Unheated R-5	R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F02	Slab edge insulation depth/length	Heated: 2 ft.	R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F03	Basement wall exterior insulation R-value installed per manufacturer's instructions.	R-5	R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F04	Basement wall exterior insulation depth	10 ft. or to equipment floor	R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F05	Crawl space wall insulation R-value installed per manufacturer's instructions.	R-5 (cavity) R-13 (cavity)	R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F06	Snow melt controls		R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F07	Insulation protection		R=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		



Residential Requirements of the 2009 IECC. U. S. DOE Building Energy Codes Program.

<http://www.energycodes.gov/becu/trainers.stm> Date visited: 6/28/2011

Demonstrate Compliance



Prescriptive Method

The following provisions must be met:

- General building thermal envelope (*Section 402.1*)
- Specific insulation requirements (*Section 402.2*)
- Fenestration (*Section 402.3*)
- Duct insulation (*Section 403.2.1*)
- Lighting equipment (*Section 404.1*)



General Building Thermal Envelope

(Section 402.1)

Insulation and fenestration criteria *(Section 402.1.1)*

- Meet requirements of Table 402.1.1 for the appropriate climate zone

R- value computation *(Section 402.1.2)*

- Do not include other building material R-values or air films
- Layered insulation
 - Add R-values of layers to get the component R-value
- Blown insulation
 - Use manufacturer's settled R-value

U-factor alternative *(Section 402.1.3)*

- Assembly U-factor not more than that listed in Table 402.1.3

Insulation and Fenestration Criteria (Section 402.1.1)

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION <i>U</i> -FACTOR	SKYLIGHT ^a <i>U</i> -FACTOR	CEILING <i>R</i> -Value	WOOD FRAME WALL <i>R</i> - VALUE	MASS WALL <i>R</i> - VALUE ^f	FLOOR <i>R</i> - VALUE	BASEMENT ^b WALL <i>R</i> -VALUE	SLAB ^c <i>R</i> - VALUE AND DEPTH	CRAWL SPACE ^c WALL <i>R</i> - VALUE
5A	0.35	0.60	38	20 or 13 + 5 ^e	13/17	30 ^d	10/13	10, 2ft	10/13
6A	0.35	0.60	49	20 or 13 + 5 ^e	15/19	30 ^d	15/19	10, 4ft	10/13
7	0.35	0.60	49	21	19/21	38 ^d	15/19	10, 4ft	10/13

a. The fenestration *U*-factor column excludes skylights.

b. The first *R*-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.

c. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less, in zones 1-3 for heated slabs.

d. Or insulation sufficient to fill the framing cavity, R-19 minimum.

e. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

f. The second *R*-value applies when more than half the insulation is on the interior.

From DELEG Construction Code Part 10 Michigan Uniform Energy Code

U-factor Alternative (Section 402.1.3)

Table 402.1.3
Equivalent U-Factors^a

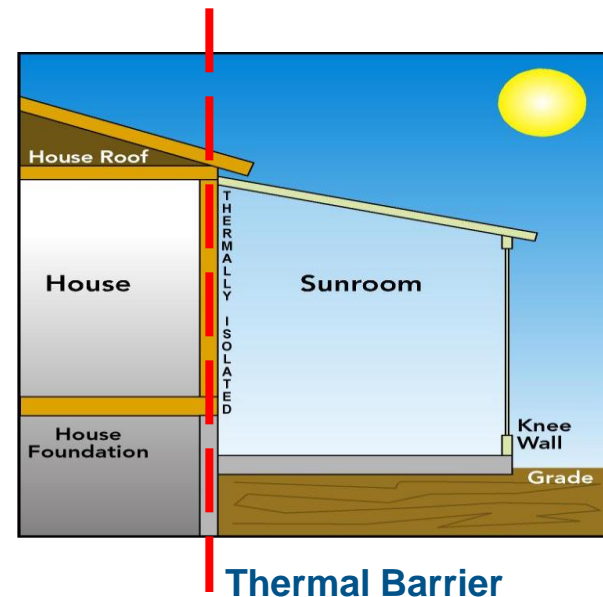
Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass wall U-Factor ^b	Floor U-Factor	Basement Wall U-Factor ^d	Crawl Space Wall U-Factor ^c
5A	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6A	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7	0.35	0.60	0.026	0.057	0.057	0.026	0.050	0.065

- a. Nonfenestration *U*-factors shall be obtained from measurement, calculation, or an approved source.
- b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be the same as the frame wall *U*-factor in Zones 5 to 7.
- c. Basement wall *U*-factor requirements shown in Table 402.1.3 include wall construction and interior air films, but exclude soil conductivity and exterior air films.
- d. Foundation *U*-factor requirements shown in Table 402.1.3 include wall construction and interior air films, but exclude soil conductivity and exterior air films. *U*-factors for determining code compliance in accordance with section 402.1.4 (total UA alternative) of section 405 (simulated performance alternative) shall be modified to include soil conductivity and exterior air films.

From DELEG Construction Code Part 10 Michigan Uniform Energy Code

Thermally Isolated Sunroom Insulation (Section 402.2.11)

- Ceilings insulated to a minimum R-24
- Walls insulated to a minimum R-13
- Must be thermally isolated
- Separate heating or cooling system or zone



Fenestration (*Section 402.3*)

Thermally isolated sunroom U-factor (*Section 402.3.5*)

- Windows and door maximum U-factor of 0.50
- Skylight maximum U-factor of 0.75
- New windows and doors in the separating wall must meet the thermal envelope requirement

Replacement fenestration (*Section 402.3.6*)

- Replacement windows and skylights shall meet the U-factor requirements in Table 402.1.1

Compliance Using *REScheck*

Training Module



MICHIGAN STATE
UNIVERSITY



**School of Planning, Design
& Construction**

Michigan State University
East Lansing, Michigan

REScheck Introduction



- Based on UA tradeoff
- REScheck Software Options
 - Web-based Version
 - Automatically updates
 - Save files online or download
 - Desktop Version
 - No internet connection required
 - Must check for updates
 - Rescheck package generator
 - Design your own code-compliant insulation and window packages based on regional requirements
 - No longer available after January 2011





Before Using REScheck, You Will Need:

- Basic understanding of Windows-based programs
- Basic information about the builder and house to be constructed
- House plans including:
 - Areas of exterior walls, glazing, roof/ceiling, basement walls, doors, crawl walls and floors
 - R-values, U-values, wall heights and insulation depths
 - Heating and cooling system efficiencies*

*Not included when choosing IECC 2009

REScheck Web or Desktop Download

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

Building Energy Codes Program

ABOUT BECP | WHY BUILDING ENERGY CODES | RELATED LINKS

Search energycodes.gov

Less Energy. Less Cost. Less Carbon.

BROWSE...

- Publications
- Events Calendar
- Job/Internship Opportunities

QUICKLINKS FOR...

- Architects/Engineers /Designers
- Builders/Contractors
- Code Enforcement Officials
- State & Local Code Adopters
- Codes Advocates
- Students

FOLLOW US!

RSS Facebook YouTube Twitter

POWER TOOLS

- REScheck
- Status
- COMcheck
- Helpline

RECENT UPDATES

- Jeffrey A. Johnson Award Announced! posted 07.20.2010
- July 2010 *Setting the Standard* Newsletter Released posted 07.16.2010
- COMcheck 3.8.0 Now Available! posted 07.08.2010

CODES IN THE NEWS

- Notice of Upcoming Funding Opportunity
Source: Building Energy Codes Program, 8.11.2010
- EERE Webinar: National Residential Retrofit Guidelines August 11

ARE YOU SETTING THE STANDARD?
Keep up-to-date on what's happening in the codes world.
Read the latest issue!
» Learn More

Software & Tools

Status of Energy Codes

Solutions & Help Center

Building Energy Codes University

To learn more about a featured item, click on the corresponding image.

REScheck Training

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Building Energy Codes Program

ABOUT BECP | WHY BUILDING ENERGY CODES | RELATED LINKS | **HOME**

Search energycodes.gov
 >>

EERE Information Center

Less Energy. Less Cost. Less Carbon.

LEARN MORE ABOUT...

Residential Compliance with
REScheck™

Commercial Compliance with
COMcheck™

Federal Building Codes

ALSO ON THIS WEBSITE...

Status of Codes

Solutions & Help Center

Software & Tools

Building Energy Codes
University

Publications

Events Calendar

Software & Tools

The Building Energy Codes Program offers two main compliance assessment software—REScheck for residential compliance assessment, and COMcheck for commercial compliance assessment—in both downloadable and web-based tools. BECP also offers both pre-defined prescriptive packages—which allow you to select from various combinations of energy conservation measures, based on your climate zone location—and a web-based prescriptive package generator which allows you to generate your own code-compliant insulation and window packages based on building location, window-to-wall ratio, and your choice of insulation levels. Along with the pre-defined prescriptive packages and generator, BECP has developed a set of prescriptive package field guides for the 1998/2000 IECC.

REScheck

COMcheck

Federal Tools

The latest Windows version of REScheck is Version 4.3.1 (released March 2010).

- [See What's New in REScheck](#)
- [REScheck Prescriptive Package Generator](#)
- [Residential Online Training/ Education](#)
- [States that can use REScheck for Compliance](#)
- [Known problems in REScheck](#)
- [REScheck Product Archive](#)
- [2009 IECC Residential Prescriptive Requirements](#)

Get REScheck for
your desktop

No time to download?
Use REScheck-Web!

Additions and Renovations



- In *REScheck*, model additions and renovations as a addition/alteration (new project)
- The *REScheck* software tools cannot currently be used to show compliance using the prescriptive criteria alternative compliance defined for sunrooms and additions in the 2009 IECC. Compliance can be shown by including requirements for the applicable minimum component insulation and maximum U-factor for fenestration on the building plans.
- Attaching the applicable table to your building plans and highlighting the applicable criteria will help expedite approval.

Sunroom Requirements



- Sunrooms must meet the following criteria to use the sunroom compliance path:
 - An area <500 square feet
 - >40% glazing of gross exterior wall and roof area
 - thermally isolated
 - not used as a kitchen or sleeping quarters
 - separate heating/cooling system or zone

Ceiling Insulation

- Zones 5-8 R-24

Wall Insulation

- All zones R-13

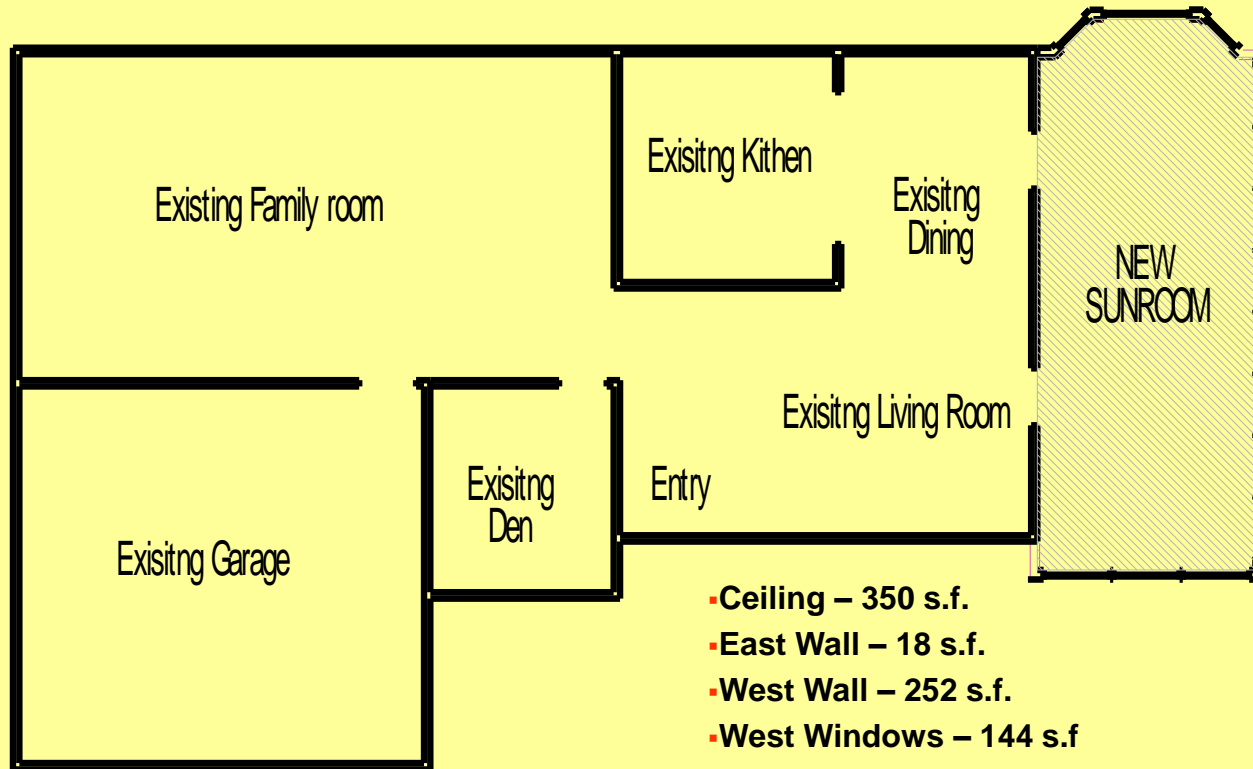
Fenestration U-Factor

- Zones 4-8 0.50

Skylight U-Factor

- Zones 4-8 0.75

Sunroom Addition



- Ceiling – 350 s.f.
- East Wall – 18 s.f.
- West Wall – 252 s.f.
- West Windows – 144 s.f.
(U-value .35/SHGC .40)
- North Wall – 112 s.f.
- North Windows – 63 s.f.
(U-value .35/SHGC .40)
- South Wall – 126 s.f.
- South Windows – 51 s.f.
(U-value .35/SHGC .40)
- Floor – 350 s.f.

Compliance Report



Generated by REScheck-Web Software Compliance Certificate

Energy Code: 2009 IECC
Location: East Lansing, Michigan
Construction Type: Single Family
Glazing Area Percentage: 18%
Heating Degree Days: 7228
Climate Zone: 5

Construction Site:

Owner/Agent:

Designer/Contractor:

Project Information and
Passing Score Displayed

Inventory of Building
Components

Compliance: Passes using UA trade-off

Compliance: Maximum UA: 582 Your UA: 577

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Ceiling: Raised or Energy Truss	2415	38.0	0.0		60
Exterior Wall 1: Wood Frame, 16in. o.c.	911	19.0	0.0		30
Door 1: Solid	40			0.500	20
Window Main: Vinyl Frame, Double Pane	369			0.350	129
Ext. Wall 2 South: Wood Frame, 16in. o.c.	834	19.0	0.0		39
Window 2: Vinyl Frame, Double Pane	149			0.350	52

Inspection Checklist



Generated by REScheck-Web Software

Inspection Checklist

Checklist Allows Code
Official to Verify Individual
Building Components

Ceilings:

- ☐ Ceiling: Raised or Energy Truss, R-38.0 cavity Insulation

Comments: _____
Insulation must achieve full height over the plate lines of exterior walls.

Above-Grade Walls:

- ☐ Exterior Wall 1: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

- ☐ Ext. Wall 2 South: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

- ☐ Ext. Wall 3 East: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

- ☐ Ext. Wall 4 West: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

- ☐ Knee Wall West: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

- ☐ Knee Wall East: Wood Frame, 16in. o.c., R-19.0 cavity Insulation

Comments: _____

Energy Features Certificate



2009 IECC Energy Efficiency Certificate

Insulation Rating	R-Value
Ceiling / Roof	38.00
Wall	19.00
Floor / Foundation	30.00
Ductwork (unconditioned spaces):	_____

Glass & Door Rating	U-Factor	SHGC
Window	0.35	0.15
Door	0.50	NA

Heating & Cooling Equipment	Efficiency
Heating System: _____	_____
Cooling System: _____	_____
Water Heater: _____	_____

Name: _____	Date: _____
Comments:	

Certificate Posted at Electrical Panel to Identify Primary Building Components

Name of Building Inspector and Date of Final Inspection



Q + A

MICHIGAN STATE
UNIVERSITY



END

MICHIGAN STATE
UNIVERSITY