



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable



Building Energy Codes

How to Use REScheck Energy Code Compliance Software

U.S. Department of Energy
Building Energy Codes Program

Speakers: Pam Cole and Rosemarie Bartlett,
PNNL

www.energycodes.gov

techsupport@becp.pnl.gov



U.S. Department of Energy
Energy Efficiency and Renewable Energy *Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable*



EERE Home

Building Energy Codes Program



About the Program

Compliance Tools

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DOE's Building Energy Codes Program is an information resource on national model energy codes. We work with other government agencies, state and local jurisdictions, national code organizations, and industry to promote stronger building energy codes and help states adopt, implement, and enforce those codes.

The Program recognizes that energy codes maximize energy efficiency only when they are fully embraced by users and supported through education, implementation, and enforcement.

Free Software



REScheck

[REScheck](#), [REScheck-Web](#), [REScheck Package Generator](#)



COMcheck

[COMcheck](#), [COMcheck-Web](#), [COMcheck Package Generator](#)

Technical Support



Resource Center

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NEWS

Notice Requesting Public Input on Further Analysis Related to Wall Insulation Requirements for Residential Buildings in the IECC and Other Potential Code Change Proposals

Building Technologies State Energy Outreach and Deployment State Energy Program (SEP) Special Projects Grant Solicitation Now Open

Statement of the Department of Energy - State Energy Code Criteria for Residential AC and HP

2005 ICC Final Action Hearings

LIVE WEBCAST Residential Requirements of the 2006 International Energy Conservation Code (IECC) April 20, 2006 Register Now.

What Residential Code Compliance Tools does BECP offer?

Prescriptive Approach

- Simple, fast and easy
- Generally most stringent
- Requires minimum input
- Based on climate and WWR
- Uses a prototype building

1

Printed guides on
www.energycodes.gov

or

2



Trade-off Approach

- Trade-off between components
- Provides design flexibility
- Requires area & U/R-factors
- Uses UA calculation (REScheck)

Free

1



Desktop Versions:

Windows
Mac

or

2



All REScheck tools available from www.energycodes.gov

Training Tools

- PowerPoint presentations with faculty notes
- Case studies
- Online training
- Online videos



The screenshot shows the "Building Energy Codes ONLINE TRAINING" website. The user is logged in as "Pam Cole". The page is for the "REScheck101" course. It features a navigation menu on the left with sections for "Administration" (Change password, Unenrol me from REScheck101) and "Courses" (REScheck Training, COMcheck Training, Residential Requirements of the 2006 IECC, Article 124 - Single Top Plates). The main content area is titled "REScheck 101 Training" and includes a welcome message, a description of the course, and a "Pilot Study" section. A "Topics" sidebar on the right lists five topics: Scope of IECC, General Requirements for Building Envelope, General Requirements for Heating, Ventilation, and Air Conditioning, General Requirements for Service Water Heating, and General Requirements for Electrical. The website footer indicates it is a "Local intranet".

Welcome to the Building Energy Codes Resource Center



This system has been developed to provide users with information about energy codes and beyond code technologies. You can SEARCH by keyword, or BROWSE the available topics. Start your research using the toolbar at the top of the page.

Resources are available in a variety of different media types, including Articles, Graphics, Online Tools, Presentations, and Videos. The BECP Resource Center gathers content not only from our own archives, but also provides links to energy code resources from around the web. [Learn more about the Resource Center.](#)

NEW MATERIALS

[Article #1529: Energy Policy Act 2005 and Tax Credits](#)

[Article #1533: Appropriate Use of Building Energy Simulation Software](#)

[Article #1484: Vestibule Case Study](#)

POPULAR RESOURCES

[Article #139: Insulating Suspended Ceilings](#)

[Building Energy Codes Glossary](#)

[Article #1420: Energy Code Climate Zones](#)

[Article #1469: How Do I Enter Non-Uniformly Insulated Basement Walls in REScheck?](#)

When does REScheck apply?

Residential New Construction and Additions

- 1-2 single family dwellings
- Multifamily dwellings: 3 or more attached dwelling units 3 stories or less

State Dependent

- Not all states have the same code, some states have state-specific energy codes
- Check to see what code is applicable in your state and if REScheck is accepted
- Status of State Codes
 - http://www.energycodes.gov/implement/state_codes/index.stm

Residential Requirements

1) Mandatory Requirements:

- Moisture Control
- Air Leakage - Recessed Lighting Fixtures
- Infiltration Control
- Solar Heat Gain Coefficient
- Building Mechanical Systems and Equipment
- Service Water Heating

2) Climate Specific Requirements:

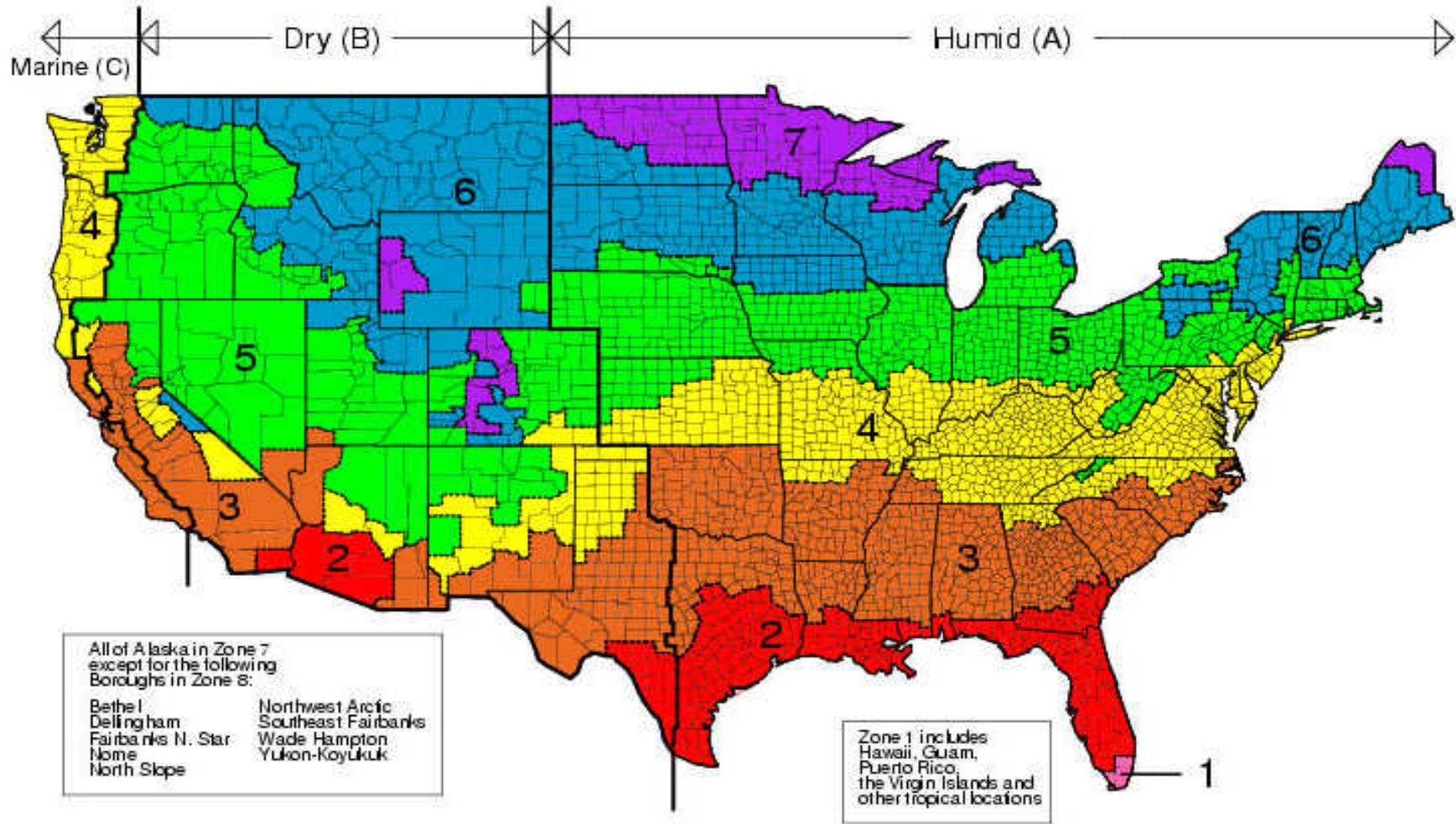
- Foundations
 - Crawlspace
 - Slabs
 - Basements
- Above Grade Walls
- Skylights, Windows, and Doors
- Roofs
- Duct Insulation



What's New in REScheck for 2006 IECC

- Climate Zones
- Envelope Requirements
- Fenestration Hard Limits
- New Software Inputs
 - Conditioned Floor area
 - SHGC
- Panel Certificate
- Different Approach to HVAC Trade-offs

Climate Zones in 2006 IECC & REScheck



Insulation and Fenestration

Requirements by Climate Zone in 2006 IECC

**Table 402.1.1
Insulation and Fenestration Requirements by Component**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB R-VALUE & DEPTH	CRAWL SPACE WALL R-VALUE
1	1.20	0.75	0.40	30	13	3	13	0	0	0
2	0.75	0.75	0.40	30	13	4	13	0	0	0
3	0.65	0.65	0.40	30	13	5	19	0	0	5 / 13
4 except Marine	0.40	0.60	NR	38	13	5	19	10 / 13	10, 2ft	10 / 13
5 and Marine 4	0.35	0.60	NR	38	19 or 13+5	13	30	10 / 13	10, 2 ft	10 / 13
6	0.35	0.60	NR	49	19 or 13+5	15	30	10 / 13	10, 4 ft	10 / 13
7 and 8	0.35	0.60	NR	49	21	19	30	10 / 13	10, 4 ft	10 / 13

U-Factor Requirements

Requirements by Climate Zone in 2006 IECC and in REScheck

**Table 402.1.3
Equivalent U-Factors**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.06	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

2006 IECC Compliance Paths and REScheck Approach

- 2006 IECC (2 Main Paths)
 - Prescriptive
 - Sub paths (R-value computation, U-factor Alternative, and Total UA)
 - Performance
- REScheck Approach
 - Total UA Alternative (same as U-factor alternative but allows trade-offs across all envelope components)
 - Limited scope performance analysis for HVAC trade-offs

Fenestration – 2006 IECC says

Fenestration includes opaque doors

- Windows in colder zones have both prescriptive maximum U-factor requirement and a hard trade-off limit
- An area-weighted average of fenestration can be used to satisfy the U-factor & SHGC requirements
 - Both are subject to hard limits, even in trade-offs
- NFRC rated and certified

Exceptions:

- Unrated single-pane products comply in Climate Zone 1
- Unrated double-pane with thermal break complies in Climate Zones 2 and 3
- 15 sq. ft. of glazing (and one opaque door) can be exempted
 - For example, decorative glass on/near front door

Fenestration – REScheck

- Area-weighted average U-factor and SHGC are subject to hard limits, even in trade-offs
- An area credit of 15 sq.ft. is applied to all fenestration
 - The software looks for the highest glazing U-factor and exempts up to 15 sq. ft. of it
 - REScheck eliminates this 15 sq.ft. in both the proposed UA and the required UA calculation
- A UA credit for the user-specified door with the poorest U-factor is applied similarly to the glazed fenestration exemption
- Window replacement cannot be shown using REScheck

Windows – U-Factors

Requirements by Climate Zone in 2006 IECC and in REScheck

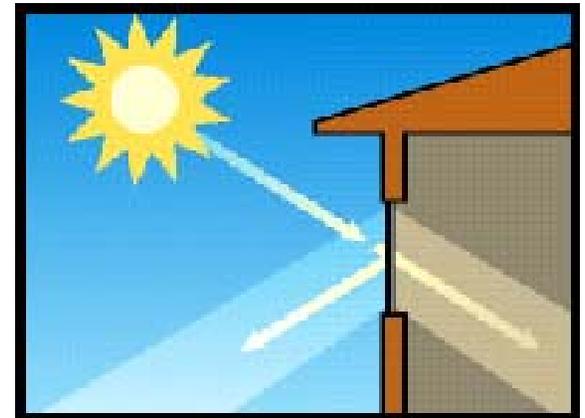
- Hard trade-off limits (cannot be exceeded even in trade-offs)
 - U-0.48 maximum in Zones 4 and 5
 - U-0.40 maximum in Zones 6-8
 - U-0.75 for skylights in Zones 4-8
 - These are based on building average; individual windows or skylights can be worse if the area-weighted average meets these requirements

Windows - SHGC

Requirements by Climate Zone in 2006 IECC and in REScheck

- Solar Heat Gain Coefficient
 - Prescriptive Requirement
 - SHGC of 0.40 or lower required in Climate Zones 1-3 using an area-weighted average
 - Mandatory Requirement (hard trade-off limit) in performance path trade-offs
 - SHGC cannot exceed 0.50 when in Climate Zones 1-3
 - Default SHGCs cannot be used in Climate Zones 1-3

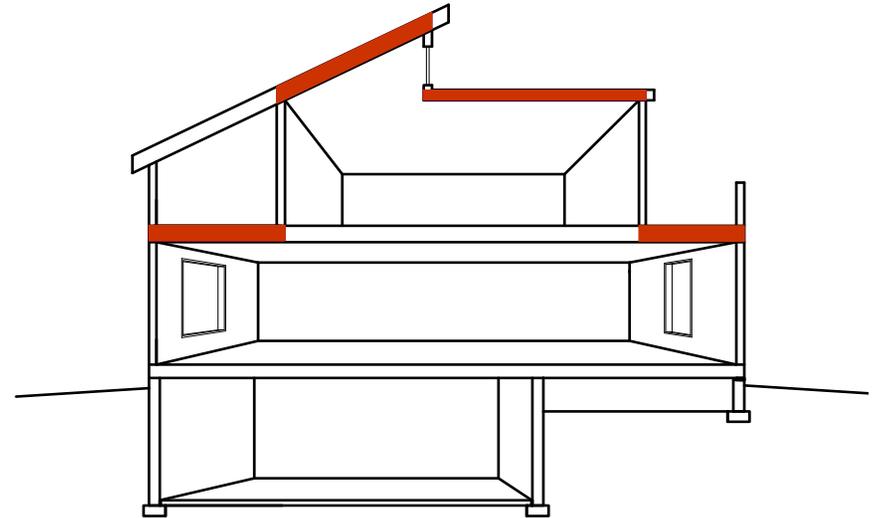
Solar Heat Gain Coefficient



Ceilings

Requirements by Climate Zone in 2006 IECC and in REScheck

- Meet or exceed R-values
- Requirements vary by assembly type
- Compliance accounts for insulation between framing AND continuous insulation over framing
- Special-case allowances
 - Cathedral Ceilings (no attics)
 - Raised or Energy Truss

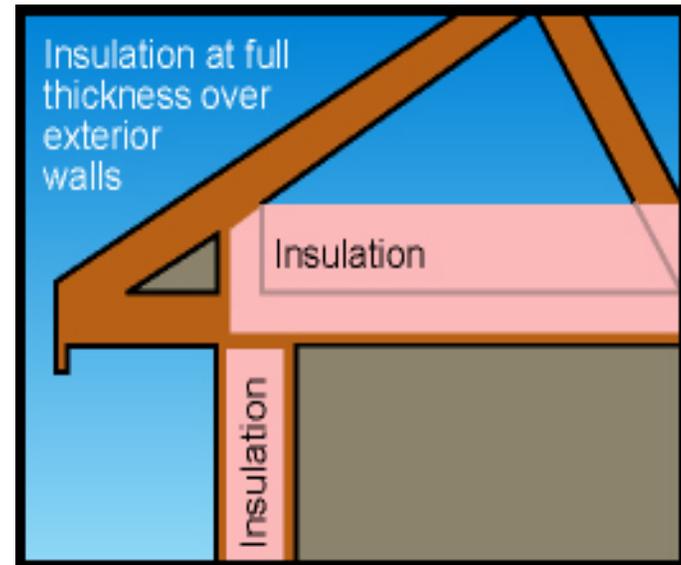


Raised Heel Truss

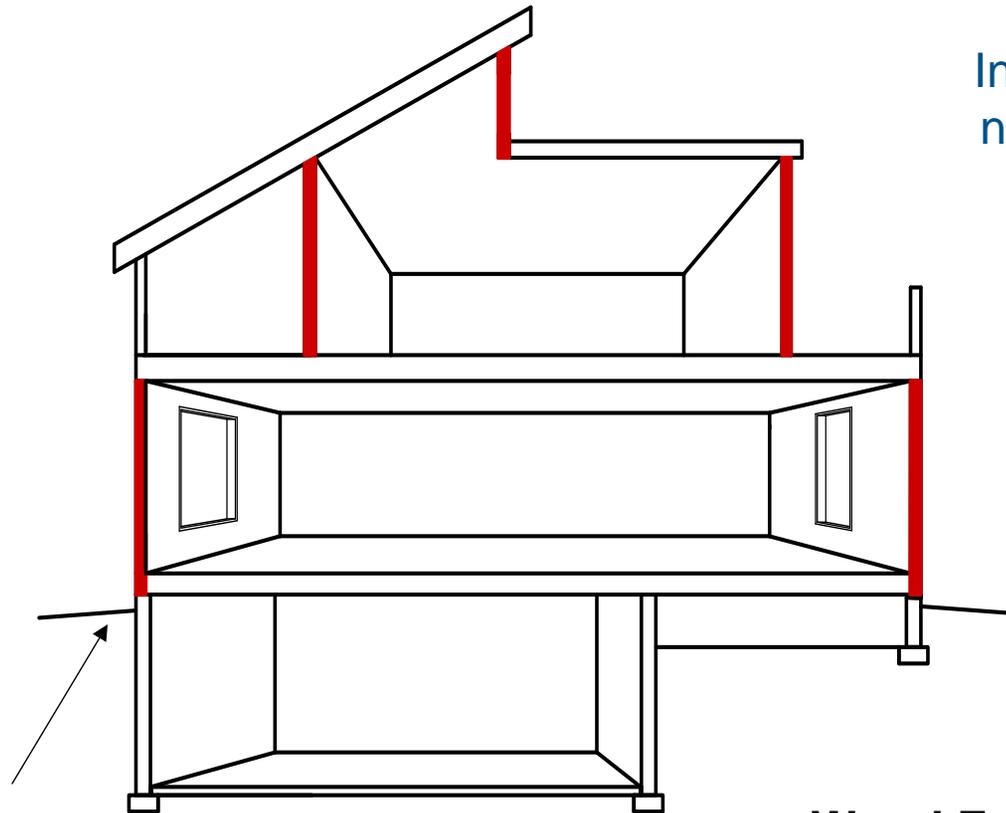
Requirements by Climate Zone in 2006 IECC and in REScheck



- Raised Heel/Energy Truss credit if insulation is full height over exterior wall
 - R-30 instead of R-38
 - R-38 instead of R-49



Above Grade Walls



Insulate walls including those next to unconditioned spaces

Don't forget to insulate rim joists

Wood Frame Walls

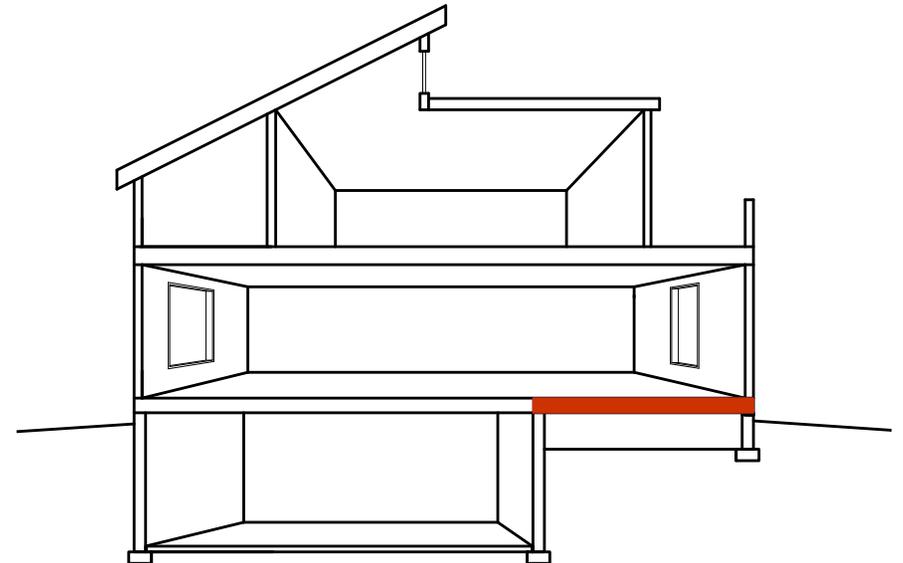
Climate Zones

- 1-4: R-13
- 4 marine and 5-8: R-19 or 13+5

Floors Over Unconditioned Space

Requirements by Climate Zone in 2006 IECC and in REScheck

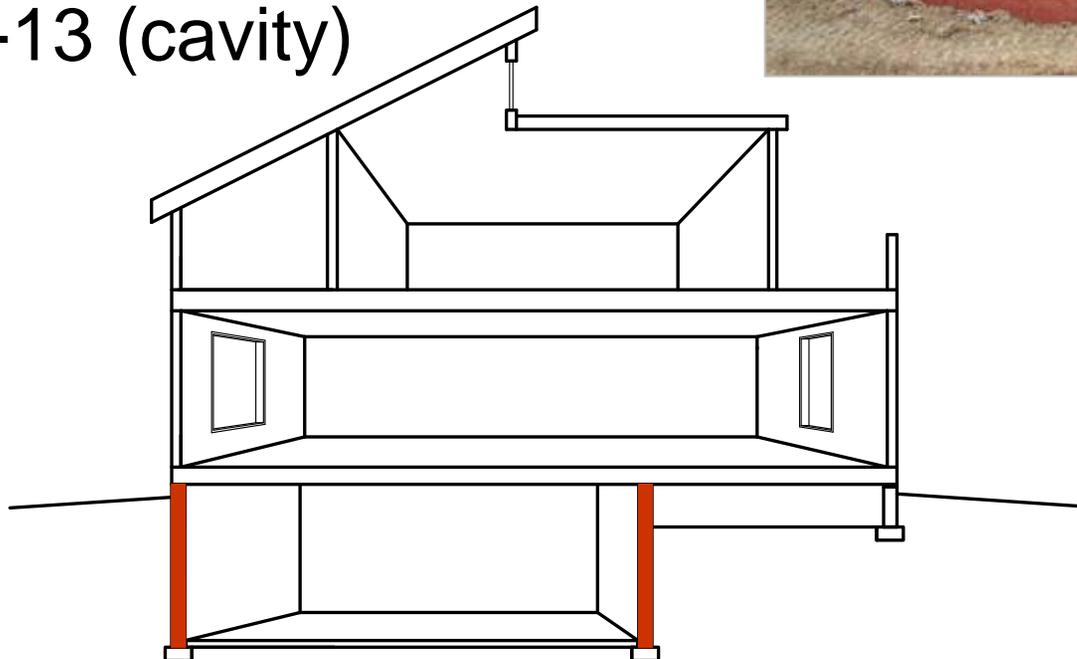
- Space can be unheated basement or a crawlspace or outdoor air
- Zones 1-2: R-13
- Zones 3-4AB: R-19
- Zones 4C-8: R-30



- If you don't meet these insulation levels, additional insulation of other envelope components is required to comply

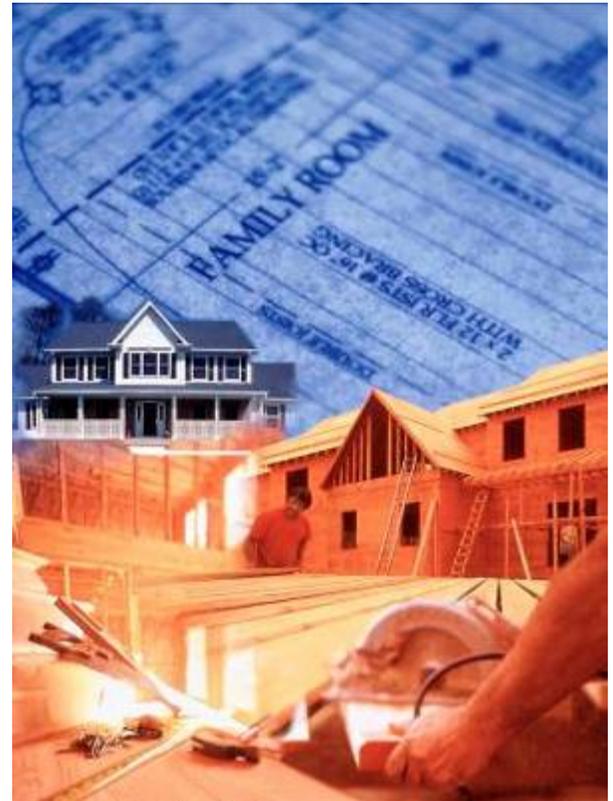
Below-Grade Walls

-  50% below grade
- Zones 1-3: R-0
- Zones 4-8: R-10 (continuous) or R-13 (cavity)



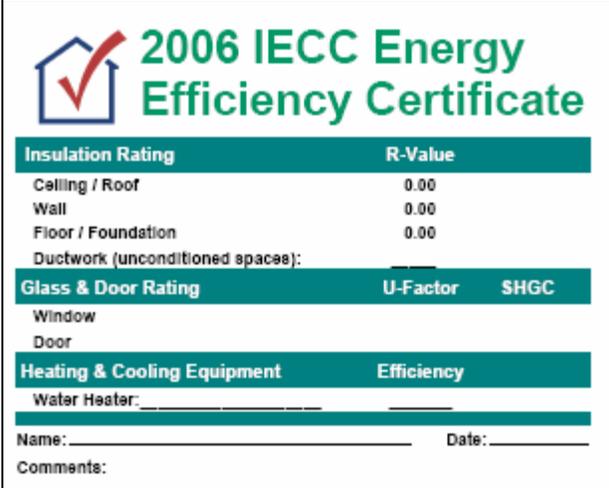
Compliance/Documentation/ Inspections

- Code Official has final authority
- Electronic media can be used
 - Email compliance report
- Construction work for which a permit is required is subject to inspection
- Certificate is required



Certificate

- Permanently posted on the electrical distribution panel
- Shall include the following:
 - R-values of insulation installed for the thermal building envelope including ducts outside conditioned spaces
 - U-factors for fenestration
 - SHGC for fenestration
 - HVAC efficiencies
 - SWH equipment



The image shows a form titled "2006 IECC Energy Efficiency Certificate". It features a logo of a house with a checkmark inside a square. The form is divided into several sections with teal headers. The "Insulation Rating" section has a table with columns for the component and its R-Value. The "Glass & Door Rating" section has a table with columns for the component, U-Factor, and SHGC. The "Heating & Cooling Equipment" section has a line for "Water Heater" efficiency. At the bottom, there are lines for "Name", "Date", and "Comments".

Insulation Rating		R-Value
Ceiling / Roof		0.00
Wall		0.00
Floor / Foundation		0.00
Ductwork (unconditioned spaces):		

Glass & Door Rating		U-Factor	SHGC
Window			
Door			

Heating & Cooling Equipment		Efficiency
Water Heater:		

Name: _____ Date: _____
Comments: _____

HVAC Trade-offs

- REScheck is a “limited scope” performance analysis tool as permitted under Section 404.6.2
- Performance analysis is attempted only when:
 - House fails by UA compliance
 - High Efficiency HVAC equipment has been specified
- How this impacts REScheck
 - Requires users to initiate compliance check
 - Requires entry of orientation and SHGC
 - Doesn't always improve compliance even if high-efficiency HVAC is specified

Case Study – REScheck Software



Jones Residence

The image shows a Windows XP desktop environment with a blue sky and green field background. A large, semi-transparent blue box is centered on the screen, containing the REScheck logo and program information. The desktop is populated with various application icons, including Microsoft Outlook, Internet Explorer, Firefox Setup, ETR, Microsoft Photo Editor, Mozilla Firefox, Adobe Reader, Work_Pkg, URL's and Emails, Software Analysis, URL's, Attendee_List, Microsoft PowerPoint, Link Check, Implementati..., Microsoft Word, Desktop Stuff, COMcheck-EZ, Microsoft Outlook, Emails, Microsoft Excel, Articles, PhotoStudio 5, and Adobe Acrobat. The taskbar at the bottom shows the Start button, several open applications, and system tray icons including the Recycle Bin and a clock showing 1:26 PM.



REScheck™

DOE's Building Energy Codes Program

Internet Address: www.energycodes.gov

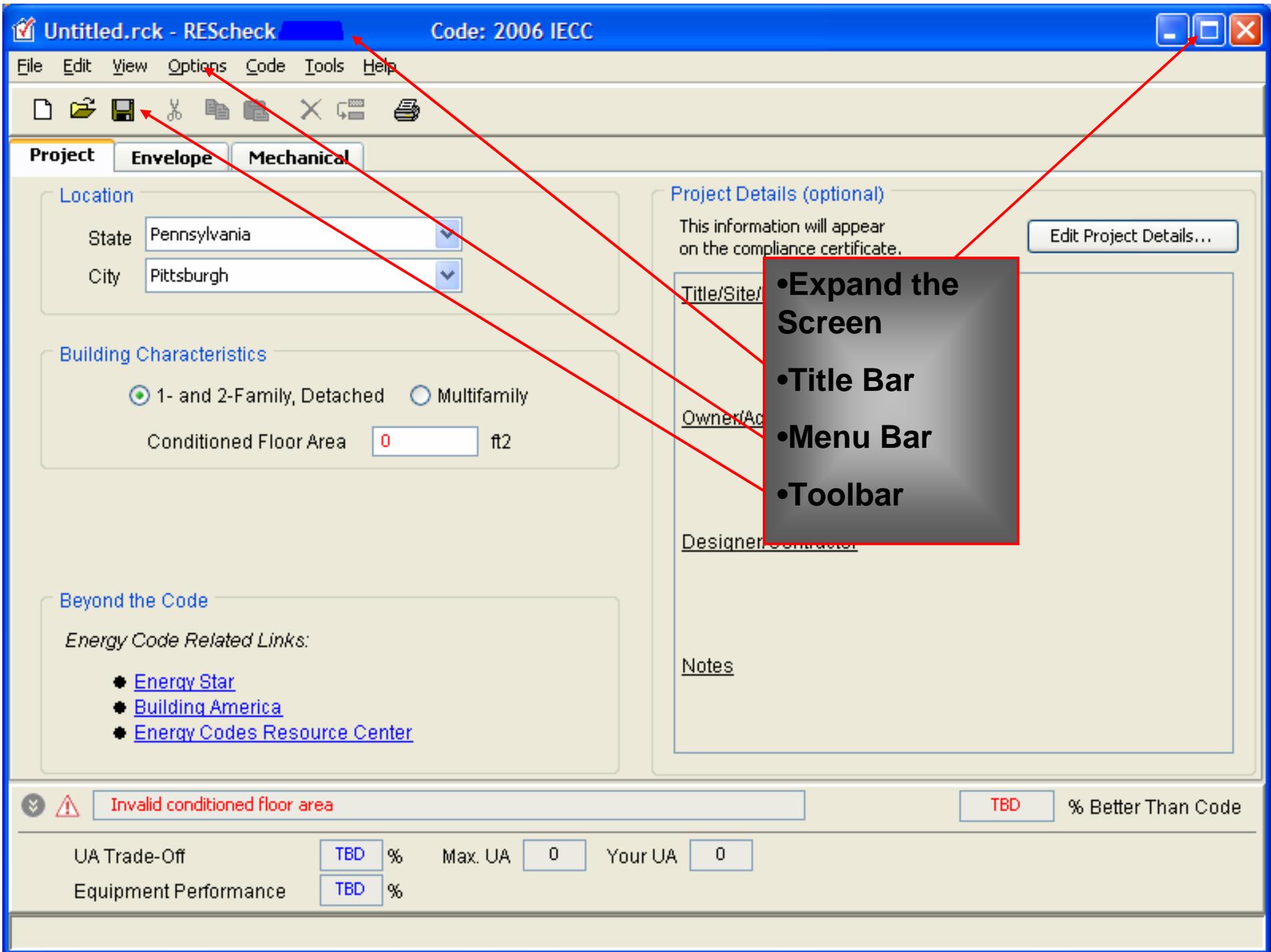
Technical Support: techsupport@becp.pnl.gov

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Loading...

Drawing Pad

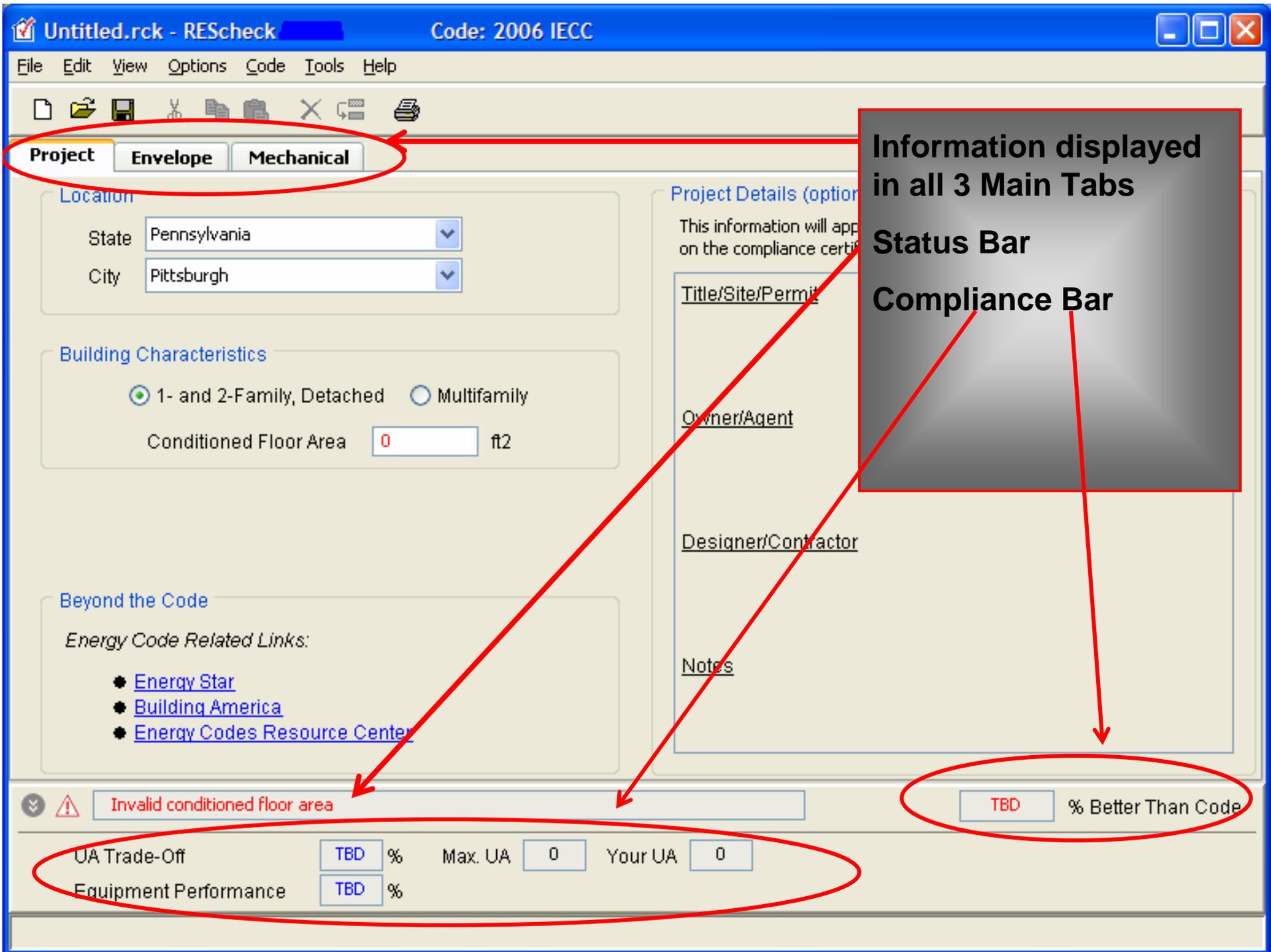


•Expand the Screen

•Title Bar

•Menu Bar

•Toolbar



Information displayed
in all 3 Main Tabs

Status Bar

Compliance Bar

Invalid conditioned floor area

TBD

% Better Than Code

UA Trade-Off

TBD

%

Max. UA

0

Your UA

0

Equipment Performance

TBD

%

Untitled.rck - REScheck Code: 2006 IECC

File Edit View Options Code Tools Help

Project Envelope Mechanical

Project Tab:

- Location
- Building Characteristics

Location

State Pennsylvania

City Pittsburgh

Building Characteristics

1- and 2-Family, Detached Multifamily

Conditioned Floor Area 0 ft2

Beyond the Code

Energy Code Related Links:

- [Energy Star](#)
- [Building America](#)
- [Energy Codes Resource Center](#)

Project Details (optional)

This information will be used to generate the permit application on the compliance code website.

Title/Site/Permit

Owner/Agent

Designer/Contractor

Notes

Invalid conditioned floor area

TBD % Better Than Code

UA Trade-Off TBD % Max. UA 0 Your UA 0

Equipment Performance TBD %

Untitled.rck - REScheck Code: 2006 IECC

File Edit View Options Code Tools Help

Project Envelope Mechanical

Location

State

City

Project Tab:
- Project Details
- Beyond Code Advisor

Project Details (optional)

This information will appear on the compliance certificate.

Edit Project Details...

Title/Site/Permit

Owner/Agent

Designer/Contractor

Notes

Beyond the Code

Energy Code Related Links:

- [Energy Star](#)
- [Building America](#)
- [Energy Codes Resource Center](#)

Invalid conditioned floor area TBD % Better Than Code

UA Trade-Off TBD % Max. UA 0 Your UA 0

Equipment Performance TBD %

Envelope Section

Untitled.rck - REScheck Code: 2006 IECC

File Edit View Options Code Tools Help

Project **Envelope** Mechanical

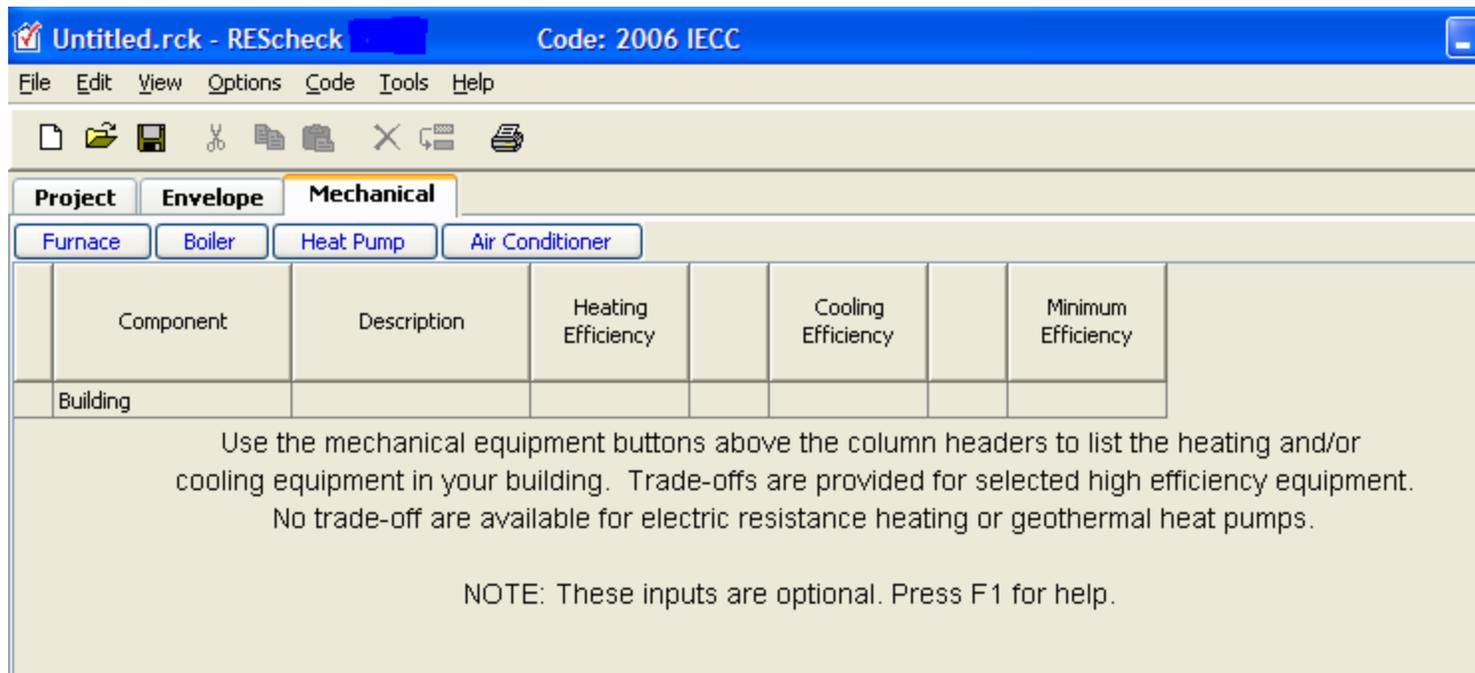
Ceiling Skylight Wall Window Door Basement Floor Crawl Wall

	Component	Assembly	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U-F
	Building						
1	Ceiling 1	Flat Ceiling or Scissor Truss	2500	ft2	38.0	0.0	0
2	Wall 1	Wood Frame, 16" o.c.	3200	ft2	19.0	0.0	0
3	Window 1	Wood 15" o.c.	200	ft2			0
4	Floor 1	Concrete Slab	2500	ft2			0

Building Components are added by clicking on these.

Mechanical Inputs

- No user entries are required
- Only get “credit” for high-efficiency equipment



The screenshot shows the REScheck software interface. The title bar reads "Untitled.rck - REScheck" and "Code: 2006 IECC". The menu bar includes "File", "Edit", "View", "Options", "Code", "Tools", and "Help". The toolbar contains icons for file operations. The "Mechanical" tab is selected, showing buttons for "Furnace", "Boiler", "Heat Pump", and "Air Conditioner". Below these buttons is a table with the following structure:

Component	Description	Heating Efficiency		Cooling Efficiency		Minimum Efficiency
Building						

Use the mechanical equipment buttons above the column headers to list the heating and/or cooling equipment in your building. Trade-offs are provided for selected high efficiency equipment. No trade-off are available for electric resistance heating or geothermal heat pumps.

NOTE: These inputs are optional. Press F1 for help.

Mechanical Requirements

- Mandatory requirements such as duct insulation are listed in the Inspection Checklist
- The Checklist is automatically prepared by the software based on user-entered inputs such as applicable code and building location



Duct Insulation:
Return Ducts in unconditioned spaces must be insulated to R-4
Supply Ducts outside the building must be insulated to R-8

		Duct Insulation:
[]		Supply ducts in unconditioned attics or outside the building must be insulated to R-8.
[]		Return ducts in unconditioned attics or outside the building must be insulated to R-4.
[]		Supply ducts in unconditioned spaces must be insulated to R-8.
[]		Return ducts in unconditioned spaces (except basements) must be insulated to R-2.
[]		Where exterior walls are used as plenums, the wall must be insulated to R-8.
		Insulation is not required on return ducts in basements.

SWH Requirements in REScheck

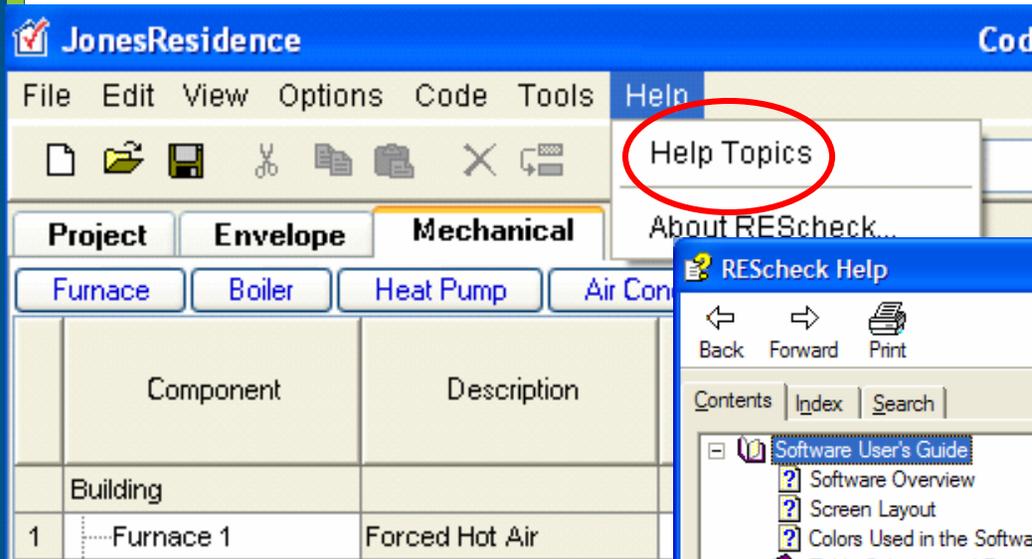
- Mandatory requirements such as heat traps are listed in the Inspection Checklist
- No software entries for Service Water Heating

Service Water Heating:

Water heaters with vertical pipe risers must have a heat trap on both the inlet and outlet unless the water heater has an integral heat trap or is part of a circulating system

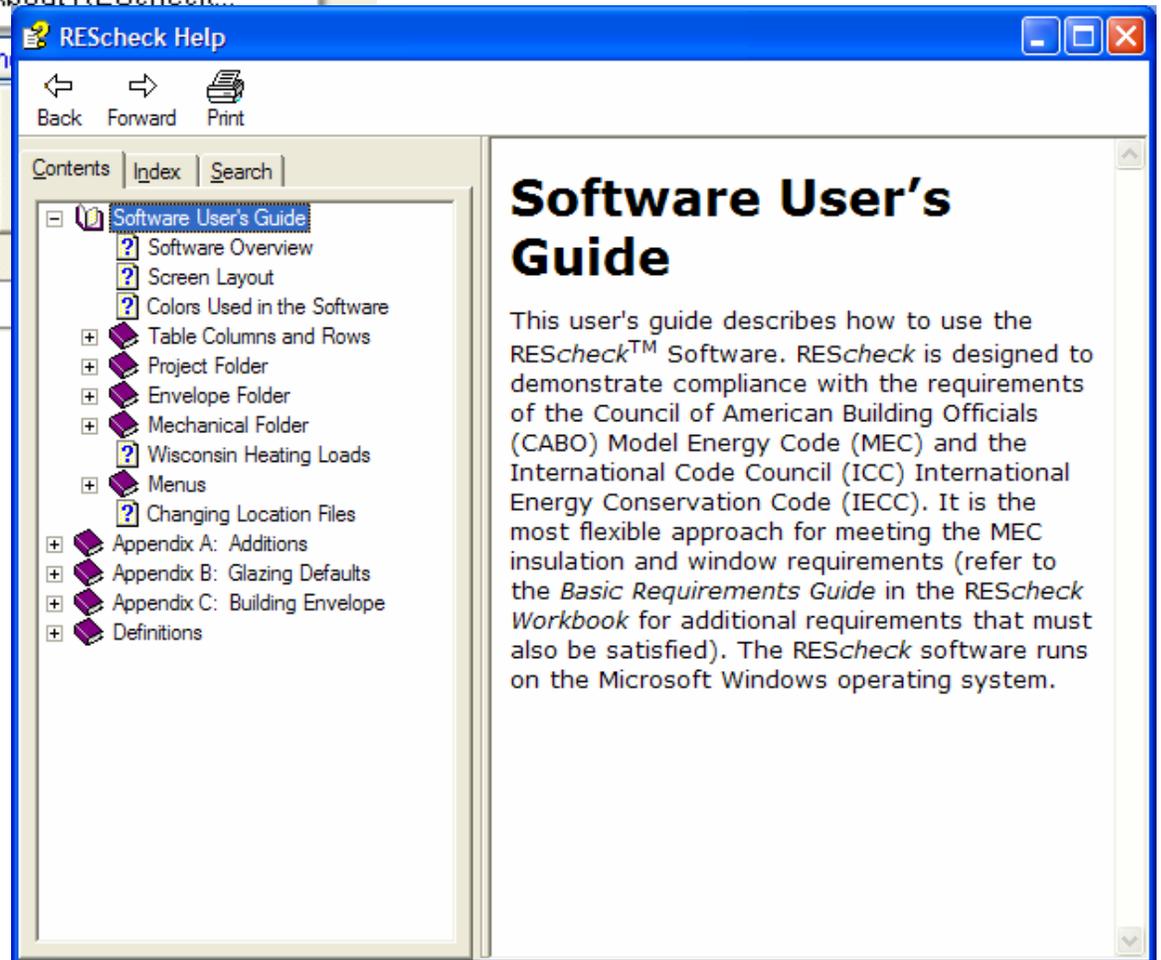
	Service Water Heating:
[]	Water heaters with vertical pipe risers must have a heat trap on both the inlet and outlet unless the water heater has an integral heat trap or is part of a circulating system.
[]	Insulate circulating hot water pipes to the levels in Table 1.
	Circulating Hot Water Systems:
[]	Insulate circulating hot water pipes to the levels in Table 1.
	Swimming Pools:
[]	All heated swimming pools must have an on/off heater switch and require a cover unless over 20% of the heating energy is from non-depletable sources. Pool pumps require a time clock.
	Heating and Cooling Piping Insulation:
[]	HVAC piping conveying fluids above 105 °F or chilled fluids below 55 °F must be insulated to the levels in Table 2.

Need Help?



The screenshot shows the main window of the software titled "JonesResidence". The menu bar includes "File", "Edit", "View", "Options", "Code", "Tools", and "Help". The "Help" menu is open, and the "Help Topics" option is circled in red. Below the menu bar, there are tabs for "Project", "Envelope", and "Mechanical". Under "Mechanical", there are sub-tabs for "Furnace", "Boiler", "Heat Pump", and "Air Con". A table is visible with the following data:

	Component	Description
	Building	
1	Furnace 1	Forced Hot Air



The screenshot shows the "REScheck Help" window. The title bar reads "REScheck Help". The window contains a navigation pane on the left with a tree view of the help topics. The "Software User's Guide" is selected and expanded, showing the following sub-topics:

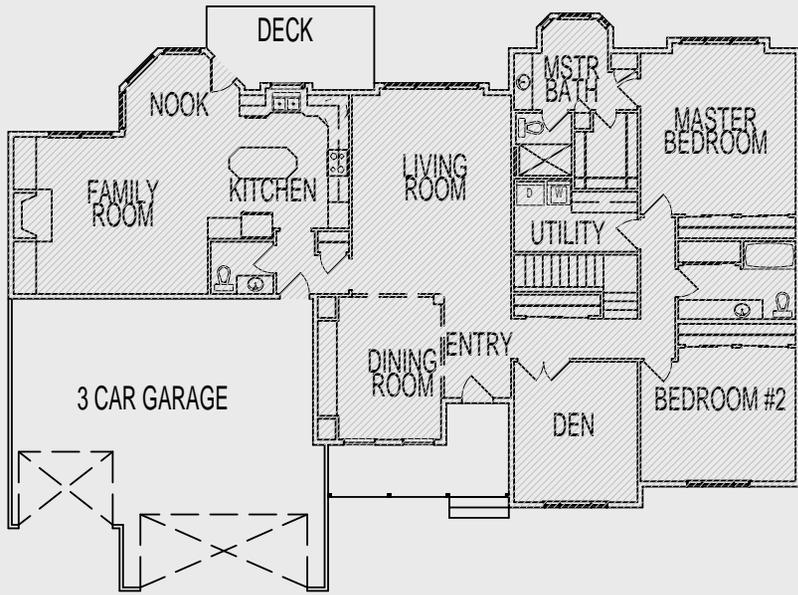
- Software Overview
- Screen Layout
- Colors Used in the Software
- Table Columns and Rows
- Project Folder
- Envelope Folder
- Mechanical Folder
- Wisconsin Heating Loads
- Menus
- Changing Location Files
- Appendix A: Additions
- Appendix B: Glazing Defaults
- Appendix C: Building Envelope
- Definitions

The main content area displays the "Software User's Guide" with the following text:

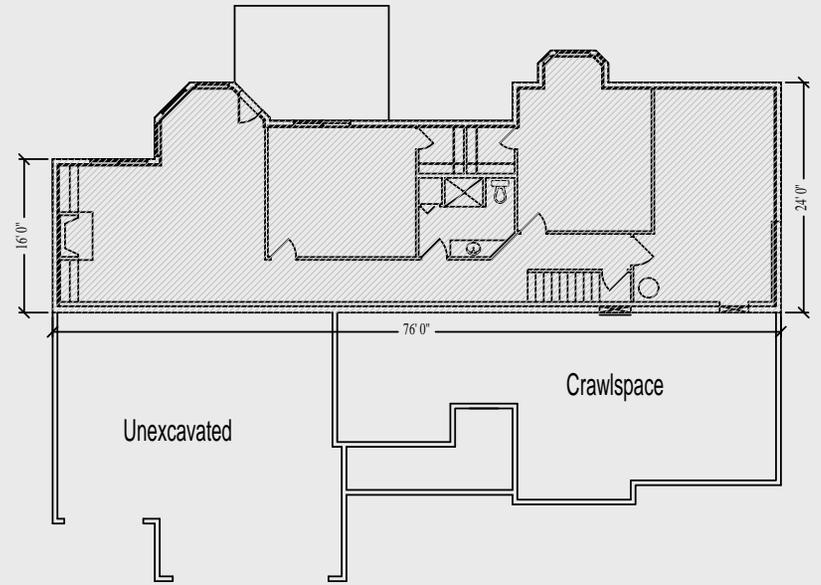
Software User's Guide

This user's guide describes how to use the REScheck™ Software. REScheck is designed to demonstrate compliance with the requirements of the Council of American Building Officials (CABO) Model Energy Code (MEC) and the International Code Council (ICC) International Energy Conservation Code (IECC). It is the most flexible approach for meeting the MEC insulation and window requirements (refer to the *Basic Requirements Guide* in the REScheck Workbook for additional requirements that must also be satisfied). The REScheck software runs on the Microsoft Windows operating system.

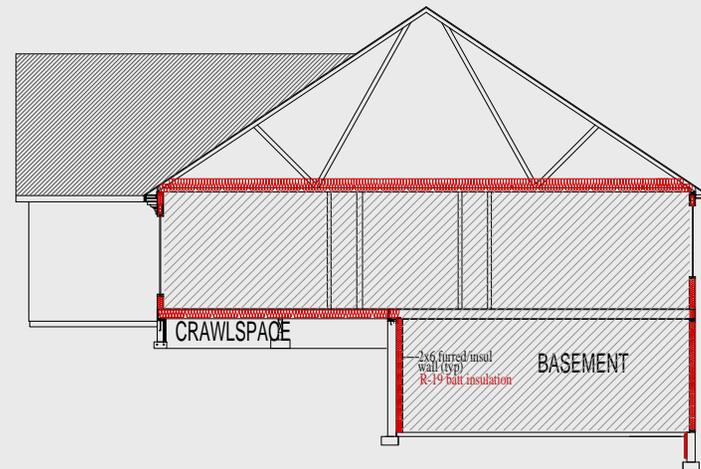
- Building Envelope



Conditioned Main Floor



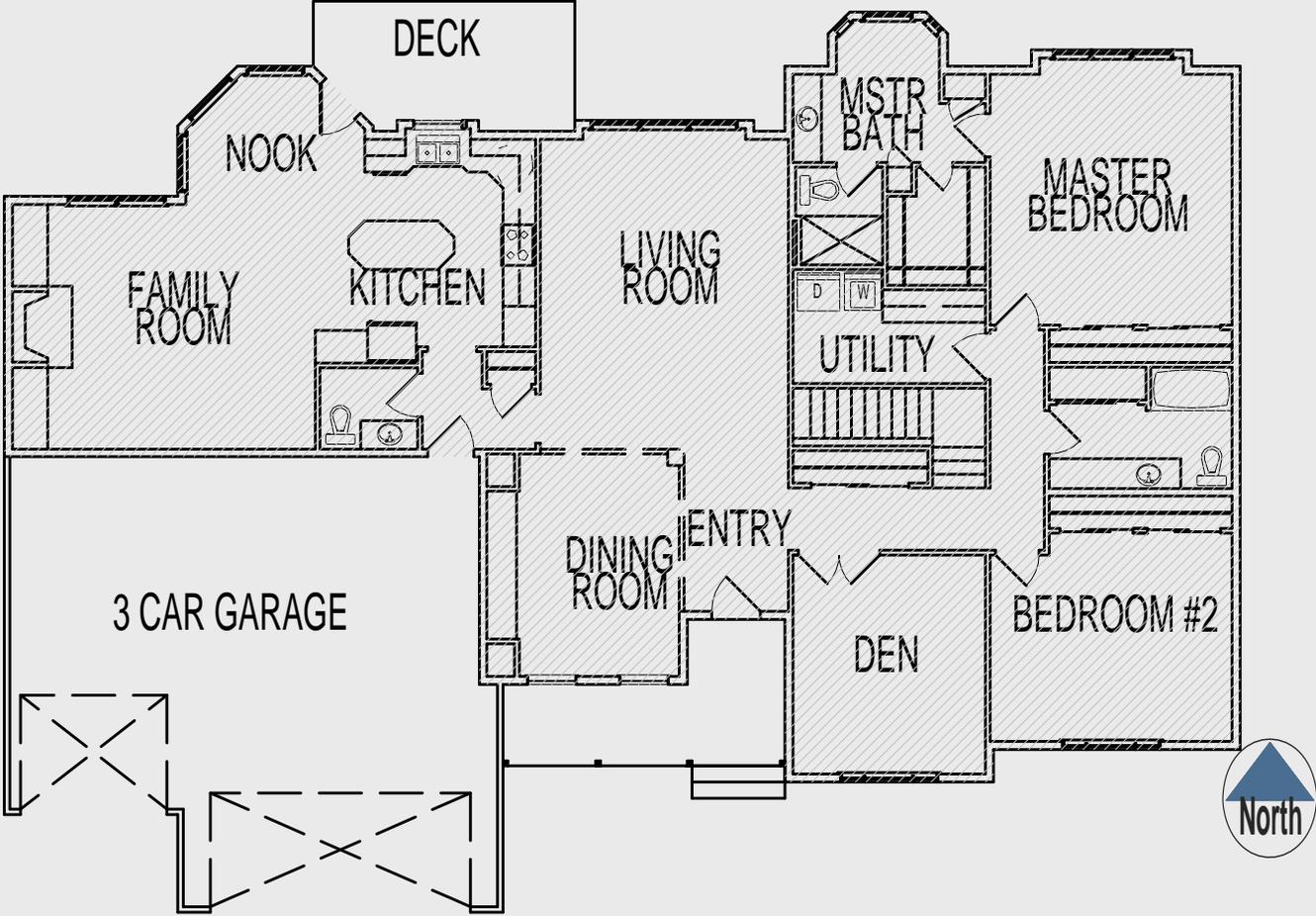
Conditioned Basement



Building Section

- Ceiling Area

Ceiling Area
2415 s.f.



- Exterior Wall Areas

12' Exterior Walls - 689 s.f.

North – 221 s.f.

South – 234 s.f.

East – 52 s.f.

West – 182 s.f.

9' Exterior Walls - 2180 s.f.

North – 690 s.f.

South – 600 s.f.

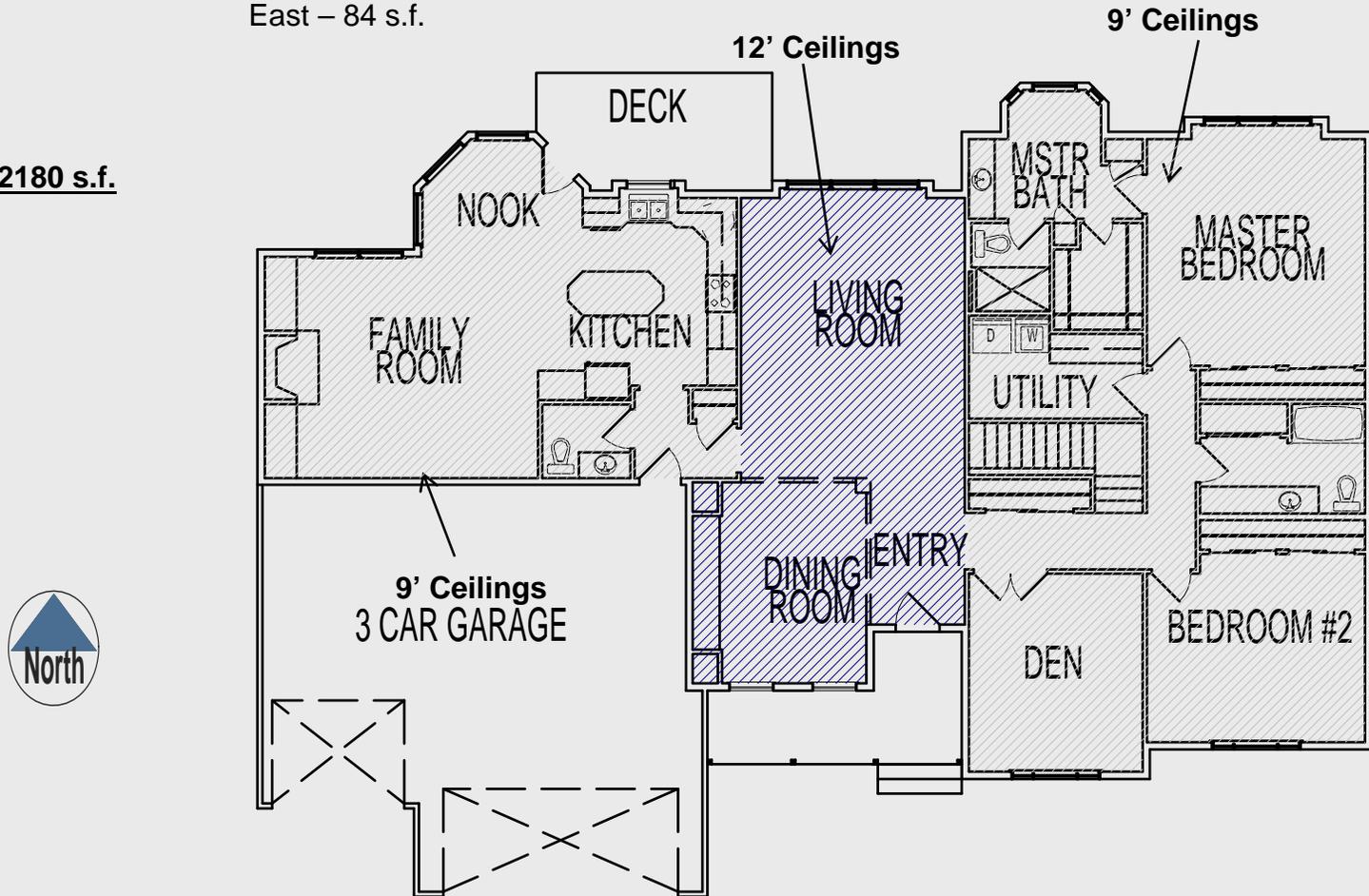
East – 440 s.f.

West – 450 s.f.

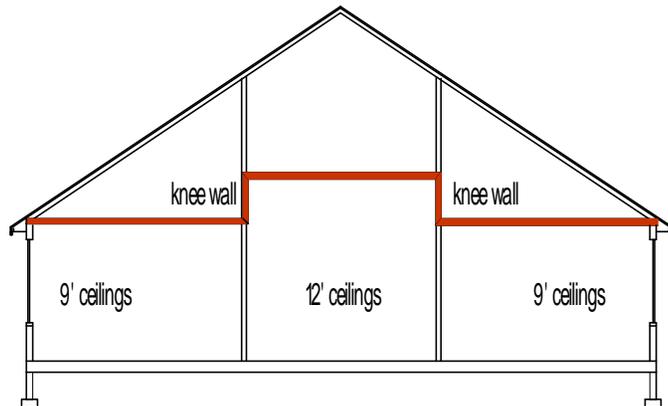
3' knee walls (between 9'&12' sections) – 153 s.f.

West – 69 s.f.

East – 84 s.f.

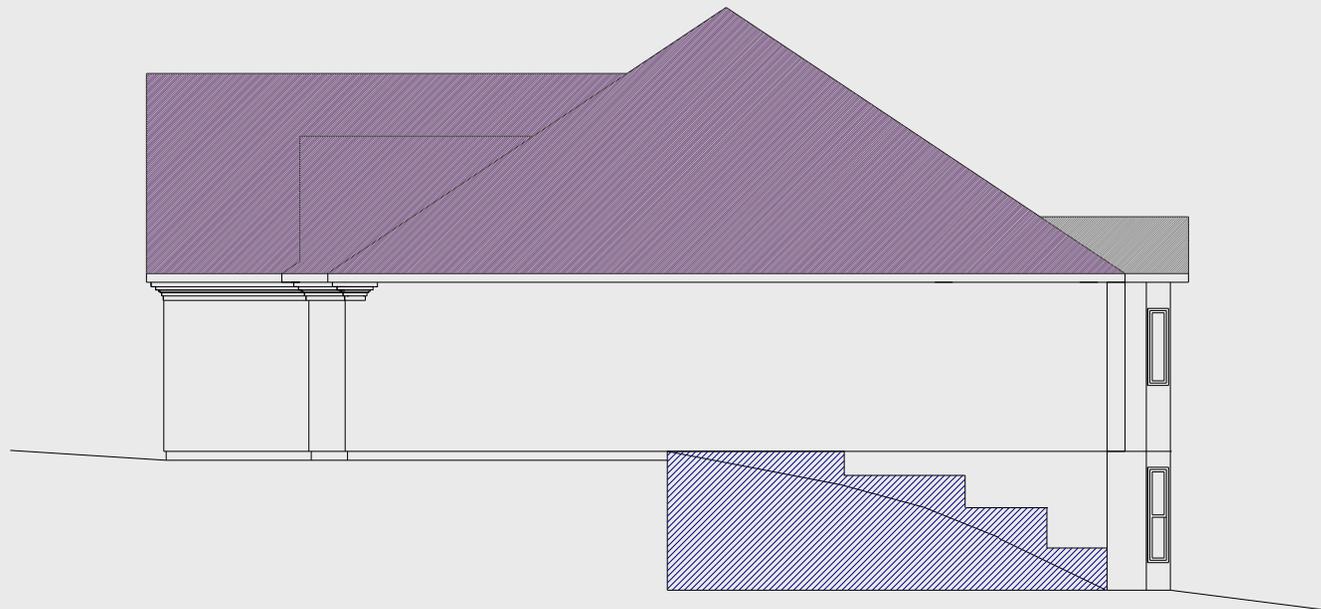


Knee Wall Insulation



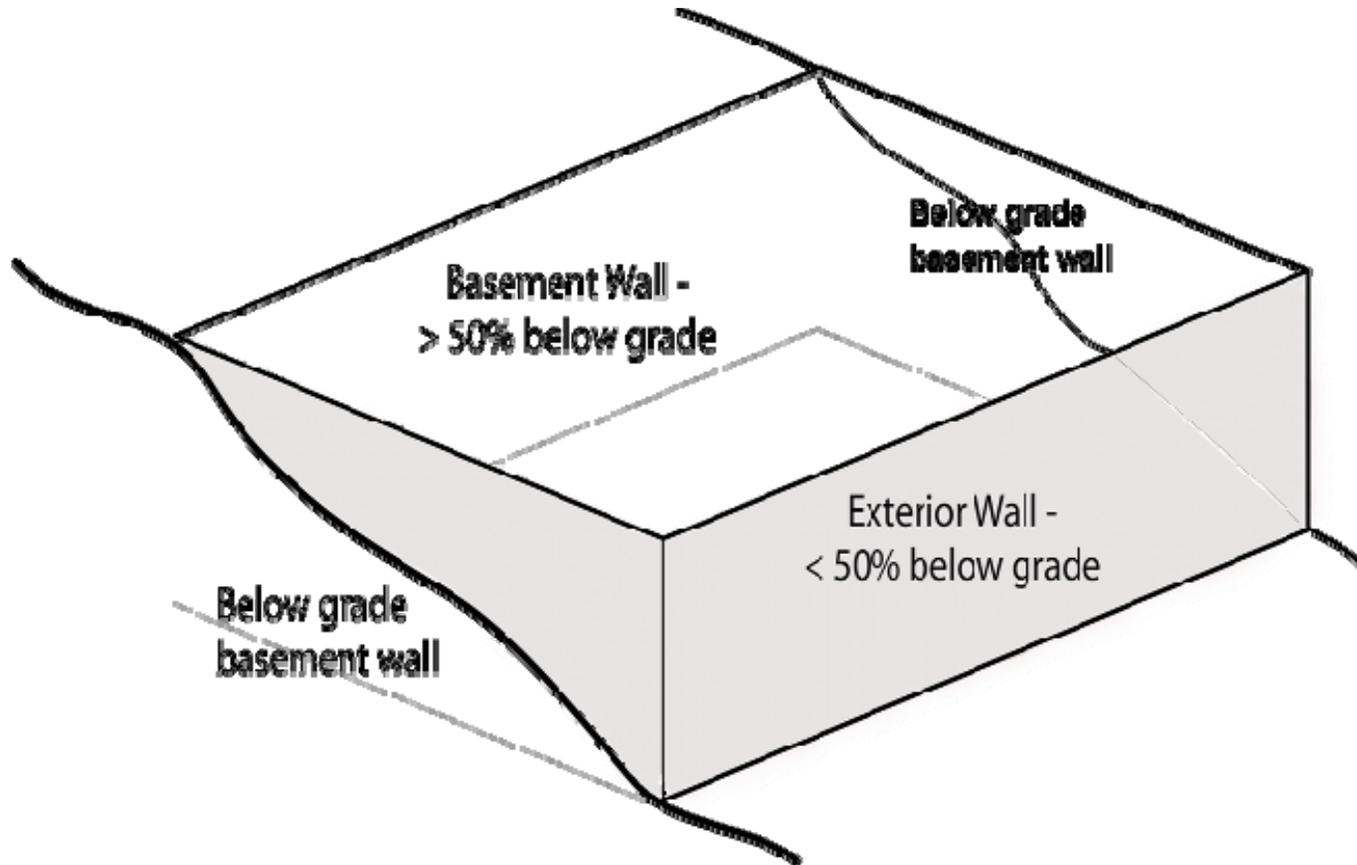
No, No... Never cut the batts too short

- Basement Walls -
 - below grade

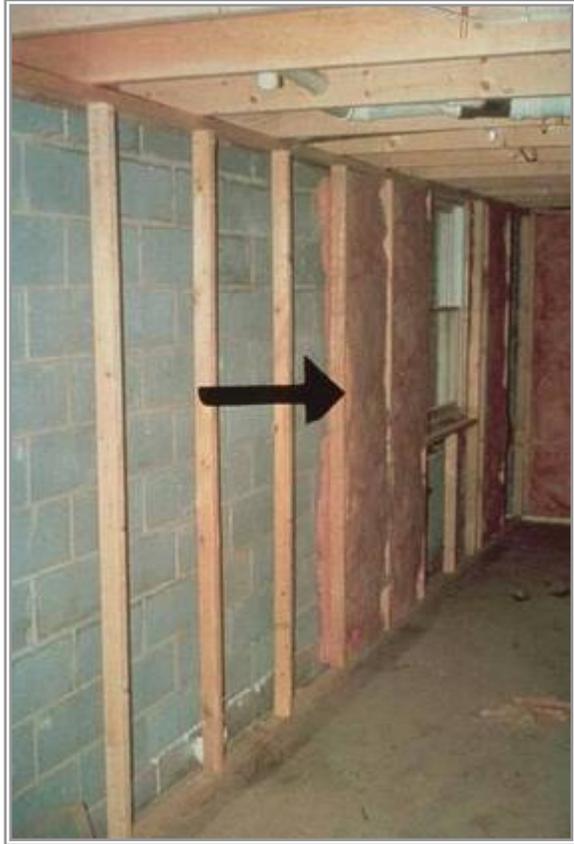


>50% below grade =
below grade concrete basement wall

Defining Below-Grade Walls



Ways to Insulate Basement Walls



Interior Studs w/batts



Below-Grade Walls in REScheck

Project		Envelope		Mechanical	
Ceiling		Skylight		Wall	
Window		Door		Basement	
Component	Assembly	Gross Area			
Building					
1	Basement Wall 1	Solid Concrete or Masonry	0	ft2	
<ul style="list-style-type: none"> Solid Concrete or Masonry Masonry Block with Empty Cells Masonry Block with Integral Insulation Wood Frame Insulated Concrete Forms Other 					

Basement Walls

Enter the specified dimensions in feet (not inches) in the boxes provided. A basement wall less than 50% below grade is considered an above-grade wall and must be entered using the Wall button.

Wall Height (ft)
Measured from the top of the wall to the basement floor.

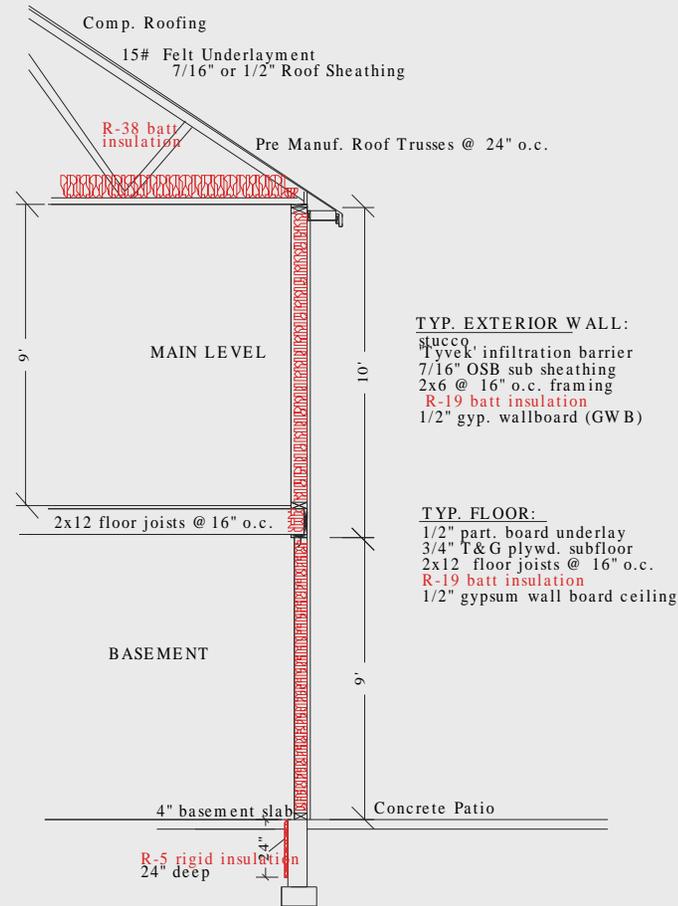
Depth Below Grade (ft)
Measured from the finished outside grade to the basement floor.

Depth of Insulation (ft)
Measured from the top of the wall to where the insulation stops.



Any individual wall of a conditioned basement with an average depth 50% or more below grade should be entered using the *Basement* button. Walls of conditioned basements with an average depth LESS than 50% below grade should be entered as an above-grade wall using the *Wall* button.

- Including Rim Joists in the Exterior Wall Area



BASEMENT SECTION @ EXTERIOR WOOD WALL

- Basement Wall Areas

Above Grade Bsmt Walls (exterior wood) = 837 s.f. (93' x 9')
 (entered as wood frame wall not a basement wall)

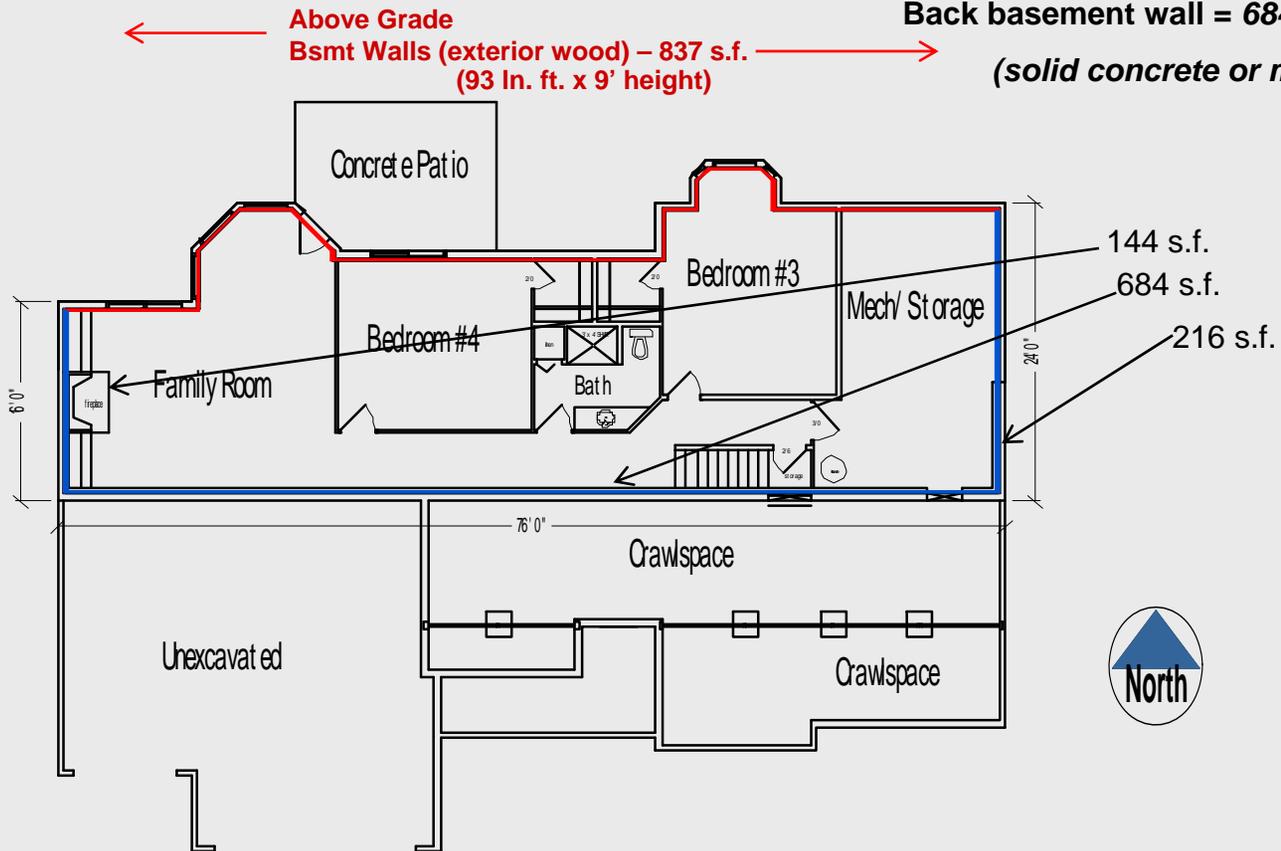
Below Grade Bsmt Walls = 1044 s.f.

Side basement walls = 360 s.f.

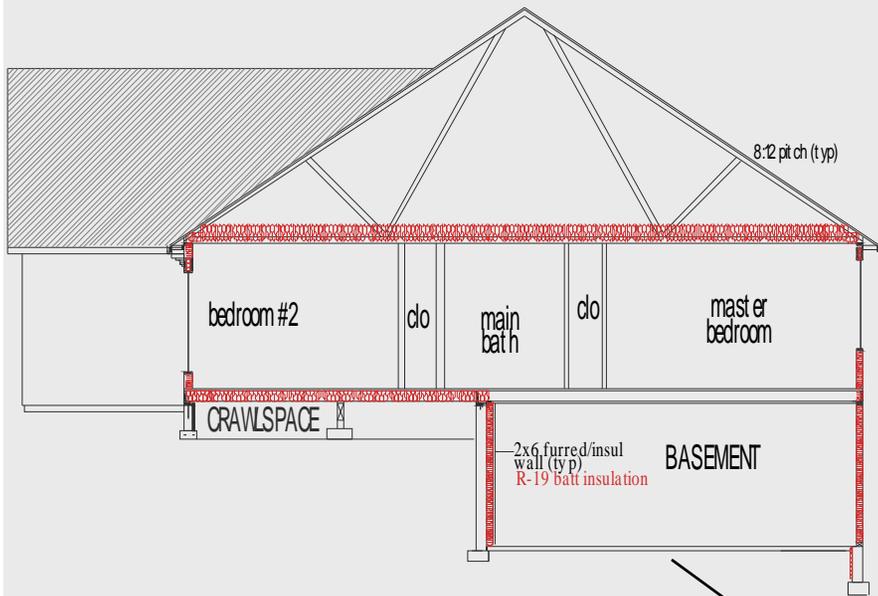
- West Wall – 144 s.f

- East Wall – 216 s.f.

Back basement wall = 684 s.f. (76'x9')
 (solid concrete or masonry)



- Basement Walls



“back” below grade basement wall
(entire back wall is adjacent to
crawlspace)

Basement Walls

Enter the specified dimensions in feet (not inches) in the boxes provided. A basement wall less than 50% below grade is considered an above-grade wall and must be entered using the Wall button.

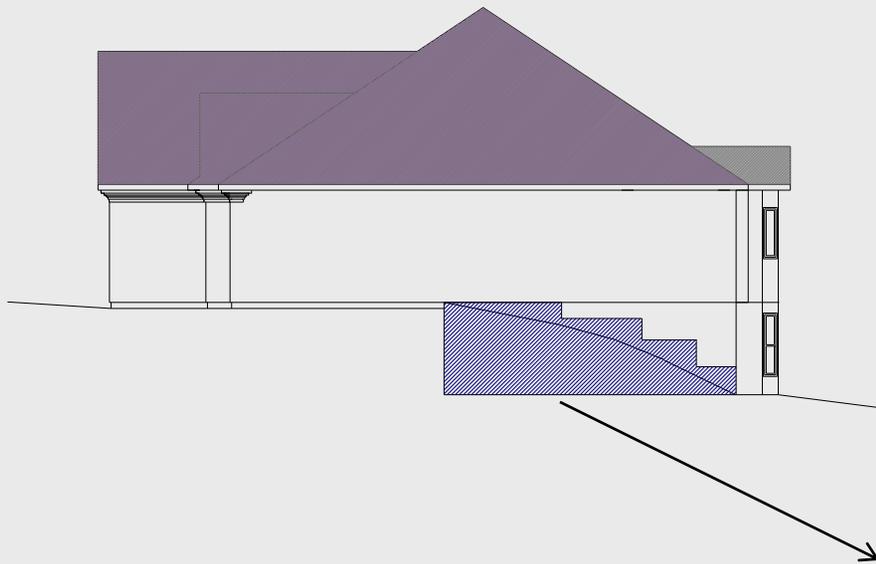
Wall Height (ft)
Measured from the top of the wall to the basement floor.

Depth Below Grade (ft)
Measured from the finished outside grade to the basement floor.

Depth of Insulation (ft)
Measured from the top of the wall to where the insulation stops.

OK Cancel

- Basement Walls



“side” below grade basement walls

Basement Walls ✕

Enter the specified dimensions in feet (not inches) in the boxes provided.
A basement wall less than 50% below grade is considered an above-grade wall and must be entered using the Wall button.

The diagram shows a cross-section of a basement wall. The ground level is indicated by a blue horizontal line. The wall extends below this level. Three dimension lines with input boxes are shown: one for wall height above grade, one for depth below grade, and one for insulation depth. The input boxes contain the value '0.0'.

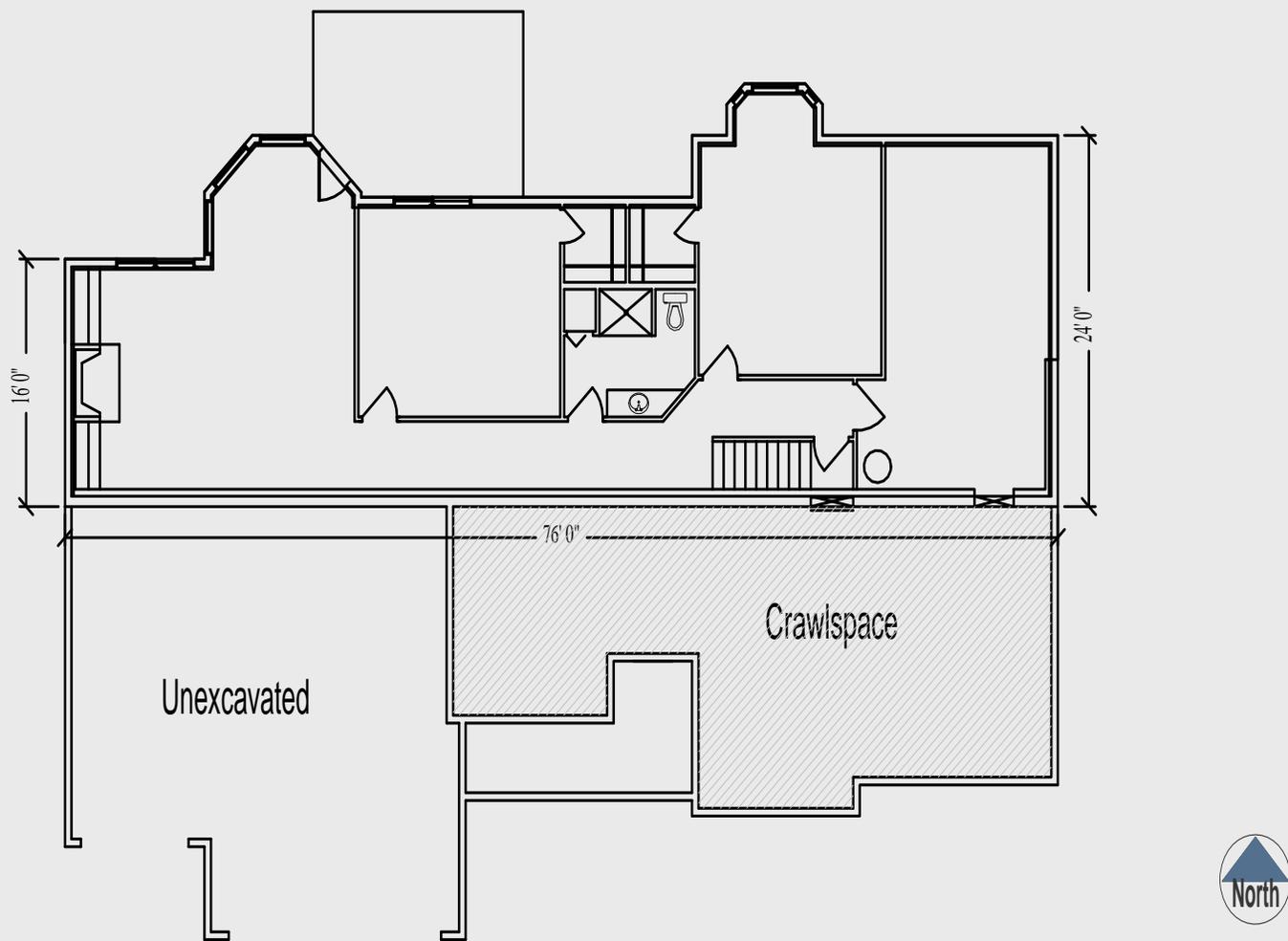
Wall Height (ft)
Measured from the top of the wall to the basement floor.

Depth Below Grade (ft)
Measured from the finished outside grade to the basement floor.

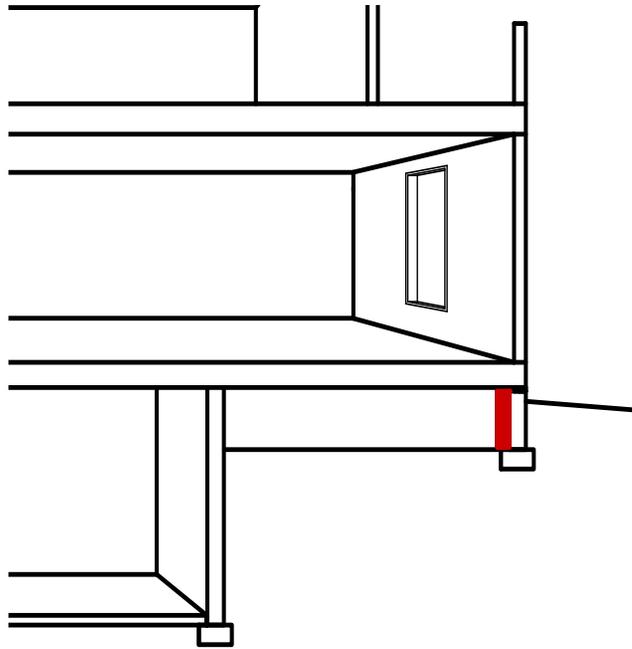
Depth of Insulation (ft)
Measured from the top of the wall to where the insulation stops.

- Floor Area

Crawlspace Area - 783 s.f.



Crawlspace Wall Insulation



Insulated crawlspace wall =

- no foundation vents
- + mechanically vented or conditioned



Crawlspace Walls in REScheck

Project Envelope Mechanical

Ceiling Skylight Wall Window Door Basement Floor Crawl Wall

Component	Assembly	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	Wall Height (ft)	Depth Below Grade (ft)	Depth Below Inside Grade (ft)
Building									
1 Crawl 1	Solid Concrete or Masonry	0 ft2	0.0	0.0	0.0	0	0.0	0.0	0.0

Unventilated Crawl Space Walls

The crawl space wall option applies only to walls of unventilated crawl spaces. Enter the specified dimensions in feet (not inches) in the boxes provided.

Wall Height (ft)
Measured from the top of the wall to top of the footing.

Depth Below Grade (ft)
Measured from outside grade to the top of the footing.

Depth of Insulation (ft)
Include the total vertical plus horizontal distance.

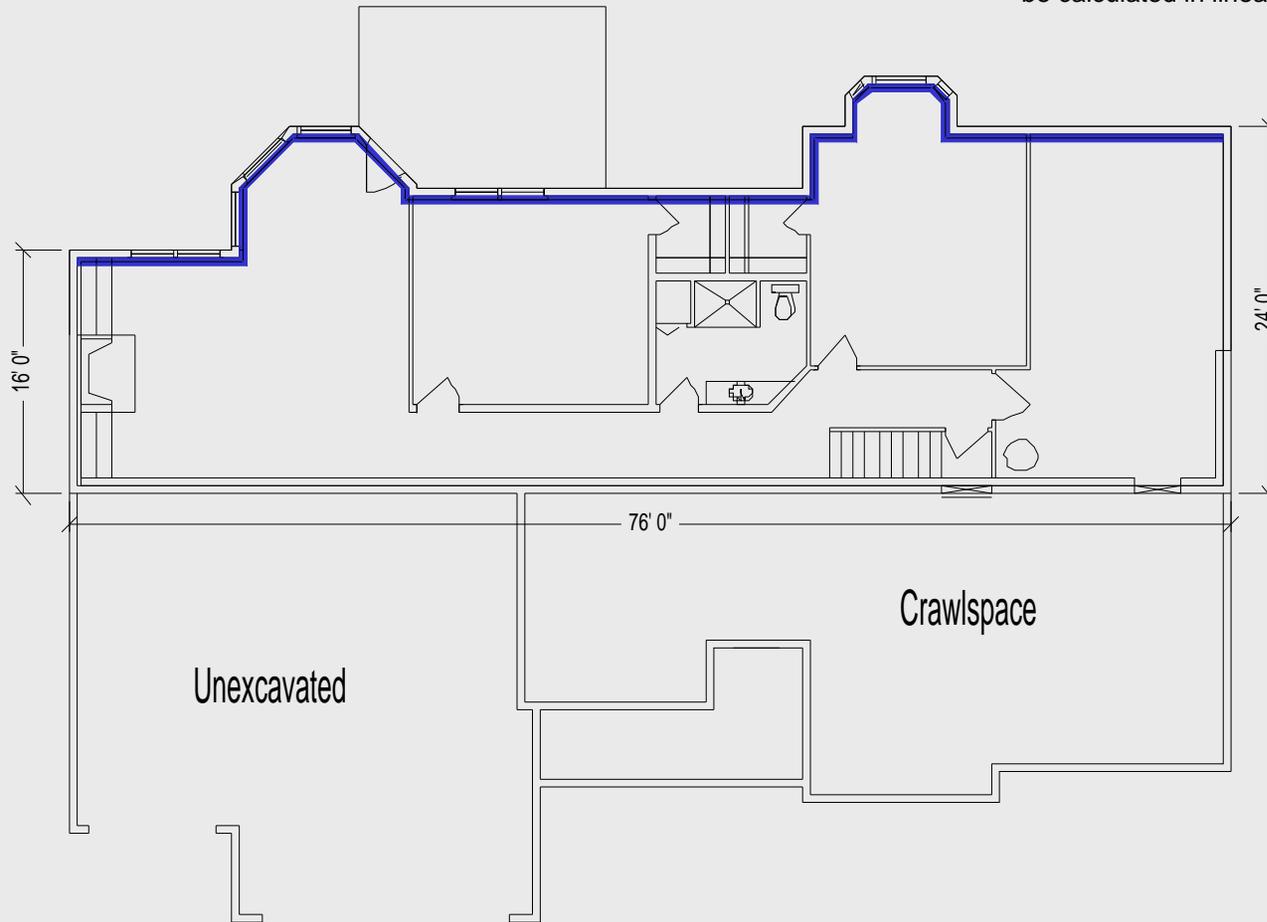
Depth Below Inside Grade (ft)
Measured from inside grade to the top of the footing.

OK Cancel

- Slab Perimeter

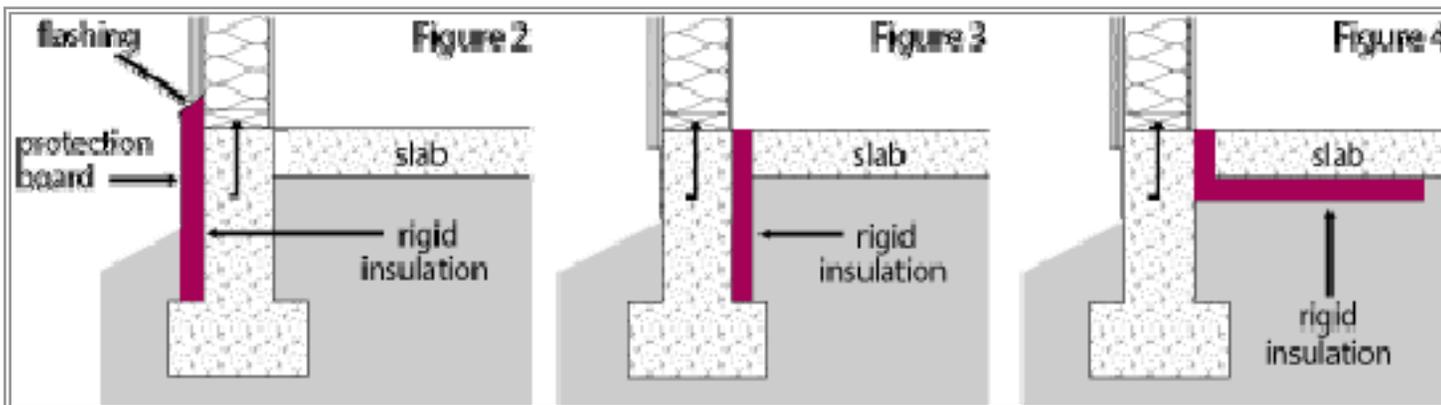
← Slab Perimeter - 93 linear feet →

Line represents the slab edge to be calculated in linear feet.

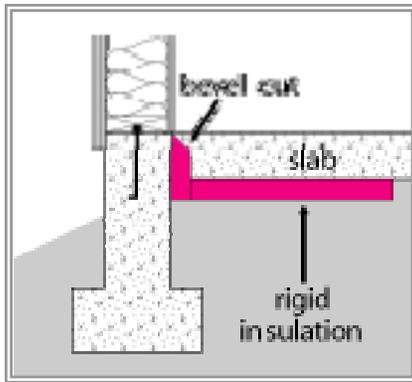


Slab Edge Insulation

- Proposed R-value must meet or exceed
- Downward from top of slab a minimum of 24" (< 6000 HDD), 48" (> 6000 HDD)
- Downward to at least the bottom of the slab and then horizontally – 24" (< 6000 HDD), 48" (> 6000 HDD)



Slab Edge Insulation



Slabs in REScheck

Project		Envelope		Mechanical	
Ceiling		Skylight		Wall	
Window		Door		Basement	
Component	Assembly	Gross Area			
Building					
1	Floor 1	Click here to select Asse...	0	ft2	
		All-Wood Joist/Truss			
		Slab-On-Grade		Unheated	
		Structural Insulated Panels		Heated	
		Other			

Slab-On-Grade Floors

Enter the depth of the insulation (ft.), including the total vertical and horizontal distance: ft.

Horizontal Insulation ($A + B = \text{Insulation Depth}$)

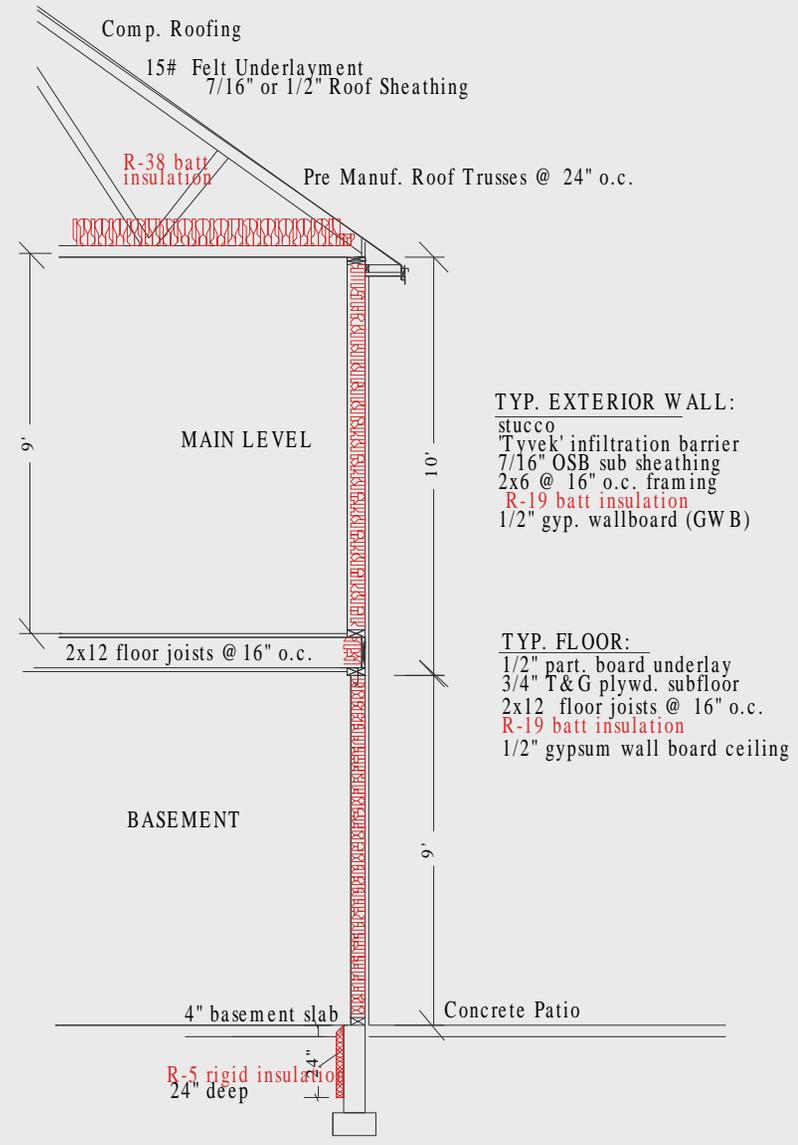
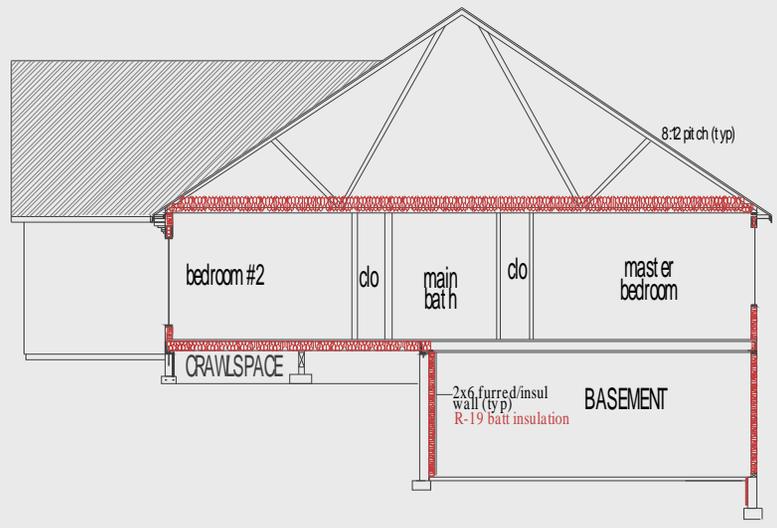
Vertical Insulation ($A = \text{Insulation Depth}$)



- Depth of Insulation - Enter the depth (ft) of the insulation you intend to install as measured from the top of the slab to where the insulation stops. This distance should include the total vertical plus horizontal distance. Refer to the illustration below of acceptable configurations. If you enter a depth of 0, the program assumes no insulation is to be installed.

- Insulation Levels

- Roof/Ceiling - R-38 batts
- Wall - R-19 batts
- Floor - R-30 batts
- Slab - R-5 rigid (24" vertical)



- Window/ Door Area

Window Area - 533 s.f.;

U-value = 0.35 & SHGC .40

North – 369 s.f.

South – 149 s.f.

West – 15 s.f.

Glass Doors <50% glass - 40 s.f.; U-value = 0.50

North – 40 s.f.

Opaque Doors - 40 s.f.; U-value = 0.50

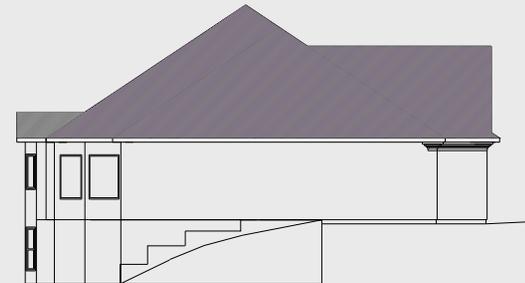
South – 40 s.f.



South



North

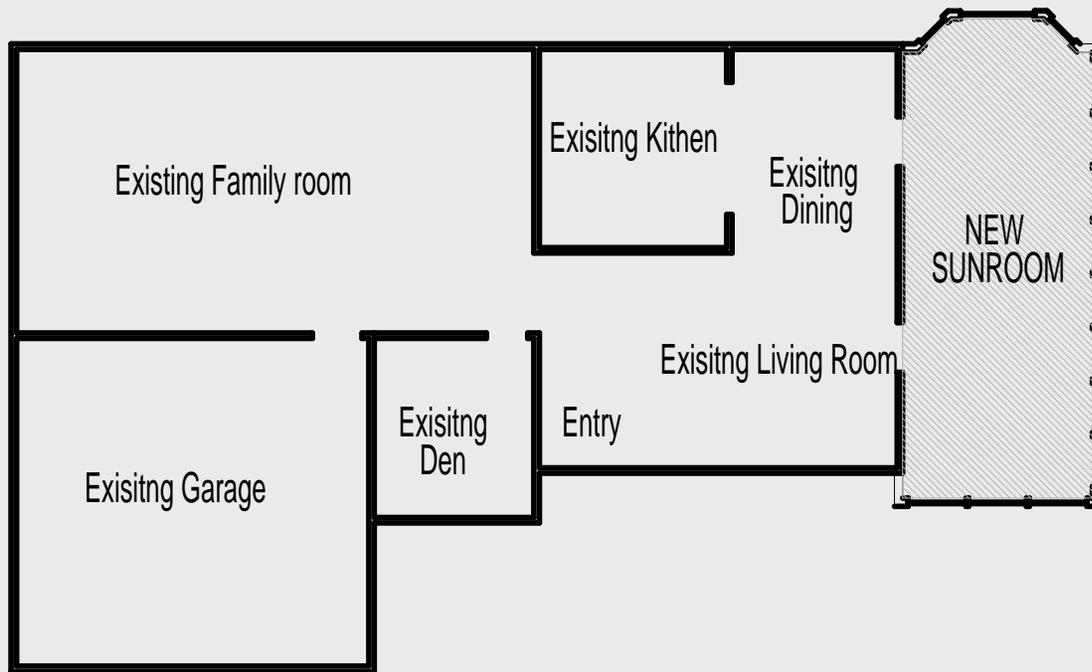


West



East

Sunroom Addition

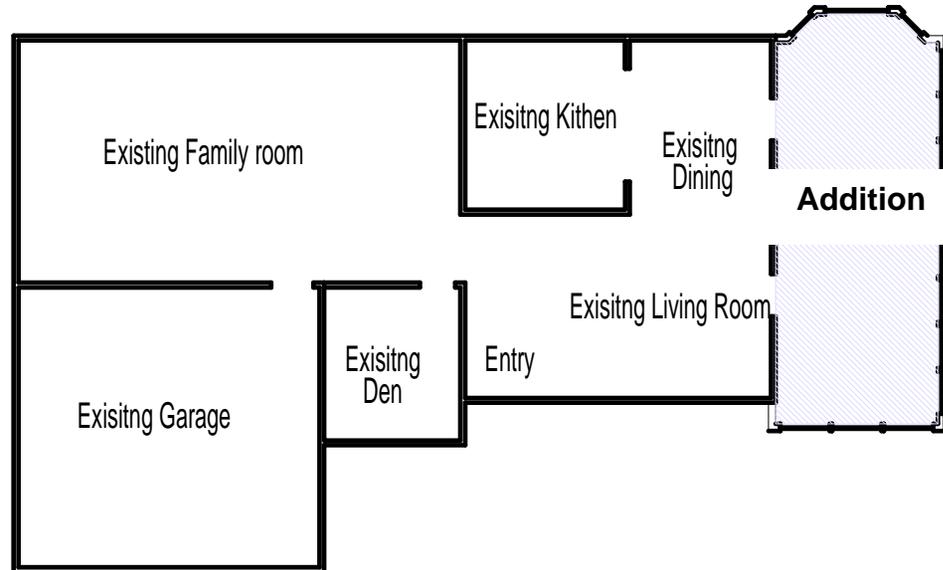


- Ceiling – 350 s.f.
- East Wall – 18 s.f.
- West Wall – 252 s.f.
- West Windows – 144 s.f.
 - (U-value .35/SHGC .40)
- North Wall – 112 s.f.
- North Windows – 63 s.f.
 - (U-value .35/SHGC .40)
- South Wall – 126 s.f.
- South Windows – 51 s.f.
 - (U-value .35/SHGC .40)
- Floor – 350 s.f.



Additions

- Compliance options for additions
 - Treat as a stand-alone building
 - Bring entire building into compliance



REScheck cannot be used

Special Rules for Sunrooms

Sunroom addition defined:

- > 40% glazing of gross exterior wall and roof area
- Separate heating or cooling system or zone
- Must be thermally isolated and not used as a kitchen or sleeping quarters



REScheck cannot be used

Sunroom Requirements/2006 IECC

Minimum Insulation:

- ceiling R-19 for climate zones 1-4
- ceiling R-24 for climate zones 5-8
- walls R-13 for all climate zones

A new wall (or walls) separating a sunroom from a conditioned space shall meet the building thermal envelope requirements.

Fenestration:

0.50 U-factor in climate zones 4-8 is a maximum

Skylights:

0.75 U-factor in all climate zones

Any new windows and doors separating the sunroom from conditioned space shall meet the building envelope requirements.

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