Case Study – RES*check* Software

Jones Residence, Bowman, SC

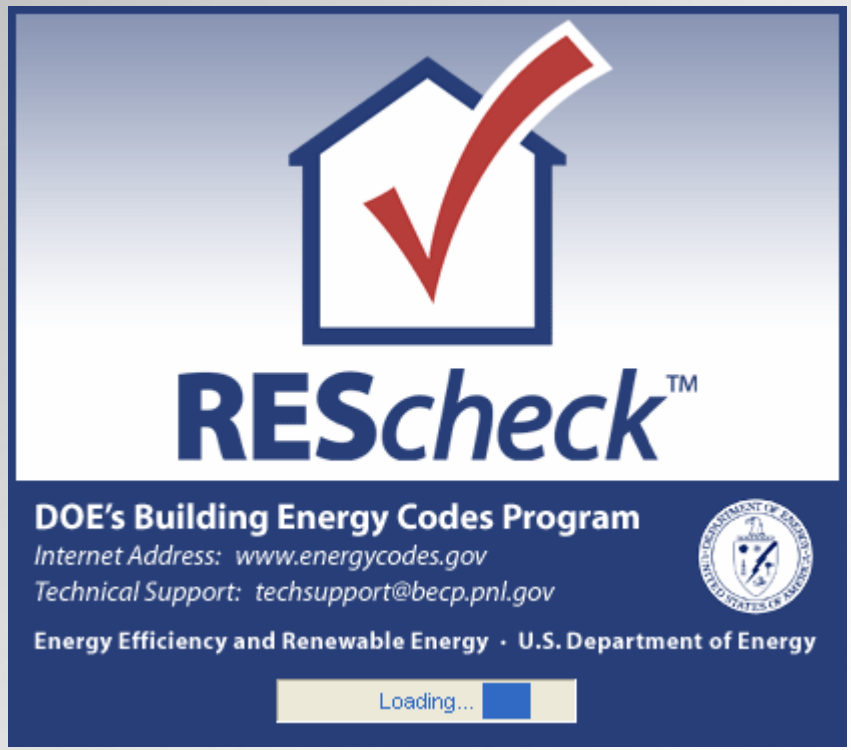
What is REScheck?

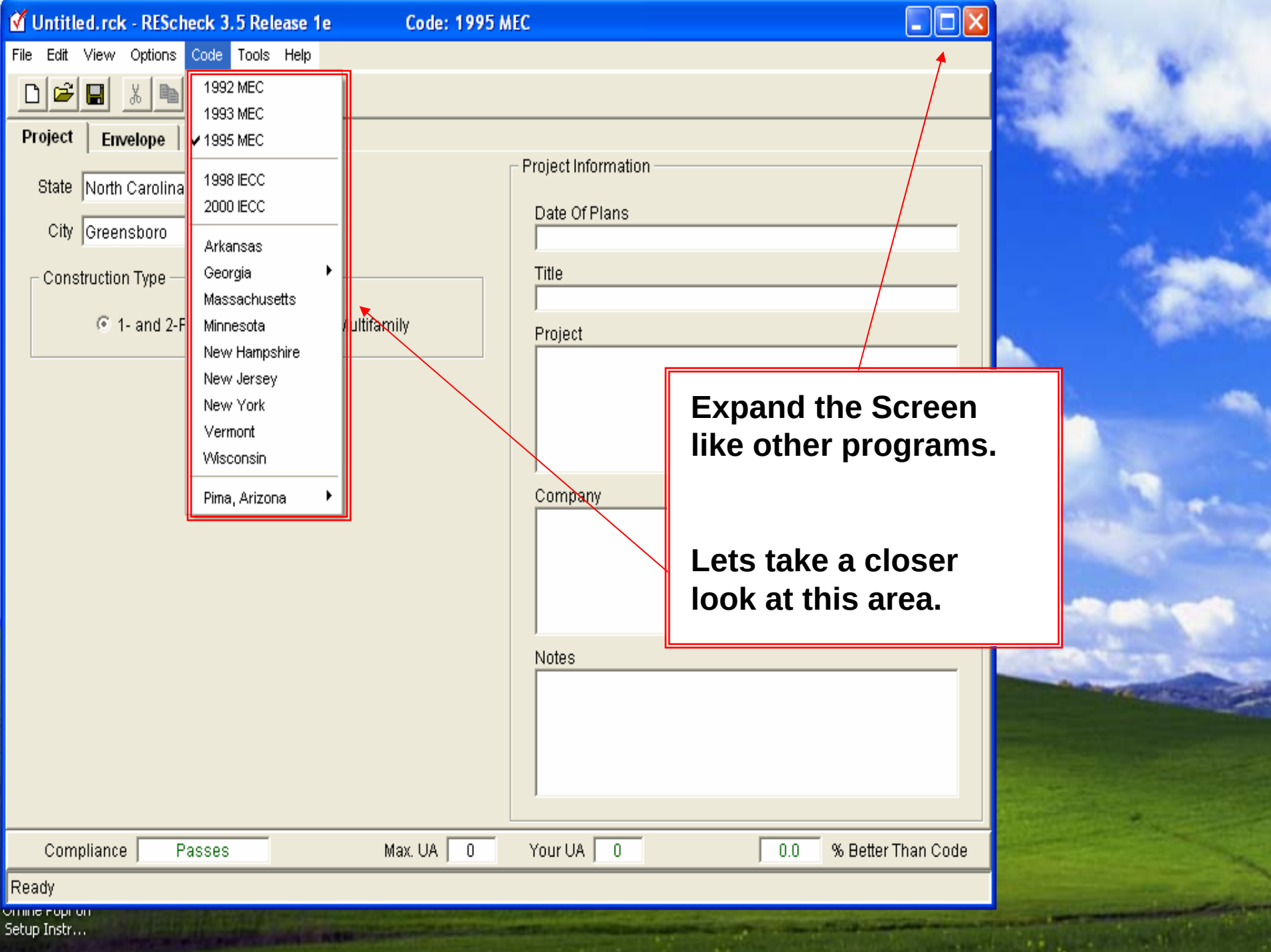
- **REScheck is a computer program that can be used to demonstrate Energy Code Compliance**
- **The Software is self-contained**
  - **Energy Code book can be used as needed for reference only**
- **Relatively simple to use and very flexible**

What Do I Need to Know?

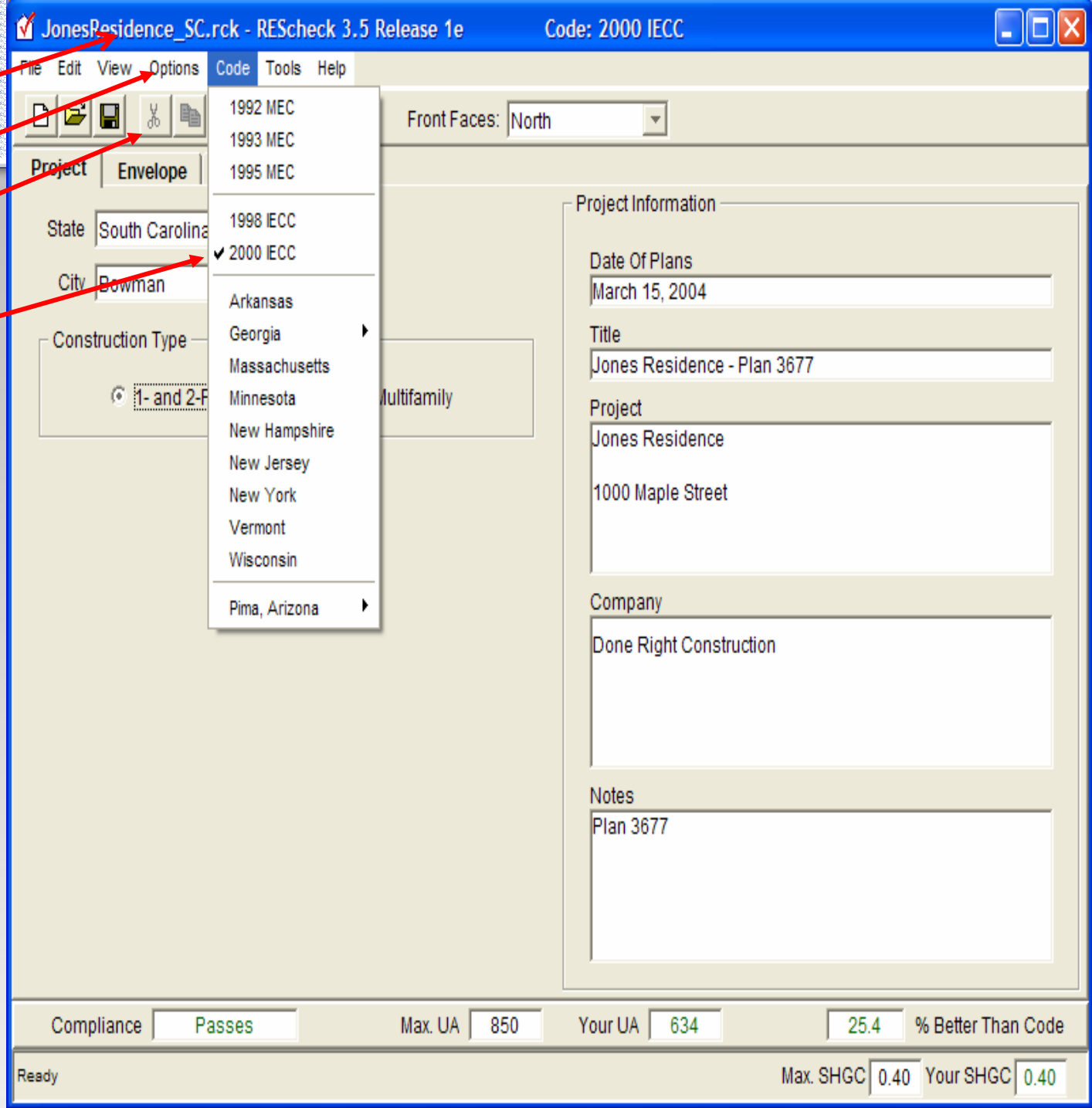
Information you need to use REScheck:

1. **General Understanding of Windows-based Computer Programs**
2. **Basic Information about the Builder and Home to be Constructed**
3. **House Plans including Exterior Wall Areas, Glazing Areas, Roof/Ceiling Areas, Basement Wall Areas, etc.**
4. **Insulation R-Values, NFRC Glazing and Door U-Values, etc.**
5. **Heating and Cooling System Efficiencies**


REScheck™
DOE's Building Energy Codes Program
Internet Address: www.energycodes.gov
Technical Support: techsupport@becp.pnl.gov
Energy Efficiency and Renewable Energy · U.S. Department of Energy
Loading...


Untitled.rck - REScheck 3.5 Release 1e
Code: 1995 MEC
File Edit View Options Code Tools Help
1992 MEC
1993 MEC
1995 MEC
1998 IECC
2000 IECC
Arkansas
Georgia
Massachusetts
Minnesota
New Hampshire
New Jersey
New York
Vermont
Wisconsin
Pima, Arizona
Project
Envelope
State North Carolina
City Greensboro
Construction Type
1- and 2-F
ultifamily
Project Information
Date Of Plans
Title
Project
Company
Notes
Compliance Passes
Max. UA 0
Your UA 0
0.0 % Better Than Code
Ready
Expand the Screen like other programs.
Lets take a closer look at this area.

- **Title Bar**
- **Menu Bar**
- **Toolbar**
- **Make sure the correct code is chosen.**



JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

State: South Carolina

City: Bowman

Construction Type

1- and 2-Family, Detached Multifamily

Project Information

Date Of Plans: March 15, 2004

Title: Jones Residence -

Project: Jones Residence

1000 Maple Street

Company: Done Right Construction

Notes: Plan 3677

Three Main Screens

Your Building Compared to the Energy Code

Compliance: Passes

25.4% Better Than Code

Compliance: Passes Max. UA: 850 Your UA: 634 25.4 % Better Than Code

Enter a description of your project. Max. SHGC: 0.40 Your SHGC: 0.40

JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

State: South Carolina

City: Bowman

Construction Type

- (•) 1- and 2-Family, Detached
- ( ) Multifamily

Project Information

Date Of Plans: March 15, 2004

Title: Jones Residence - Plan 3677

Project: Jones Residence

1000 Maple Street

Company: Done Right Construction

Notes: Plan 3677

Project Basic Information

Compliance: Passes | Max. UA: 850 | Your UA: 634 | 25.4 % Better Than Code

Select 1- and 2-Family, Detached for all detached one- and two-family dwellings.

Max. SHGC: 0.40 | Your SHGC: 0.40

JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

State: South Carolina

City: Bowman

Bamberg
Barnwell
Batesburg
Beaufort
Belton
Belvedere
Bennettsville
Berea
Bethune
Bishopville
Blacksburg
Blackville
Blenheim
Bluffton
Blythewood
Boiling Springs (Spartanburg)
Bonneau
Bowman
Branchville
Briarcliffe Acres

Multifamily

Project Information

Date Of Plans: March 15, 2004

Title: Jones Residence - Plan 3677

Project: Jones Residence

1000 Maple Street

Company: Done Right Construction

Notes: Plan 3677

Compliance: Passes | Max. UA: 850 | Your UA: 634 | 25.4 % Better Than Code

If you can't find the building's city, choose a nearby city that has similar weather conditions.

Max. SHGC: 0.40 | Your SHGC: 0.40

JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

Ceiling | Skylight | Wall | Window | Door | Basement | Floor | Crawl Wall

	Component	Assembly	Orientation	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	SHGC	W He (
	Building										
1	Ceiling 1	All-Wood Joist/Rafter/Truss		2415	ft2	38.0	0.0	0.03	72		
2	Exterior Wall 1	Wood Frame, 16" o.c.	Front	911	ft2	19.0	0.0	0.06	30		
3	Door 1	Opaqu						0.5	20		
4	Window main	Vinyl F						0.4	148	0.40	
5	Exterior Wall 2 Sou	Wood					0.0	0.06	39		
6	Window 2	Vinyl F						0.4	60	0.40	
7	Door 2	Solid						0.5	20		
8	Exterior Wall 3 Eas	Wood					0.0	0.06	30		
9	Exterior Wall 4 We	Wood					0.0	0.06	37		
10	Window 3	Vinyl F						0.4	6	0.40	
11	Knee Wall West	Wood					0.0	0.06	4		
12	Knee Wall East	Wood					0.0	0.06	5		
13	Basement Wall 2	Solid C					0.0	0.053	8		9
14	Basement Wall 1	Solid C					0.0	0.053	11		9
15	Basement Wall 3	Solid C					0.0	0.047	32		9
16	Floor 1	All-Wo					0.0	0.047	37		
17	Floor 2	Slab-C					5.0	0.804	75		

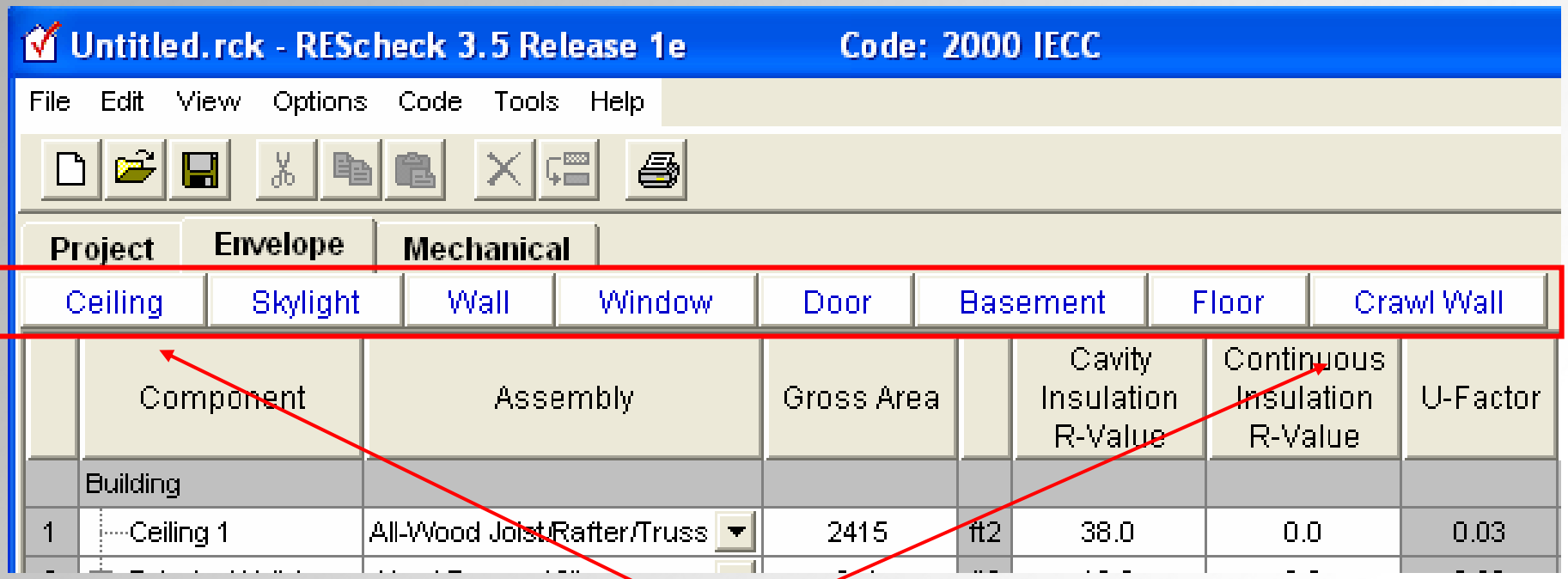
Main Building Envelope

1. This is where you add square footage values for ceilings, exterior walls, windows, etc.
2. This is where you add U-factors and R-values for ceilings, exterior walls, windows etc.
3. Continuous insulation is entered separately from cavity insulation.

Compliance: Passes Max. UA: 850 Your UA: 634 25.4 % Better Than Code

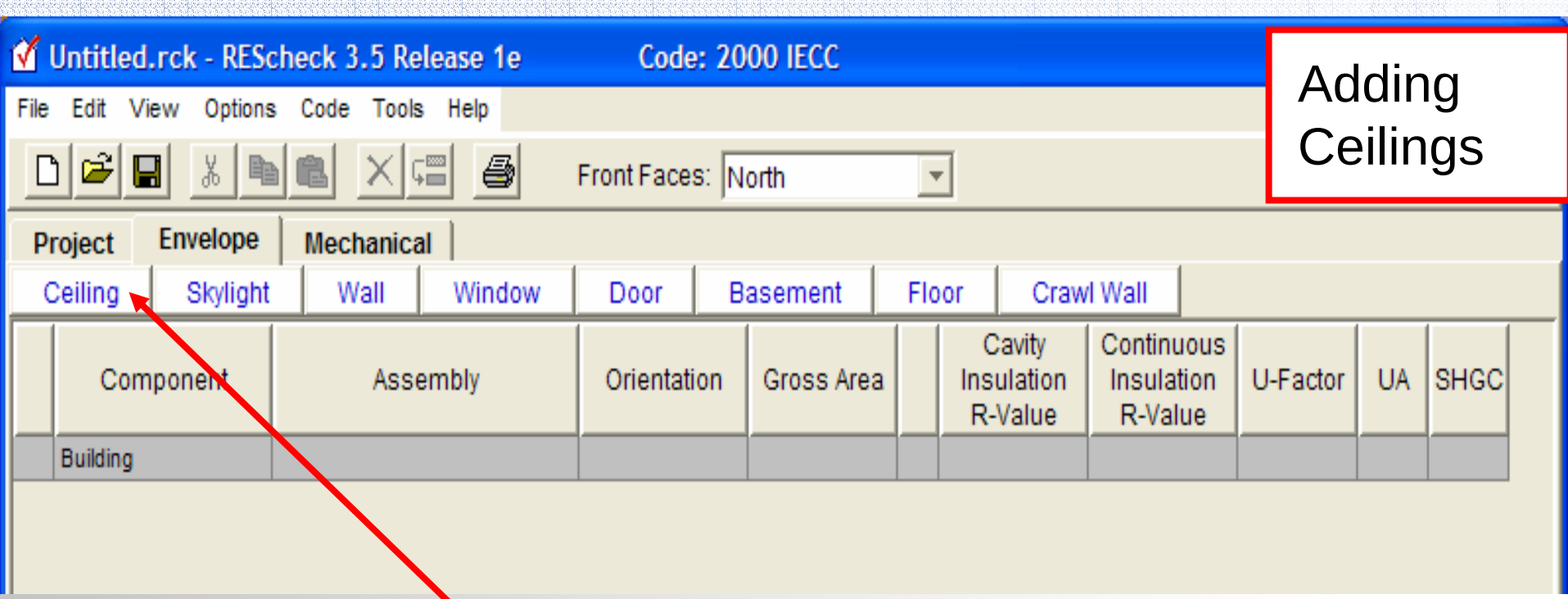
Select the blue-on-white buttons to create a list of envelope components for the building. Max. SHGC: 0.40 Your SHGC: 0.40

Envelope Section



Building Components are added by clicking on these.

Adding Ceilings



Step 1:

Click on Ceiling

Untitled.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

Ceiling | Skylight | Wall | Window | Door | Basement | Floor | Crawl Wall

Adding Ceilings

	Component	Assembly	Orientation	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value			
	Building									
1	Ceiling 1	Click here to select Assem...		0	ft2			0.0	0	

- Flat Ceiling or Scissor Truss
- Cathedral Ceiling (no attic)
- Raised or Energy Truss
- Structural Insulated Panels (SIPs)
- Other

Step 2:

Select Ceiling Type (This can be repeated so that different ceiling types and any number of skylights can be added individually.)

Compliance: Invalid Area(s) Max. UA: 0 Your UA: 0 0.0 % Better Than Code

Click the Assembly fields to display a list of assembly choices. "Other" assembly types are editable. Max. SHGC: 0.40 Your SHGC: 0.00

Untitled.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

Ceiling | Skylight | Wall | Window | Door | Basement | Floor | Crawl Wall

Adding Ceilings

	Component	Assembly	Orientation	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U		
	Building									
1	Ceiling 1	Flat Ceiling or Scissor Truss		2415	ft2	0.0	0.0	0.568	0	

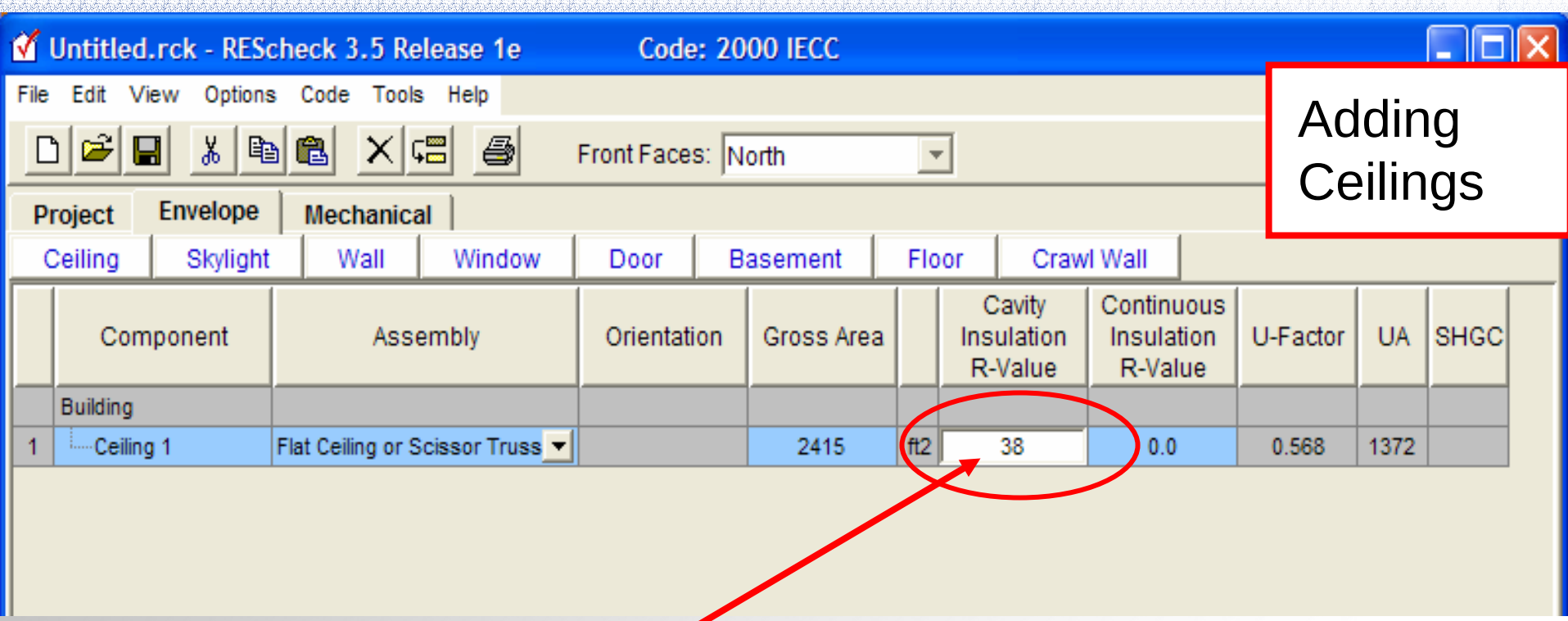
Step 3:

Add square footage (In this case 2415 square feet)

Compliance: Invalid Area(s) | Max. UA: 0 | Your UA: 0 | 0.0 % Better Than Code

Enter the gross ceiling/roof area in sq. ft. (including the area of skylights). | Max. SHGC: 0.40 | Your SHGC: 0.00

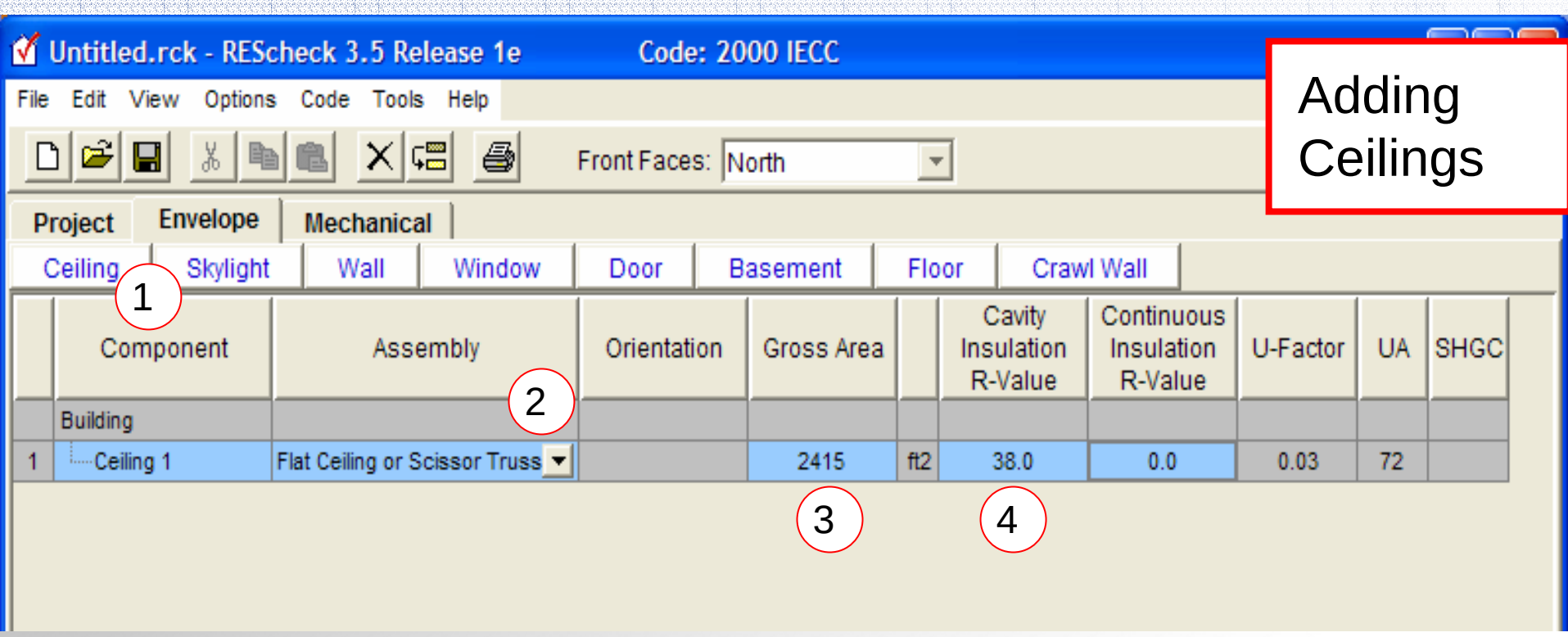
Adding Ceilings



Step 4:

Add insulation R-Value (R-38 in this example)

Adding Ceilings



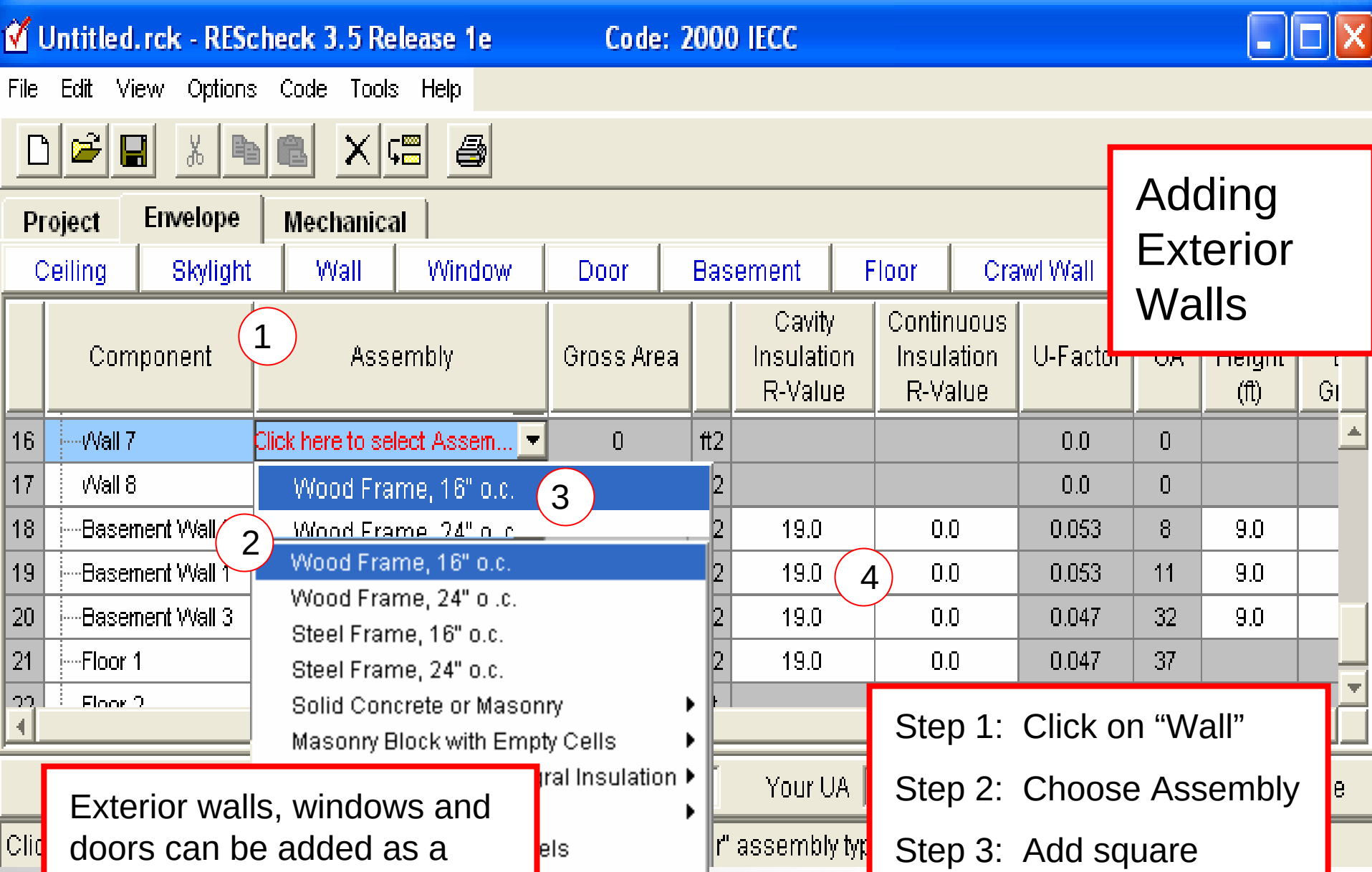
Step 1: Click on “Ceiling”

Step 2: Select Ceiling type

Step 3: Add square footage

Step 4: Add insulation R-Value

Adding Exterior Walls



Step 1: Click on “Wall”

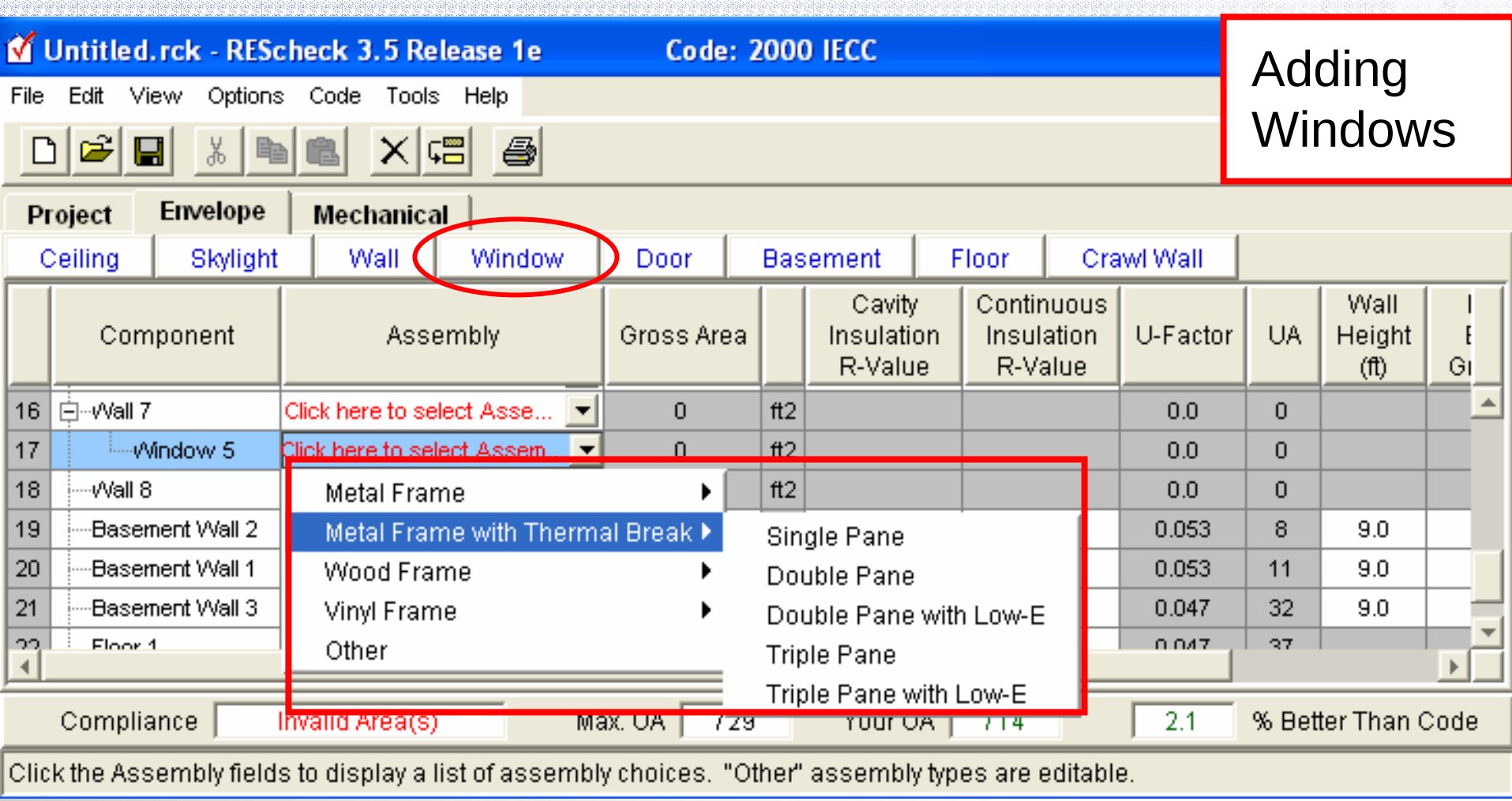
Step 2: Choose Assembly

Step 3: Add square footage

Step 4:Add the R-Values

Exterior walls, windows and doors can be added as a total sum or each exposure can be added separately

Adding Windows



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File Edit View Options Code Tools Help

Orientation (Envelope)
Overhang Projection Factor (Envelope)
Comments/Description (Envelope)

Project Env

Ceiling Skylight Wall Window Door Basement

	Component	Assembly	Gross Area		Ca Insu R-V	HGC
	Building					

These options can be used in project areas with < 3500 HDD

Use the blue-on-white buttons at the top of the screen to create a description of your building.

Compliance Passes Max. UA 0 Your UA 0 0.0 % Better Than Code

Ready Max. SHGC 0.40 Your SHGC 0.00

JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

Ceiling | Skylight | Wall | Window | Door | Basement | Floor | Crawl Wall

	Component	Assembly	Orientation	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	SHGC	Overhang Projection Factor	Wall Height (ft)
	Building											
1	Ceiling 1	All-Wood Joist/Rafter/Truss		2415	ft2	38.0	0.0	0.03	72			
2	Exterior Wall 1	Wood Frame, 16" o.c.	Front	911	ft2	19.0	0.0	0.06	30			
3	Door 1	Opaque	Front	40	ft2			0.5	20			
4	Window main	Vinyl Frame, Double Pane	Front	369	ft2			0.4	148	0.40	0.15	
5				834	ft2	19.0	0.0	0.06	39			
6				149	ft2			0.4	60	0.40	0.15	
7				40	ft2			0.5	20			
8			de	492	ft2	19.0	0.0	0.06	30			
9			ide	632	ft2	19.0	0.0	0.06	37			
10			ide	15	ft2			0.4	6	0.40	0.15	
11	Knee Wall West	Wood Frame, 16" o.c.	Left Side	69	ft2	19.0	0.0	0.06	4			
12	Knee Wall East	Wood Frame, 16" o.c.	Right Side	84	ft2	19.0	0.0	0.06	5			
13	Basement Wall 2	Solid Concrete or Masonry	Left Side	144	ft2	19.0	0.0	0.053	8			9.0
14	Basement Wall 1	Solid Concrete or Masonry	Right Side	216	ft2	19.0	0.0	0.053	11			9.0
15	Basement Wall 3	Solid Concrete or Masonry	Front	684	ft2	19.0	0.0	0.047	32			9.0
16	Floor 1	All-Wood Joist/Truss, Ove...		783	ft2	19.0	0.0	0.047	37			
17	Floor 2	Slab-On-Grade:Unheated		93	ft		5.0	0.804	75			

- Orientation Specified
- SHGC entered
- Overhangs calculated

Compliance: Passes Max. UA: 850 Your UA: 634 25.4 % Better Than Code

Click the Assembly fields to display a list of assembly choices. "Other" assembly types are editable. Max. SHGC: 0.40 Your SHGC: 0.38

JonesResidence_SC.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

Front Faces: North

Project | Envelope | Mechanical

Ceiling | Skylight | Wall | Window | Door | Basement | Floor | Crawl Wall

Basement Walls

	Component	Assembly	Orientation	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	S		
	Building											
1	Ceiling 1	All-Wood Joist/Rafter/Truss		2415	ft2	38.0	0.0	0.03	72			
2	Exterior Wall 1	Wood Frame, 16" o.c.	Front	911	ft2	19.0	0.0	0.06	30			
3	Door 1	Opaque	Front	40	ft2			0.5	20			
4	Window main	Vinyl Frame, Double Pane	Front	369	ft2			0.4	148	0.40	0.15	
5	Exterior Wall 2 Sou	Wood Frame, 16" o.c.	Back	834	ft2	19.0	0.0	0.06	39			
6	Window 2	Vinyl Frame:Double Pane ...	Back	149	ft2			0.4	60	0.40	0.15	
7	Door 2	Solid	Back	40	ft2			0.5	20			
8	Exterior Wall 3 Eas	Wood Frame, 16" o.c.	Left Side	492	ft2	19.0	0.0	0.06	30			
9	Exterior Wall 4 We	Wood Frame, 16" o.c.	Right Side	632	ft2	19.0	0.0	0.06	37			
10	Window 3	Vinyl Frame:Double Pane ...	Right Side	15	ft2			0.4	6	0.40	0.15	
11	Knee Wall West	Wood Frame, 16" o.c.	Left Side	69	ft2	19.0	0.0	0.06	4			
12	Knee Wall East	Wood Frame, 16" o.c.	Right Side	84	ft2	19.0	0.0	0.06	5			
13	Basement Wall 2	Solid Concrete or Masonry	Left Side	144	ft2	19.0	0.0	0.053	8			9.0
14	Basement Wall 1			216	ft2	19.0	0.0	0.053	11			9.0
15	Basement Wall 3			684	ft2	19.0	0.0	0.047	32			9.0
16	Floor 1			783	ft2	19.0	0.0	0.047	37			
17	Floor 2			93	ft		5.0	0.804	75			

- Solid Concrete or Masonry
- Masonry Block with Empty Cells
- Masonry Block with Integral Insulation
- Wood Frame
- Insulated Concrete Forms
- Other

Compliance: Passes Max. UA: 850 Your UA: 634 25.4 % Better Than Code

Click the Assembly fields to display a list of assembly choices. "Other" assembly types are editable. Max. SHGC: 0.40 Your SHGC: 0.38

ed.rck - REScheck 3.5 Release 1e Code: 2000 IECC

View

Env

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sement W

sement W

or 1

or 2

Wall Height (ft)

9.0

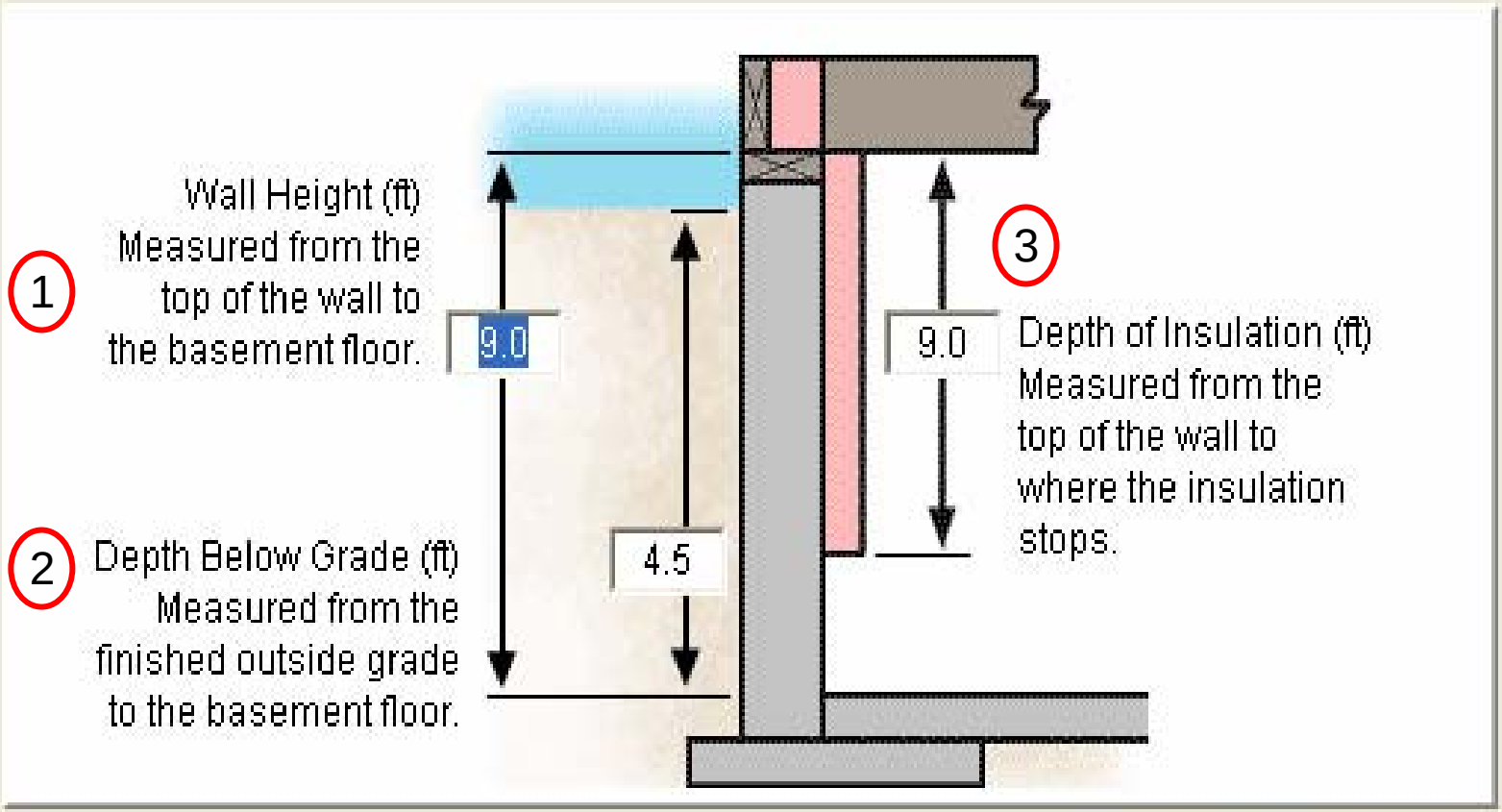
9.0

9.0

0.0

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.



OK Cancel

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ssembly fields to display a list of assembly choices. "Other" assembly types are editable.

Untitled.rck - REScheck 3.5 Release 1e Code: 2000 IECC

File Edit View Options Code Tools Help

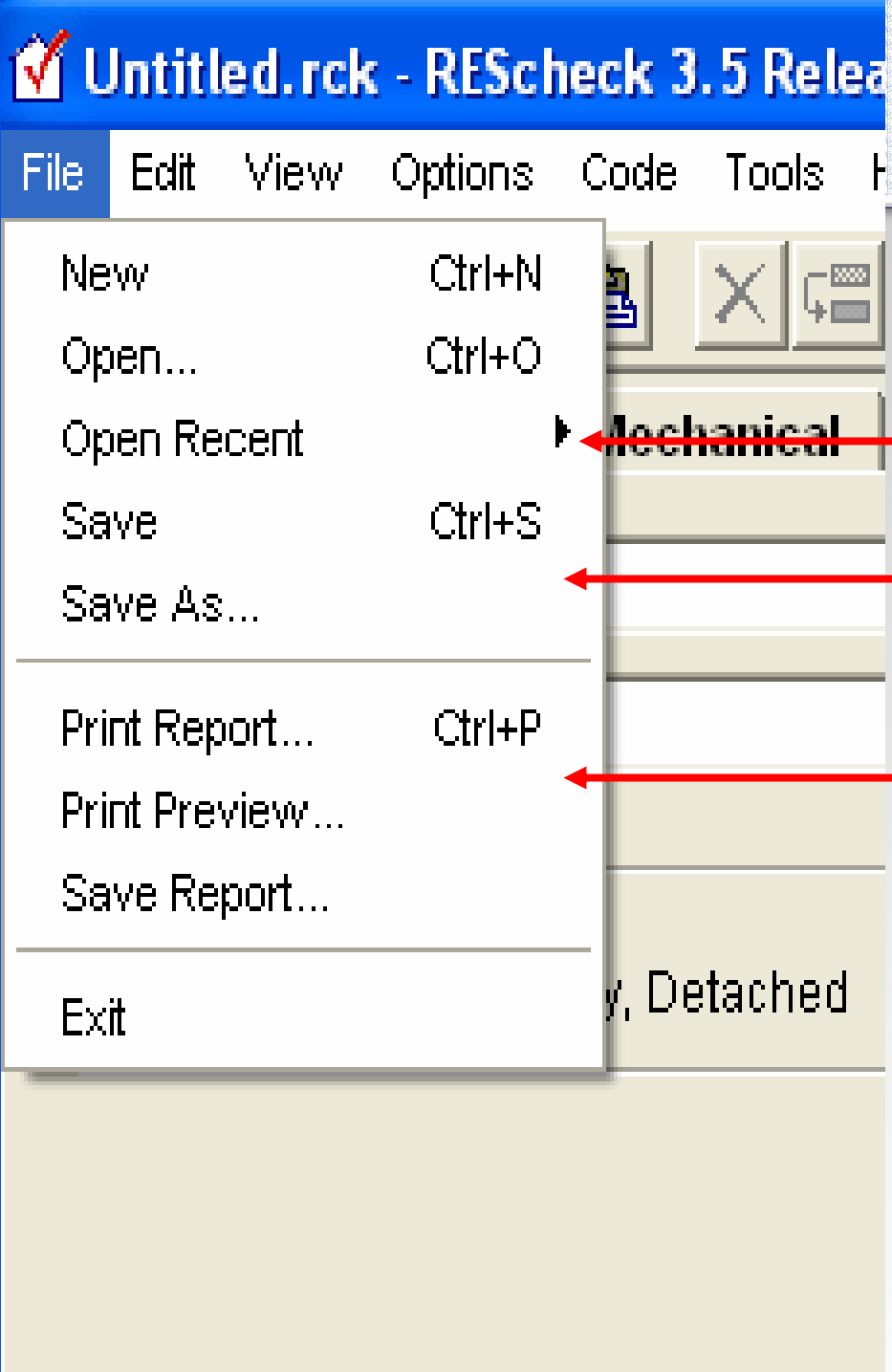
Project | Envelope | Mechanical

Furnace | Boiler | Heat Pump | Air Conditioner

	Component	Description	Heating Efficiency		Cooling Efficiency		Minimum Efficiency
	Building						
1	Furnace 1	Forced Hot Air	78.0	AFUE			78.0 AFUE
2	Air Conditioner 1	Electric Central Air			10.0	SEER	10.0 SEER

AFUE: Annual Fuel Utilization Efficiency

SEER: Seasonal Energy Efficiency Ratio

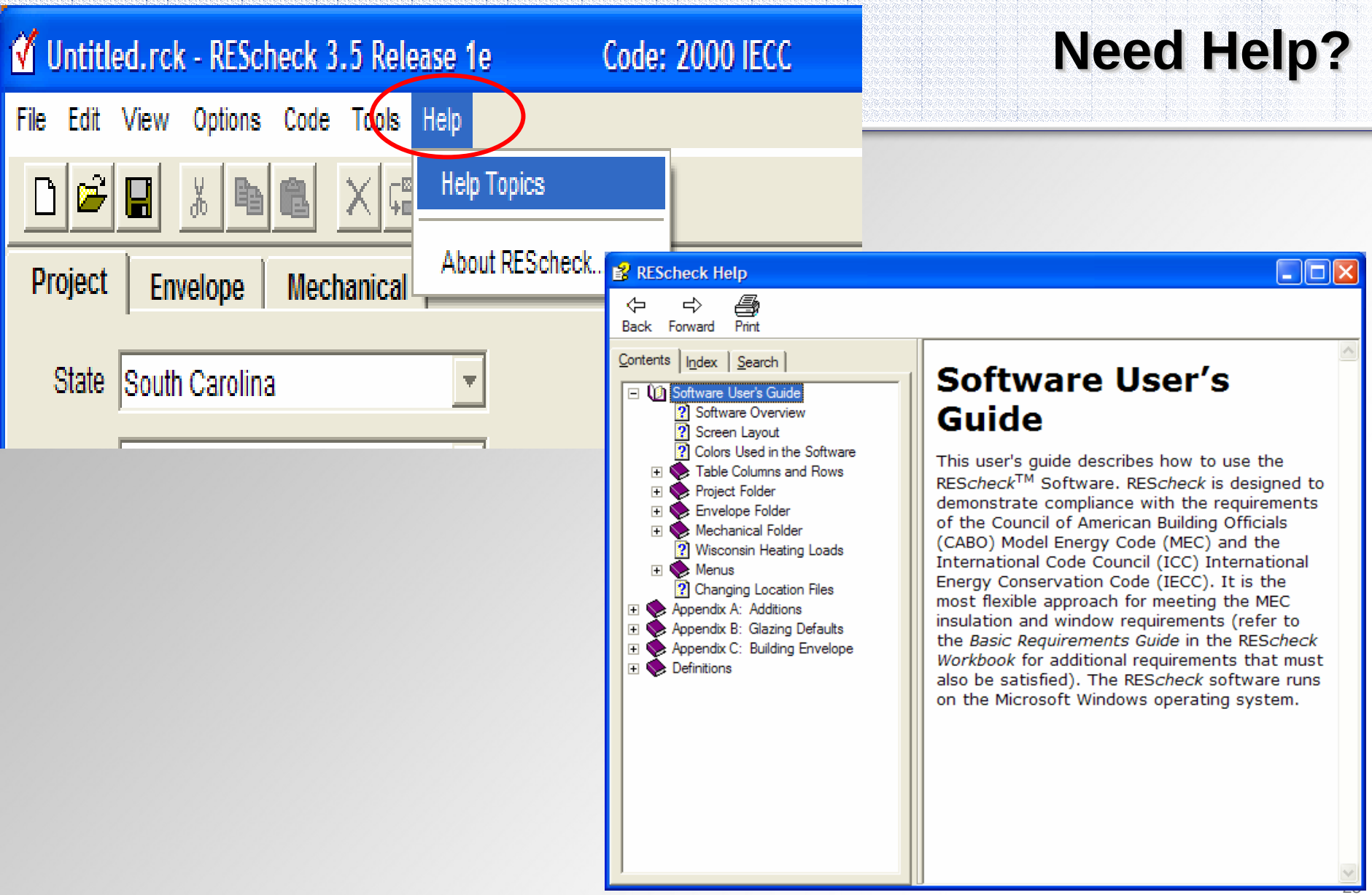


Last files worked on are here

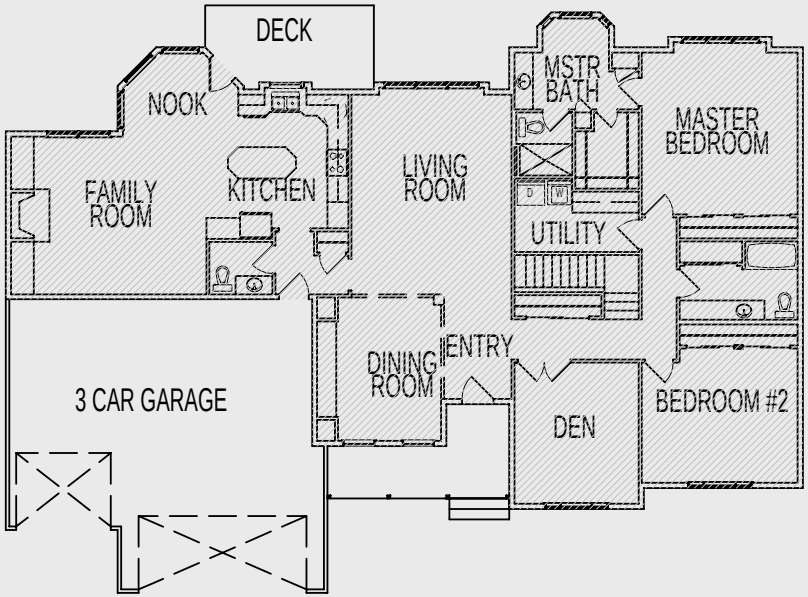
Save as many files as you like

Print and Preview reports

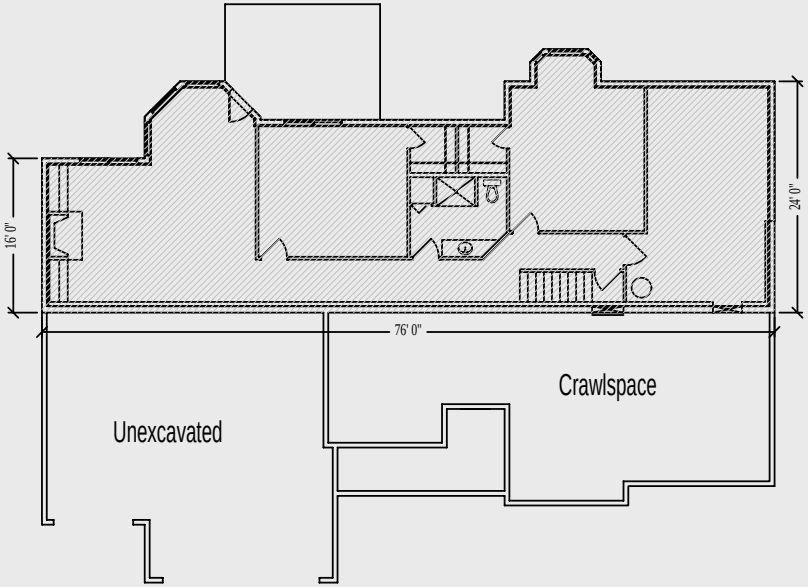
Need Help?


Untitled.rck - REScheck 3.5 Release 1e
Code: 2000 IECC
File Edit View Options Code Tools Help
Help Topics
About REScheck...
Project
Envelope
Mechanical
State
South Carolina
REScheck Help
Back
Forward
Print
Contents
Index
Search
Software User's Guide
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
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.

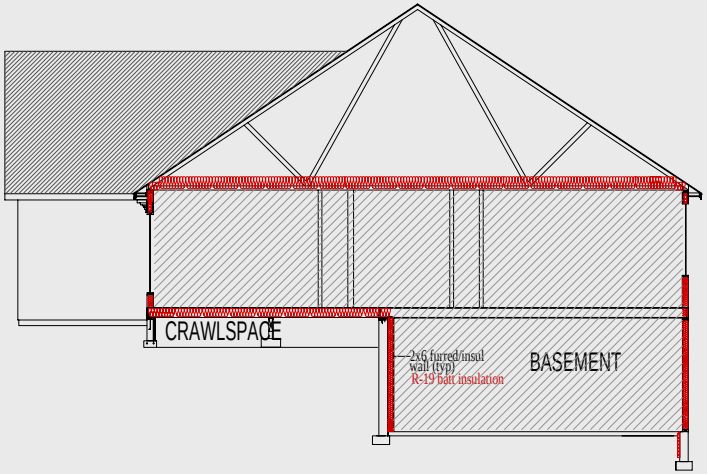
Building Envelope



Conditioned Main Floor



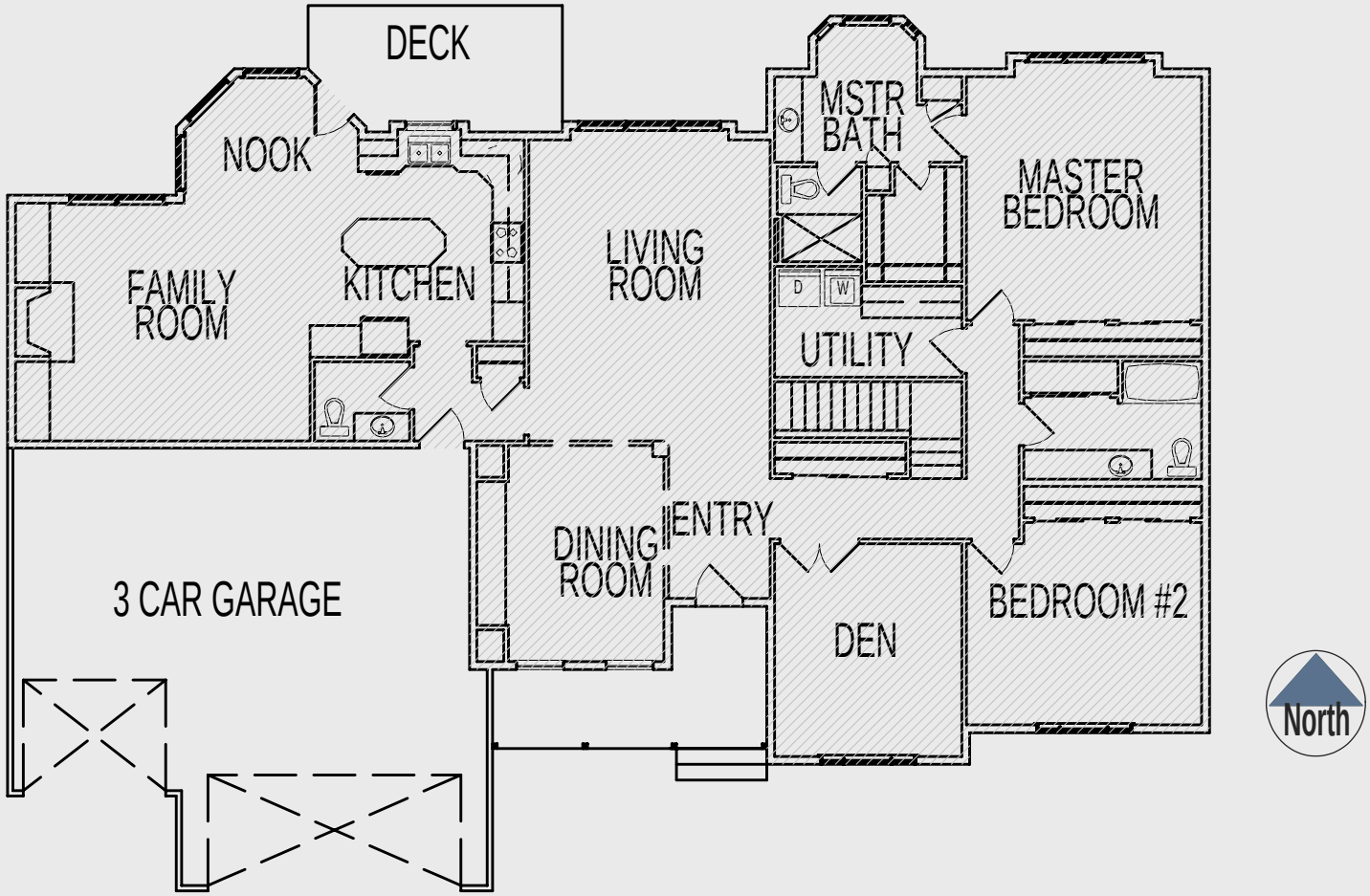
Conditioned Basement



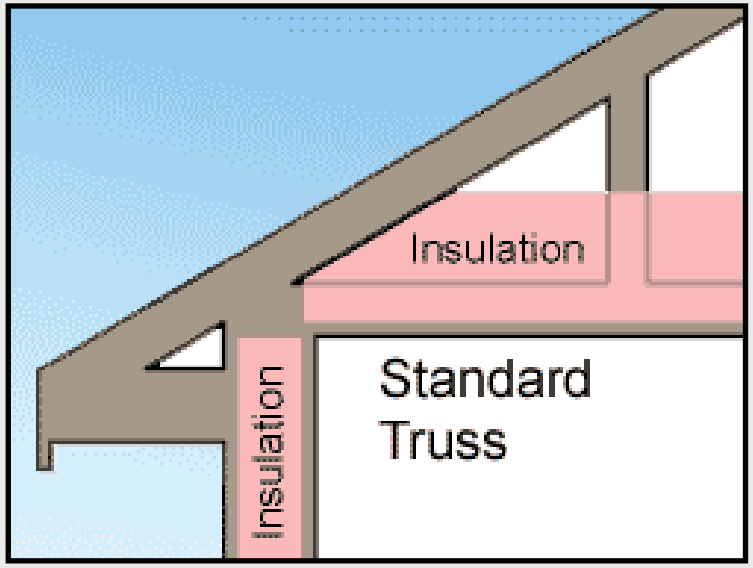
Building Section

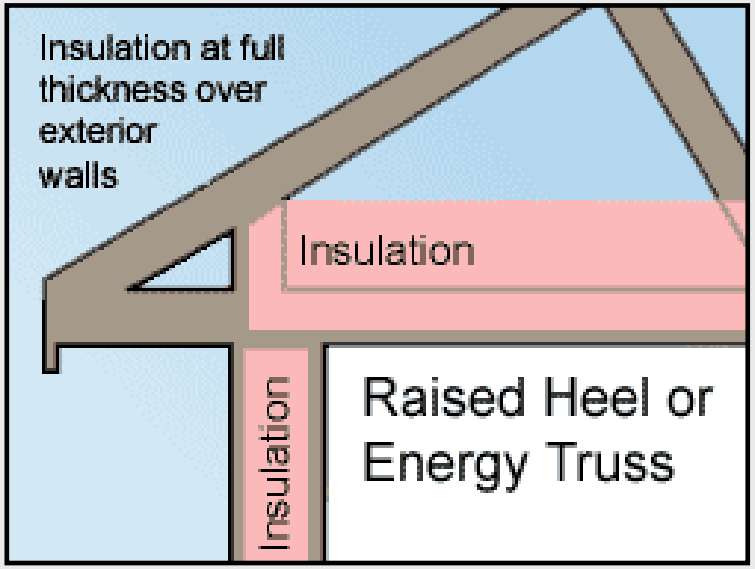
- Ceiling Area

Ceiling Area
2415 s.f.



☞Raised Heel or Energy Truss





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.

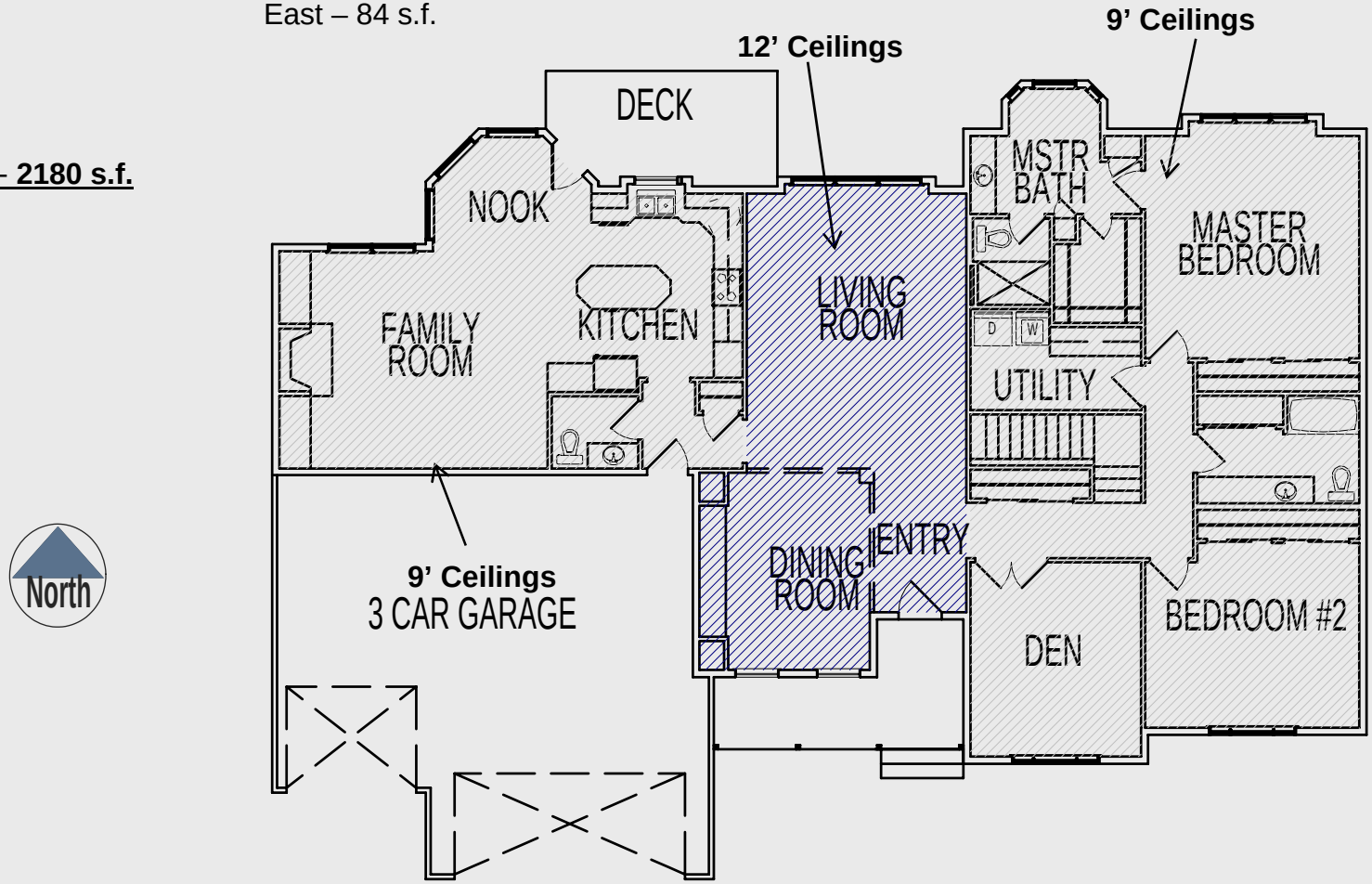
East – 440 s.f.

West – 450 s.f.

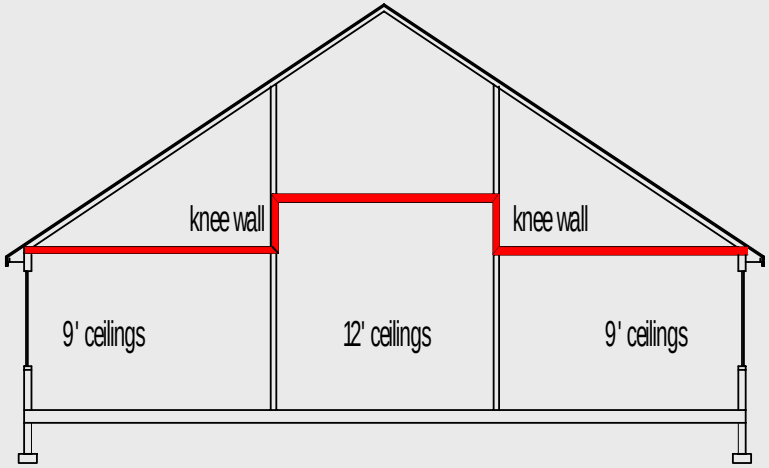
3’ knee walls (between 9’&12’ sections) – **153 s.f.**

West – 69 s.f.

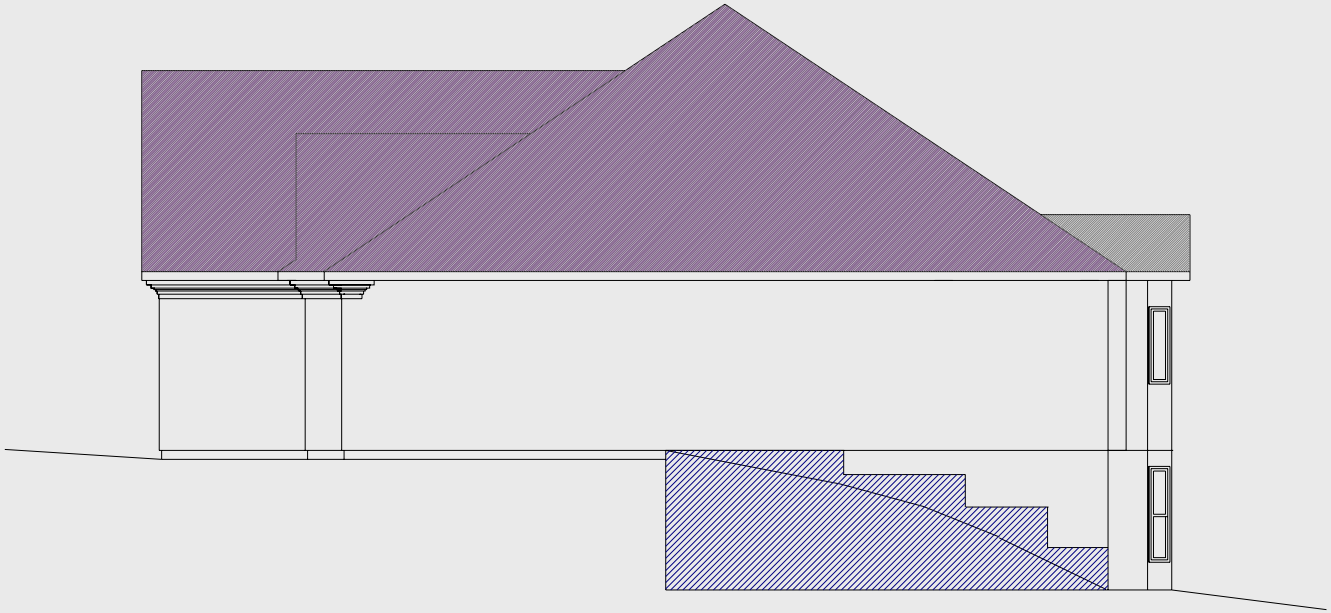
East – 84 s.f.



Insulated Knee Walls



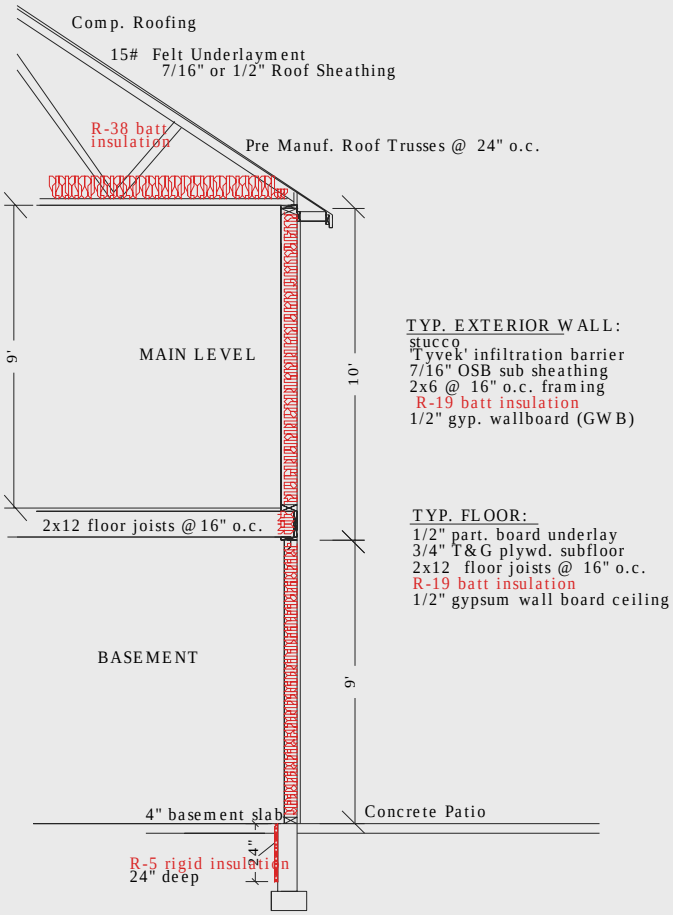
- Basement Walls -
  - below grade



>50% below grade =

below grade concrete basement wall

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.

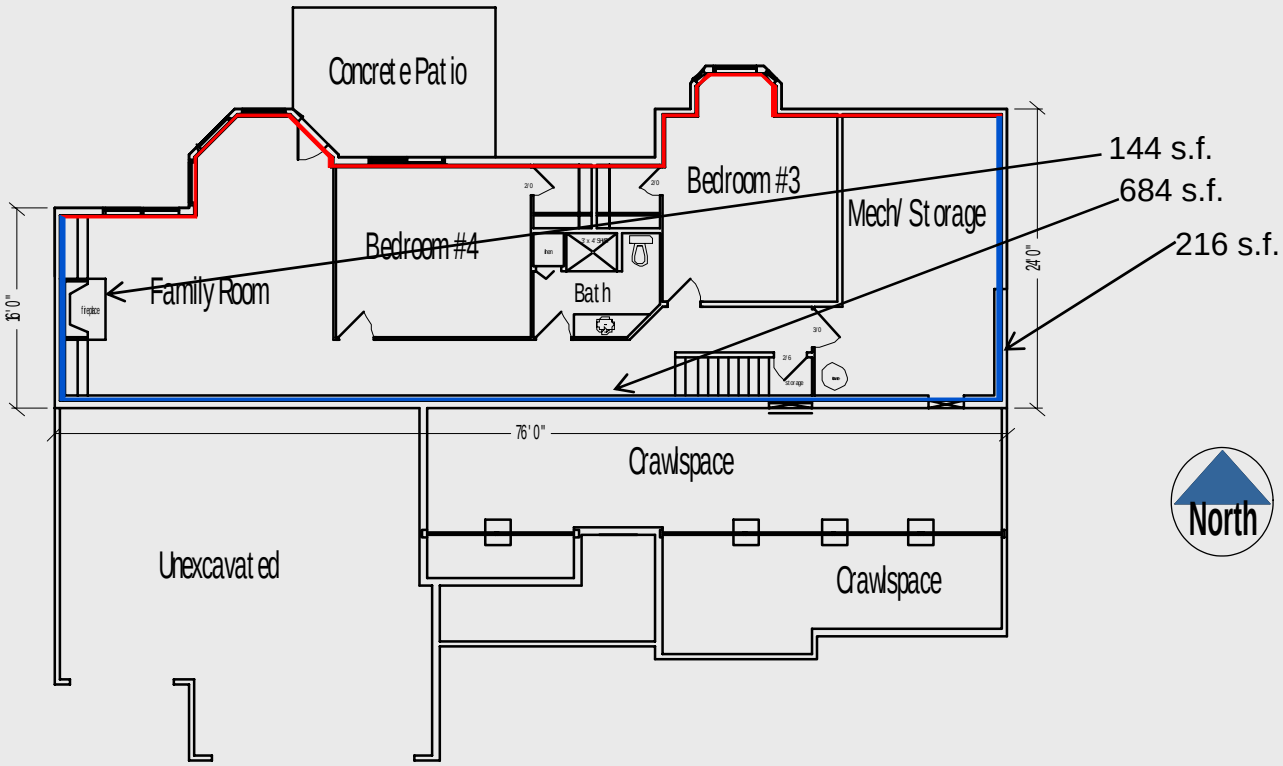
Side basement walls = 360 s.f.

- ***West Wall – 144 s.f***
- ***East Wall – 216 s.f.***

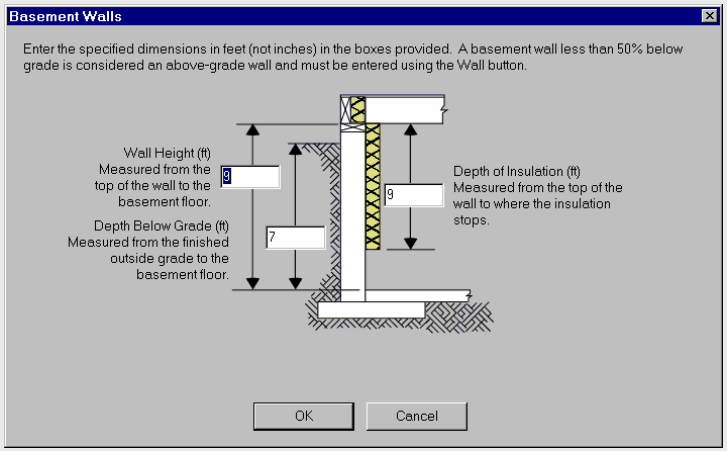
Back basement wall = *684 s.f. (*76'x9')

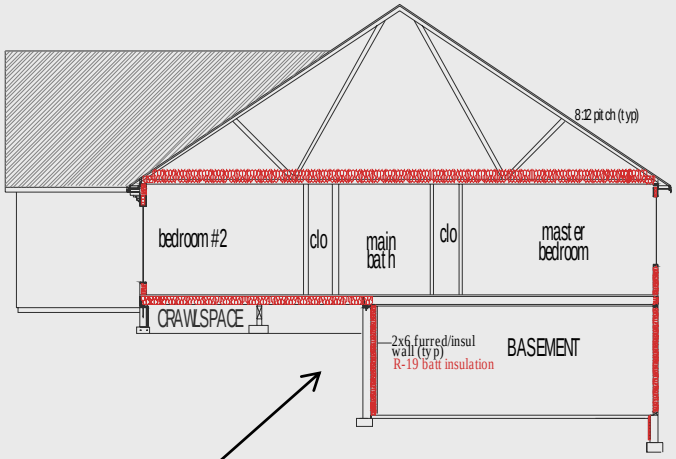
(solid concrete or masonry)

Above Grade
Bmst Walls (exterior wood) – 837 s.f.
(93 ln. ft. x 9' height)

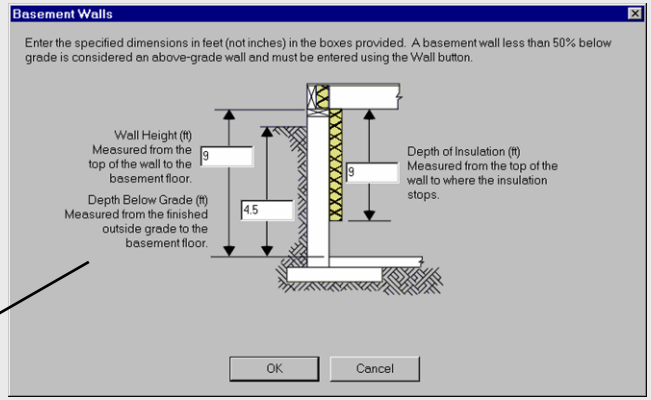


- Basement Walls -
  - RES*check* inputs

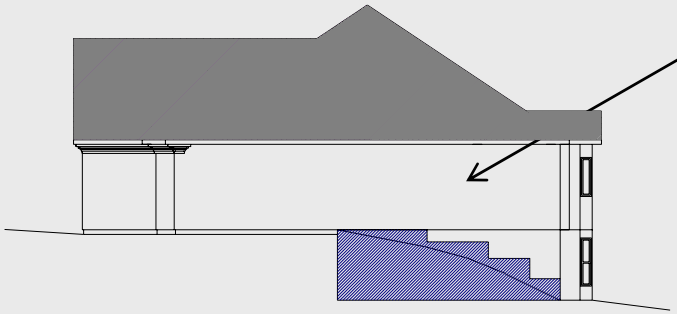




"side" below grade basement walls

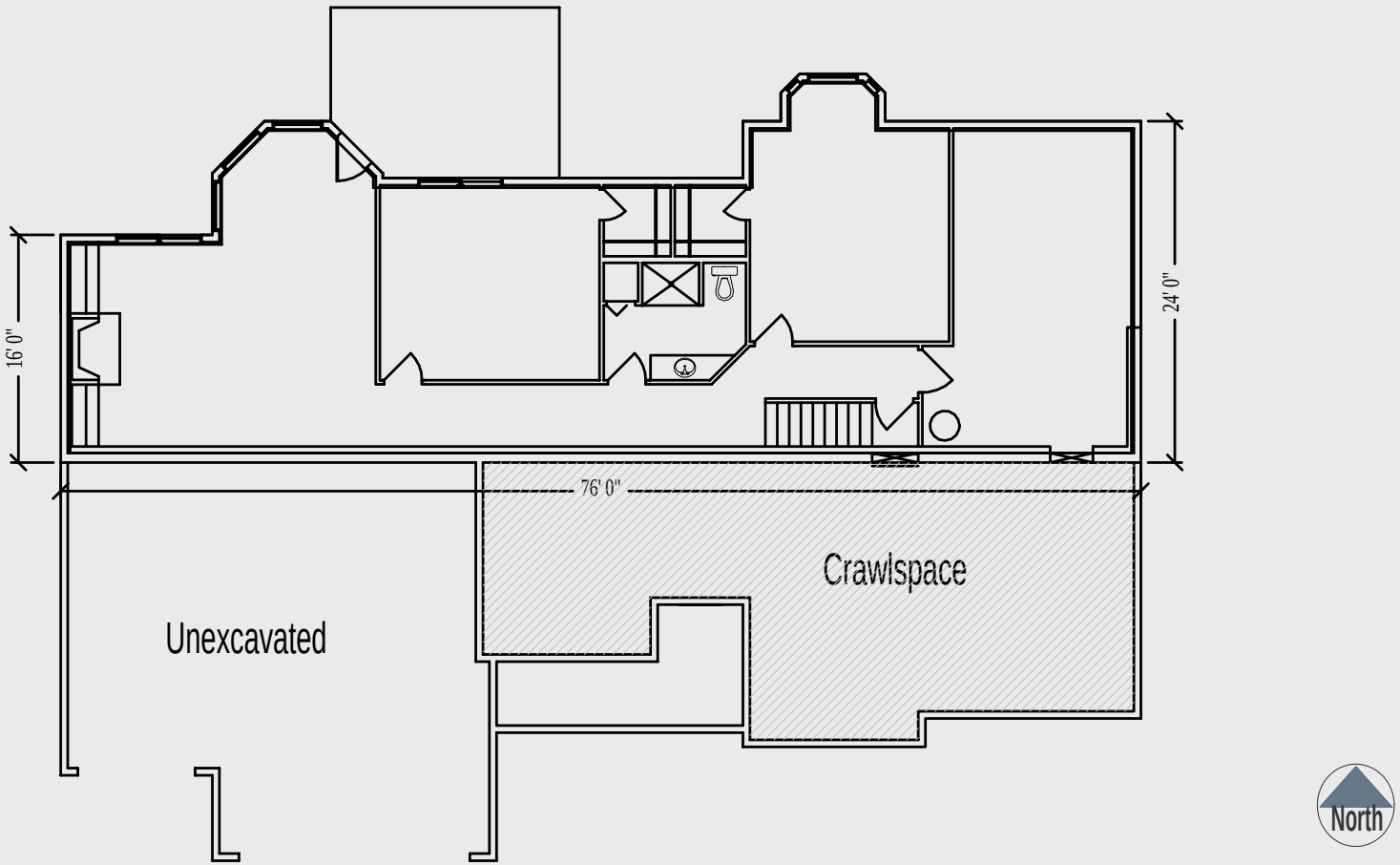


"back" below grade basement wall (entire back wall is adjacent to crawlspace



- Floor Area

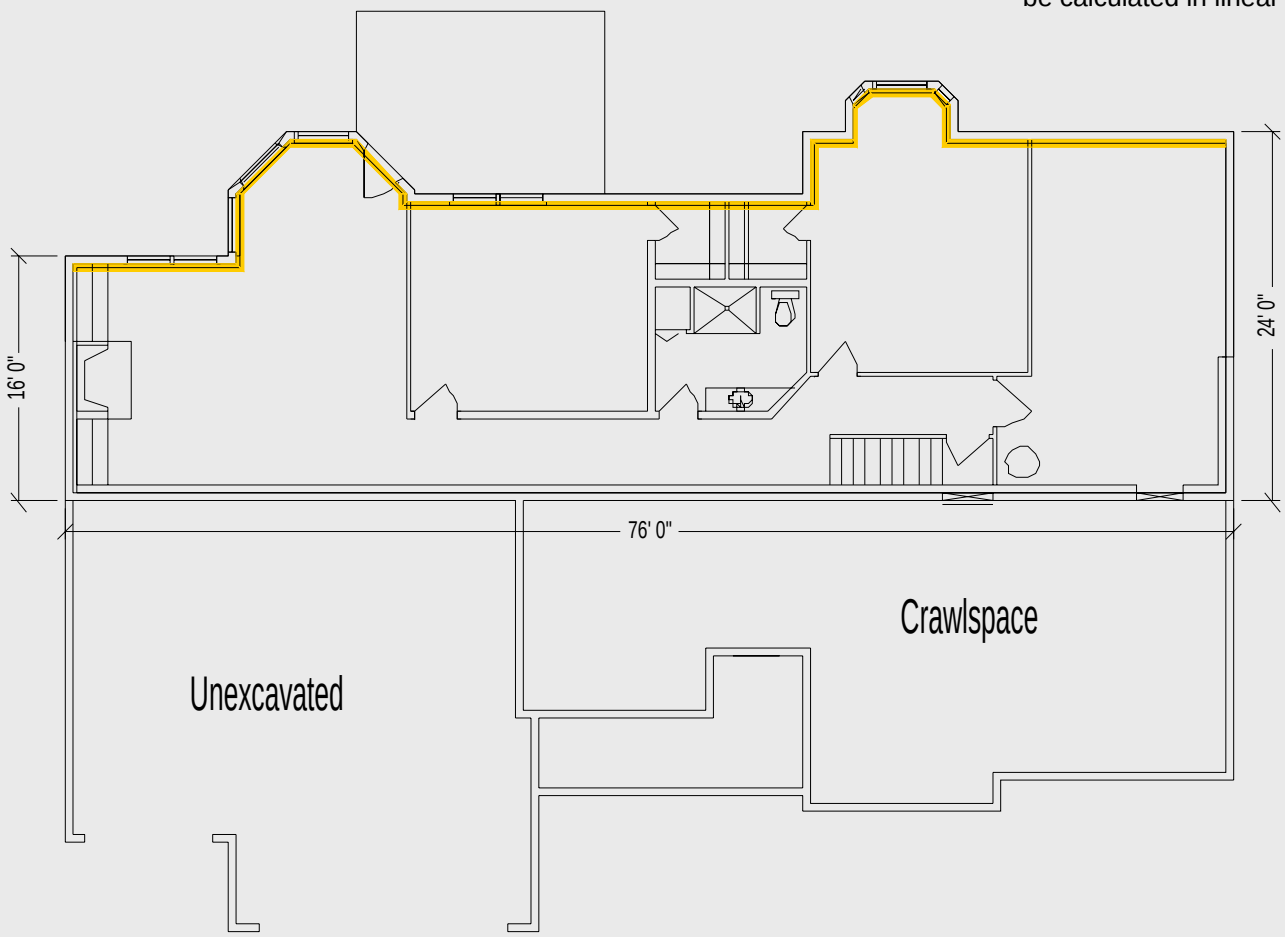
Crawlspace Area - 783 s.f.



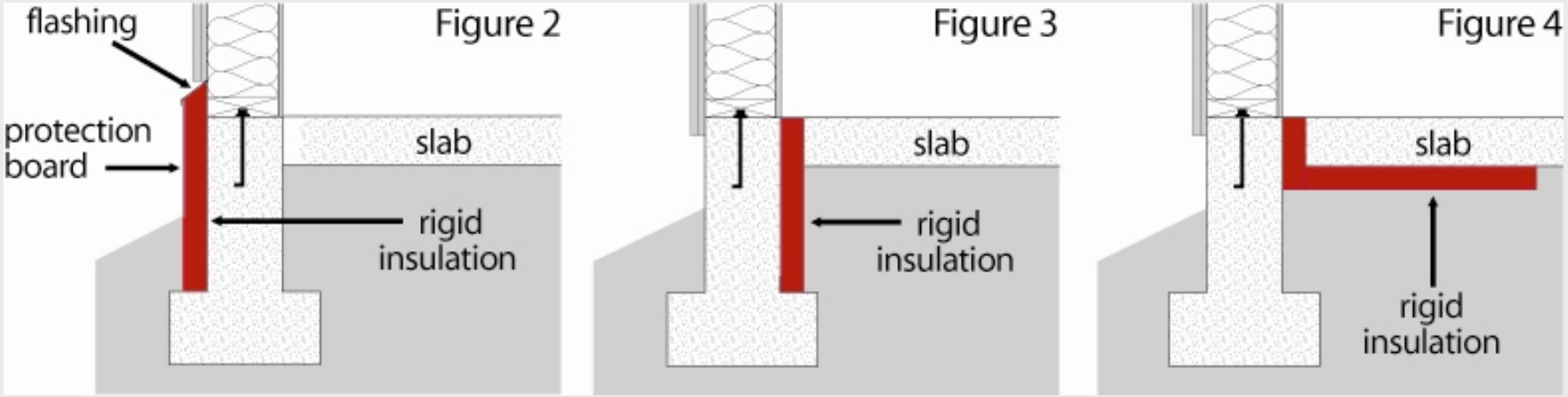
Slab Perimeter

Slab Perimeter - 93 linear feet

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



- Perimeter Slab Insulation



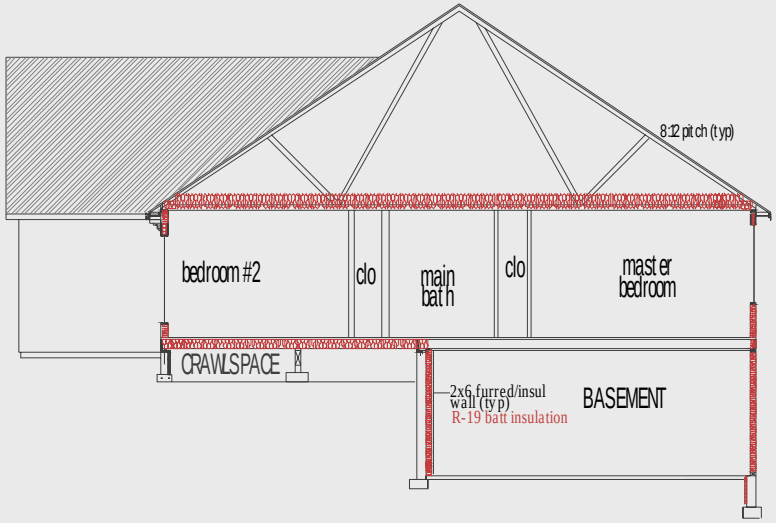
Insulation Levels

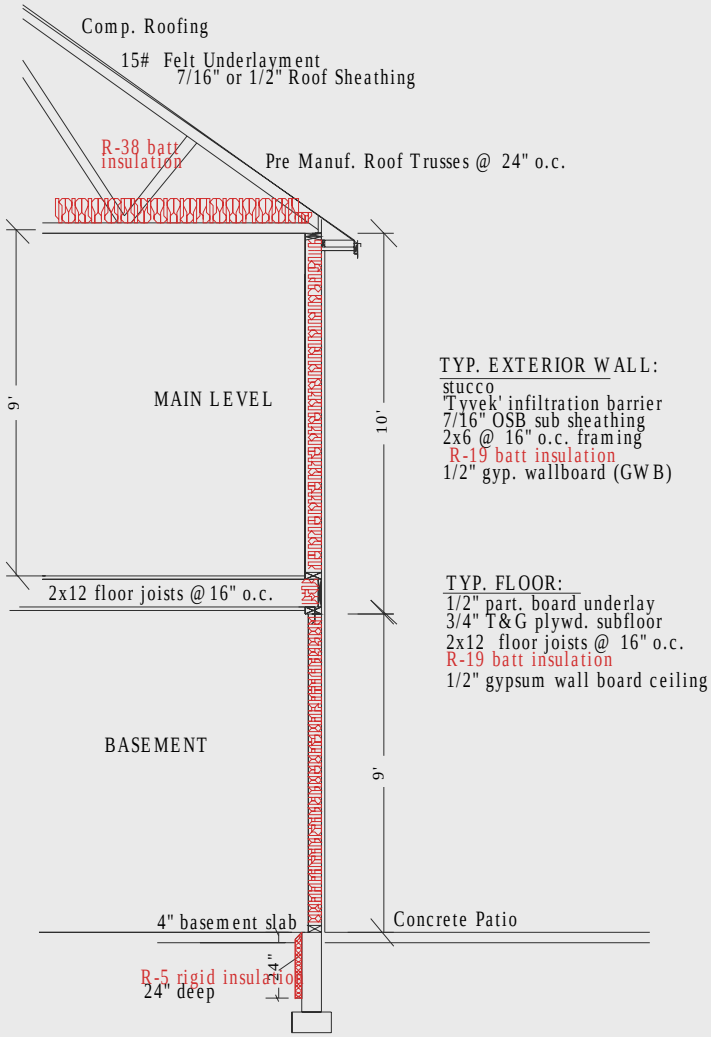
Roof/Ceiling - R-38 batts

Wall - R-19 batts

Floor - R-19 batts

Slab - R-5 rigid (24” vertical)





Window/ Door Area

Window Area - 533 s.f.;

U-value = 0.40 & 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

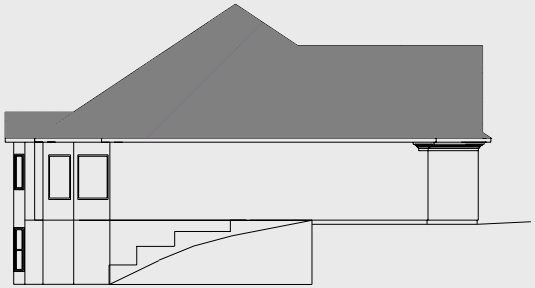
North – 40 s.f.

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

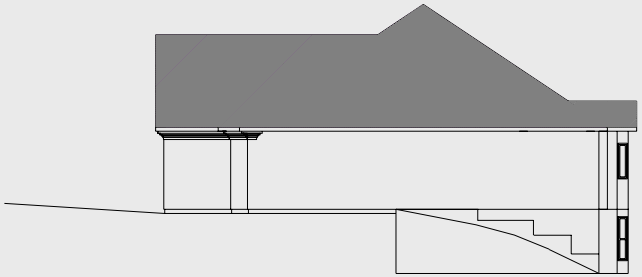
South – 40 s.f.

South

North

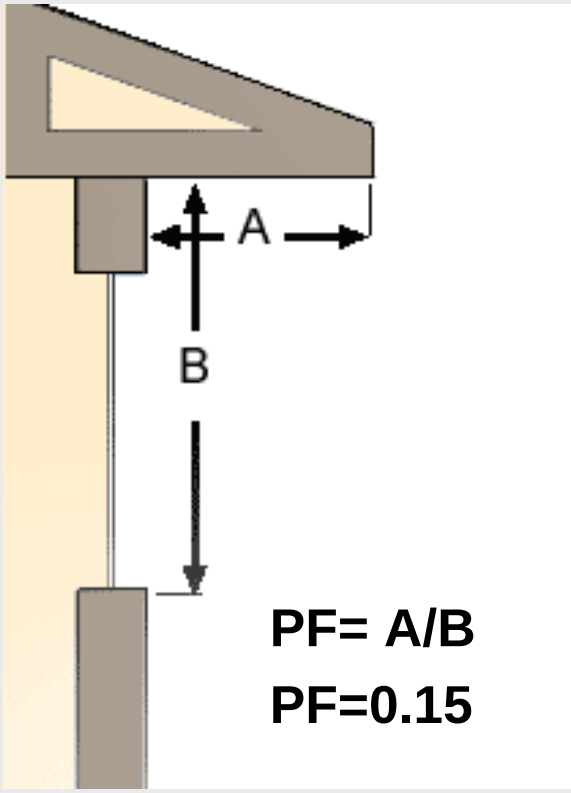


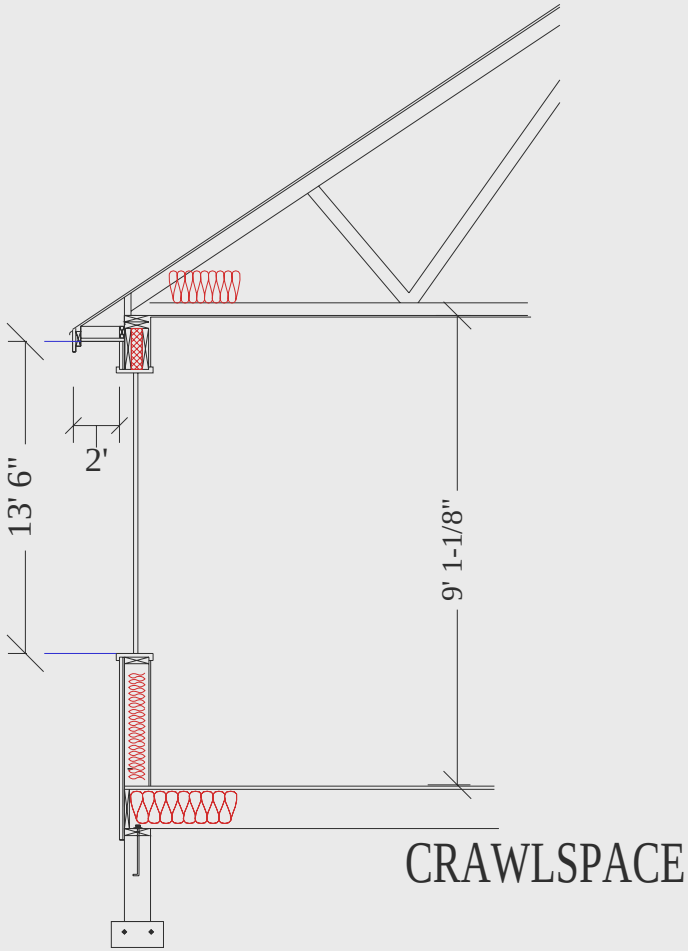
West



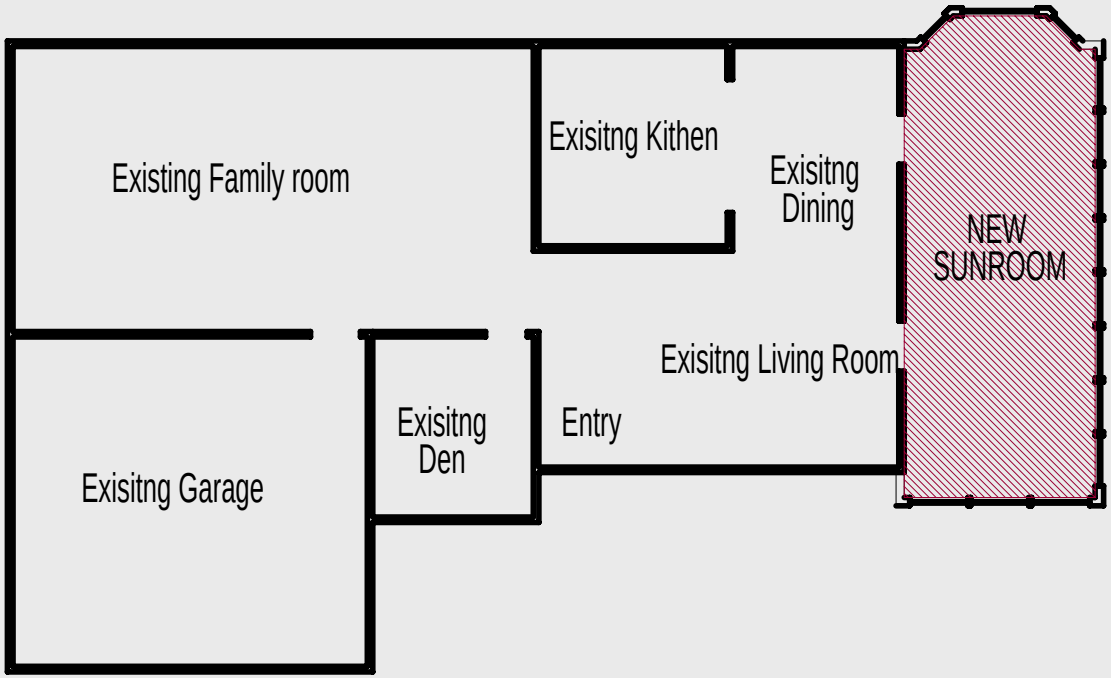
East

Overhang/Projection Factor (PF)





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.

N