



Prescriptive Packages User's Guide

2002 New York State Energy Conservation Construction Code

Prescriptive Packages Overview

The Prescriptive Packages were developed to demonstrate compliance with the insulation and window requirements of the 2002 Energy Conservation Construction Code of New York State. The prescriptive package approach requires minimal calculations and is the simplest method for demonstrating compliance with the insulation and window requirements for residential buildings. Refer to the **Basic Requirements** for additional requirements that must also be satisfied.

The materials include prescriptive packages for both one- and two-family buildings (referred to as single-family buildings) and multifamily buildings (such as apartments, condominiums, townhouses, dormitories, and rowhouses). Multifamily buildings include residential buildings three stories or less in height with three or more attached dwelling units. When applying the prescriptive packages to multifamily buildings, it is recommended that the packages be applied to the entire building (as opposed to individual dwelling units).

Quick Start

This section provides quick-and-easy instructions for using the prescriptive packages.

Find Your Climate Zone

The Prescriptive Packages give requirements for climate zones which fall along county boundaries. You can determine your climate zone from the list of counties given Figure 1A or Chapter 3 Table 302.1 of the NYS ECCC.

Select a Prescriptive Package

Tables of prescriptive packages may have been included with this guide or may be downloaded separately from the Internet. The packages correspond to one of 7 climate zones.

Each climate zone has a table of prescriptive packages from which you can select one package. If your building meets the insulation R-value, glazing, and

heating and/or cooling equipment efficiency requirements specified for the package you select, then the building complies with the code insulation and window requirements. Refer to the first page of the prescriptive package tables for notes that further clarify the requirements.

Complete the Prescriptive Package Worksheet

Fill in the *Prescriptive Package Worksheet* to document your building's compliance with the insulation and window requirements of the code. Be sure to include the climate zone number for your building's location, the prescriptive package number for the package you selected, and the code edition applicable to the selected package. Copy the glazing area percentage, R-value, and U-factor requirements specified in your selected package to the corresponding blanks on the right side of the worksheet. Write in the glazing area of your building and your proposed insulation R-values and glazing and door U-factors on the left side of the worksheet. If the package you selected requires high-efficiency heating or cooling equipment, record the efficiency, make, and model number of the equipment you intend to install.

Check for Compliance

Your building complies if:

- your glazing area is less than or equal to the required glazing area, and
- all proposed insulation R-values are greater than or equal to all required insulation R-values, and
- all proposed glazing and door U-factors are less than or equal to all required glazing and door U-factors, and
- your heating and cooling equipment meets the requirements specified for the package you selected (see Footnote 9).

Table 302.1: Climatic Conditions - New York State

COUNTY	WINTER DESIGN DRY-BULB TEMP.	SUMMER DESIGN DRY-BULB TEMP.	COINCIDENT WET-BULB TEMP.	HEATING DEGREE DAYS	ZONE	COUNTY	WINTER DESIGN DRY-BULB TEMP.	SUMMER DESIGN DRY-BULB TEMP.	COINCIDENT WET-BULB TEMP.	HEATING DEGREE DAYS	ZONE
Albany	-7	86	70	6894	14A	Niagara	2	85	73	6747	14A
<u>Allegany</u>	1	86	71	6734	15	Oneida	-5	86	70	7244	15
<u>Bronx</u>	13	89	73	4910	11B	<u>Ormond</u>	-3	85	71	6834	14A
<u>Broome</u>	-2	82	69	7273	15	Ontario	1	86	71	6734	14A
<u>Cattaraugus</u>	2	85	73	6747	15	Orange	6	83	73	5750	12B
<u>Cayuga</u>	-3	85	71	6834	14A	Orleans	1	86	71	6734	14A
<u>Chautauque</u>	2	85	73	6747	13A	<u>Oswego</u>	-3	85	71	6834	14A
<u>Chemung</u>	-2	87	71	6845	15	<u>Otsego</u>	-5	86	70	7244	15
<u>Chenango</u>	-2	82	69	7273	15	Putnam	6	83	73	5750	12B
<u>Clinton</u>	-9	83	69	7837	15	Queens	13	89	73	4910	10B
<u>Columbia</u>	-7	86	70	6894	13A	<u>Rensselaer</u>	-7	86	70	6894	14A
<u>Cortland</u>	-2	82	69	7273	15	Richmond	13	89	73	4910	11B
<u>Delaware</u>	-5	86	70	7244	15	Rockland	13	89	73	4910	12B
<u>Dutchess</u>	2	88	72	6391	13A	<u>St Lawrence</u>	-15	84	71	8255	15
<u>Elie</u>	2	85	73	6747	14A	Saratoga	-5	86	70	7244	14A
<u>Essex</u>	-15	84	71	8255	16	Schenectady	-7	86	70	6894	14A
<u>Franklin</u>	-15	84	71	8255	16	Schoharie	-7	86	70	6894	15
<u>Fulton</u>	-7	86	70	6894	15	<u>Schuyler</u>	-2	87	71	6845	15
<u>Genesee</u>	1	86	71	6734	14A	Seneca	1	86	71	6734	14A
<u>Greene</u>	-7	86	70	6894	14A	<u>Steuben</u>	1	86	71	6734	15
<u>Hamilton</u>	-10	85	71	7635	16	Surfolk	11	83	74	5750	11B
<u>Herkimer</u>	-5	86	70	7244	15	Sullivan	6	83	73	6750	15
<u>Jefferson</u>	-12	83	70	7540	15	<u>Ulster</u>	-2	87	71	6845	15
<u>Kings</u>	13	89	73	4910	10B	<u>Tompkins</u>	-2	82	69	7273	15
<u>Lewis</u>	-12	83	70	7540	15	Ulster	6	83	73	6750	15
<u>Livingston</u>	1	86	71	6734	14A	Warren	-10	85	71	7635	15
<u>Madison</u>	-5	86	70	7244	14A	Washington	-10	85	71	7635	15
<u>Monroe</u>	1	86	71	6734	14A	Wayne	1	86	71	6734	14A
<u>Montgomery</u>	-7	86	70	6894	14A	<u>Westchester</u>	7	84	73	5750	12B
<u>Nassau</u>	13	89	73	4910	11B	Wyoming	1	86	71	6734	14A
<u>New York</u>	13	89	73	4910	10B	<u>Yates</u>	1	86	71	6734	14A

Figure 1A. Design Conditions

Figure 1. Using Prescriptive Package

Table 302.1: Climatic Conditions - New York State

COUNTY	WINTER DESIGN OUTDOOR TEMP.	SUMMER DESIGN OUTDOOR TEMP.	CONCURRENT 70°F-80°F TEMP.	HEATING DESIGN OUTDOOR TEMP.	ZONE	COUNTY	WINTER DESIGN OUTDOOR TEMP.	SUMMER DESIGN OUTDOOR TEMP.	CONCURRENT 70°F-80°F TEMP.	HEATING DESIGN OUTDOOR TEMP.	ZONE
Albany	-7	86	70	6004	14A	Madison	-2	85	70	6747	14A
Albany	1	86	71	6734	15	Oneida	-5	86	70	7249	15
Brock	-13	89	73	4910	11B	Columbia	-3	85	71	6834	14A
Broome	-2	82	69	7273	15	Columbia	1	86	71	6734	14A
Cattaraugus	2	85	73	6747	15	Columbia	6	83	73	5750	13B
Cayuga	-3	85	71	6834	14A	Columbia	1	86	71	6734	14A
Chemung	2	85	73	6747	13A	Columbia	-3	85	71	6834	14A
Chemung	-2	87	71	6845	15	Columbia	-5	85	70		
Chemung	1	81	69	7273	15	Columbia	6	83	73		

1. Find Climate Zone

Table 5 / Zone 14A
One- and Two Family Dwellings
Prescriptive Packages - 2002 NYSECC

Pkg	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency ³
	Glazing Area %	Glazing U-Factor ²	Ceiling R-Value ³	Wall R-Value ³	Floor R-Value ³	Basement Wall R-Value ³	Slab Perimeter R-Value ³	Crawl Space Wall R-Value ³	
1	8%	0.43	R-38	R-16	R-19	R-10	R-7	R-16	Normal
2	12%	0.45	R-49	R-19	R-26	R-13	--	--	Normal
3	12%	0.40	R-49	R-21	R-19	R-10	R7-	R-17	Normal
4	17%	0.35	R-38	R-19	R-19	R-10	R-7	R-17	Normal
5	15%	0.35	R-49	R-21	R-21	R-11	R-11	R-20	Normal
6	18%	0.33	R-49	R-22	R-25	R-11	R-14	R-19	Normal
7	20%	0.30	R-49	R-26	R-21	R-11	R-10	R-17	Normal
8	22%	0.30	R-49	R-22	R-30	R-14	--	--	Normal
9	25%	0.25	R-49	R-19	R-30	R-14	--	--	Normal

2. Select Prescriptive Package



Residential Prescriptive Package Worksheet

For Compliance with the

2002 New York State Energy Conservation Construction Code

Builder Name: Impeccable Construction Co. Date: 2/15/2012
 Builder Address: 2 Compaissant Rd, Schenectady, NY 12308
 Building Address: 1 Paradigm Dr., Niskayuna, NY 12309
 Description: One Family Dwelling Package #: 5 Zone #: 14A
 Submitted By: Jim & Jane Comely Phone #: 212-555-5555

PROPOSED		REQUIRED																																
Glazing Area $100 \times \frac{288}{1923} = 15\%$ <p>Glazing Area Gross Wall Area Proposed Glazing Area</p>		15% <p>Maximum Glazing Area</p>																																
R-Value <table border="1"> <thead> <tr> <th>Description</th> <th>Comments</th> <th>Proposed R-Value</th> </tr> </thead> <tbody> <tr> <td>Ceiling</td> <td></td> <td>R-49</td> </tr> <tr> <td>Wall</td> <td></td> <td>R-21</td> </tr> <tr> <td>Floor Over Unconditioned Space</td> <td></td> <td>R-21</td> </tr> <tr> <td>Floor Over Outside Air</td> <td></td> <td>R-49</td> </tr> <tr> <td>Basement Wall</td> <td></td> <td>R-N/A</td> </tr> <tr> <td>Slab Floor</td> <td><input type="checkbox"/> Heated <input type="checkbox"/> Un-Heated</td> <td>R-8</td> </tr> <tr> <td>Crawl Space Wall</td> <td></td> <td>R-N/A</td> </tr> </tbody> </table>		Description	Comments	Proposed R-Value	Ceiling		R-49	Wall		R-21	Floor Over Unconditioned Space		R-21	Floor Over Outside Air		R-49	Basement Wall		R-N/A	Slab Floor	<input type="checkbox"/> Heated <input type="checkbox"/> Un-Heated	R-8	Crawl Space Wall		R-N/A	<table border="1"> <thead> <tr> <th>Minimum R-Value</th> </tr> </thead> <tbody> <tr> <td>R-49</td> </tr> <tr> <td>R-21</td> </tr> <tr> <td>R-21</td> </tr> <tr> <td>R-49</td> </tr> <tr> <td>R-11</td> </tr> <tr> <td>R-11</td> </tr> <tr> <td>R-24</td> </tr> </tbody> </table>	Minimum R-Value	R-49	R-21	R-21	R-49	R-11	R-11	R-24
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3. Complete Prescriptive Worksheet

Detailed Step-By-Step Instructions

The *Prescriptive Package Worksheet* included with this guide can be used to document compliance with the insulation and window requirements of the code. The following instructions explain how to complete this worksheet. Figure 2 shows an example *Prescriptive Package Worksheet*. The numbers in Figure 2 identify the various locations on this worksheet that correspond to the following steps.

Step 1: Find Your Climate Zone

The Prescriptive Packages give requirements for climate zones which fall along county boundaries. You can determine your climate zone from the list of counties given in Figure 1A. Based on the county in which your building is located, find your climate zone.

Step 2: Select a Prescriptive Package

The tables of prescriptive packages correspond to one of 7 climate zones. Locate the table of prescriptive packages for the climate zone you identified in Step 1.

Select a package for your building from this table. If your building meets the insulation R-value, glazing, and heating and cooling efficiency requirements specified by the package you select, then the building complies with the code insulation and window requirements. Refer to the first page of the prescriptive packages for notes that further clarify the requirements.

The glazing U-factor and the glazing area percentage listed for each package are the maximum allowed for that package. The area of a glazing assembly is the interior surface area of the entire assembly, including glazing, sash, curbing and other framing elements. The areas of all glazing assemblies (including windows, sliding glass doors, skylights, and windows of conditioned basements) must be included when computing the total glazing area (see Footnote 1).

The nominal area or rough opening is also acceptable for flat windows and doors. The glazing area and window U-factor for your building can be averaged by using the *Glazing Area/U-Factor Trade-Off Worksheet* (instructions are given on the worksheet). Use of this worksheet does not alter the insulation R-value and equipment efficiency requirements in the package.

The insulation R-values listed for each package are the minimum allowed for that package. R-value requirements refer to the R-value of the insulation only. Wall and ceiling insulation R-values refer to the sum of the stud cavity insulation plus insulated sheathing (if used). For example, an R-16 wall requirement can be met with R-13 cavity insulation and R-3 sheathing. It is important to select a package consistent with the proposed framing used in the building. For example, it would be impossible to comply with a package specifying R-38 ceiling insulation (approximately 12 in. thick) if the building plans include a cathedral ceiling with 2x8 framing (approximately 7.5 in. thick).

Some of the packages specify high-efficiency heating equipment (*High Heating*), or high-efficiency heating equipment (*High Heating*) and high-efficiency cooling equipment (*High Cooling*). High-efficiency heating units have an annual fuel utilization efficiency (AFUE) of at least 90% or a heating seasonal performance factor (HSPF) of at least 7.8. High-efficiency cooling units have a seasonal energy efficiency ratio (SEER) of at least 12.0. For example, if you intend to

install a 10 SEER air conditioner and a 92% AFUE furnace, the *High Heating* packages would apply to your building, but *High Heat/Cool* packages would not. If you plan to install more than one piece of heating equipment or more than one piece of cooling equipment, the equipment with the lowest efficiency must meet or exceed the efficiency required by the selected package. AFUE, HSPF, and SEER ratings can be obtained from manufacturer data sheets or certified product directories.

Step 3: Complete the General Information Section

Fill in the information at the top of the *Prescriptive Package Worksheet*. Be sure to record your climate zone number, prescriptive package number, and code edition.



For Compliance with the
2002 New York State Energy Conservation Construction Code

Builder Name:	Impeccable Construction Co.	Date:	2/15/2002
Builder Address:	2 Complainant Rd., Schenectady, NY 12308		
Building Address:	1 Paradigm Dr., Niskayuna, NY 12309		
Description:	One Family Dwelling	Package #:	5
		Zone #	14A
Submitted By:	Jim & Jane Cornely	Phone #:	212-555-5555

PROPOSED

REQUIRED

Glazing Area

5

100x

288

Glazing Area

1923

Gross Wall Area

=

15

Proposed Glazing Area

%

15

Maximum Glazing Area

%

R-Value

Description	Comments	Proposed R-Value
Ceiling		R- 4.9
Wall	6	R- 2.1
Floor Over Unconditioned Space		R- 2.1
Floor Over Outside Air		R- 4.9
Basement Wall		R- N/A
Slab Floor	<input type="checkbox"/> Heated <input type="checkbox"/> UnHeated	R- 8
Crawl Space Wall		R- N/A

Minimum R-Value
R- 4.9
R- 2.1
R- 2.1
R- 4.9
R- 11
R- 11
R- 2.6

U-Factor

Description	Comments	Proposed U-Factor
Glazing	7	U- 0.35
Door	FRONT DOOR EXEMPT	U- 0.35
		U-

Maximum U-Factor
U- 0.35
U- 0.35
U-

Equipment Efficiency (This section may be left blank if Normal is selected on the right.)

Heating

78%

AFUE/HSPF

8

Make & Model Number

Cooling

Efficiency

SEER

Make & Model Number

☐ Normal
 ☐ High Heating
 ☐ High Cooling
 ☐ High Heating & Cooling

Statement of Compliance: The proposed building design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the requirements of the New York State Energy Conservation Construction Code.

Builder/Designer	Impeccable Construction Co.	4/15/02
Company Name		Date

Step 4: Complete the Required Section

Copy the *Glazing Area* percentage from the prescriptive package you have chosen to the space labeled *Maximum Glazing Area*. Depending on the package you have selected, this percentage will range from 8% to 25% for One- and two-family dwelling buildings or 12% to 30% for multifamily buildings. Copy the insulation R-value and glazing U-factor requirements from the selected prescriptive package to the *Minimum R-Value* and *Maximum U-Factor* sections of the worksheet. The required R-value for floors over outside air is the same as that for ceilings, so copy the ceiling R-value requirement from the selected prescriptive package to the *Minimum R-Value* box for floors over outside air. The slab R-value requirement is for unheated slabs. In all locations add an additional R-2 if you intend to install a heated slab. A heated slab has ducts or hydronic heating elements in or under the slab.

If high-efficiency heating equipment is specified in the package you have chosen, put an "X" in the box labeled *High Heating*. If both high-efficiency heating and high-efficiency cooling equipment are specified, put an "X" in the box labeled *High Heating & Cooling*. If normal heating and cooling efficiency is specified in the package you selected, put an "X" in the box labeled *Normal*.

Step 5: Complete the Proposed Glazing Area Section

Calculate the total area (ft²) of all glazing assemblies (windows, sliding glass doors, skylights, etc.) located in the building envelope. The area of an assembly is the interior surface area of the entire assembly, including glazing, sash, curbing, and other framing elements. The nominal area or rough opening is acceptable for flat windows. The area of windows in the exterior walls of conditioned basements should be included. Windows in unconditioned basements are *NOT* included. Record the total area of all applicable assemblies in the space labeled *Glazing Area*.

Next, calculate the gross wall area (ft²) and record this area in the space labeled *Gross Wall Area*. The gross wall area includes the following:

- all above-grade walls enclosing conditioned spaces (including attic kneewalls and skylight shafts)
- the peripheral edges of the floors (the area of the band joist and perimeter framing between floors)
- walls of conditioned basements with an average depth less than 50% below grade (include the entire wall area – even the below-grade portions). For further clarification, refer to the basement wall examples given in Step 6.
- all windows and doors (including windows and doors in conditioned basements).

Divide the glazing area by the gross wall area and multiply by 100 to determine the *Proposed Glazing Area* percentage.

Step 6: Complete the Proposed R-Value Section

Record the proposed R-value of the insulation to be installed in each applicable ceiling, wall, floor, basement wall, slab-edge, and crawl space wall component in the *Proposed R-Value* column of the worksheet.

Multiple R-Values and U-Factors Some components may consist of more than one R-value (e.g., part of the ceiling may be insulated to R-38 and part to R-19). If each component R-value is greater than or equal to the required R-value, record the lowest component R-value. However, if one of the R-values is less than the required R-value, perform an area-weighted average R-value calculation using the *R-Value/U-Factor Weighted Average Worksheet*. If the resulting average R-value is greater than or equal to the required R-value, the component complies and the average R-value should be transferred to the *Prescriptive Package Worksheet*.

Some buildings will use more than one glazing or door U-factor (e.g., windows and sliding glass doors with different U-factors may both be installed). If each U-factor is less than or equal to the required U-factor, record the highest (in value) component U-factor. However, if one of the U-factors exceeds the maximum U-factor requirement, perform an area-weighted average U-factor calculation using the *R-Value/U-Factor Weighted Average Worksheet*. If the resulting average U-factor is less than or equal to the required U-factor, the component complies and the average U-factor should be transferred to the *Prescriptive Package Worksheet*.

Ceiling R-Value Proposed R-values for ceilings represent the sum of the cavity insulation plus insulating sheathing (if used). For ventilated ceilings, insulating sheathing must be placed between the conditioned space and the ventilated portion of the roof (typically applied to the trusses or rafters immediately behind the drywall or other ceiling finish material).

The ceiling R-value requirements do not assume a raised or oversized truss construction. If the insulation achieves the full insulation thickness over the plate lines of exterior walls, R-30 insulation may be used to meet an R-38 insulation requirement and R-38 insulation may be used to meet an R-49 insulation requirement (see Footnote 3). If you are taking credit for a raised or oversized truss, note this in the *Comments* section of the worksheet.

Wall R-Value R-values for walls represent the sum of the cavity insulation plus insulating sheathing (if used). The wall R-value requirements are for wood-frame walls. However, the packages may be adapted for steel-frame and mass walls by using Tables 1 through 4. The use of steel-frame or mass walls should be noted in the *Comments* section of the worksheet.

Floor R-Value Floors over unconditioned space include floors over unconditioned crawl spaces, basements, and garages. Floors over outside air include floor cantilevers, the floor of an elevated building, and floors of overhangs (such as the floor above a recessed entryway or open carport). Floors over outside air must meet the ceiling R-value requirement.

Basement R-Value Basement walls that enclose conditioned spaces must be insulated from the top of the basement wall to distance specified in Figure 3a below ground level or to the basement floor, whichever is less. If you intend to install insulation on both the exterior and interior of the wall, provide the sum of both R-values.

Figure 3a
FOUNDATION INSULATION DEPTH

HEATING DEGREE DAYS	DEPTH BELOW GRADE
Less Than or Equal to 5000	24"
5001 - 6000	24"
6001 - 7000	48"
7001 - 8000	48"
8001 - 9000	84"

Any individual wall of a conditioned basement with an average depth 50% or more below grade is considered a basement wall; a wall over 50% above grade is considered an above-grade wall and must meet the wall R-value requirement for the package.

The following examples help to clarify the treatment of basements with wood kneewalls, walk-out basements, and basement walls constructed from specialty foundation systems.

Example 1: Wood Kneewalls

Assume a basement is to be constructed with 3-ft-high wood kneewalls built on a 5-ft-high concrete foundation. R-13 insulation will be installed in the wood kneewall cavities and R-5 rigid insulation will be installed on the concrete foundation walls. The wood kneewalls are completely above grade and fully insulated. The concrete foundation walls are 4 ft below grade and fully insulated.

Because each basement wall is at least 50% below grade, both the masonry foundation and the wood kneewalls must be insulated to at least the basement R-value requirement specified in the selected prescriptive package. If the basement wall R-value requirement in the selected prescriptive package is R-5 or less, both the wood kneewalls and the concrete foundation walls meet the requirement and you may enter R-5 for the proposed R-value of the basement walls. If, however, the requirement is greater than R-5, you will have to perform an area-weighted average U-factor calculation using the *R-Value/U-Factor Weighted Average Worksheet* to verify that the average basement wall R-value meets or exceeds the required R-value.

Example 2: Walk-Out Basement

Assume an 8-ft basement is to be built on a slope so that the front wall is 7 ft below grade and the rear wall is totally above grade. The ground level along both side walls is sloped so that approximately 50% of each wall is below grade. The rear basement wall will be wood-frame construction with R-19 insulation. The other three walls will be concrete walls with R-10 insulation. All four walls will be fully insulated.

Because the front and side walls are at least 50% below grade, they must be insulated to at least the basement R-value requirement specified in the selected prescriptive package. The rear wall is not 50% below grade, however, and is therefore subject to the above-grade wall requirement. Note that the basement floor along the rear wall should be considered a slab-on-grade component. Slab

insulation should be installed along the basement floor for the length of the rear wall. The slab insulation must meet or exceed the slab R-value requirement specified for the selected package.

Example 3: Specialty Foundation Systems

Manufacturers of insulating foam concrete form systems and pre-manufactured concrete panels with integrated insulation generally supply R-value ratings for the entire wall, not just the insulation. Where the R-value of the insulation alone is not known, the manufacturer overall wall R-value rating may be used.

Slab R-Value The prescriptive package slab R-value requirements are for unheated slabs. Add an additional R-2 for heated slabs, except in Zone 1 which does not require slab insulation. For packages with a slab insulation requirement, the insulation must extend a total linear distance of at least 24 in. in Zones 2-12 and 48 in. in Zones 13-19. In the *Comments* section, indicate whether the slab will be heated or unheated. A heated slab is a slab with ducts or hydronic heating elements in or under the slab.

Slab Insulation Depth Slab insulation can be installed using any of several different configurations. Refer to the definition of Slab Insulation for a description and illustration of acceptable configurations.

Crawl Space Wall R-Value The crawl space wall R-value requirements are for walls of unventilated crawl spaces (i.e., not directly vented to the outside). The crawl space wall insulation must extend from the top of the wall to the inside finished grade. If the inside finished grade is less than 12 inches (305 mm) below the outside finished grade or the vertical wall insulation stops less than 12 inches below the outside grade, the insulation must instead extend vertically and horizontally a minimum of 24 linear inches (601 mm) from the outside grade level. Figure 3 illustrates the crawl space wall insulation depth requirements.

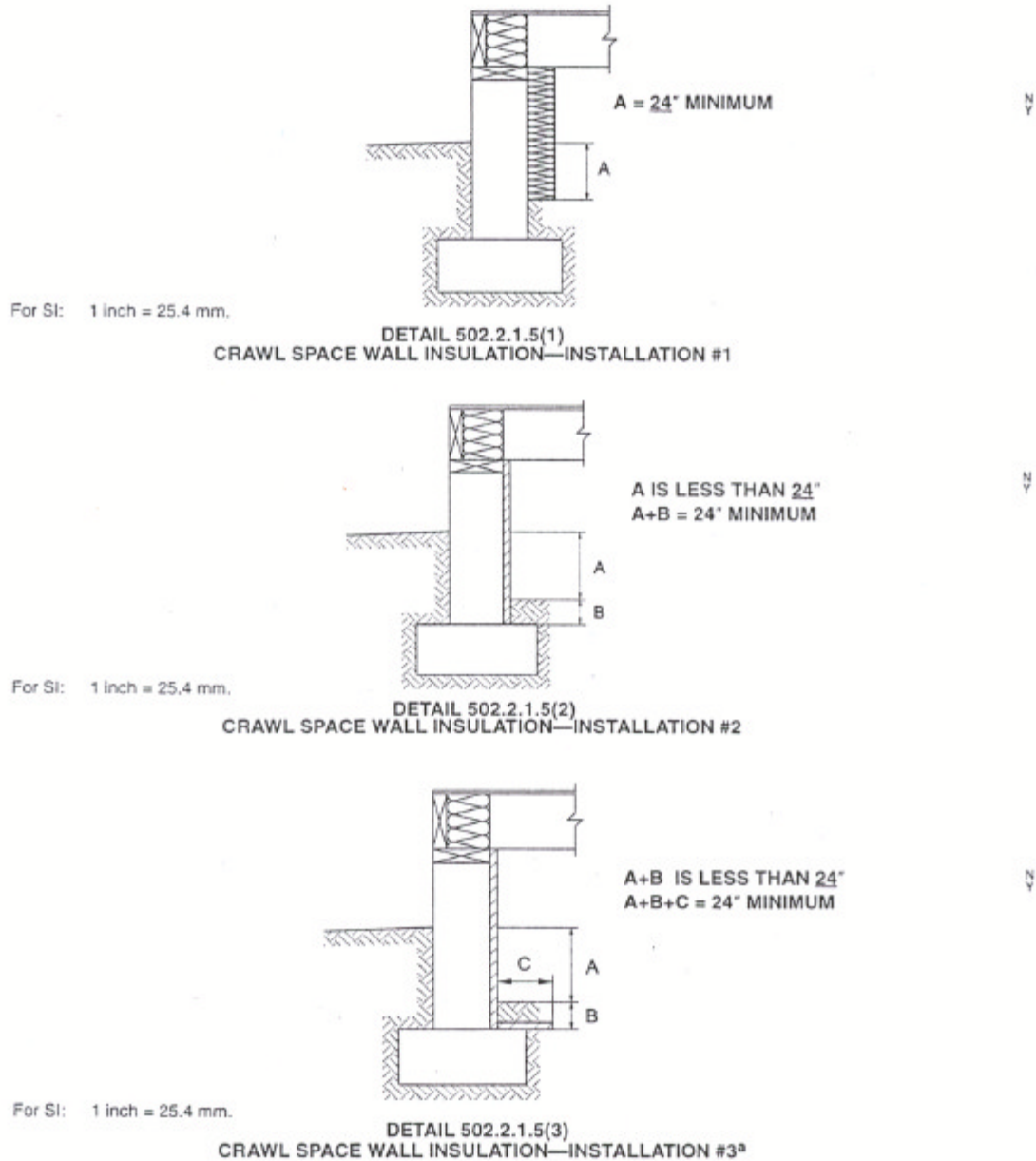


Figure 3. Crawl Space Wall Insulation Depth Requirement

Step 7: Complete the Proposed U-Factor Section

Glazing Record the proposed U-factors for glazing assemblies (such as windows, skylights, and sliding glass doors) in the *Proposed U-Factor* column of the worksheet. Up to 1% of the total allowed glazing area may be excluded from the U-factor requirement.

U-factors for glazing should be tested and documented by the manufacturer in accordance with the NFRC test procedure or taken from Appendix B. Center-of-glass U-factors cannot be used.

Doors In the *Proposed U-Factor* column of the worksheet, record the proposed U-factors for all opaque doors in the building envelope.

U-factors for doors must be tested and documented by the manufacturer in accordance with the NFRC test procedure or taken from Chapter 1 Section 102.5.2.

The U-factor requirement for all doors in the building envelope (regardless of the prescriptive package chosen) is 0.35. The prescriptive package approach allows you to exclude one door from this requirement. If more than one door fails to meet the 0.35 U-factor requirement, perform an area-weighted average U-factor calculation using the *R-Value/U-Factor Weighted Average Worksheet* (one door may also be excluded from this calculation). If a door contains glass and an aggregate U-factor rating for that door is not available, include the glass area of the door with your glazing and use the opaque door U-factor from NYS ECCC Chapter 1 Section 102.5.2 to determine compliance with the door.

Step 8: Complete Equipment Efficiency Section

If the *Heating/Cooling Equipment Efficiency* column is marked *Normal* for the package you have selected, leave this section blank. If high-efficiency heating or cooling equipment is specified in the package you select, record the proposed equipment efficiency in the space(s) labeled *Efficiency* and record the equipment make and model number in the space(s) labeled *Make and Model Number*. If you plan to install more than one piece of heating equipment or more than one piece of cooling equipment, you must enter the efficiency of the unit with the lowest rating.

Step 9: Check for Compliance

Compliance is achieved if:

- the *Proposed Glazing Area* percentage is less than or equal to the *Maximum Glazing Area* percentage, and
- all R-values in the *Proposed R-Value* column are greater than or equal to the corresponding values in the *Minimum R-Value* column, and
- all glazing and door U-factors in the *Proposed U-Factor* column are less than or equal to the corresponding values in the *Maximum U-Factor* column, and
- your selected package specifies *Normal* equipment; OR your package specifies *High Heating* equipment and your proposed heating equipment has an AFUE of at least 90% or an HSPF of at least 7.8; OR your package specifies *High Heat/Cool* and your proposed equipment meets *High Heating* listed requirements and your proposed Cooling equipment has a SEER of at least 12.

If all components do not meet the requirements of the selected prescriptive package, you can select another package, modify the design to meet the selected package requirements, or select another compliance approach.

When you have completed the *Prescriptive Package Worksheet*, sign and date the worksheet in the blanks provided. Transfer the insulation R-values and glazing and door U-factors to the building plans or specifications. If you are taking credit for high-efficiency equipment, also transfer the efficiency, make, and model number of the equipment.

Steel-Frame Wall Equivalent R-Values

The Prescriptive Packages give R-value requirements for wood-frame walls. Steel-frame walls can comply with these requirements if equivalent cavity and sheathing insulation R-values are selected from the following tables. Use Table 1 for 16-in. O.C. steel-frame wall constructions. Use Table 2 for 24-in. O.C. steel-frame wall constructions.

The left column lists the wood-frame wall R-value requirements specified in the prescriptive packages. The right column lists equivalent steel-frame wall cavity and sheathing R-value requirements. An equivalent steel wall must be insulated to one of the cavity plus sheathing R-value combinations listed to the right of the wood-frame wall requirement.

Example: A steel-frame house is being built to the specifications of the One- and two-family dwelling Prescriptive Package 5 in Zone 8. The wood-frame wall R-value requirement for this package is R-13. The steel-frame walls are to be 16-in. O.C. construction with R-5 sheathing. The Table 1 indicates that R-11 cavity insulation must be installed. The other acceptable combinations are R-15 cavity insulation with R-4 sheathing and R-21 cavity insulation with R-3 sheathing.

Table 1. 16-in. O.C. Steel-Frame Wall Equivalent R-Values

Wood-Frame Wall R-Value	Equivalent Steel-Frame Wall Cavity and Sheathing R-Value ^(a)
R-11	R-0+R-9, R-11+R-4, R-15+R-3, R-21+R-2
R-13	R-11+R-5, R-15+R-4, R-21+R-3
R-14	R-11+R-6, R-13+R-5, R-19+R-4
R-15	R-11+R-6, R-15+R-5, R-19+R-4
R-16	R-11+R-8, R-15+R-7, R-21+R-6
R-17	R-11+R-9, R-13+R-8, R-19+R-7
R-18	R-11+R-9, R-15+R-8, R-21+R-7
R-19	R-11+R-10, R-13+R-9, R-19+R-8, R-25+R-7
R-20	R-11+R-10, R-13+R-9, R-19+R-8
R-21	R-13+R-10, R-19+R-9, R-25+R-8
R-22	R-13+R-10, R-19+R-9
R-24	R-19+R-10, R-25+R-9
R-25	R-19+R-10
R-26	R-19+R-11, R-21+R-10
(a) The cavity insulation R-value requirement is listed first, followed by the sheathing R-value requirement.	

Table 2. 24-in. O.C. Steel-Frame Wall Equivalent R-Values

Wood-Frame Wall R-Value	Equivalent Steel-Frame Wall Cavity and Sheathing R-Value ^(a)
R-11	R-0+R-9, R-11+R-3, R-15+R-2, R-25+R-0
R-13	R-11+R-4, R-15+R-3, R-19+R-2
R-14	R-11+R-5, R-13+R-4, R-15+R-3, R-21+R-2
R-15	R-11+R-5, R-13+R-4, R-19+R-3, R-21+R-2
R-16	R-11+R-7, R-13+R-6, R-19+R-5, R-25+R-4
R-17	R-11+R-8, R-13+R-7, R-15+R-6, R-21+R-5
R-18	R-11+R-8, R-13+R-7, R-19+R-6, R-25+R-5
R-19	R-11+R-9, R-13+R-8, R-15+R-7, R-21+R-6
R-20	R-11+R-9, R-13+R-8, R-19+R-7, R-21+R-6
R-21	R-11+R-9, R-15+R-8, R-21+R-7
R-22	R-11+R-10, R-13+R-9, R-19+R-8, R-21+R-7
R-24	R-11+R-10, R-15+R-9, R-19+R-8
R-25	R-13+R-10, R-19+R-9, R-21+R-8
R-26	R-15+R-10, R-19+R-9, R-25+R-8
(a) The cavity insulation R-value requirement is listed first, followed by the sheathing R-value requirement.	

Mass Wall Equivalent R-Values

The Prescriptive Packages give R-value requirements for wood-frame walls. High mass walls in some locations have lower insulation requirements than wood-frame walls, with more credit given in warmer locations. The following tables can be used to determine the equivalent insulation requirements when high-mass walls are used instead of wood-frame walls. To qualify as a high-mass wall, the heat capacity of the exterior wall must be greater than or equal to 6 Btu/ft² °F [123 kJ/m² K] of exterior wall area. Masonry and concrete walls having a mass greater than or equal to 30 lb/ft² (146 kg/m²) and solid walls having a mass greater than or equal to 20 lb/ft² (98 kg/m²) will meet this requirement.

Use Table 3 for mass walls with exterior or integral insulation and Table 4 for mass walls with interior insulation. The left column lists the wood-frame wall R-value requirements specified in the prescriptive packages. The right column lists equivalent mass wall insulation R-value requirements.

Example: A house with high-mass walls is being built to the specifications of Prescriptive Package 5 in Zone 8. The wood-frame wall R-value requirement for this package is R-13. The mass walls will have exterior insulation. Table 3 indicates that in Zone 8, R-6 exterior insulation may be installed instead of R-13.

Table 3. High-Mass Wall Equivalent R-Values; Exterior or Integral Insulation

Wood-Frame Wall R-Value	Equivalent High-Mass Wall R-Value					
	Zones 1 to 4	Zones 5 to 8	Zones 9 to 11	Zones 12 to 13	Zones 14 to 15	Zones 16 to 19
R-11	R-6	R-6	R-7	R-8	R-9	R-10
R-13	R-6	R-6	R-8	R-9	R-10	R-11
R-14	R-6	R-7	R-8	R-9	R-10	R-11
R-15	R-7	R-7	R-8	R-9	R-10	R-12
R-16	R-7	R-7	R-8	R-9	R-11	R-12
R-17	R-7	R-7	R-9	R-10	R-11	R-13
R-18	R-7	R-7	R-9	R-10	R-11	R-13
R-19	R-8	R-9	R-10	R-11	R-13	R-15
R-20	R-8	R-9	R-10	R-11	R-13	R-16
R-21	R-8	R-9	R-10	R-12	R-14	R-16
R-22	R-8	R-9	R-10	R-12	R-14	R-17
R-23	R-9	R-9	R-11	R-12	R-14	R-17
R-24	R-9	R-9	R-11	R-12	R-14	R-27
R-25	R-9	R-10	R-11	R-13	R-15	R-18
R-26	R-9	R-10	R-11	R-13	R-15	R-18

Table 4. High-Mass Wall Equivalent R-Values; Interior Insulation

Wood-Frame Wall R-Value	Equivalent High-Mass Wall R-Value					
	Zones 1 to 4	Zones 5 to 8	Zones 9 to 11	Zones 12 to 13	Zones 14 to 15	Zones 16 to 19
R-11	R-10	R-10	R-11	R-11	R-12	R-12
R-13	R-11	R-11	R-12	R-12	R-14	R-14
R-14	R-12	R-12	R-12	R-12	R-15	R-15
R-15	R-13	R-13	R-13	R-13	R-15	R-15
R-16	R-13	R-13	R-13	R-14	R-15	R-15
R-17	R-14	R-14	R-14	R-15	R-16	R-16
R-18	R-15	R-15	R-15	R-15	R-16	R-16
R-19	R-16	R-16	R-16	R-19	R-19	R-19
R-20	R-16	R-16	R-16	R-20	R-20	R-20
R-21	R-17	R-17	R-17	R-21	R-21	R-21
R-22	R-17	R-17	R-17	R-21	R-21	R-21
R-23	R-18	R-18	R-18	R-22	R-22	R-22
R-24	R-19	R-19	R-19	R-22	R-22	R-22
R-25	R-20	R-20	R-20	R-22	R-22	R-22
R-26	R-21	R-21	R-21	R-23	R-23	R-23

Compliance Example

Assume that you plan to build the One- and two-family dwelling house shown in Figure 4 on a lot located in Niskayuna, New York. Niskayuna is in Schenectady County and is designated as Zone 14A (see Table 302.1). For the purposes of this example, assume you have chosen Package 5 from the One- and two-family dwelling prescriptive packages offered for Zone 14A. Compliance for a multifamily building is handled in much the same way, only packages should be selected from the tables developed specifically for multifamily buildings.

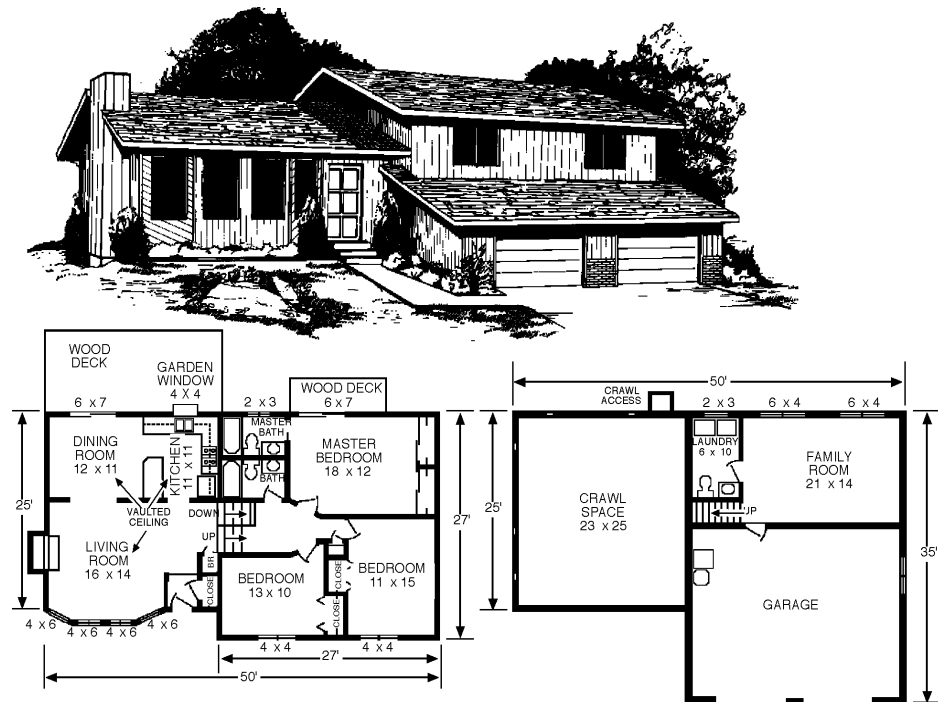


Figure 4. Example House

Table 5 lists the components that make up the building envelope, the dimensions of some of these components, and the proposed insulation R-values and window and door U-factors. Figure 5 shows how to determine the proposed and required R-values recorded on the *Prescriptive Package Worksheet*.

Table 5. Example House Specifications

Building Component	Area	Insulation Level
Ceilings With Attic (Std. Truss) Vaulted	N/A N/A	R-49 R-38
Walls (2x4 @ 16-in. O.C.) Without Sheathing(a) With Sheathing	276 ft ² (gross) 1647 ft ² (gross)	R-21 R-21 (R-15 cavity + R-8 sheathing)
Windows Sliding Glass Doors	204 ft ² 84 ft ²	U-0.30 U-0.45
Doors Entrance Garage to Family Room	N/A N/A	U-0.54 U-0.35
Floors Over Garage Over Crawl Space Slab (Unheated) Bay Window Floor	N/A N/A N/A N/A	R-21 R-21 R-11 (24-in. depth) R-49
(a) Walls without sheathing are located between the family room and the garage, the laundry room and the crawl space, and the garage and the living room.		

Determine Which Components are Part of the Building Envelope

The advantage of the prescriptive package approach over the trade-off approach and the software approach is that you are not required to know the areas of many of the building components (Table 5 lists only the areas that you will need). You **DO** need to compute a glazing area percentage, however, and this computation requires the gross wall area and total glazing area. Before you can determine the gross wall area of your building, you must first determine which walls are part of the building envelope and which are not. Only the building components that are part of the building envelope are relevant.

Building envelope components are those that separate conditioned spaces (heated or cooled rooms) from outside air or from unconditioned spaces (rooms that are neither heated nor cooled). Walls, floors, and other building components separating two conditioned spaces are **NOT** part of the building envelope.

Walls In this example, the garage is unconditioned, so the exterior garage walls are not part of the building envelope. The wall between the conditioned family room and the unconditioned garage is part of the building envelope, including the wall of the stairwell facing the garage. Likewise, the wall between the garage and the living room is part of the building envelope.

Part of the laundry room wall separates the laundry room from the crawl space and the other part separates the laundry room from the kitchen. The wall portion adjacent to the crawl space is part of the building envelope because it separates the conditioned laundry from the unconditioned crawl space. The wall portion adjacent to the kitchen can be ignored because it separates two conditioned spaces. The wall portion adjacent to the family room can also be ignored. Likewise, the wall between the upstairs bathrooms and the kitchen and the wall between the center bedroom and the living room are not part of the building envelope. Portions of both of these walls are also adjacent to outside air, and those portions are part of the building envelope. The following walls are part of

the building envelope and their areas need to be included when computing the gross wall area:

- all walls between interior conditioned space and outside air
- the walls between the family room and the garage
- the walls between the garage and the living room
- the wall between the laundry room and the crawl space.

Ceilings The dining room, living room, bay window roof, and entryway have a vaulted ceiling that will be insulated to R-38. The rest of the home has a ceiling with attic which will be insulated to R-49.

Floors The floor of the bay window is considered a floor over outside air and must meet the ceiling R-value requirement. The floors over the garage and the crawl space are floors over unconditioned space, and must meet the floor R-value requirement. Because the floor over the crawl space is to be insulated, the crawl space is not part of the building envelope and the crawl space walls are not considered. The family room has a slab-on-grade floor which must meet the slab perimeter R-value requirement.

Glazing and Doors There are two sliding glass doors in the building envelope – one leading from the dining room to the larger deck and one leading from the master bedroom to the smaller deck. There are two opaque doors in the building envelope – the front entry door and the door leading from the garage into the family room. One door may be excluded from the U-factor requirement of 0.35 (i.e., may have a U-factor greater than 0.35)

Complete the Required Section

Transfer all of the requirements specified by Package 5 to the right side of the *Prescriptive Package Worksheet* (in the *REQUIRED* section). Record the maximum allowed glazing area (15% in this example) in the space labeled *Maximum Glazing Area*. Transfer the R-value and U-factor requirements from the package to the boxes under the *Minimum R-Value* and *Maximum U-Factor* columns. Note that floors over outside air must meet the prescriptive package ceiling R-value requirement (R-30 in this example), so the ceiling requirement is listed across from the *Floor Over Outside Air* component. The U-factor requirement for all doors is 0.35, so this value has been entered on the worksheet for you (one door may be exempted from this requirement). Package 5 specifies *Normal* heating equipment efficiency, so place an "X" in the *Normal* box.

Complete the Proposed R-Value Section

Record the R-values of the insulation that you intend to install in the *Proposed R-Value* column. These proposed values are listed in Table 5. The example house does not have a basement, so place "N/A" in the *Proposed R-Value* column for basement walls to indicate that they are not applicable. Although there is a crawl space, it is ventilated and the insulation will be installed on the floor over the crawl space, so place "N/A" in the *Proposed R-Value* column for crawl space walls as well.

Ceiling R-Value Two ceiling insulation R-values will be installed in the house. R-49 insulation is proposed for the flat ceiling below a vented attic and R-38 insulation is proposed for the vaulted ceiling. The selected package requires a minimum of R-49 ceiling insulation on standard trusses (where insulation does not achieve the full insulation thickness over plate lines of exterior walls – see footnotes to tables). In some cases you may need to calculate an average R-value for ceilings. If the required ceiling R-value is greater than the R-value you

plan to install in one part of the ceiling, but is less than the R-value you plan to install in another part of the ceiling, you may be able to meet or exceed the required ceiling R-value with the area-weighted average R-value. You can calculate this average R-value using the *R-Value/U-Factor Weighted Average Worksheet*.

R-49 insulation is proposed for the floor of the bay window (floors over outside air are subject to the ceiling R-value requirement). Enter R-49 in the *Proposed R-Value* column for floors over outside air.

Wall R-Value Most of the walls will be insulated with R-15 cavity insulation and covered with R-8 insulating sheathing. Cavity insulation and sheathing can be added together – in this case resulting in R-21. However, R-21 cavity insulation without sheathing will be installed on walls between

- the family room and the garage
- the laundry room and the crawl space
- the garage and the living room.

The selected package requires a minimum of R-21 wall insulation. Because the lowest proposed wall R-value (R-21) is greater than or equal to the minimum required (also R-21), you are not required to calculate an average R-value for walls. Enter R-21 in the *Proposed R-Value* column for walls.

Floor R-Value The floor above the crawl space and the floor over the garage are both floors over unconditioned space. Both of these floors will be insulated with R-21 batt insulation. Enter R-21 for the *Floor Over Unconditioned Space* component.

Slab R-Value Enter R-11 for the *Slab Floor* component. In the *Comments* column, indicate that the slab will be unheated. In all locations except Zone 1, heated slabs have more stringent requirements than unheated slabs (see Footnote 7). Also indicate the depth of the insulation you intend to install (slab insulation must extend 24 in. in Zones 2-12 and 48 in. in Zones 13-19).

Complete the Proposed U-Factor Section

Glazing U-Factor Two different glazing U-factors were proposed. The windows have a U-factor of 0.30 and the sliding glass doors have a U-factor of 0.45, both of which have been rated and labeled by the manufacturer in accordance with the NFRC test procedure. Because 0.45 is greater than the maximum U-factor specified in the package (0.35), you must calculate an area-weighted average U-factor. Complete the *R-Value/U-Factor Weighted Average Worksheet* and transfer the results to the *Prescriptive Package Worksheet*. Figure 5 shows the portion of the *R-Value/U-Factor Weighted Average Worksheet* used to calculate the average glazing U-factor for this house (0.34). If both proposed U-factors had been less than or equal to the required U-factor, then the weighted-average computation would not have been necessary and you could have recorded the higher of the two U-factors.

Door U-Factor The U-factor requirement for all opaque doors (regardless of the prescriptive package chosen) is 0.35. The entry door has a U-factor of 0.54 and the door from the garage to the family room has a U-factor of 0.35. Therefore, the entry door does not meet the U-factor requirement and the garage door does meet it exactly. On average, the proposed door U-factors will clearly not comply with this or any other package. However, one door may be exempted from this requirement (see Note b). This exemption allows one door to exceed the 0.35 U-factor requirement. Because the entry door of the example house may be exempted and the garage door complies, record the U-factor of the garage door (0.35) as the *Proposed U-Factor* for the *Door* component. If more than one door

had exceeded the door U-factor requirement, an area-weighted average of all non-exempted doors would have been necessary to show compliance.

Complete the Proposed Heating Efficiency Section

The selected package does not require high-efficiency equipment. You may leave this section blank.

Check for Compliance

To verify compliance with the requirements of Prescriptive Package 5 for Zone 8, compare the *PROPOSED* and *REQUIRED* sections of the *Prescriptive Package Worksheet*.

- The *Proposed Glazing Area* is less than or equal to the allowed *Maximum Glazing Area*, and
- the *Proposed R-Values* for each of the building components are greater than or equal to the required *Minimum R-Values*, and
- the *Proposed U-Factors* for glazing and doors are less than or equal to the required *Maximum U-Factors*, and
- there are no equipment efficiency requirements.

You have demonstrated that your building design complies with the code insulation and window requirements (congratulations!). Sign and date the worksheet.

