Georgia State Supplements and Amendments to the 2000 International Energy Conservation Code

(2000 Edition)

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Revised January 1, 2003

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FOREWORD

The International Energy Conservation Code, 2000 Edition, published by the International Codes Council and the Southern Building Code Congress International, Inc., when used in conjunction with these Georgia Supplements and Amendments, shall constitute the official *Georgia State Energy Code for Buildings*. For high-rise and non-residential structures, the International Energy Conservation Code adopts by reference *American Society of Heating, Refrigerating, and Air Conditioning Engineers (ANSI/ASHRAE/IESNA) Standard 90.1-2001*.

INTRODUCTION

This document supplements and amends *The International Energy Conservation Code (IECC), 2000 Edition.* In cases where there are differences between these "Supplements and Amendments" and the IECC, or with *ANSI/ASHRAE/IESNA Standard 90.1-2001,* these "Supplements and Amendments" shall take precedence.

Each Chapter of this document associates directly with the corresponding chapter of the IECC.

- Chapter 1: Administration and Enforcement.
- Chapter 2: Definitions.
- Chapter 3. Establishes the design criteria for the entire state of Georgia and defines the five climate zones. The climate zones establish the design conditions for use with chapters 4, 5, 6 and 8.
- Chapter 4: Pertains to residential building design by systems analysis, as well as the use of renewable resources such as wind, solar, geothermal, etc. Chapter 4 has only one amendment, 402.1.3.1.4, which establishes 0.40 as the minimum Solar Heat Gain Coefficient (SHGC) for all Climate Zones in Georgia.
- Chapter 5: Residential compliance by designed component[1] performance, thereby analyzing the total building for compliance one component at a time. Assuming each individual component of the building meets the thermal requirements of the code then the entire building is deemed to comply. This chapter offers the use of "Trade-offs" to achieve compliance by allowing the builder to substitute or "trade-off" values between building components. A properly executed "Georgia Trade-off Worksheet[2]" or the use of appropriate computer software such as *MECcheck*[3] may be used to validate any trade-off.
- Chapter 6: Offers prescriptive compliance via the Single Step Compliance Method by selecting an option directly from the charts in the correct climate zone. The values from the option show the minimum requirements for each component of a residential structure for the specific climate zone.
- Chapter 7: Pertains to building design for all commercial buildings, except those that comply with Chapter 8, the Single Step Compliance for Simple Commercial Buildings or appropriate computer software such as *COMcheck*[4]may be used to validate compliance.
- Chapter 8: Pertains to design by acceptable practice for commercial buildings. Where differences between this document and the IECC, or *ANSI/ASHRAE/IESNA Standard 90.1-2001* are noted, this document shall take precedence.
- Chapter 9. Pertains to reference standards, Figure 9-1, F_2-Values for Slab-on-Grade and Figure 9-2, Group R Buildings, A-1 and A-2 Component R values/U factors.
- Appendix. Existing Appendix becomes "Appendix A" and adds a new Appendix B with updated Prescriptive methods and Trade-off methods to demonstrate compliance; including new Prescriptive Single Step Compliance Tables for most commercial buildings.

SUMMARY

In summary, Chapters 4, 5 and 6 offer different methods to achieve code compliance for low-rise residential construction and Chapters 7 and 8 offer different methods to achieve code compliance on commercial and high-rise residential construction. Appendix B provides additional prescriptive methods of showing compliance, some simple methods and forms to calculate and demonstrate compliance and some illustrations to help understand the code requirements. Individual structures should be addressed by a compliance method from a single chapter approach and not by a combination of compliance methods. **The "basic requirements" of the IECC apply to all compliance methods.**

Please note, the maximum 0.40 Solar Heat Gain Coefficient (SHGC) and maximum 0.65 U-factor required for residential windows[5] in this document shall become effective January 1, 2004. For the period of January 1, 2003 to December 31, 2003, the "Single-Step" Residential Energy Code Compliance packages[6] may be used to determine code compliance by disregarding the 0.40 SHGC requirement.

In dealing with the energy conservation requirements promulgated by this code, discussion of insulation R-values and component U-factors may appear to overshadow the matter of controlling air infiltration. Air infiltration accounts for substantial heat loss, heat gain, and moisture migration in a building. Proper sealing around all doors, windows, and other envelope penetrations through the walls, ceiling and foundations is as important to code compliance as is the installation of the proper R-value in a component. Proper sealing shall be done by the builder and inspected by the Building Official or Building Inspector.

It is not the intention of this code to abridge safety or health. There may be cases where conflicts occur between this code and other codes that are mandatory within the state. Provided safety, health, or environmental requirements under other applicable codes are not abridged, this code shall be enforced as written.

GEORGIA STATE AMENDMENTS

CODE REFERENCE:
Change all references from ASHRAE/IESNA 90.1-1999 to *ANSI/ASHRAE/IESNA 90.1-2001* respectively.

APPENDICES:
Appendices are not enforceable unless they are specifically referenced in the body of the code or adopted for enforcement in the ordinance of the authority having jurisdiction.

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1. The word "component" for purposes of this code is defined as being a particular segment of a building such as a wall, ceiling, or floor. Hence, the terms *wall component* or *ceiling component.*
2. See Appendix B for "Georgia Trade-Off Worksheet".
3. *MECcheck* is a computer program developed by Pacific Northwest National Laboratories for the US Department of Energy to help demonstrate compliance with the IECC. Information on obtaining this program software can be obtained by calling 800/270-CODE or by downloading free of charge from the Internet at www.energycodes.gov.
4. *COMcheck* is a computer program developed by Pacific Northwest National Laboratories for the US Department of Energy to help demonstrate compliance with the IECC. Information on obtaining this program software can be obtained by calling 800/270-CODE or by downloading free of charge from the Internet at www.energycodes.gov.
5. As referenced by Chapters 5 and 6, these do not apply in a Chapter 4 compliance analysis.
6. See Appendix B for "Single-Step" Residential Energy Code Compliance packages

**Revise the Georgia State Energy Code (International Energy Conservation Code), 2000 Edition, as follows:*

CHAPTER 1
ADMINISTRATION AND ENFORCEMENT

SECTION 101
SCOPE AND GENERAL REQUIREMENTS

*Delete the following sections from Chapter 1 without substitution.

Section 101.1 Title
Section 101.4.2.4 Change in occupancy
(Effective January 1, 2003)

SECTION 102
MATERIALS, SYSTEMS AND EQUIPMENT

*Revise Section 102.5.2 Fenestration product rating, certification and labeling, 2nd paragraph to read as follows:

Section 102.5.2 Fenestration product rating, certification and labeling.

When a manufacturer has not determined product U-factor in accordance with NFRC 100 for a particular product line, compliance with the building envelope requirements of this code shall be determined by assigning and labeling such products a default U-factor in accordance with tables 102.5.2(1) and 102.5.2(2). When a SHGC or shading coefficient is used for code compliance and a manufacturer has not determined product SHGC in accordance with NFRC 200 for a particular product line, compliance with the building envelope requirements of this code shall be determined by assigning and labeling such products with a default SHGC in accordance with Table102.5.2(3). Product features shall be verified for the product to qualify for default value associated with those features. Where the existence of a particular feature cannot be determined with reasonable certainty, the product shall not receive credit for that feature. Where a composite of materials from two different product types is used, the product shall be assigned the higher U-factor. The default labels shall clearly indicate:

1. The manufacturer's/assembler's name.
2. "**DEFAULT VALUES**" taken from Tables 102.5.2(1), 102.5.2(2) and 102.5.2(3).
3. The manufacturer's/assembler's certification that it has selected the appropriate default value for the product.

(Effective January 1, 2003)

SECTION 104
CONSTRUCTION DOCUMENTS

* Delete Section 104 Construction documents without substitution.
(Effective January 1, 2003)

SECTION 105
INSPECTIONS

* Delete Section 105 Inspections without substitution.
(Effective January 1, 2003)

CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

*Revise Section 202 General definitions to read as follows:

THERMAL CONDUCTANCE. Timed rate of heat flow through a body (frequently per unit area) from one of its bounding surfaces to the other for a unit temperature difference between the two surfaces, under steady conditions (Btu/H x ft^2 ^oF) [W/(m^2 x K)]. The insulation shall be stabilized (aged) prior to testing for Thermal Conductance.

THERMAL RESISTANCE (R). The reciprocal of thermal conductance (H x ft^2 x ^oF/Btu) [(m^2 x K)/W]. All R-values shall be stabilized (aged) R-values.
(Effective January 1, 2003)

*Revise Section 202 General definitions to add a new definition to read as follows:
ATTIC KNEE WALL. Any vertical or near-vertical wall in the building envelope that has conditioned space on one side and unconditioned attic space on the other side. If the envelope features the insulation installed along the sloped ceiling, the vertical wall is considered an interior wall and thus does not require insulation.
(Effective January 1, 2003)

CHAPTER 3
DESIGN CONDITIONS

SECTION 301
DESIGN CRITERIA

*Delete Section 301.1 General and substitute the following:

301.1 General. The criteria of this chapter and Figure 302.1(11) establish the design conditions for use with Chapters 4, 5, 6 and 8.
(Effective January 1, 2003)

SECTION 302
THERMAL DESIGN PARAMETERS

*Revise Table 302.1 EXTERIOR DESIGN CONDITIONS, footnote "b" to read as follows:

b. The degree-days heating base (HDD) (base 65 ^{o}F) and cooling base (CDD) (base 65 ^{o}F) shall be Climate Zones per Figure 302.1(11). For purposes of determining HDD, the following shall be used: Climate Zone 4B -1999 HDD; Climate Zone 5A – 2499 HDD; Climate Zone 6B – 2999 HDD; Climate Zone 7A – 3499 HDD; and Climate Zone 8 – 3999 HDD. Approved software that is based on specific city or county HDD or CDD shall be acceptable to show Energy Code compliance.

(Effective January 1, 2003)

CHAPTER 4
RESIDENTIAL BUILDING DESIGN BY SYSTEMS ANALYSIS AND DESIGN OF BUILDLNGS UTILIZING RENEWABLE ENERGY SOURCES

SECTION 402
SYSTEMS ANALYSIS

*Revise Section 402.1.3.1.4 Fenestration system solar heat gain coefficient, Standard design to read as follows:

402.1.3.1.4 Fenestration system solar heat gain coefficient, Standard design. The fenestration system solar heat gain coefficient (SHGC), inclusive of framed sash and glazing area, of the glazing systems in the Standard design shall be 0.40 during periods of mechanical heating and cooling operation. These fenestration system SHGC values shall be multiplied together with (added in series to) the interior shading values as specified in Section 402.1.3.1.5 to arrive at an overall solar heat gain coefficient for the installed glazing. This requirement shall have a delayed implementation date of January 1, 2004.
(Effective January 1, 2003)

CHAPTER 5
RESIDENTIAL BUILDING DESIGN BY COMPONENT PERFORMANCE APPROACH

SECTION 502
BUILDING ENVELOPE REQUIREMENTS

*Revise Section 502.1.3 Recessed lighting fixtures to delete requirement No. 2 without substitution.
(Effective January 1, 2003)

*Delete Section 502.1.5 Fenestration solar heat gain coefficient and substitute the following:

502.1.5 Fenestration solar heat gain coefficient. In all Georgia climate zones (4B through 8), the combined solar heat gain coefficient (the area-weighted average) of all glazed fenestration products (including the effects of any permanent exterior solar shading devices) in the building shall not exceed 0.40. This requirement shall have a delayed implementation date of January 1, 2004.
(Effective January 1, 2003)

*Revise Table 502.2 Heating and Cooling Criteria, footnotes "a" and "d" to read as follows:

a. Values shall be determined by using the graphs [Figures 502.2(1), 502.2(2), 502.2(3), 502.2(4), 502.2(5) and 502.2(6)] and HDD as specified in Section 302. The minimum insulation R-values shall be: Attic knee walls, R-19; Cavity walls, R-11; Mass walls, R-5; Roof/ceiling, R-19; Floors over unheated spaces, R-11; Basement walls, R-5; and Crawl space walls, R-5. Maximum window U-factor shall be 0.65. This window requirement shall have a delayed implementation date of January 1, 2004.
d. Slab edge insulation shall not be used for unheated slabs in Georgia.
(Effective January 1, 2003)

*Delete Section 502.2.4 Compliance by prescriptive specification on an individual component basis and substitute the following:

Section 502.2.4 Compliance by prescriptive specification on an individual component basis. For buildings with fenestration less than or equal to 15 percent, 18 percent, 25 percent, or 30 percent (Type A-1 residential buildings) or 25 percent (Type A-2 residential buildings) of the gross exterior wall area, the thermal resistance of insulation applied to the opaque building envelope components shall be greater than or equal to the minimum R-values, and the thermal transmittance of all fenestration assemblies shall be less than or equal to the maximum U-factors shown in Tables 502.2.4(1), 502.2.4(2), 502.2.4(3), 502.2.4(4) or 502.2.4(5) as applicable. Sections 502.2.4.1 through 502.2.4.12 and 502.2.4.15 through 502.2.4.17 shall apply to the use of these tables.
(Effective January 1, 2003)

*Delete Tables 502.2.4(1) through 502.2.4(9) in their entirety and substitute the following:

Table 502.2.4(1)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS, TYPE A-1 RESIDENTIAL BUILDINGS
WINDOW + DOOR AREA 15 PERCENT OF GROSS EXTERIOR WALL AREA

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	Glazing U-factor[1]	SHGC[1]	Ceiling R-value[2]	Exterior Wall R-value[3]	Floor R-value	Basement Wall R-value	Slab Perimeter R-value[4]	Crawl Space Wall R-value
4B	0.65	0.40	R-30	R-13	R-11	R-5	R-0	R-5
5A	0.65	0.40	R-30	R-13	R-11	R-5	R-0	R-6
6B	0.65	0.40	R-30	R-13	R-19	R-6	R-0	R-7
7A-1	0.55	0.40	R-30	R-13	R-19	R-7	R-0	R-8
7A-2	0.65	0.40	R-38	R-16	R-19	R-7	R-0	R-8
8	0.55	0.40	R-30	R-16	R-19	R-8	R-0	R-10

Note 1: Up to 5% of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to allow for decorative glazing.

Note 2: Up to 25% of sloped ceiling area may be R-19 in Climate Zones 4B, 5A, 6B, 7A, and 8.

Note 3: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 4: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

Table 502.2.4(2)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS, TYPE A-1 RESIDENTIAL BUILDINGS
WINDOW + DOOR AREA 18 PERCENT OF GROSS EXTERIOR WALL AREA

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	Glazing U-factor[1]	SHGC[1]	Ceiling R-value[2, 3]	Exterior Wall R-value[4]	Floor R-value	Basement Wall R-value	Slab Perimeter R-value[5]	Crawl Space Wall R-value
4B	0.65	0.40	R-30	R-13	R-11	R-5	R-0	R-5
5A	0.55	0.40	R-30	R-13	R-11	R-5	R-0	R-6
6B-1	0.55	0.40	R-30	R-15	R-19	R-6	R-0	R-7
6B-2	0.55	0.40	R-38	R-13	R-19	R-6	R-0	R-7
7A-1	0.55	0.40	R-38[3]	R-16	R-19	R-7	R-0	R-8
7A-2	0.55	0.40	R-38	R-15	R-19	R-7	R-0	R-8
7A-3	0.45	0.40	R-30	R-13	R-19	R-7	R-0	R-8
8-1	0.50	0.40	R-38[3]	R-16	R-19	R-8	R-0	R-10
8-2	0.45	0.40	R-38	R-13	R-19	R-8	R-0	R-10

Note 1: Up to 5% of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to allow for decorative glazing.

Note 2: Up to 25% of sloped ceiling area may be R-19 in Climate Zones 4B, 5A, 6B, 7A, and 8.

Note 3: May use R-30 for these packages instead of R-38 where construction techniques are employed to obtain the full height of insulation. See paragraph 502.2.4.5.

Note 4: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 5: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

Table 502.2.4(3)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS, TYPE A-1 RESIDENTIAL BUILDINGS
WINDOW + DOOR AREA 25 PERCENT OF GROSS EXTERIOR WALL AREA

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	Glazing U-factor[1]	SHGC[1]	Ceiling R-value[2]	Exterior Wall R- value[3]	Floor R-value	Basement Wall R-value	Slab Perimeter R-value[4]	Crawl Space Wall R-value
4B	0.55	0.40	R-30	R-16	R-13	R-5	R-0	R-5
5A	0.50	0.40	R-30	R-16	R-13	R-5	R-0	R-6
6B	0.42	0.40	R-30	R-16	R-19	R-6	R-0	R-7
7A	0.40	0.40	R-30	R-19	R-19	R-7	R-0	R-8
8	0.40	0.40	R-30	R-19	R-19	R-8	R-0	R-10

Note 1: Up to 5% of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to allow for decorative glazing.

Note 2: Up to 25% of sloped ceiling area may be R-19 in Climate Zones 4B, 5A, 6B, 7A, and 8.

Note 3: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 4: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

Table 502.2.4(4)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS, TYPE A-1 RESIDENTIAL BUILDINGS
WINDOW + DOOR AREA 30 PERCENT OF GROSS EXTERIOR WALL AREA

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	Glazing U-factor[1]	SHGC[1]	Ceiling R-value[2]	Exterior Wall R-value[3]	Floor R-value	Basement Wall R-value	Slab Perimeter R-value[4]	Crawl Space Wall R-value
4B	0.55	0.40	R-30	R-19	R-13	R-5	R-0	R-5
5A	0.45	0.40	R-30	R-19	R-13	R-5	R-0	R-6
6B	0.40	0.40	R-38	R-19	R-19	R-6	R-0	R-7
7A	0.40	0.40	R-38	R-19	R-19	R-7	R-0	R-8
8	0.50	0.40	R-38	R-16	R-19	R-8	R-0	R-10

Note 1: Up to 5% of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to allow for decorative glazing.

Note 2: Up to 25% of sloped ceiling area may be R-19 in Climate Zones 4B, 5A, 6B, 7A, and 8.

Note 3: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 4: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

Table 502.2.4(5)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS, TYPE A-2 RESIDENTIAL BUILDINGS
WINDOW + DOOR AREA 25 PERCENT OF GROSS EXTERIOR WALL AREA

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	**Glazing U-factor[1]**	**SHGC[1]**	**Ceiling R-value[2]**	**Exterior Wall R-value[3]**	**Floor R-value**	**Basement Wall R-value**	**Slab perimeter R-value[4]**	**Crawl Space Wall R-value**
4B	0.65	0.40	R-19	R-11	R-11	R-5	R-0	R-5
5A	0.65	0.40	R-19	R-11	R-11	R-5	R-0	R-5
6B	0.55	0.40	R-30	R-13	R-11	R-5	R-0	R-5
7A	0.55	0.40	R-30	R-13	R-11	R-5	R-0	R-5
8	0.55	0.40	R-30	R-13	R-11	R-8	R-0	R-10

Note 1: Up to 5% of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to allow for decorative glazing.

Note 2: Up to 25% of sloped ceiling area may be R-19 in Climate Zones 4B, 5A, 6B, 7A, and 8.

Note 3: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 4: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

(Effective January 1, 2003)

*Delete Section 502.2.4.4 Window area, exempt and substitute the following:

502.2.4.4 Window area, exempt. Five (5) percent of the total window area computed under Section 502.2.4.3 shall be exempt from the "Glazing *U*-factor" and Solar Heat Gain Coefficient (SHGC) requirements.
(Effective January 1, 2003)

*Delete Sections 502.2.4.13 and 502.2.4.14 without substitution.
(Effective January 1, 2003)

*Delete Section 502.2.4.15 Fenestration solar heat gain coefficient and substitute the following:

502.2.4.15 Fenestration solar heat gain coefficient. In all Georgia climate zones (4B through 8), fenestration products shall also meet the requirements of Section 502.1.5. This window requirement shall have a delayed implementation date of January 1, 2004.
(Effective January 1, 2003)

*Revise Section 502.2.5 Prescriptive path for additions and window replacements to read as follows:

502.2.5 Prescriptive path for additions and window replacements. As an alternative to demonstrating compliance with Section 402 or 502.2, additions with a conditioned floor area less than 500 square feet (46.5 m^2) to existing single-family residential buildings and structures shall meet the prescriptive envelope component criteria in Table 502.2.5 for the designated Climate Zones applicable to the location. The U-factor of each individual fenestration product (windows, doors and skylights) shall be used to calculate an area-weighted average fenestration product U-factor for the addition, which shall not exceed the applicable listed values in Table 502.2.5. For additions, the total area of fenestration products shall not exceed 40 percent of the gross wall and roof area of the addition. The R-values for opaque thermal envelope components shall be equal to or greater than the applicable listed values in Table 502.2.5. Replacement fenestration products (where the entire unit, including the frame, sash and glazing, is replaced) shall meet the prescriptive fenestration U-factor criteria in Table 502.2.5 for the designated Climate Zones applicable to the location. Fenestration products used in additions and as replacement windows in accordance with this section shall also meet the requirements of Section 502.1.5 in all Georgia climate zones (4B through 8).

Remaining exception unchanged.

(Effective January 1, 2003)

*Delete Table 502.2.5 in its entirety and substitute the following:

TABLE 502.2.5
PRESCRIPTIVE ENVELOPE COMPONENT CRITERIA ADDITIONS TO AND REPLACEMENT WINDOWS FOR EXISTING TYPE A-1 RESIDENTIAL BUILDINGS

CLIMATE ZONE	MAXIMUM		MINIMUM INSULATION R-VALUE					
	Gazing Fenestration U-factor[a]	Glazing SHGC[a]	Ceiling	Wall	Floor	Basement Wall	Slab perimeter	Crawl Space Wall
4B	0.65	0.40	R-19	R-11	R-11	R-5	R-0	R-5
5A -8	0.55	0.40	R-19	R-11	R-11	R-5	R-0	R-5

[a]. This window requirement shall have a delayed implementation date of January 1, 2004.

(Effective January 1, 2003)

CHAPTER 6
SIMPLIFIED PRESCRIPTIVE REQUIREMENTS FOR RESIDENTIAL BUILDINGS, TYPE A-1 AND A-2

SECTION 601
GENERAL

*Revise Section 601.2.1 Residential buildings, Type A-1 to read as follows:

601.2.1 Residential buildings, Type A-1. Compliance for Type A-1 residential buildings shall be demonstrated by either:

1. Meeting the requirements of this chapter for buildings with a fenestration area that does not exceed 18 percent of the gross area of exterior walls; or
2. Meeting the requirements of Chapter 4, or Chapter 5 for Type A-1 residential buildings; or
3. Meeting one of the Climate Zone "Single Step Compliance" Tables; or
4. Georgia Tradeoff Worksheet with Window Takeoff worksheet, and if applicable the R-value of Wood Stud Walls Worksheet and/or R-value of Steel Stud Wall Worksheet; or
5. Documentation from an approved software program*.

**Note: MECcheck is an approved software program. MECcheck may be downloaded free of charge from www.energycodes.gov.*
(Effective January 1, 2003)

*Revise Section 602.1 Thermal performance criteria to read as follows:

602.1 Thermal performance criteria. The minimum required insulation R-value or maximum required U-factor for each element in the building thermal envelope (fenestration, roof/ceiling, opaque wall, floor, slab edge, crawl space wall and basement wall) shall be in accordance with the criteria in Table 602.1.

Type A-1 residential buildings, with greater than 18-percent glazing area, Type A-2 residential buildings, with greater than 25-percent glazing area shall determine compliance using the building envelope requirements of Chapter 4 or Chapter 5.
Remaining sub-sections unchanged.
(Effective January 1, 2003)

*Revise Table 602.1 to read as follows:

Table 602.1
SIMPLIFIED PRESCRIPTIVE BUILDING ENVELOPE THERMAL COMPONENT CRITERIA
MINIMUM REQUIRED THERMAL PERFORMANCE (*U*-FACTOR AND *R*-VALUE)[1]

Maximum			Minimum					
CLIMATE ZONE FROM FIGURE 302.1(11)	**Glazing U-factor**	**SHGC[2]**	**Ceiling R-value[3,4]**	**Exterior Wall R-value[5]**	**Floor R-value**	**Basement Wall R-value**	**Slab Perimeter R-value[6]**	**Crawl Space Wall R-value**
4B	0.65	0.40	R-30	R-13	R-11	R-5	R-0	R-5
5A	0.55	0.40	R-30	R-13	R-13	R-5	R-0	R-6
6B	0.55	0.40	R-30	R-13	R-19	R-6	R-0	R-7
7A	0.55	0.40	R-38	R-16	R-19	R-7	R-0	R-8
8	0.50	0.40	R-38	R-16	R-19	R-8	R-0	R-10

Note 1: Maximum 18 % fenestration area.

Note 2: Up to 5 % of the fenestration may be exempt from meeting the window U-factor and Solar Heat Gain Coefficient (SHGC) requirements to all0 for decorative glazing.

Note 3: Up to 25% of sloped ceiling may be R-19 in Climate Zones 4B, 5A, 6B and 7A & 8.

Note 4: May use R-30 in Climate Zones 7A and 8 where construction techniques are employed to obtain the full height of insulation. See paragraph 502.2.4.5.

Note 5: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 6: Foam plastics shall not be installed on the exterior of below grade foundation walls or below grade on slab foundations. See paragraph 502.2.1.4.

(Effective January 1, 2003)

*Delete Section 602.2 Maximum solar heat gain coefficient for fenestration and substitute the following:

602.2 Maximum solar heat gain coefficient for fenestration. In all Georgia climate zones (4B through 8), the area-weighted-average solar heat gain coefficient (SHGC) for glazed fenestration installed in the building envelope shall not exceed 0.40. This requirement shall have a delayed implementation date of January 1, 2004.
(Effective January 1, 2003)

CHAPTER 7
BUILDING DESIGN FOR ALL COMMERCIAL BUILDINGS

SECTION 701
SCOPE

*Revise Section 701.1 General as follows:

701.1 General. Commercial buildings shall meet the requirements of *ANSI/ASHRAE/IESNA 90.1-2001*.
Remaining text unchanged.
(Effective January 1, 2003)

*Add new Section 701.2 Minimum commercial building thermal component requirements and Table 701 to read as follows:

701.2 Minimum commercial building thermal component requirements. Table 701 lists the minimum thermal envelope requirements that shall be met on all commercial buildings for roofs, walls, and glazed fenestration.

Table 701
Minimum Thermal Component Requirements

Element	Type	R-value of insulation	Maximum U-factor/ SHGC
Roof	Metal Bldgs[1]	R-19 with Thermal Block	U-0.65
	Other Bldgs.	R-15	
Walls	Cavity walls	R-13	N/A
	Mass walls	R-7	
Glazed Fenestration	Any	N/A	U-0.65/ SHGC 0.60

Note 1: Metal buildings with purlins 5' on center and 1" thermal block.

(Effective January 1, 2003)

CHAPTER 8
DESIGN BY ACCEPTABLE PRACTICE FOR COMMERCIAL BUILDINGS

SECTION 801
SCOPE

*Revise Section 801.2 as follows:

801.2 Application. The requirements in Section 802, 803, 804, and 805 shall each be satisfied on an individual basis. Where one or more section(s) is not satisfied, compliance for that section(s) shall be demonstrated in accordance with the applicable provisions of *ANSI/ASHRAE/IESNA 90.1-2001*.

Existing exception unchanged.

(Effective January 1, 2003)

SECTION 802
BUILDING ENVELOPE REQUIREMENTS

*Revise Section 802.1 as follows:

802.1 General. Walls, roof assemblies, floors, glazing, and slabs on grade which are part of the building envelope for buildings where the window and glazed door area is not greater than 50 percent of the gross area of above-grade walls shall meet the requirements of Sections 802.2.1 through 802.2.8, as applicable. Buildings with more glazing shall meet the applicable provisions of *ANSI/ASHRAE/IESNA 90.1-2001*.

Remaining text unchanged.

(Effective January 1, 2003)

*Revise Section 802.2 as follows:

802.2 Criteria. The building envelope components shall meet each of the applicable requirements in Tables 802.2(1), 802.2(2), 802.2(3) and 802.2(4), based on the percentage of wall that is glazed. The percentage of wall that is glazed shall be determined by dividing the aggregate area of rough openings for glazing (windows and glazed doors) in all the above grade walls associated with the building envelope by the total gross area of all above grade exterior walls that are a part for the building envelope. In buildings with multiple types of building envelope construction, each building envelope construction type shall be evaluated separately. Where Table 802.2(1), 802.2(2), 802.2(3) and 802.2(4) does not list a particular construction type, the applicable provisions of *ANSI/ASHRAE/IESNA 90.1-2001* shall be used in lieu of Section 802.

Remaining text unchanged.

(Effective January 1, 2003)

*Add new Section 802.3.3 to read as follows:

802.3.3 Dampers integral to the building envelope. Stair, elevator shaft vents, and other dampers integral to the building envelope shall be equipped with motorized dampers with a maximum leakage rate of 3 cfm/ft^2 at 1.0 in w.g. (250 Pa) when tested in accordance with AMCA 500. Such dampers shall be closed during normal building operation and shall open as required by fire and smoke detection systems.
Exception: Gravity (non-motorized) dampers are permitted to be used in buildings less than three stories in height above grade.
(Effective January 1, 2003)

*Add new Section 802.3.4 to read as follows:

802.3.4 Loading dock weatherseals. Cargo doors and loading dock doors shall be equipped with weatherseals to restrict infiltration when vehicles are parked in the doorway.
(Effective January 1, 2003)

*Add new Section 802.3.5 to read as follows:

802.3.5 Vestibules. A door that separates conditioned space from the exterior shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time.
Exceptions:
1. Buildings in Climate Zones 1a through 4b as indicated in Table 302.1.
2. Doors not intended to be used as a building entrance door, such as mechanical or electrical equipment rooms.
3. Doors opening directly from a dwelling unit.
4. Doors that open directly from a space less than 3,000 ft^2 (298 m^2) in area.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

(Effective January 1, 2003)

*Add new Section 802.3.6 to read as follows:

802.3.6 Recessed Lighting Fixtures. When installed in the building envelope, recessed lighting fixtures shall meet one of the following requirements:
1. Type IC rated, manufactured with no penetrations between the inside of the recessed fixture and ceiling cavity and sealed or gasketed to prevent air leakage into the unconditioned space.
2. Type IC rated, in accordance with ASTM E 283 no more than 2.0 cubic feet per minute (cfm) (0.944 L/s) air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 1.57-psi (75 Pa) pressure difference and shall be labeled.

(Effective January 1, 2003)

SECTION 803
BUILDING MECHANICAL SYSTEMS

*Revise Section 803.2.6 as follows:

803.2.6 Cooling with Outdoor air. Each system over 65,000 Btu/h (19KW) cooling capacity located in other than Climate Zones 1, 2, 3b, 5a or 6b as shown in Table 302.1 shall have an economizer that will automatically shut off the cooling system and allow all of the supply air to be provided directly from outdoors.

Economizers shall be capable of operating at 100% outside air, even if additional mechanical cooling is required to meet the cooling load of the building. Where a single room or space is supplied by multiple air systems, the aggregate capacity of those systems shall be used in applying this requirement.

Exceptions:

1. Where the cooling equipment is covered by the minimum efficiency requirements of Table 803.2.2(1) or 803.2.2(2) and meets the efficiency requirements of Table 803.2.6.
2. Systems with air or evaporatively cooled condensers and which serve spaces with open case refrigeration or that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the ICC International Mechanical Code.
3. Systems under 135,000 Btu/h (40KW) cooling capacity in Climate Zones 3c, 5b, 7, 13b, and 14.

(Effective January 1, 2003)

*Revise Section 803.3.2 as follows:

803.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables 803.2.2(1) through 803.2.2(6) and Table 803.2.2(5), when tested and rated in accordance with the applicable test procedure. The efficiency shall be verified through certification under an approved certification program, or if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions and/or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrate the combined efficiency of the specified components meets the requirements herein.

Where unitary or prepackaged equipment is used in a complex HVAC system and is not covered by Section 803.3.2, the equipment shall meet the applicable requirements of Section 803.2.2.

Exception:

Equipment listed in Table 803.2.2(2) not designed for operation at ARI standard test conditions of 44ºF (7ºC) leaving chilled water temperature and 85ºF (29ºC) entering condenser water temperature shall have a minimum full load COP and IPLV rating as shown in Tables 803.3.2(3) through 803.3.2(5) as applicable. The table values are only applicable over the following full load design ranges:

1. Leaving Chilled Water Temperature: 40 to 48ºF (4C to 9ºC)
2. Entering Condenser Water Temperature: 75 to 85ºF (24C to 29ºC). Chillers designed to operate outside of these ranges are not covered by this code. Condensing Water Temperature Rise: 5 to 15 ºF (-15 to –9 ºC)

(Effective January 1, 2003)

*Delete Tables 803.2.2(1) through 803.2.2(5) and substitute to read as follows and add the following new Tables 803.3.2(1) through 803.3.2(3):

TABLE 803.2.2 (1)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS, ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Efficiency as of 10/29/2001[b]	Test Procedure[a]
Air Conditioners, Air Cooled	< 65,000 Btu/h[d]	Split System	10.0 SEER	10.0 SEER	ARI 210/240
		Single Package	9.7 SEER	9.7 SEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	8.9 EER[c]	10.3 EER[c]	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package	8.5 EER[c]	9.7 EER[c]	ARI 340/360
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split System and Single Package	8.5 EER[c] 7.5 IPLV[c]	9.5 EER[c] 9.7 IPLV[c]	
	≥ 760,000 Btu/h	Split System and Single Package	8.2 EER[c] 7.5 IPLV[c]	9.2 EER[c] 9.4 IPLV[c]	
Air Conditioners, Water and Evaporatively Cooled	< 65,000 Btu/h	Split System and Single Package	9.3 EER	12.1 EER	ARI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	10.5 EER[c]	11.5 EER[c]	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h	Split System and Single Package	9.6 EER[c]	11.0 EER[c]	ARI 340/360
	> 240,000 Btu/h	Split System and Single Package	9.6 EER[c] 9.0 IPLV[c]	11.0 EER[c] 10.3 IPLV[c]	

For SI: 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] IPLVs are only applicable to equipment with capacity modulation.

[c] Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

[d] Single-phase air-cooled air-conditioners < 65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA). SEER values are those set by NAECA.

TABLE 803.2.2 (2)
UNITARY AND APPLIED HEAT PUMPS, ELECTRICALLY OPERATED,
MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Efficiency as of 10/29/2001[b]	Test Procedure[a]
Air Cooled, (Cooling Mode)	< 65,000 Btu/h[d]	Split System	10.0 SEER	10.0 SEER	ARI 210/240
		Single Package	9.7 SEER	9.7 SEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	8.9 EER[c]	10.1 EER[c]	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package	8.5 EER[c]	9.3 EER[c]	ARI 340/360
	≥ 240,000 Btu/h	Split System and Single Package	8.5 EER[c] 7.5 IPLV[c]	9.0 EER[c] 9.2 IPLV[c]	
Water-Source (Cooling Mode)	< 17,000 Btu/h	85°F Entering Water	9.3 EER		ARI 320
		86°F Entering Water		11.2 EER	ISO-13256-1
	≥ 17,000 Btu/h and <65,000 Btu/h	85°F Entering Water	9.3 EER		ARI 320
		86°F Entering Water		12.0 EER	ISO-13256-1
	≥ 65,000 Btu/h and < 135,000 Btu/h	85°F Entering Water	10.5 EER		ARI 320
		86°F Entering Water		12.0 EER	ISO-13256-1
Groundwater-Source (Cooling Mode)	< 135,000 Btu/h	70°F Entering Water 50°F entering water	11.0 EER 11.5 EER		ARI 325
		59°F Entering Water		16.2 EER	ISO-13256-1
Ground Source (Cooling Mode)	< 135,000 Btu/h	77°F Entering Brine 70°F Entering Brine	10.0 EER 10.4 EER		ARI 330
		77°F Entering Water		13.4 EER	ISO-13256-1
Air Cooled (Heating Mode)	< 65,000 Btu/h[d] (Cooling Capacity)	Split System	6.8 HSPF	6.8 HSPF	ARI 210/240
		Single Package	6.6 HSPF	6.6 HSPF	
	≥65,000 Btu/h and < 135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air	3.0 COP	3.2 COP	
	≥135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air	2.9 COP	3.1 COP	ARI 340/360
Water-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	70°F Entering Water	3.8 COP		ARI 320
		68°F Entering Water		4.2 COP	ISO-13256-1
Groundwater-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	70°F Entering Water 50°F Entering Water	3.4 COP 3.0 COP		ARI 325
		50°F Entering Water		3.6 COP	ISO-13256-1
Ground Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	32°F Entering Brine	2.5 COP		ARI 330
		32°F Entering Water		3.1 COP	ISO-13256-1

For SI: °C = [(°F)-32]/1.8, 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] IPLVs and Part load rating conditions are only applicable to equipment with capacity modulation.

[c] Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

[d] Single-phase air-cooled heat pumps < 65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA). SEER and HSPF values are those set by NAECA.

TABLE 803.2.2 (3)
PACKAGED THERMAL AIR CONDITIONERS,
PACKAGED THERMAL HEAT PUMPS

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[b]	Efficiency as of 10/29/2001[b]	Test Procedure[a]
PTAC (Cooling Mode) New Construction	All Capacities	95°F db Outdoor Air	10.0 - (0.16 x Cap/1000)[b] EER	12.5 - (0.213 x Cap/1000)[b] EER	ARI 310/380
PTAC (Cooling Mode) Replacements[c]	All Capacities	95°F db Outdoor Air	10.0 - (0.16 x Cap/1000)[b] EER	10.9 - (0.213 x Cap/1000)[b] EER	
PTHP (Cooling Mode) New Construction	All Capacities	95°F db Outdoor Air	10.0 - (0.16 x Cap/1000)[b] EER	12.3 - (0.213 x Cap/1000)[b] EER	
PTHP (Cooling Mode) Replacements[c]	All Capacities	95°F db Outdoor Air	10.0 - (0.16 x Cap/1000)[b] EER	10.8 - (0.213 x Cap/1000)[b] EER	
PTHP (Heating Mode) New Construction	All Capacities		2.9 - (0.026 x Cap/1000)[b] COP	3.2 - (0.026 x Cap/1000)[b] COP	
PTHP (Heating Mode) Replacements[c]	All Capacities		2.9 - (0.026 x Cap/1000)[b] COP	2.9 - (0.026 x Cap/1000)[b] COP	

For SI: °C = [(°F)-32]/1.8, 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] Cap means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7000 Btu/h, use 7,000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.

[c] Replacement units shall be factory labeled as follows: "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Replacement efficiencies apply only to units with existing sleeves less than 16-in. (406 mm) high and less than 42-in. (1,067 mm) wide.

TABLE 803.2.2 (4)
WARM AIR FURNACES, WARM AIR DUCT FURNACES AND UNIT HEATERS, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[d]	Efficiency as of 10/29/2001[d,e]	Test Procedure[a]
Warm Air Furnace, Gas-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E_t[c]	78% AFUE or 80% E_t[c]	DOE 10 CFR Part 430 or ANSI Z21.47
	≥225,000 Btu/h (66 kW)	Maximum Capacity[c]	80% E_t	80% E_c[f]	ANSI Z21.47
Warm Air Furnace, Oil-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E_t[c]	78% AFUE or 80% E_t[c]	DOE 10 CFR Part 430 or UL 727
	≥225,000 Btu/h (66 kW)	Maximum Capacity[b]	81% E_t	81% E_t[g]	UL 727
Warm Air Duct Furnaces, Gas-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	78% E_t 75% E_t	80% E_c[e] ———	ANSI Z83.9
Warm Air Unit Heaters, Gas-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	78% E_t 74% E_t	80% E_c[e] ———	ANSI Z83.8
Warm Air Unit Heaters, Oil-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	81% E_t 81% E_t	80% E_c[e] ———	UL 731

For SI: 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] Minimum and maximum ratings as provided for and allowed by the unit's controls.

[c] Combination units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) may comply with either rating.

[d] E_t = Thermal efficiency. See test procedure for detailed discussion.

[e] E_c = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.

[f] E_c = Combustion efficiency. Units shall also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

[g] E_t = Thermal efficiency. Units shall also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

TABLE 803.2.2 (5)
BOILERS, GAS- AND OIL-FIRED, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type[f]	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[c,e]	Efficiency as of 10/29/2001[d]	Test Procedure
Boilers, Gas-Fired	< 300,000 Btu/h	Hot Water	80% AFUE	80% AFUE	DOE 10 CFR Part 430
		Steam	75% AFUE	75% AFUE	
	≥300,000 Btu/h and ≤ 2,500,000 Btu/h	Maximum Capacity[b]	80% E_c	75% E_t	H.I. HBS 86
	> 2,500,000 Btu/h[f]	Hot Water	80% E_c	80% E_c	
		Steam	80% E_c	80% E_c	
Boilers, Oil-Fired	< 300,000 Btu/h		80% AFUE	80% AFUE	DOE 10 CFR Part 430
	≥300,000 Btu/h and ≤ 2,500,000 Btu/h	Maximum Capacity[b]	83% E_c	78% E_t	H.I. HBS 86
	> 2,500,000 Btu/h[f]	Hot Water	83% E_c	83% E_c	
		Steam	83% E_c	83% E_c	
Oil-Fired (Residual)	≥300,000 Btu/h and ≤2,500,000 Btu/h	Maximum Capacity[b]	83% E_c	78% E_t	H.I. HBS 86
	> 2,500,000 Btu/h[f]	Hot Water	83% E_c	83% E_c	
		Steam	83% E_c	83% E_c	

For SI: 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] Minimum and maximum ratings as provided for and allowed by the unit's controls.

[c] E_c = Combustion efficiency (100% less flue losses). See reference document for detailed information.

[d] E_t = Thermal efficiency. See reference document for detailed information.

[e] Alternate test procedures used at the manufacturer's option are ASME PTC-4.1 for units over 5,000,000 Btu/h input, or ANSI Z21.13 for units greater than or equal to 300,000 Btu/h and less than or equal to 2,500,000 Btu/h input.

[f] These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers, and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.

TABLE 803.3.2(1)
CONDENSING UNITS, ELECTRICALLY OPERATED
MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Efficiency as of 10/29/2001[b]	Test Procedure[a]
Condensing Units, Air Cooled	≥135,000 Btu/h		9.9 EER 11.0 IPLV	10.1 EER 11.2 IPLV	ARI 365
Condensing Units, Water or Evaporatively Cooled	≥135,000 Btu/h		12.9 EER 12.9 IPLV	13.1 EER 13.1 IPLV	

For SI: 1 Btu/hr = 0.2931 W

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] IPLVs are only applicable to equipment with capacity modulation.

TABLE 803.3.2 (2)
WATER CHILLING PACKAGES, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Efficiency as of 10/29/2001[b]	Test Procedure[a]
Air Cooled, With Condenser, Electrically Operated	< 150 Tons		2.70 COP 2.80 IPLV	2.80 COP 2.80 IPLV	ARI 550 or ARI 590 as appropriate
	≥150 Tons		2.50 COP 2.50 IPLV		
Air Cooled, Without Condenser, Electrically Operated	All Capacities		3.10 COP 3.20 IPLV	3.10 COP 3.10 IPLV	ARI 590
Water Cooled, Electrically Operated, Positive Displacement (Reciprocating)	All Capacities		3.80 COP 3.90 IPLV	4.20 COP 4.65 IPLV	
Water Cooled, Electrically Operated, Positive Displacement (Rotary Screw and Scroll)	< 150 Tons		3.80 COP 3.90 IPLV	4.45 COP 4.50 IPLV	ARI 550 or ARI 590 as appropriate
	≥150 Tons and < 300 Tons		4.20 COP 4.50 IPLV	4.90 COP 4.95 IPLV	
	≥300 Tons		5.20 COP 5.30 IPLV	5.50 COP 5.60 IPLV	
Water Cooled, Electrically Operated, Centrifugal	< 150 Tons		3.80 COP 3.90 IPLV	5.00 COP 5.00 IPLV	ARI 550
	≥150 Tons and < 300 Tons		4.20 COP 4.50 IPLV	5.55 COP 5.55 IPLV	
	≥300 Tons		5.20 COP 5.30 IPLV	6.10 COP 6.10 IPLV	
Air Cooled Absorption Single Effect	All Capacities		0.48 COP	0.60 COP	
Water Cooled Absorption Single Effect	All Capacities		0.60 COP	0.70 COP	
Absorption Double Effect, Indirect-Fired	All Capacities		0.95 COP 1.00 IPLV	1.00 COP 1.05 IPLV	ARI 560
Absorption Double Effect, Direct-Fired	All Capacities		0.95 COP 1.00 IPLV	1.00 COP 1.00 IPLV	

For SI: 1 Ton = 3.517 kW

[a] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

[b] The chiller equipment requirements do not apply for chillers used in low temperature applications where the design leaving fluid temperature is less than or equal to 40°F (4°C).

TABLE 803.3.2 (3)
COPS AND IPLVS FOR NON-STANDARD CENTRIFUGAL CHILLERS < 150 TONS

Centrifugal Chillers < 150 Tons COP_{std} = 5.4								
			Condenser Flow Rate					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	Lift[a] (°F)	Required COP and IPLV					
46	75	29	6.00	6.27	6.48	6.80	7.03	7.20
45	75	30	5.92	6.17	6.37	6.66	6.87	7.02
4	75	31	5.84	6.08	6.26	6.53	6.71	6.86
43	75	32	5.75	5.99	6.16	6.40	6.58	6.71
42	75	33	5.67	5.90	6.06	6.29	6.45	6.57
41	75	34	5.59	5.82	5.98	6.19	6.34	6.44
46	80	34	5.59	5.82	5.98	6.19	6.34	6.44
40	75	35	5.50	5.74	5.89	6.10	6.23	6.33
45	80	35	5.50	5.74	5.89	6.10	6.23	6.33
44	80	36	5.41	5.66	5.81	6.01	6.13	6.22
43	80	37	5.31	5.57	5.73	5.92	6.04	6.13
42	80	38	5.21	5.48	5.64	5.84	5.95	6.04
41	80	39	5.09	5.39	5.56	5.76	5.87	5.95
46	85	39	5.09	5.39	5.56	5.76	5.87	5.95
40	80	40	4.96	5.29	5.47	5.67	5.79	5.86
45	85	40	4.96	5.29	5.47	5.67	5.79	5.86
44	85	41	4.83	5.18	5.40	5.59	5.71	5.78
43	85	42	4.68	5.07	5.28	5.50	5.62	5.70
42	85	43	4.51	4.94	5.17	5.41	5.54	5.62
41	85	44	4.33	4.80	5.05	5.31	5.45	5.53
40	85	45	4.13	4.65	4.92	5.21	5.35	5.44
Condenser DT[b]			14.04	11.23	9.36	7.02	5.62	4.68

For SI: ºC = [(ºF)-32]/1.8

[a] Lift = Entering Condenser Water Temperature 40 ºF – Leaving Chilled Water Temperature ºF

[b] Condenser DT = Leaving Condenser Water Temperature ºF – Entering Condenser Water Temperature ºF

$K_{adj} = 6.1507 - 0.30244(X) + 0.0062692(X)^2 - 0.000045595(X)^3$

where X = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

TABLE 803.3.2 (4)
COPS AND IPLVS FOR NON-STANDARD CENTRIFUGAL CHILLERS
> 150 TONS, £ 300 TONS

Centrifugal Chillers > 150 Tons, £ 300 Tons COP_{std} = 5.55								
			Condenser Flow Rate					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	Lift[a] (°F)	Required COP and IPLV					
46	75	29	6.17	6.44	6.66	6.99	7.23	7.40
45	75	30	6.08	6.34	6.54	6.84	7.06	7.22
44	75	31	6.00	6.24	6.43	6.71	6.90	7.05
43	75	32	5.91	6.15	6.33	6.58	6.76	6.89
42	75	33	5.83	6.07	6.23	6.47	6.63	6.75
41	75	34	5.74	5.98	6.14	6.36	6.51	6.62
46	80	34	5.74	5.98	6.14	6.36	6.51	6.62
40	75	35	5.65	5.90	6.05	6.26	6.40	6.51
45	80	35	5.65	5.90	6.05	6.26	6.40	6.51
44	80	36	5.56	5.81	5.97	6.17	6.30	6.40
43	80	37	5.46	5.73	5.89	6.08	6.21	6.30
42	80	38	5.35	5.64	5.80	6.00	6.12	6.20
41	80	39	5.23	5.54	5.71	5.91	6.03	6.11
46	85	39	5.23	5.54	5.71	5.91	6.03	6.11
40	80	40	5.10	5.44	5.62	5.83	5.95	6.03
45	85	40	5.10	5.44	5.62	5.83	5.95	6.03
44	85	41	4.96	5.33	5.55	5.74	5.86	5.94
43	85	42	4.81	5.21	5.42	5.66	5.78	5.86
42	85	43	4.63	5.08	5.31	5.56	5.69	5.77
41	85	44	4.45	4.93	5.19	5.46	5.60	5.69
40	85	45	4.24	4.77	5.06	5.35	5.50	5.59
Condenser DT[b]			14.04	11.23	9.36	7.02	5.62	4.68

For SI: °C = [(°F)-32]/1.8

[a] Lift = Entering Condenser Water Temperature °F – Leaving Chilled Water Temperature °F

[b] Condenser DT = Leaving Condenser Water Temperature °F – Entering Condenser Water Temperature °F

$K_{adj} = 6.1507 - 0.30244(X) + 0.0062692(X)^2 - 0.000045595(X)^3$

where X = Condenser DT + Lift

$COP_{adj} = K_{adj} * COP_{std}$

TABLE 803.3.2 (5)
COPS AND IPLVS FOR NON-STANDARD CENTRIFUGAL CHILLERS > 300 TONS

Centrifugal Chillers > 300 Tons COP_{std} = 6.1								
			Condenser Flow Rate					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	Lift[a] (°F)	Required COP and IPLV					
46	75	29	6.80	7.11	7.35	7.71	7.97	8.16
45	75	30	6.71	6.99	7.21	7.55	7.78	7.96
44	75	31	6.61	6.89	7.09	7.40	7.61	7.77
43	75	32	6.52	6.79	6.98	7.26	7.45	7.60
42	75	33	6.43	6.69	6.87	7.13	7.31	7.44
41	75	34	6.33	6.60	6.77	7.02	7.18	7.30
46	80	34	6.33	6.60	6.77	7.02	7.18	7.30
40	75	35	6.23	6.50	6.68	6.91	7.06	7.17
45	80	35	6.23	6.50	6.68	6.91	7.06	7.17
44	80	36	6.13	6.41	6.58	6.81	6.95	7.05
43	80	37	6.02	6.31	6.49	6.71	6.85	6.94
42	80	38	5.90	6.21	6.40	6.61	6.75	6.84
41	80	39	5.77	6.11	6.30	6.52	6.65	6.74
46	85	39	5.77	6.11	6.30	6.52	6.65	6.74
40	80	40	5.63	6.00	6.20	6.43	6.56	6.65
45	85	40	5.63	6.00	6.20	6.43	6.56	6.65
44	85	41	5.47	5.87	6.10	6.33	6.47	6.55
43	85	42	5.30	5.74	5.98	6.24	6.37	6.46
42	85	43	5.11	5.60	5.86	6.13	6.28	6.37
41	85	44	4.90	5.44	5.72	6.02	6.17	6.27
40	85	45	4.68	5.26	5.58	5.90	6.07	6.17
Condenser DT[b]			14.04	11.23	9.36	7.02	5.62	4.68

For SI: °C = [(°F)-32]/1.8

[a] Lift = Entering Condenser Water Temperature °F – Leaving Chilled Water Temperature °F

[b] Condenser DT = Leaving Condenser Water Temperature °F – Entering Condenser Water Temperature °F

$K_{adj} = 6.1507 - 0.30244(X) + 0.0062692(X)^2 - 0.000045595(X)^3$

where X = Condenser DT + Lift

$COP_{adj} = K_{adj} * COP_{std}$

TABLE 803.3.2 (6)
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Sub-Category or Rating Condition	Performance Required as of 10/29/2001[a,b]	Test Procedure[c]
Propeller or Axial Fan Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥38.2 gpm/hp (3.23 L/s·kW)	CTI ATC-105 and CTI STD-201
Centrifugal Fan Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	= 20.0 gpm/hp (1.7 L/s·kW)	CTI ATC-105 and CTI STD-201
Air Cooled Condensers	All	125°F (52°C) Condensing Temperature R22 Test Fluid 190°F (88°C) Entering Gas Temperature 15°F (8°C) Subcooling 95°F (35°C) Entering Drybulb	≥176,000 Btu/h·hp (69 COP)	ARI 460

For SI: °C = [(°F)-32]/1.8, 1 Btu/h = 0.2931 W, 1 L/s·kW = 11.8gpm/hp

[a] For purposes of this table, cooling tower performance is defined as the maximum flow rating of the tower units (gpm) divided by the fan nameplate rated motor power units (hp).

[b] For purposes of this table air-cooled condenser performance is defined as the heat rejected from the refrigerant units (Btu/h) divided by the fan nameplate rated motor power units (hp).

[c] Chapter 9 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

(Effective January 1, 2003)

*Revise Section 803.3.3.5 as follows:

803.3.3.5 Economizers. Economizers shall be provided on each system over 65,000 Btu/h (19 kW) cooling capacity in accordance with Section 803.2.6.

Exceptions:

Water economizers that are capable of cooling supply air by direct and/or indirect evaporation and providing up to 100% of the expected system cooling load at outside air temperatures of 50^0 F (10^0 C) dry bulb/45^0 F (7.2^0 C) wet bulb and below.

Systems under 135,000 Btu/h (40kW) cooling capacity in Climate Zones 3c, 5b, 7, 13b, and 14.

(Effective January 1, 2003)

*Add new Section 803.3.3.8 to read as follows:

803.3.3.8 Heat rejection equipment fan speed control. Each fan powered by a motor of 7.5 hp (5.6 kW) or larger shall have the capability to operate that fan at two-thirds of full speed or less, and shall have controls that automatically change the fan speed to control the leaving fluid temperature or condensing temperature/pressure of the heat rejection device.
Exception: Factory-installed heat rejection devices within HVAC equipment tested and rated in accordance with Tables 803.3.2(1) through 803.3.2(3).
(Effective January 1, 2003)

*Delete Section 803.3.4.1 Temperature reset for air systems without substitution.
(Effective January 1, 2003)

SECTION 805
LIGHTING SYSTEMS

*Revise Section 805.2 as follows:

805.2 Lighting controls. Lighting systems shall be provided with controls as required in Sections 805.2.1, 805.2.2 and 805.2.3.
(Effective January 1, 2003)

*Add new Section 805.2.3 to read as follows:

805.2.3 Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections 805.2.3.1, 805.2.3.2 or 805.2.3.3.

Exceptions:

1. Areas that have only 1 luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms, or public lobbies.

(Effective January 1, 2003)

*Add new Sections 805.2.3.1, 805.2.3.2 and 805.2.3.3 as follows:

805.2.3.1 Bi-Level Switching. Each area less than 250 ft^2 (23 m^2) that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent.

Exceptions:

1. Areas that have only 1 luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms, or public lobbies.
4. Guest rooms.

805.2.3.2 Automatic lighting shutoff. Buildings larger than 5,000 ft^2 shall be equipped with an automatic control device to shut off lighting in all spaces. This automatic control device shall function on either:

1. A scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 25,000 ft^2 and are not more than one floor, or
2. An unscheduled basis by occupant intervention.

805.2.3.3 Guest rooms. Guest rooms in hotels, motels, boarding houses, or similar buildings shall have at least one master switch at the main entry door that controls all permanently wired lighting fixtures and switched receptacles, except those in the bathroom(s). Suites shall have a control meeting these requirements at the entry to each room or at the primary entry to the suite. (Effective January 1, 2003)

CHAPTER 9
REFERENCED STANDARDS

Revise Chapter 9 to add the following:

ANSI/ASHRAE/IESNA--90.1-2001	*Energy Standard for Buildings except Low-Rise Residential Buildings*
ASHRAE- 2001	*Handbook Fundamentals*
NEMA TP1-1996	*Guide for Determining Energy Efficiency for Distribution Transformers*
NEMA TP2-1998	*Standard Test Method for Measuring the Energy Consumption of Distribution Transformers*
NEMA TP3-2000	*Standard for the Labeling of Distribution Transformer Efficiency*

Remaining text unchanged.
(Effective January 1, 2003)

*Add Figure 9-1 F_2-values for Slab-on-Grade Perimeter Insulation and Figure 9-2 Component Performance Table to read as follows:

Figure 9-1
F_2-values for Slab-on-Grade Perimeter Insulation

R-value of insulation horizontal or vertical	24 inches	36 inches	48 inches
R-0	1.043	1.042	1.041
R-1	0.906	0.881	0.886
R-2	0.859	0.823	0.826
R-2.75 [1]	0.839	0.799	0.799
R-3	0.833	0.791	0.790
R-4	0.816	0.769	0.764
R-5	0.804	0.752	0.745
R-6	0.794	0.739	0.728
R-7	0.786	0.727	0.714
R-8	0.779	0.717	0.702
R-9	0.773	0.709	0.692
R-10	0.767	0.701	0.684
R-11	0.767	0.699	0.677
R-12	0.767	0.696	0.670
R-13	0.767	0.694	0.664
R-14	0.767	0.692	0.658
R-15	0.767	0.691	0.655
R-16	0.767	0.688	0.649

Note 1. May use R-2.75 @ 48" in residential applications where carpet or hardwood on plywood is used as the finish floor treatment.

(Effective January 1, 2003)

Figure 9-2
Group R Buildings A -1 & A-2 Component Performance R-Values/U-factor

U-factor/R-value - Group R Buildings - A1 & A2 Heating					Floors over Unheated Spaces	Floors over Unheated Spaces	Unheated Slab-on grade[1]	Heated Slab-on grade	Crawl Space Wall	Crawl Space Wall	Basement Walls	Basement Wall
Climate	**A-1 Walls**	**A-2 Walls**	**Roof/Ceiling A1 & A2**	**Roof/ Ceiling**								
Zone	U-factor	U-factor	U-factor	R-value	U-factor	R-value	R-value	R-value	U-factor	R-value	U-factor	R-value
4B	0.197	0.281	0.039	25.77	0.07	14.29	0	R-6	0.150	6.67	0.158	6.31
5A	0.180	0.248	0.036	27.78	0.07	14.29	R-4	R-6	0.135	7.41	0.147	6.81
6B	0.172	0.215	0.036	27.78	0.05	20	R-4	R-6	0.120	8.33	0.135	7.40
7A	0.164	0.215	0.036	27.78	0.05	20	R-4	R-6	0.105	9.52	0.123	8.10
8	0.157	0.215	0.036	28.15	0.05	20	R-4	R-6	0.090	11.11	0.112	8.94

Note: 1: Foam plastics shall not be installed below grade or within 6 inches of grade, except when approved by the local Building Official. The stated R-value is for trade-off purposes only.

(Effective January 1, 2003)

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APPENDIX

*Revise Appendix to read as follows:
Change all references for existing Appendix to “Appendix A”.

*Add new Appendix B to read as follows:

APPENDIX B

Throughout this Appendix there is information that may be helpful in meeting and understanding the Georgia State Energy Code. In cases of conflict, refer to the 2000 International Energy Conservation Code for clarification.

CHECKLIST
Wood Framing
Low Rise Residential Use

To be filled out by permit applicant and presented to Building Department at time permit is requested
A copy will be available at the job site for CEO (Code Enforcement Officers) review.

	Enter Values Y or N
√ (check one) ☐ New Building ☐ Renovation	
Flat Ceilings Insulation - min. R-30 or R-38 (Yes & List R-value)	_____
Access to attic area insulated (Yes)	_____
Sloped Ceiling (min R-19) Insulation - on max 25% max amount sloped area) (Yes)	_____
Percent of Fenestration (openings in conditioned wall area divided by conditioned gross wall area x 100) (List maximum percent of openings)	_____
Window U-factor from label-NFRC Label √, Default Label √, Manufacturer's Label √	_____
Window SHGC (0.40 or less) Labeled (see above)	_____
Door U-factor =or greater than Window U-factor (yes)	_____
Wall R-value (R-value cavity Insulation + Sheathing R-value)	_____
Cavity insulation R-value - R-value of batting	_____
Sheathing R-value - may add 1 for reflective air space to sheathing R-value	_____
Knee Wall Insulation R-value - min. R-19	_____
Floor Insulation R-value (Check Climatic zone chart for required value)	_____
Basement Wall Insulation for conditioned basement or in-lieu of floor (above) insulation	_____
Concrete/masonry walls min R-5, or if stud walls, same as Wall R-value	_____
Air Infiltration (see Section 502.3)	
Windows caulked, sealed with 0.34-0.37 AIR (Air Infiltration Rate) (Yes)	_____
Doors sealed weather-stripped including to unconditioned area (attic, unheated Basement, etc) with max. 0.5 AIR (Air Infiltration Rate) (Yes)	_____
Sole Plate caulked or sealed (yes)	_____
"Can" Lights properly sealed	_____
Tubs/Showers on exterior walls properly sealed	_____
Other penetrations/openings caulked sealed or gasketed as necessary	_____
Heating/Cooling Efficiency	
Gas Furnace AFUE min 78% (Yes)	_____
Heat Pump HSPF min 6.8 (Yes)	_____
Air Conditioner SEER min 10 (Yes)	_____
Other system(s) such as propane or fuel oil, list type & efficiency_____	_____
Duct insulation R-8 min. (list R-value)	_____
Ducts sealed/caulked (Yes)	_____
Crawl Space Foundation Vents (Yes)	_____
Mechanical Ventilation to outside:	
Kitchen (Yes or No)	_____
Baths (Yes or No)	_____
Other vents (explains) _____	_____

Other (list any additional information or comments- attach additional pages if necessary)

_____

Permit Holder_____

Job Address _____ Permit No._____

City ST ZIP _____ Issued _____

County _____ Subdivision_____ Lot _____

Georgia Trade-Off Worksheet

Climate Zone _____

% Windows & Doors= Divide total openings by total wall area

Line No.	A	B. Area ft²	C. R-value / U-factor	D. BTU/Hr/°F.	*	E.	F. Area ft²	G. U-factor	H. BTU/Hr/°F.
		Proposed House			*	***Code House*** (Chapter 5 U-Factors)			
	ROOF/CEILING				*	**Roof**			
1	Clg/Attic area		/ _____ =	_____	*				
2	Sloped/Tray Ceiling Extra		/ _____ =	_____	*				
3	Other Area_____		/ _____ =	_____	*	(B4 here) > >	_____ x	_____ =	_____
4	Total Roof/Ceiling				*				
	Note: May figure avg. R-value of Ceiling by adding 1.0 to R-insulation				*				
	WALL (25% Framing Factor)				*	**Wall**			
5	Total Wall area				*				
6	Opaque w/insul sheathing		/ _____ =	_____	*				
7	Opaque w/OSB-Plywood[1]		/ _____ =	_____	*				
8	Opaque w/gypsum[1]		/ _____ =	_____	*				
9	Opaque w/other		/ _____ =	_____	*				
10	Door 30x68 (20SF)		x _____ =	_____	*				
11	Door 28x68 (17.8 SF)		x _____ =	_____	*				
12	Door 26x68 (16.7 SF)		x _____ =	_____	*				
13	Doors other		x _____ =	_____	*				
14	Window Area[3]		x _____ =	_____	*	(B 17 here)	_____ x	_____ =	_____
15	Window area[3]		x _____ =	_____	*				
16	Window Area[3]		x _____ =	_____	*				
17	Total area				*				
	FLOOR Over Unconditioned Area and Slab-on-grade				*	**Floor**			
18	Floor area (ft²) _____		/ _____ =	_____	*	(B18 here) > >	_____ x	_____ =	_____
	and/or Length		_____ =	_____	*				
19	Slab perim (ft) _____		xF$_2$ _____ =	_____	*	(total B19 +			
20	Slab perim (ft) _____		xF$_2$ _____ =	_____	*	B20 here) >>	_____ xF$_2$	_____ =	_____
	(Foam plastics shall not be installed below grade or within 6 inches of grade.)								
	Note: May figure avg. R-value of Floor by adding 1.5 to R-insulation				*				
	BASEMENT WALL				*	**BASEMENT WALL**			
21	Opaque area _____		/ _____ =	_____	*				
22	Opaque other (_____)		/ _____ =	_____	*				
23	Opaque other (_____)		/ _____ =	_____	*	(B 24 here) > >	_____ x	_____ =	_____
24	Total Opaque basement walls				*				
	Note: Windows and Doors must go in Wall Area and basement must meet "Code" definition of "basement"								
	CRAWL SPACE WALL (Must be approved by Building Official)				*	**CRAWL SPACE WALL**			
25	Area _____		/ _____	_____	*	(B 25 here) > >	_____ x	_____ =	_____
					*				
26	**GRAND TOTAL**	Total D.26 = or< H.26			*	**GRAND TOTAL**			

Builder/Permit Holder _____ Permit No.:_____

Company Name_____ Job Name:_____

Address_____ Address: _____

City_____ST___ZIP_____ City/State/Zip: _____

Contractor Signature_____ _____

1. Refers to plywood or OSB installed on exterior wall as bracing in lieu of insulated sheathing.
2. Refers to gypsum board installed on wall in lieu of sheathing as in a garage application.
3. In Climate Zones 4B, 5A, 6B, 7A and 8 the Solar Heat Gain Coefficient (SHGC) shall be 0.40 or less.

Georgia Trade-Off Worksheet

Climate Zone 7A

EXAMPLE

% Windows & Doors = **18.0%** Divide total openings by total wall area

Line	***Proposed House***					***Code House*** (Chapter 5 U-Factors)				
	A	**B.**	**C.**		**D.**	**E.**	**F.**	**G.**		**H.**
No.		Area ft²	R-value U-factor		BTU/Hr/°F.		Area ft²	U-factor		BTU/Hr/°F.
	ROOF/CEILING					**Roof**				
1	Clg/Attic area	1323	/ 31	=	42.68					
2	Sloped/Tray Ceiling Extra	441	/ 20	=	22.05					
3	Other Area_____		/	=		(B4 here)	1764	x 0.0360	=	63.50
4	Total Roof/Ceiling	1764			64.73					
	Note: May figure avg. R-value of Ceiling by adding 1.0 to R-insulation									
	WALL (25% Framing Factor)					**Wall**				
5	Total Wall area	1815.8								
6	Opaque w/insul sheathing	994.9	/ 14.53	=	68.47					
7	Opaque w/OSB-Plywood[1]	288	/ 11.83	=	24.34					
8	Opaque w/gypsum[1]	206	/ 11.52	=	17.88					
9	Opaque w/other		/	=						
10	Door 30x68 (20SF)	40	x 0.35	=	14.00					
11	Door 28x68 (17.8 SF)	17.8	x 0.55	=	9.79					
12	Door 26x68 (16.7 SF)		x	=						
13	Doors other	40	x 0.55	=	22.00					
14	Window Area	211	x 0.55	=	116.05	(B 17 here)	1815.8	x 0.1644	=	298.52
15	Window area 40x40	18.1	x 0.55	=	9.96					
16	Window area		x	=						
17	Total area	1815.8			282.49					
	FLOOR **Over Unconditioned Area and Slab-on-grade**					**Floor**				
18	Floor area (ft²)	1750	/			(B18 here)		x	=	
	and/or	Length								
19	Slab perim (ft)	127	xF_2 0.7986		101.42	(total B19 +				
20	Slab perim (ft)	72	xF_2 1.0408		74.94	B20 here) >:	199	xF_2 0.8164	=	162.46
	(Foam plastics shall not be installed below grade or within 6 inches of grade.)									
	Note: May figure avg. R-value of Floor by adding 1.5 to R-insulation									
	BASEMENT WALL					**BASEMENT WALL**				
21	Opaque area		/	=						
22	Opaque other (_____)		/	=						
23	Opaque other (_____)		/	=		(B 24 here)		x	=	
24	Total Opaque basement walls									
	Note: Windows and Doors must go in Wall Area and basement must meet "Code" definition of "basement"									
	CRAWL SPACE WALL (Must be approved by the Building Official)					**CRAWL SPACE WALL**				
25	Area		/			(B 25 here)		x	=	
26	**GRAND TOTAL**	Total D.26 = or< H.26			523.58	**GRAND TOTAL**				524.49

Builder/Permit Holder _____ Permit No.:_____

Company Name_____ Job Name:_____

Address_____ Address: _____

City_____ST___ZIP_____ City/State/Zip: _____

Contractor Signature_____

1. Refers to plywood or OSB installed on exterior wall as bracing in lieu of insulated sheathing.
2. Refers to gypsum board installed on wall in lieu of sheathing as in a garage application.
3. In Climate Zones 4B, 5A, 6B, 7A and 8 the Solar Heat Gain Coefficient (SHGC) shall be 0.40 or less.

	TABLE 502.2.2.1.1		
Parallel Paths Worksheet	R-value of Wood Stud Walls	R-value Thru Framing	R-Value Between Framing
Component	**R-values* of Product(s)**		
Inside Air Film	ASHRAE Handbook Fundamentals p. 25.2 Table 1 - STILL AIR	0.68	0.68
Inside Wall Material	Drywall: 1/2" __R-0.45 5/8"__ R-0.56; Paneling __ R-0.25 Other __ R-___ (Product)_____		
Studs	2x4 __ R-4.38 2x6___ R-6.88		
Insulation	__R-11 __R-13 __R-15 __R-19 __R-21 __R-18 (R-19 compressed to 5 1/2") Cellulose Fiber__ R-12 (3.5pcf x 3 ½") __Foam Type_____& Thick._____ inch R-_____ EPS R-3.85/in. Extruded Styrene R-5/in. Polyiso R-5.6-8.0/in __Other R-___ Product_____		
Sheathing	Fiber Bd: 1/2" Reg.__ R-1.32 1/2" Intermediate__R-1.22 25/32" Fiber Bd __ R-2.06 Paperboard __ R-0.20 Plywood/OSB __ 3/8" R-0.47 __1/2" R-0.62 __5/8" R-0.77 __3/4" R-0.93 Gypsum Sheathing x_ 1/2" R-0.45 ___5/8" R-0.56 Foam:__R-2.0;_R-3.0;__R-4.0;__R 5.0;__R-6.0;__R-7.0;__R-8.0; __R-10 __EPS R-3.85/in.__ Extruded Styrene R-5/in. __Polyiso R-5.6-8.0/in Other __ R-____ (Product) _____		
Air Space	3/4" Non-Reflective__R-0.7; 3/4" Reflective__ R-2.1		
Exterior Finish	Hardboard__ R-0.67; 1/2"; Wood Drop 1x8 __R-0.79 Plywood:3/8"__R-0.47; 1/2"__R-0.62; 5/8"__R-0.77; 3/4"__R-0.93 Beveled Lap: 1/2"__ R-0.81; 3/4"__ R-1.05 Aluminum, Vinyl or Steel over Sheathing __R-0.61; Brick __ 0.44 Stucco__R-0.2; or ASTM C-236 test R-____ Other __ R-____ Product _____ Note: All R-values based on ASHRAE or approved ASTM C-236/ASTM C-518/ASTM C-976		
Outside Air Film	ASHRAE Handbook Fundamentals p. 25.2 Table 1 - MOVING AIR 15 mph	0.17	0.17
	Total R-values = Convert R-value to U-factor 1/R= Framing Factors (Opaque Wall) x Framing Factor 16" OC 21% Plus Headers 4% Add U-factors for Uw Note: for ASHRAE Trade-off Shall Convert to System R-value R(av) 1/Uw	 0.25 Uw= R(av)=	 0.75

*R-value per 2001 ASHRAE Handbook Fundamentals, ASTM C-236/C-976/C518, or NER/Compliance Report. All insulation products shall have a FTC Fact Sheet. The higher the R-value the greater the insulating power. Ask your seller for FTC Fact sheet on R-values. To get the marked R-value, it is essential that the insulation be installed properly.

Builders Name/Company_____ Job _____

Address _____ Location_____

City State _____

Signature_____

This space for Designer and/or Bldg Dept Stamp(s)

TABLE 502.2.2.1.1

Parallel Paths Worksheet	R-value of Wood Stud Walls Example	R-value Thru Framing	R-Value Between Framing
Component	**R-values* of Product(s)**		
Inside Air Film	ASHRAE Handbook Fundamentals p. 25.2 Table 1 - STILL AIR	0.68	0.68
Inside Wall Material	Drywall: 1/2" __R-0.45 5/8"__ R-0.56; Paneling __ R-0.25 Other __ R-___ (Product)_____	0.45	0.45
Studs	2x4 __ R-4.38 2x6___ R-6.88	4.38	
Insulation	__R-11 __R-13 __R-15 __R-19 __R-21 __R-18 (R-19 compressed to 5 1/2") Cellulose Fiber__ R-12 (3.5pcf x 3 ½") __Foam Type_____& Thick._____ inch R-_____ EPS R-3.85/in. Extruded Styrene R-5/in. Polyiso R-5.6-8.0/in __Other R-___ Product_____		13
Sheathing	Fiber Bd: 1/2" Reg.__ R-1.32 1/2" Intermediate__R-1.22 25/32" Fiber Bd __ R-2.06 Paperboard __ R-0.20 Plywood/OSB __ 3/8" R-0.47 __1/2" R-0.62 __5/8" R-0.77 __3/4" R-0.93 Gypsum Sheathing x_ 1/2" R-0.45 ___5/8" R-0.56 Foam:__R-2.0;_R-3.0;__R-4.0;__R 5.0;__R-6.0;__R-7.0;__R-8.0; __R-10 __EPS R-3.85/in.__ Extruded Styrene R-5/in. __Polyiso R-5.6-8.0/in Other __ R-____ (Product) _____	3	3
Air Space	3/4" Non-Reflective__R-0.7; 3/4" Reflective__ R-2.1		
Exterior Finish	Hardboard__ R-0.67; 1/2"; Wood Drop 1x8 __R-0.79 Plywood:3/8"__R-0.47; 1/2"__R-0.62; 5/8"__R-0.77; 3/4"__R-0.93 Beveled Lap: 1/2"__ R-0.81; 3/4"__ R-1.05 Aluminum, Vinyl or Steel over Sheathing __R-0.61; Brick __ 0.44 Stucco__R-0.2; or ASTM C-236 test R-____ Other __ R-____ Product _____ Note: All R-values based on ASHRAE or approved ASTM C-236/ASTM C-518/ASTM C-976	0.61	0.61
Outside Air Film	ASHRAE Handbook Fundamentals p. 25.2 Table 1 - MOVING AIR 15 mph	0.17	0.17
	Total R-values =	9.29	17.91
	Convert R-value to U-factor 1/R=	0.1076	0.0558
	Framing Factors (Opaque Wall) x	0.25	0.75
	Framing Factor 16" OC 21% Plus Headers 4%	0.0269	0.0419
	Add U-factors for Uw	Uw=	0.0688
	Note: for ASHRAE Trade-off Shall Convert to System R-value R(av) 1/Uw	R(av.)=	**14.54**

*R-value per 2001 ASHRAE Handbook Fundamentals, ASTM C-236/C-976/C518, or NER/Compliance Report. All insulation products shall have a FTC Fact Sheet. The higher the R-value the greater the insulating power. Ask your seller for FTC Fact sheet on R-values. To get the marked R-value, it is essential that the insulation be installed properly.

Builders Name/Company_____ Job_____
Address _____ Location_____
City State _____
Signature _____

This space for Designer and/or Bldg Dept Stamp(s)

Parallel Path Worksheet	**TABLE 502.2.2.1.1.1 R-value of Steel Stud Wall Example**	R-Value Between Framing
Component	**R-values of Product(s)**	
Inside Air Film		0.68
Inside Wall Material	Drywall: 1/2" _x_R-0.45 5/8"__ R-0.56; Paneling __ R-0.25 Other __ R-___ (Product)_____	0.45
Insulation	__R-11 _x_R-13 __R-15 __R-19 __R-21 __R-25 __R-18 (R-19 compressed to 5 1/2") Cellulose Fiber__ R-12 (3.5pcf x 3 ½") __Foam Type_____& Thick._____ inch R-_____ __Other R-___ Product_____ Correction Factors per ASHRAE 90.1; 90.2 & MEC Table 502.2.1 Correction Factor: 2x4 16" OC: R-11=0.5; R-13=0.46; R-15=0.43. 2x4 24" OC: R-11=0.60; R-13=0.55; R-15=0.52. 2x6 16" OC: R-19=0.37; R-21=0.35. 2x6 24" OC: R-19=0.45; R-21=0.43. 2x8 16" OC R-25=0.31. 2x8 24" OC: R-25=0.38. **Correction Factor for metal framing.....(R-13).....** Cavity corrected R-value	13 **0.46** 5.98
Sheathing	Fiber bd.: 1/2" Reg.__ R-1.32 1/2" Intermediate__R-1.22 25/32" Fiber bd. __ R-2.06 Paperboard __ R-0.20 Plywood/OSB __ 3/8 R-0.47 __1/2" R-0.62 __5/8" R-0.77 __3/4" R-0.93 Gypsum Sheathing __1/2" R-0.45 __5/8" R-0.56 Foam:__R-2.0;_R-3.0;__R-4.0;__R 5.0;__R-6.0;_R-7.0;__R-8.0; __R-10.0 __EPS R-3.85/in.__ Extruded Styrene R-5/in.__ Polyiso R-5.6-8.0/in Other __ R-___ (Product) _____	5.00
Air Space	__Non-Reflective R-0.70 __Reflective R - 2.1 3/4" to 1 1/2"; Other __R-____ Type_____	
Exterior Cladding	Hardboard__ R-0.67; 1/2"; Wood Drop 1x8 __R-0.79 Plywood:3/8"__R-0.47;1/2"_x_R-0.62;5/8"__R-0.77;3/4"__R-0.93 Beveled Lap: 1/2"__ R-0.81; 3/4"__ R-1.05 Metal & Vinyl Siding (hollowed-backed) __R-0.61; Brick __ 0.44 Stucco__R-0.2; Other __ R-___ Product: _____R-value based on ASHRAE or ASTM C-236	0.62
Outside Air Film		0.17
	Total R-values	12.90

*R-value per ASHRAE Handbook Fundamentals or ASTM C-236.

Builder's Name/Company_____ This Space for Designer and/or Bldg Dept Stamps

Address _____

City State _____

Signature_____

Parallel Path Worksheet	**TABLE 502.2.2.1.1.1 R-value of Steel Stud Wall**	R-Value Between Framing
Component	**R-values of Product(s)**	
Inside Air Film		0.68
Inside Wall	Drywall: 1/2" __R-0.45 5/8"__ R-0.56; Paneling __ R-0.25	
Material	Other __ R-___ (Product)_____	
Insulation	__R-11 __R-13 __R-15 __R-19 __R-21 __R-25 __R-18 (R-19 compressed to 5 1/2") Cellulose Fiber__ R-12 (3.5pcf x 3 1/2") __Foam Type_____& Thick._____ inch R-_____ __Other R-___ Product_____ Correction Factors per ASHRAE 90.1; 90.2 & MEC Table 502.2.1 Correction Factor: 2x4 16" OC: R-11=0.5; R-13=0.46; R-15=0.43. 2x4 24" OC: R-11=0.60; R-13=0.55; R-15=0.52. 2x6 16" OC: R-19=0.37; R-21=0.35. 2x6 24" OC: R-19=0.45; R-21=0.43. 2x8 16" OC R-25=0.31. 2x8 24" OC: R-25=0.38.	
	correction factor from above	
Correction Factor	Cavity corrected R-value	
Sheathing	Fiber Bd: 1/2" Reg.__ R-1.32 1/2" Intermediate__R-1.22 25/32" Fiber Bd __ R-2.06 Paperboard __ R-0.20 Plywood/OSB __ 3/8 R-0.47 __1/2" R-0.62 __5/8" R-0.77 __3/4" R-0.93 Gypsum Sheathing __1/2" R-0.45 __5/8" R-0.56 Foam:__R-2.0;_R-3.0;__R-4.0;__R 5.0;__R-6.0;_R-7.0;__R-8.0; __R-10.0 __EPS R-3.85/in.__ Extruded Styrene R-5/in.__ Polyiso R-5.6-8.0/in Other __ R-___ (Product) _____	
Air Space	__Non-Reflective R-0.70 __Reflective R- 2.1 3/4" to 1 1/2"; Other __R-____ Type_____	
Exterior Cladding	Hardboard__ R-0.67; 1/2"; Wood Drop 1x8 __R-0.79 Plywood:3/8"__R-0.47;1/2"__R-0.62;5/8"__R-0.77;3/4"__R-0.93 Beveled Lap: 1/2"__ R-0.81; 3/4"__ R-1.05 Metal & Vinyl Siding (hollowed-backed) __R-0.61; Brick __ 0.44 Stucco__R-0.2; Other __ R-___ Product: _____R-value based on ASHRAE or ASTM C-236	
Outside Air Film		0.17
	Total R-values	

*R-value per ASHRAE Handbook Fundamentals or ASTM C-236. All insulation products shall have a FTC Fact Sheet.

The higher the R-value the greater the insulating power. Ask your seller for the fact sheet on R-values.

To get the marked R-value, it is essential that the insulation be installed properly.

Builder's Name/Company_____ This Space for Designer and/or Bldg Dept. Stamps

Address _____

City State _____

Signature_____

WINDOW PRODUCT RATING, CERTIFICATION, AND LABELING

The Georgia Energy Code, Section 102.5.2 requires that fenestration products (window, glass door and skylight) shall be labeled with its U-factor and Solar Heat Gain Coefficient (SHGC). Fenestration products U-factor and SHGC shall be determined by an accredited, independent laboratory in accordance with NFRC 100 for U-factor and NFRC 200 for SHGC, or from default values from Table 102.5.2(1) for U-factor and Table 102.5.2(3) for SHGC. Manufacturers that label their products with NFRC U-factors and SHGCs shall either use an NFRC label (see sample NFRC label below) or a label of their own design. The label shall list as a minimum: U-factor, SHGC, frame type, number of panes of glazing, whether the window is fixed or operable, and the type of glazing tint, if present. The label shall contain the words "Meets Thermal Break Criteria" if the product claims a U-Factor based on a thermal-break product:

National Fenestration Rating Council (NFRC) – U-factor and SHGC

Below is a sample window label of NFRC-determined energy performance values that code officials should look for during inspections:

Fig. 102.5.2

Note: This sample window label also contains "Visible Transmittance" (VT) performance values. The Georgia Energy Code does not establish minimum requirements for VT, but this and other information that might be useful to builders, designers, consumers, and others (like air leakage rates) may also be present on labels used by some manufacturers.

Default U-factor and SHGC

If NFRC 100 and NFRC 200 are not used to determine product U-factor and SHGC, then manufacturers shall obtain default values from Table 102.5.2(1) for U-factor and Table 102.5.2(3) for SHGC and label the product with a "Default Window Label." Manufacturers or assemblers shall label their products with default U-factors and SHGCs, for example, site built and shop assembled windows without NFRC labels, shall follow the format of the sample default label below. This label shall list as a minimum: Default U-factor from Table 102.5.2(1), Default SHGC from Table 102.5.2(3), frame type, number of panes of glazing, whether the window is fixed or operable, and the type of glazing tint, if present. The label shall contain the words "Meets Thermal Break Criteria" if the product claims a U-Factor based on a thermal-break product:

<<Sample Window Label of DEFAULT Energy Performance Values>>

DEFAULT **Window Label**	**Manufacturer/Assembler Certifying to Default U-factor and Default SHGC:** **XYZ Supply Co.**
Key Features:	Double Pane Operable Wood frame Bronze Tint
U-FACTOR **Default U-factor (from Table 102.5.2(1)):**	**SHGC** **Default SHGC (from Table 102.5.2(3)):**
0.55	**0.46**

Table 502.2.3.1(1a)

Wall R-values* 2 x 4 Wood Studs 16" OC (Insulation plus sheathing)

R-11	R-12	R-13	R-14	R-15	R-16	R-17	R-18	R-19	R-20
R-11 Batts & Plywood/ OSB (R-10.90) (U-0.0917)	R-11 Batts & Fiberboard (R-11.68) (U-0.0859)	R-11 Batts & R-2 Foam (R-12.42) (U-0.0805)	R-11 Batts & R-3 Foam (R-13.49) (U-0.0741)	R-11 Batts & R-4 Foam (R-14.56) (U-0.0687)	R-11 Batts & R-5 Foam (R-15.61) (U-0.0641)	R-11 Batts & R-6 Foam (R-16.66) (U-0.060)	R-11 Batts & R-7 Foam (R-17.69) (U-0.0565)	R-11 Batts & R-8 Foam (R-18.73) (U-0. 0534)	R-11 Batts & R-9 Foam (R-19.76) (U-0.0506)
	R-11 Plywood /OSB Fiberboard (R-12.35) (U-0.0810)	R-13 Batts & Gypsum on Two Sides (Garages) (R-11.52) (U-0.087)	R-13 Batts & Fiberboard (R-12.64) (U-0.0791)	R-13 Batts & R-2 Foam (R-13.41) (U-0.0746)	R-13 Batts & R-3 Foam (R-14.53) (U-0.0688)	R-13 Batts & R-4 Foam (R-15.62) (U-0.0640)	R-13 Batts & R-5 Foam (R-16.71) (U-0.0599)	R-13 Batts & R-6 Foam (R-17.78) (U-0. 0562)	R-13 Batts & R-7 Foam (R-18.84) (U-0.0531)
		R-13 Batts & Plywood /OSB (R-11.83) (U-0.0846)	R-13 Plywood /OSB Fiberboard (R-13.34) (U-0.0750)	R-15 Batts & Plywood /OSB (R-12.65) (U-0.0790)	R-15 Batts & Fiberboard (R-13.5) (U-0.0741)	R-15 Batts & R-2 Foam (R-14.31) (U-0.0699)	R-15 Batts & R-3 Foam (R-15.47) (U-0.0646)	R-15 Batts & R-4 Foam (R-16.61) (U-0. 0602)	R-15 Batts & R-5 Foam (R-17.73) (U-0.0564)
					R-13 Batts R-0.62 OSB R-3 Foam (R-15.21) (U-0.0657)	R-13 Batts R-0.62 OSB R-4 Foam (R-16.3) (U-0.0614)	R-13 R-0.62 OSB R-5 Foam (R-17.37) (U-0.062)	R-19 Batts & Plywood /OSB (R-15.84) (U-0. 0631)	R-19 Batts & Fiberboard (R-16.64) (U-0.0601)

*Note: Wall R-values shown in this chart are for the insulated (opaque) wall areas based on 25% framing factor; does not include any fenestration (windows and doors).

TABLE 502.2.3.1(1b)

Wall R-value 3 5/8" Steel Stud 16" OC (Insulation plus sheathing)

R-11	R-13	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24
R-11 Batts & Plywood/ OSB (R-8.02) (U-0.1247)		R-11 Batts & R-3 Foam (R-10.40) (U-0.0962)	R-11 Batts & R-4 Foam (R-11.40) (U-0.0877)	R-11 Batts & R-5 Foam (R-12.40) (U-0.0641)	R-11 Batts & R-6 Foam (R-13.40) (U-0.0476)	R-11 Batts & R-7 Foam (R-14.40) (U-0.0694)	R-11 Batts & R-8 Foam (R-15.40) (U-0.0649)		R-11 Batts & R-10 Foam (R-17.40) (U-0575)			
R-11 Batts & Gypsum two sides (garage) (R-7.76) (U-0.1289)	R-13 Batts & Plywood/ OSB (R-8.50) (U-0.1176)		R-11 Batts & R-4 Foam over Plywood (R-12.02) (U-0.0832)	R-13 Batts & R-3 Foam (R-10.88) (U-0.0919)	R-13 Batts & R-4 Foam (R-11.88) (U-0.0842)	R-13 Batts & R-5 Foam (R-12.88) (U-0.0776)	R-13 Batts & R-6 Foam (R-13.88)	R-13 Batts & R-7 Foam (R-14.88) (U-0.0672)	R-13 Batts & R-8 Foam (R-15.88) (U-0630)		R-13 Batts & R-10 Foam (R-17.88) (U-0560)	
	R-13 Batts & Gypsum two sides (garage) (R-8.24) (U-0.1214)		R-15 Batts & Plywood/ OSB (R-8.97) (U-0.1115)		R-13 Batts & R-4 Foam over Plywood/ OSB (R-12.50) (U-0.080)	R-13 Batts & R-4 Foam over Plywood /OSB (R-13.50) (U-0.0741)	R-15 Batts & R-4 Foam (R-12.35) (U-0.0810)	R-15 Batts & R-5 Foam (R-13.35) (U-0.0749)		R-15 Batts & R-7 Foam (R-15.35) (U-0.0651)	R-15 Batts & R-8 Foam (R-16.35) (U-0.0612)	
							R-19 Batts & Plywood/ OSB (R-9.55) (U-0.1047)			R-19 Batts & R-3 Foam (R-11.93)	R-19 Batts & R-4 Foam (R-12.93) (U-0773)	R-19 Batts & R-5 Foam (R-13.93) (U-0.0718)

TABLE 502.2.3.1(1b) continued.
Wall R-value 6" Steel Stud 16" OC (Insulation plus sheathing)

R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26
R-19 Batts with OSB /Plywood 20% (R-9.55) (U-0.1047)	R-19 Batts with Fiber board (R-10.25) (U-0.0976)	R-19 Batts with R-2 Foam (R-10.93) (U-0.0915)	R-19 Batts with R-3 Foam (R-11.93) (U-0.0838)	R-19 Batts with R-4 Foam (R-12.93) (U-0.0.0773)	R-19 Batts with R-5 Foam (R-13.93) (U-0.0718)	R-19 Batts with R-6 Foam (R-14.93) (U-0.0670)	R-19 Batts with R-7 Foam (R-15.93) (U-0.0628)
R-19 Batts & Gypsum two sides (garage) (R-9.29) (U-0.0933)		R-21 Batts with Plywd/OSB (R-9.87) (U-0.1013)	R-21 with Fiberboard (R-10.57) (U-0.0946)	R-21 with R-2 Foam (R-11.25) (U-0.0889)	R-21 with R-3 Foam (R-12.25) (U-0.0816)	R-21 with R-4 Foam (R-13.25) (U-0.0755)	R-21 with R-5 Foam (R-14.25) (U-0.0702)

R-value of cladding is R- 0.60 generic based on R-value of siding ½"-5/8" plywood siding (0.59-0.62)

TABLE 502.2.1
SUMMARY OF MINIMUM INSULATION VALUES
MAXIMUM U-FACTOR FOR ENVELOPE COMPONENTS

ELEMENT	MODE	TYPE A-1 & A-2 RESIDENTIAL BUILDINGS R-value
Walls Stud	Heating or cooling	R-11
Walls Masonry/CMU [1]	Heating or cooling	R-5
Attic Knee Walls[2]	Heating or cooling	R-19
Roof/ceiling	Heating or cooling	R-19
Floor over unheated spaces	Heating or cooling	R-11
Windows[3]	Heating or cooling	U-0.65 with max. SHGC 0.40

Note 1: Any Mass wall above or below grade

Note 2. Attic Knee wall for purpose of Georgia Energy Code is defined as any vertical or near vertical wall in the building envelope that has conditioned space on one side and attic space on the other side.

Exception: When the attic space formed by the Attic Knee Wall, the ceiling of the floor below and the sloped roof is not vented and the sloped roof is insulated (the insulated roof is the building envelope).

Note 3: Maximum window U-factor shall be 0.65 and maximum SHGC shall be 0.40. These window requirements shall have a delayed implementation date of January 1, 2004.

"Single-Step" Residential Energy Code Compliance
Climate Zone 4B –South Georgia– Option 4B-1

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 4B, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 2,000 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.55 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.65 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-30**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Wall Sheathing** [4]	**Plywood/OSB**
-**Floor** Insulation	**R-11**
-**Basement** Masonry wall insulation	**R-5**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in South Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-30.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance
Climate Zone 5A –South Central Georgia– Option 5A-1

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 5A, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 2,500 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) ___

-% Openings in gross area of exterior wall[1]	**18% Max.**
-Doors U-factor	**0.55 Max.**
-Windows, Double Pane, U-factor[2]	**0.60 Max.**
-Solar Heat Gain Coefficient (SHGC)[2]	**0.40 Max.**
-Ceiling insulation[3]	**R-30**
-Wall cavity insulation	**R-13**
-Knee Wall insulation	**R-19**
-Wall Sheathing [4]	**Plywood/OSB**
-Floor Insulation	**R-11**
-Basement Masonry wall insulation	**R-5**
-Slab Perimeter Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in South Central Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit

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Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-30.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 6B –Central Georgia– Option 6B-1

(R-30 ceiling, R-13 batt + R-2 sheathing, 0.55=Uwindow)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 6B, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 3,000 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.55 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.55 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-30**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Insulating Sheathing** [4]	**R-2**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-6**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in Central Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.
At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-30.

Note 4: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 6B –Central Georgia– Option 6B-2

(R-38 ceiling, R-13 batt, 0.55=Uwindow)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 6B, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 3,000 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.55 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.55 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-38**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Wall Sheathing** [4]	**Plywood/OSB**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-6**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in Central Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-30.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 7A -Greater Atlanta Area– Option 7A-1

(R-30 ceiling, R-13 batt + R-3 sheathing, 0.55=Uwindow)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 7A, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 3,500 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.35 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.55 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-30**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Insulating Sheathing** [4]	**R-3**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-7**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in the Greater Atlanta area. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to obtain full height R-30.

Note 4: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 7A -Greater Atlanta Area– Option 7A-2

(R-38 ceiling, R-15 batt +OSB/Plywood)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 7A, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 3,500 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.35 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.55 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-38**
-**Wall** cavity insulation	**R-15**
-**Knee Wall** insulation	**R-19**
-**Wall Sheathing** [4]	**Plywood/OSB**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-7**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in the Greater Atlanta area. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-38.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 7A -Greater Atlanta Area– Option 7A-3

(R-30 ceiling, R-13 batt, 0.45=Uwindow)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 7A, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 3,500 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
8. Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.55 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.45 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-30**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Wall Sheathing** [4]	**Plywood/OSB**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-7**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in the Greater Atlanta area. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-30.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 8 –North Georgia– Option 8-1

(R-38 ceiling, R-13 Batt + R-3 Sheathing)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 8, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 4,000 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.55 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.50 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-38**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Insulating Sheathing** [4]	**R-3**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-8**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in North Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.

At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-38.

Note 4: When the Exterior Wall R-value is cavity insulation and continuous insulated sheathing, 25% of the gross wall area may be Plywood/OSB (for corner bracing/structural requirements) or gypsum fastened direct to the garage wall studs..

Note 5: Unheated slabs.

"Single-Step" Residential Energy Code Compliance

Climate Zone 8 –North Georgia– Option 8-2

(R-38 ceiling, R-13 Batt + OSB/Plywood)

You are "deemed to comply" with the *Georgia State Energy Code for Buildings* if your residential structure meets the following conditions:

1. Your building shall be a one or two family detached dwelling built using wood framing.
2. Your building is three stories or less in height and not larger than 5,000 square feet of conditioned area.
3. Your building site must be located in Climate Zone 8, as shown in the IECC 2000 Figure 302.1(11), an area of the state where the climatic conditions of approximately 4,000 Heating Degree Days or less apply.
4. You shall not make any substitutions of any kind for R-values/U-factors listed below.
5. Your window and door openings shall not exceed 18 percent of the gross wall area.
6. You shall comply with code requirements for envelope air sealing including all air tight, I. C. rated light fixtures in ceilings with attics and seal all ductwork with mastic.
7. Equipment minimum efficiencies shall be observed:
   Gas furnace: AFUE min 78%; A/C or Heat pump: SEER 10.0; Heat pump: HSPF 6.8; other (explain) _____

-**% Openings** in gross area of exterior wall[1]	**18% Max.**
-**Doors** U-factor	**0.35 Max.**
-**Windows**, Double Pane, U-factor[2]	**0.45 Max.**
-**Solar Heat Gain Coefficient** (SHGC)[2]	**0.40 Max.**
-**Ceiling** insulation[3]	**R-38**
-**Wall** cavity insulation	**R-13**
-**Knee Wall** insulation	**R-19**
-**Wall Sheathing** [4]	**Plywood/OSB**
-**Floor** Insulation	**R-19**
-**Basement** Masonry wall insulation	**R-8**
-**Slab Perimeter** Insulation [5]	**R-0**

All R-values shall be printed on the actual insulation and be stabilized R-values
All Windows shall have labels listing U-factor, SHGC, and Key Features

Foam Plastics shall not be installed below grade on foundation walls or below grade on slab foundations. These R-values may result in some degree of "over-design". However, this method will apply to a majority of one and two family residences built in North Georgia. If you must change one or more of the R-values/U-factors listed to a lower R-value or higher U-factor, then do not use this method. **No substitutions are allowed here.**

Instead, you may use one of the other methods to show compliance, such as The Tradeoff Worksheet or the free MECcheck software (available at www.energycodes.gov). You may also use one of the Chapter 4, 5, or 6 approaches of the 2000 IECC with Georgia modifications.
At the time a permit is requested, you shall show how you plan to meet the Georgia Energy Code. When using the ***"Single-Step" Residential Energy Code Compliance*** method, you may not be required to turn in additional paperwork to obtain a building permit.

Note 1: "% Openings" is defined by the total area of the openings of windows and doors divided by the total gross area of the exterior wall. % Openings = 100 x (windows + doors) / (opaque walls + windows + doors).

Note 2: Up to 5% of the window area may be exempt from meeting the window U-factor and SHGC requirements to allow for decorative glazing.

Note 3: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area and provided the flat portions of the ceiling are insulated to R-38.

Note 4: Insulating values for plywood, OSB or other structural sheathing are already accounted for in the approach. Garage walls may be R-13 cavity insulation with gypsum on both sides.

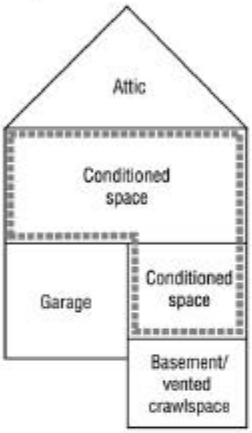
Note 5: Unheated slabs

Building Envelope

The elements of a building which enclose conditioned spaces through which thermal energy is capable of being transferred to or from the exterior or to or from spaces exempted by the provisions of Section 101.4.1. —*2000 IECC*

The *building envelope* is the barrier that separates the conditioned space from the outside or unconditioned spaces. The building envelope consists of two parts - an air barrier and a thermal barrier that must be both continuous and contiguous (touching each other). In a typical residence, the building envelope consists of the roof, walls, windows, doors, and foundation. Examples of unconditioned spaces include attics, vented crawlspaces, basements with ceiling insulation and no HVAC supply registers, and garages.

Example 1

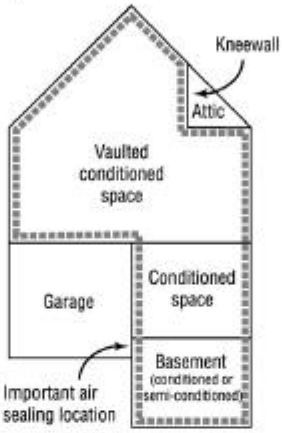


This is a conventional approach that likely locates all ductwork in unconditioned spaces.

Example R-values

- ☐ Flat ceiling: R-30
- ☐ Exterior walls: R-13 + R-3 sheathing
- ☐ Floor over garage and basement/crawl: R-19
- ☐ Ductwork sealed with mastic and insulated to R-8
- ☐ Garage**, attic and basement/crawl are unconditioned spaces

Example 2

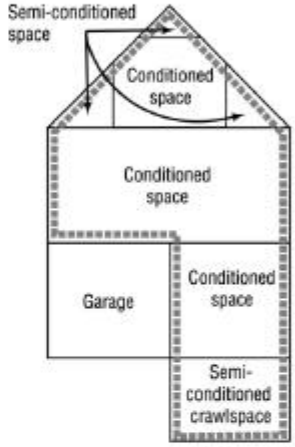


If supply registers deliver conditioned air to basement, it is considered conditioned. With no supply air, it is considered a semi-conditioned space.

Example R-values

- ☐ Flat ceiling: R-38
- ☐ Kneewalls*: R-19 (required)
- ☐ Vaulted ceiling: R-25
- ☐ Exterior walls: R-13 + R-3 sheathing
- ☐ Basement masonry walls: R-7
- ☐ Basement slab: R-0
- ☐ Ductwork sealed with mastic and insulated to R-8
- ☐ Garage** and attic are unconditioned spaces

Example 3



The top conditioned floor functions as a vaulted ceiling with interior walls althought it appears to have kneewalls and a flat ceiling. An advantage of this approach is that all upstairs ductwork is located inside the building envelope.

The crawlspace walls are insulated and do not contain vents. The crawlspace ground is covered with concrete or 100% plastic to function as a "mini-basement."

Example R-values

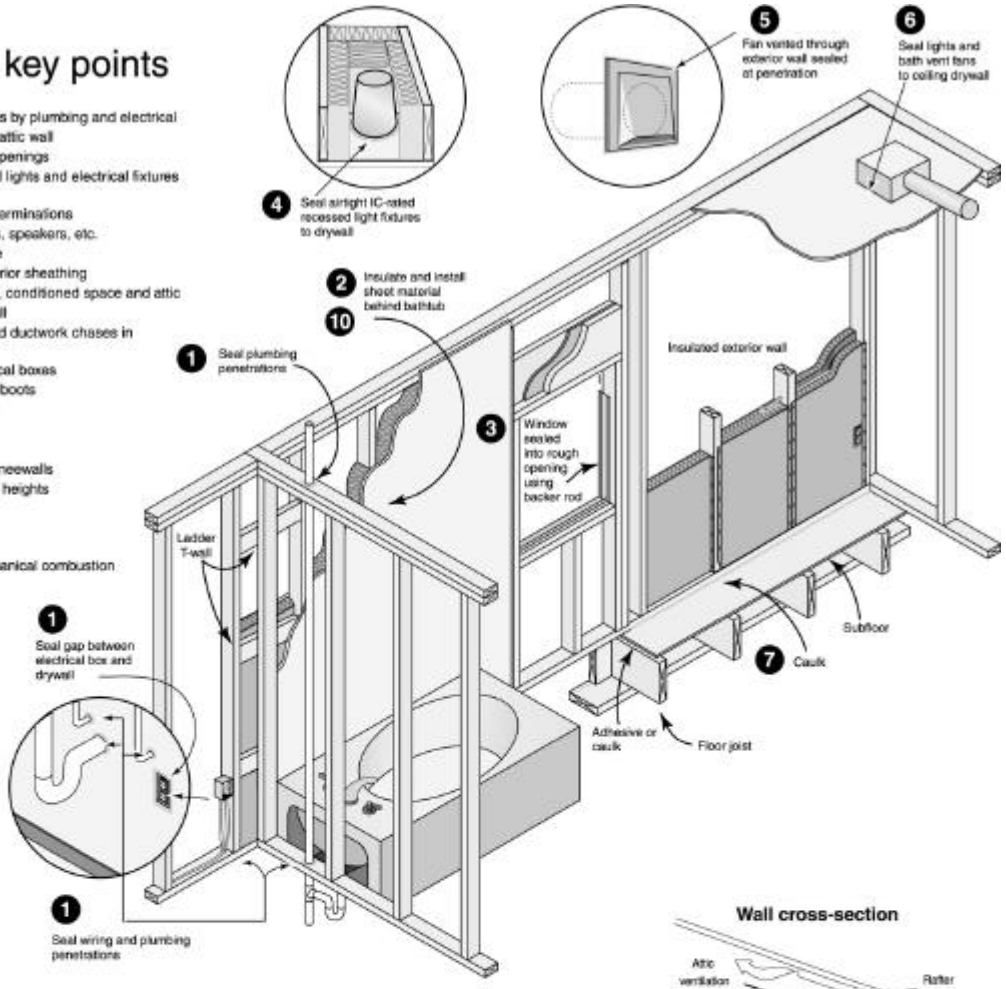
- ☐ Vaulted ceiling: R-25
- ☐ Exterior walls: R-13 + R-3 sheathing
- ☐ Crawlspace walls: R-7
- ☐ Ductwork sealed with mastic and insulated to R-6
- ☐ Garage** is unconditioned space

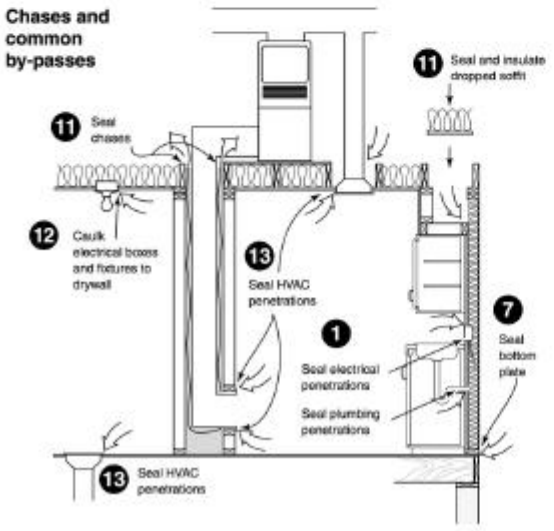
*Note: An *attic kneewall* is any vertical wall that separates conditioned space from an unconditioned attic. In Georgia, kneewalls must be insulated to R-19. An attic-side air barrier (OSB, foil-faced sheathing, etc.) is recommended.

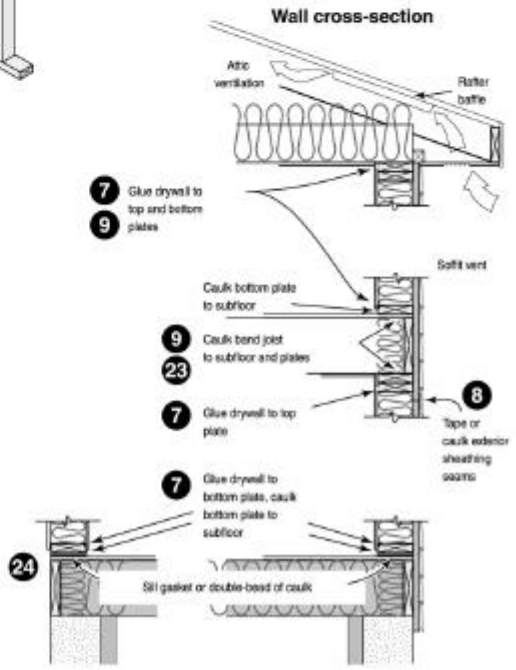
**Note: Although there is nothing to prevent the garage walls from being insulated, due to indoor air quality concerns, the garage should never be considered inside the building envelope.

Air sealing key points

1. Plate and wall penetrations by plumbing and electrical
2. Tub/shower on outside or attic wall
3. Window and door rough openings
4. Airtight, IC-rated recessed lights and electrical fixtures exposed to attic
5. Exterior wall exhaust fan terminations
6. Ceiling mounted bath fans, speakers, etc.
7. Bottom plate and top plate
8. Seams between rigid exterior sheathing
9. Band area between floors, conditioned space and attic
10. Garden tub on exterior wall
11. Mechanical equipment and ductwork chases in attics, crawlspaces
12. Ceiling/crawlspace electrical boxes
13. Ceiling/crawlspace HVAC boots
14. Shower and tub drain line
15. Fireplace inserts
16. Attic kneewall doors
17. Joist cavities under attic kneewalls
18. Transition between ceiling heights (e.g., 10' to 8')
19. Attic scuttle hole
20. Attic pull-down stairs
21. Wall penetrations of mechanical combustion closets
22. Thresholds at mechanical combustion closet doors
23. Band joist exposed to exterior
24. Band area exposed to unconditioned space (such as basement or garage)
25. Exterior wall penetrations for refrigeration lines, condensate line, etc.





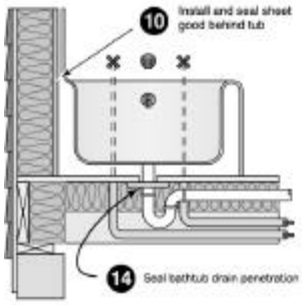


Appendix

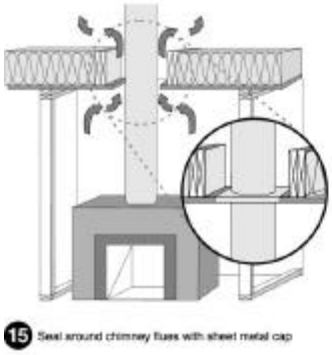
Air sealing key points *continued*

Window rough opening

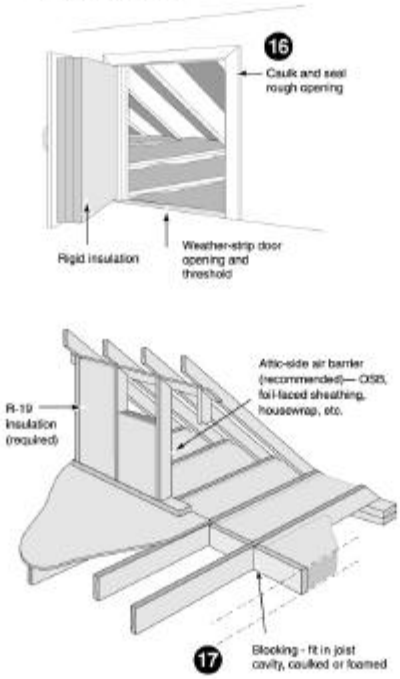
Shower/tub drain rough opening



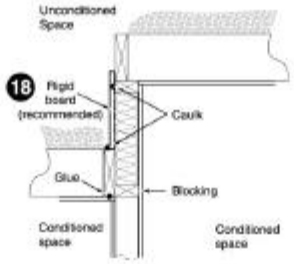
Combustion chase penetrations



Attic knee-walls

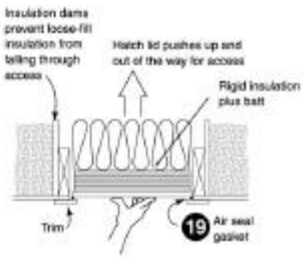


Two-level attic

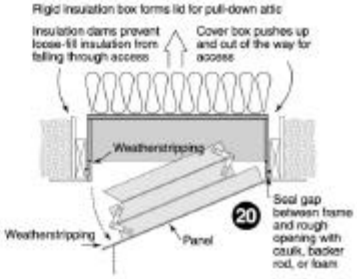


Disclaimer:
This document is intended solely to help graphically demonstrate the air leakage provisions of section 502.1.4 of the 2000 IECC. It does not cover all airsealing locations or techniques. Other code provisions may be applicable as well.

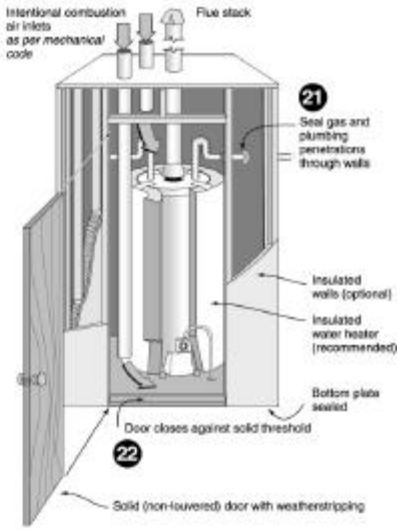
Attic scuttle



Attic pull-down stairs



Combustion closet



Exterior penetrations

Take-off for Trade-off Worksheet or MECcheck

Window & Door Square Footage											
Wood Windows			Total	Metal & Vinyl Windows			Total	Doors			Total
size	Quantity	Sq Ft	Sq Ft	size	Quantity	Sq Ft	Sq Ft	size	Quantity	Sq Ft	Sq Ft
20x32		7.7		20x30		6.0		20x68		12.0	
24x32		8.9		24x30		7.0		26x68		16.7	
28x32		10.1		28x30		8.0		28x68		17.8	
30x32		11.2		30x30		9.0		30x68		20.0	
20x310		8.2		20x32		6.3		50x68		33.3	
24x3'10"		9.5		24x32		7.4		54x68		35.6	
28x310		10.7		28x32		8.4		60x68		40.0	
30x310		12.0		30x32		9.5		Side Lt		5.6	
34x310		13.2		20x44		8.7		Other			
20x46		10.7		24x44		10.1				Total	
24x46		12.3		28x44		11.6					
28x46		13.9		30x44		13.0					
30x46		15.5		34x44		14.4					
34x46		17.1		20x46		9.0					
20x52		12.1		24x46		10.5					
24x52		14.0		28x46		12.0					
28x52		15.8		30x46		13.5					
30x52		17.6		34x46		15.0					
34x52		19.5		40x46		18.0					
24x62		16.5		50x46		22.5					
28x62		18.7		28x50		13.3					
30x62		20.9		30x50		15.0					
34x62		23.0		34x50		16.7					
Radius				20x52		10.3					
20		1.6		24x52		12.1					
24		2.1		28x52		13.8					
26		2.5		30x52		15.5					
28		2.8		34x52		17.2					
2		3.5		24x60		14.0					
40		6.3		28x60		16.0					
50 vinyl		9.8		30x60		18.0					
54		11.2		18x62		10.3					
60		14.1		24x62		14.4					
Other windows				28x62		16.4					
40x40		18.2		30x62		18.5					
				34x62		20.6					
				Other windows							
				40x20		8.0					
				2' Oct		3.7					
		Total		12"x28		2.7					
For wood windows add +2.5" width + 4" height				10"x28		2.2					
				20 Oct		3.7					
						Total					

Perimeter (slab)	
Ceiling Area R-30	
R-19	
Floor Area R-19	
R-30	

Total all windows	
Total all openings	
Gross Wall area	
Plywood/OSB	
Knee Walls	
Gypsum 1 sides	
Other	

Conversion inches to decimal

1"=	0.0833
2"=	0.1667
3"=	0.25
4"=	0.3333
5"=	0.4167
6"=	0.5
7"=	0.5833
8"=	0.6667
9"=	0.75
10"=	0.8333
11"=	0.9167

Percent Openings

Job/Model Name		
Location		
Permit Holder		
Signature		
Name & Co doing Takeoff		
Date	Phone:	Fax

Take-off for Trade-off Worksheet or MECcheck (Example)

Window & Door Square Footage											
Wood Windows			Total	Metal & Vinyl Windows			Total	Doors			Total
size	Quantity	Sq Ft	Sq Ft	size	Quantity	Sq Ft	Sq Ft	size	Quantity	Sq Ft	Sq Ft
20x32		7.7		20x30		6.0		20x68		12.0	
24x32		8.9		24x30		7.0		26x68		16.7	
28x32		10.1		28x30		8.0		28x68	1	17.8	17.8
30x32		11.2		30x30		9.0		30x68	1	20.0	20
20x310		8.2		20x32		6.3		50x68		33.3	
24x3'10"		9.5		24x32		7.4		54x68		35.6	
28x310		10.7		28x32		8.4		60x68		40.0	
30x310		12.0		30x32		9.5		Side Lt		6.7	
34x310		13.2		10x44		4.3		50Slider	1	33.34	33.34
20x46		10.7		30x44		13.0			2	Total	71.14
24x46		12.3		28x40		10.7					
28x46		13.9		30x40		12.0					
30x46		15.5		34x40		13.3					
34x46		17.1		20x46		9.0					
20x52		12.1		24x46		10.5					
24x52		14.0		28x46		12.0					
28x52		15.8		30x46		13.5					
30x52		17.6		34x46		15.0					
34x52		19.5		40x46		18.0					
24x62		16.5		50x46		22.5					
28x62		18.7		28x50	9	13.3	119.97				
30x62		20.9		30x50		15.0					
34x62		23.0		34x50		16.7					
Radius				20x52		10.3					
20		1.6		24x52		12.1					
24		2.1		28x52		13.8					
26		2.5		30x52		15.5					
28	1	2.8	2.8	20x60		12.0					
30		3.5		24x60		14.0					
40		6.3		28x60	4	16.0	64				
50		9.8		30x60		18.0					
54		11.2		40x60	1	24.0	24				
60		14.1		24x62		14.4					
Other windows				28x62		16.4					
40x3 10		17.5		30x62		18.5					
Tri Angle		2.5		34x62		20.6					
Trapezoid		13.6		Other windows							
				40x44	1	17.3	17.3				
				2' Oct		3.7					
1		Total	2.8	12"x60"		5.0					
For wood windows add				10"x28		2.2					
+2.5"width + 4" height				10"x3o		2.5					
					15	Total	225.29				

Perimeter (slab)	154.0	Total all windows	16
		Total all openings	299.2
Ceiling Area R-30	1044.0	Gross Wall area	2682.2
R-19	30.0	Plywood/OSB	640.0
Floor Area R-19	1078.0	Knee Wall	
R-30		Gypsum 2 sides	234.0
		Foam	1808.2

Conversion inches to decimal

1"=	0.083333
2"=	0.166667
3"=	0.25
4"=	0.3333
5"=	0.416667
6"=	0.5
7"=	0.583333
8"=	0.6667
9"=	0.75
10"=	0.833333
11"=	0.916667

Percent Openings
11.2%

Job/Model Name		
Location		
Permit Holder		
Signature		
Name & Co doing Takeoff		
Date	Phone	Fax

"SINGLE STEP" COMPLIANCE
FOR SIMPLE COMMERCIAL BUILDINGS

The Single Step Compliance procedure is available only for small commercial buildings with simple HVAC systems. If you demonstrate that your building complies with this procedure, you are deemed to comply with the Georgia State Energy Code. You shall complete the documentation on all of the enclosed forms for Envelope, Lighting, and HVAC and Water Heating systems and equipment.

Eligible buildings shall meet all of the following requirements:

1) Two stories or less.
2) 25,000 ft^2 or less gross floor area.
3) Maximum glazing area is 25% of the above-grade gross wall area.
4) Each HVAC system serves a single zone, controlled by a single thermostat in the zone being served.
5) Cooling (if any) is provided by one or more: air-cooled (unitary packaged or split system) air conditioners or geothermal heat pumps that do not exceed 20 tons (each).*
6) Primary heating (if any) is provided by one or more: air-cooled (unitary packaged or split system) heat pumps (with internal supplemental electric resistance heat, if needed), geothermal heat pumps, or fuel-fired furnaces. Supplemental individual electric resistance heaters are limited to a maximum of 5 kW each.*
7) The outside air quantity is 3,000 cfm or less and shall be less than 70% of the total supply air.

*Note: Hydronic or steam distribution systems are not permitted under this Single Step approach.

Failure to meet all of the above criteria precludes use of the Single Step Compliance forms. All other commercial buildings shall demonstrate compliance with any of the other compliance pathways of the Georgia State Energy Code for commercial buildings, and include submittal of proof of compliance.

Complete all information. Print clearly	**GEORGIA COMMERCIAL ENERGY CODE** **Single Step Compliance – Envelope/Insulation Systems** **Maximum 25,000 s.f. and no more than 2 stories (30') in height**

Section 1 - Project Information

Project Name		**Permit #**
Address		**Date**
Designer/Contractor	Phone	**Checked By**
Contact for This Form	Phone	**Date** **For Department Use Only**

Section 2 - General Information

Permit Floor Area: SQFT (Maximum 25,000 SQFT and 30 FT in height allowed using single step method)

Project Type: ☐ New Construction ☐ Addition ☐ Alteration ☐ Unconditioned Shell (requires approval)

Window Area (incl. skylights): _____ SQFT ÷ Gross Ext. Wall Area _____ SQFT = WWR: _____ % (max. 25%)

Section 3 – Requirements Checklist

Air Leakage - All joints and penetrations shall be caulked, gasketed, weather-stripped, or otherwise sealed to limit air leakage as per ASHRAE 90.1-2001 section 5.2.3.1. Windows and doors shall be certified as meeting air leakage requirements. Cargo doors and loading docks are required to have weatherseals. Recessed light fixtures located in the building envelope are required to be air tight, IC-rated fixtures.

Minimum/Maximum Thermal Values:

Description	**Min Req'd R-Value**	**Notes (List Actual Values)**
Framed walls	**R-13**	
Masonry walls – continuous	**R-7**	
Below Grade (basement) Walls	**R-7**	
Slabs - Heated slabs not allowed this option	**R-0**	
Floor over unconditioned space or exterior	**R-10**	
Roof with continuous insulation above deck	**R-18**	
Roof with insulation between framing	**R-30**	
(Insulation not allowed on suspended ceilings)		
Metal Building Roof with purlins:		
< 5 ft o.c. w/ thermal block (insulation between purlins)	**R-25**	
5ft+ o.c. with thermal block	**R-19**	
Description	**Max Allow. U-Factor**	
Doors – Swinging	**0.7**	
Doors – Non-swinging	**1.45**	
Fenestration – Windows	**0.60**	
Fenestration – Skylights (max. 5% of roof area)	**0.65**	
Window Solar Heat Gain Coefficient	**Max Allow. SHGC**	See next page for overhang (PF) multipliers
PF = 0.0 (no shading)	**0.40**	

NOTE: Insulation shall have R-values labeled on the insulation. Windows shall have labels showing U-factor and SHGC. Using this prescriptive one step method, no substitutions are allowed; max/min values shall be adhered to.

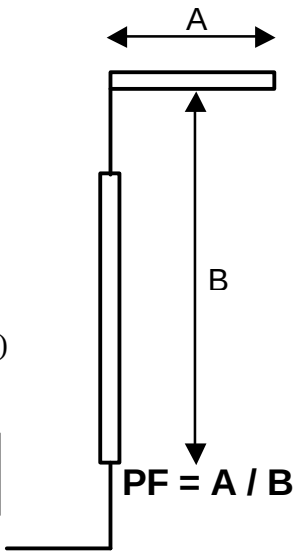
Section 4 - Compliance Statement

The design represented in this document is consistent with the building plans, specifications, and other documents submitted for the construction permit and meets the Georgia State Energy Code requirements.

Principal Envelope Designer - Name	**Signature**	**Date**

NOTE: *This form is required to be on the plans.*

Permanent Projection Factor (PF)
SHGC Multiplier Table



$$PF = \frac{\text{Length of permanent projection} \quad (A)}{\text{Distance from bottom of overhang to bottom of window} \quad (B)}$$

$$SHGC_{fenestration} = SHGC_{glazing} \times SHGC_{Multiplier}$$

Permanent PF Table	
PF	SHGC Multiplier
<0.1	1.00
<0.2	0.91
<0.3	0.82
<0.4	0.74
<0.5	0.67
<0.6	0.61
<0.7	0.56
<0.8	0.51
<0.9	0.47
<1.0	0.44

***Example 1*:** Eight foot, Double paned, clear glazing with SHGC = 0.69, one foot gap over window, and six foot permanent overhang.

$$PF = \frac{6' \ (A)}{9' \ (B)} = \mathbf{0.67}$$

Look up multiplier from chart for PF = 0.67 (between 0.6 and 0.7). Multiplier is 0.56

$SHGC_{fenestration} = SHGC_{glazing} \times SHGC_{Multiplier} = 0.69 \times 0.56 = \underline{0.39}$ (less than 0.4)

Example 2: Ten windows (each 4' x 8') on front façade: Clear glazing SHGC =0.70 with PF = 0.33. Sides of building have twenty windows (each 6' x 6') with no overhang but low-e coating with SHGC = 0.34. Gross wall area is 4,300 sq. ft.

Determine Percent Glazing:
10 x (4 x 8) = 320 sq. ft. plus 20 x (6 x 6) = 720 sq. ft. Total: 1,040 sq. ft.
Window to Wall Ratio (WWR): 100 x (1,040 sq. ft / 4,300 sq. ft.) = 24.2% (less than 25%)

Determine Weighted Average Fenestration SHGC for whole building:
Use the PF chart for the front windows for PF = 0.33 (between 0.3 and 0.4). Multiplier is 0.74
$SHGC_{front\ fenestration} = SHGC_{glazing} \times SHGC_{Multiplier} = 0.70 \times 0.74 = \underline{0.52}$
$SHGC_{side\ fenestration} = \underline{0.34}\ SHGC_{avg} = (A_1 \times SHGC_1 + A_2 \times SHGC_2) / A_{Total} =$
$(320 \times 0.52 + 720 \times 0.34) / 1040 = \underline{0.395}$ (less than 0.4)

Complete all information. Print clearly	**GEORGIA COMMERCIAL ENERGY CODE** **Single Step Compliance – Lighting Systems** **Maximum 25,000 s.f. and no more than 2 stories (30') in height**

Section 1 – Project Information

Project Name		**Permit #**
Address		**Date**
Designer/Contractor	Phone	**Checked By**
Contact for This Form	Phone	**Date** **For Department Use Only**

Section 2 – General Information

Permit Floor Area: SQFT (Maximum 25,000 SQFT and 30 FT in height allowed using single step method)

Project Type: ☐ New Construction ☐ Addition ☐ Alteration ☐ Unconditioned Shell (requires approval)

Section 3 – Requirements Checklist

INTERIOR **Notes:**

Switch required in each space _____
Exceptions: Designated security/emergency areas
Lighting in egress (e.g. corridors/stairs)
Automatic lighting shutoff for buildings > 5,000 SQFT _____
Bi-level switching required _____
Area Exceptions: Spaces w/ single fixture
Areas w/ occupancy sensors
Corridors, storerooms, rest rooms, lobbies
Hotel guest rooms
Hotel guest rooms require master switch _____
1 and 3 lamp florescent fixtures require tandem wiring within space _____
Exceptions: Fixtures not on same switch
Fixtures w/ high frequency electronic ballast

EXTERIOR

Photocell or Automatic Timeclock (7 day, seasonal, 4 hr backup) required _____
Exceptions: Covered areas where required for eye adaptation
All exterior fixtures shall be min. efficacy of 45 lumens/watt (no incandescents)
Exceptions: Low voltage landscape lighting and motion sensor fixtures _____

INTERIOR LIGHTING POWER REQUIREMENTS

Exit signs > 20 watts shall be minimum 35 lumens/watt (no incandescent fixtures) _____
Recessed lighting in building envelope shall be air-tight, IC-rated fixtures _____

☐ Entire Building: Bldg Type: _____Proposed Total Watts: _____

Gross Floor Area _____ SQFT X _____ Allow. Watts/SQFT = _____ Max Allow. Watts

☐ Tenant Area or Portion of Building (see back of this form for allowable values)

Occupancy	Area SQFT	X	Max. W/SQFT	=	Total Watts	Proposed Watts
_____	_____		_____		_____	_____
_____	_____		_____		_____	_____
_____	_____		_____		_____	_____
			Total Max. Allowable Watts		_____	_____ Total

The design represented in this document is consistent with the building plans, specifications, and other documents submitted for the construction permit and meets the Georgia State Energy Code requirements.

Principal Lighting Designer - Name	**Signature**	**Date**

NOTE: *This form is required to be on the plans.* A lighting power table may be incorporated into the lighting fixture schedule.

GA Single Step Commercial Buildings: Maximum Allowable Interior Lighting Power

Building or Area Occupancy Type	Entire Building Watts/SQFT	Tenant Area or Building Portion Watts/SQFT
Auditorium	--	1.6
Bank/financial institution	--	2.0
Classroom/lecture hall	--	1.6
Convention, conference or meeting center	--	1.5
Corridor, restroom, support area	--	0.8
Dining	--	1.4
Exercise center	1.4	1.1
Exhibition hall	--	3.3
Grocery store	1.9	2.1
Gymnasium playing surface	--	1.9
Hotel function	--	2.4
Industrial work < 20 ft ceiling height	--	2.1
Industrial work, 20 ft ceiling height	--	3.0
Kitchen	--	2.2
Library	1.5	1.8
Lobby – hotel	--	1.9
Lobby – other	--	1.0
Mall, arcade, or atrium	--	1.4
Medical and clinical care	1.6	1.6
Museum	1.6	1.6
Office	1.3	1.5
Religious worship	2.2	3.2
Restaurant	1.7	1.7
Retail sales, wholesale showroom	1.9	2.1
School	1.5	--
Storage, industrial, and commercial	0.6	1.0
Theaters – motion picture	1.1	1.0
Theaters – performance	1.4	1.5
Other	0.6	1.0

Exempt Lighting that does not count toward your lighting wattage calculation (these fixtures still require separate controls, except for emergency lighting): -- Not Applicable

Display lighting in galleries, museums and monuments
- Lighting integral to equipment installed by the manufacturer
- Medical and dental specialized lighting
- Theatrical purpose lighting
- Lighting for plant growth or maintenance
- Lighting in spaces for the visually impaired
- Lighting in partitioned retail display areas
- Historic landmark lighting
- Lighting integral to advertising or directional signage
- Exit sign and emergency lighting that is normally off

Complete all information on both pages. Print clearly	**GEORGIA COMMERCIAL ENERGY CODE** **Single Step Compliance – Mechanical Systems** **Maximum 25,000 s.f. and no more than 2 stories (30') in height**

Section 1 - Project Information

Project Name		**Permit #**
Address		**Date**
Contractor/Designer	Phone	**Checked By**
Contact for This Form	Phone	**Date** **For Department Use Only**

Section 2 - General Information

Permit Floor Area: SQFT (Maximum 25,000 SQFT and 2 stories allowed using single step method)

Project Type: ☐ New Construction ☐ Addition ☐ Alteration

Section 3 – Requirements Checklist

HVAC Systems Requirements – Simple Systems (Unitary & Packaged) 20 ton maximum per system

Simplified HVAC Requirements:	**Value / Ö / Yes / NA / Comment:**
An HVAC load calculation shall be performed for the building and be in accordance with an accepted calculation procedure. (such as the ASHRAE Handbook of Fundamentals)	_____
Each system shall serve a single zone with a single thermostat.	_____
The system shall have manual changeover or dual set point control for changing from heating to cooling modes.	_____
Reheat for dehumidification or simultaneous heating and cooling	NOT ALLOWED
If the system is greater than 65,000 Btu/h and has a fan motor greater than ¾ HP, there shall be time clock that: allows start-stop capability for each day of a seven day period, has 10 hour battery backup, provides for manual override in maximum 2 hour increments, has 55 ^{o}F setback and 90 ^{o}F set up capability for off hours temperature setting	_____
If heating and cooling is provided from separate units, the thermostats shall be interlocked to prevent simultaneous heating and cooling.	_____
Airflow balancing shall be within 10% of design parameters	_____
If a heat pump has internal electric resistance heating, the electric heat cannot be used if conditions permit heat pump operation for heat (defrost cycle excepted).	_____
Duct Insulation: Ductwork NOT located in conditioned space: minimum R-8 insulation (insulation requirements for ductwork located within conditioned spaces shall be evaluated as necessary to control condensation)	_____
Pipe Insulation:	
Pipe size less than 1.5" diameter: insulation thickness = 0.5"	_____
Pipe size greater than 1.5" diameter: insulation thickness = 1.0"	_____
Duct sealing: All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed with mastic or with sealant method satisfying UL-181A or 181B (no pressure sensitive, cloth tape shall be used for primary sealing).	_____
Exhausts over 300 cfm (per system) that do not operate continuously shall have gravity or motor operated dampers that shut when system is not in use. Exception: Commercial kitchen grease hoods.	_____
Optimum start control required on systems > 10,000 cfm	_____

Complete all information on both pages. Print clearly	**GEORGIA COMMERCIAL ENERGY CODE** **Single Step Compliance – Mechanical Systems** **Maximum 25,000 s.f. and no more than 2 stories (30') in height**

Equipment Efficiency:			**Value / Ö / Yes / NA / Comment:**
A/C - Air Cooled	65,000	135,000 Btu/h	10.3 EER _____
	> 135,000	240,000 Btu/h	9.7 EER _____
Heat Pumps – shall satisfy both heating and cooling values			
Cooling Mode	65,000	135,000 Btu/h	10.1 EER _____
	>135,000	240,000 Btu/h	9.3 EER _____
Heating Mode	65,000	135,000 Btu/h	3.2 COP _____
	>135,000	240,000 Btu/h	3.1 COP _____
PTACs Cooling mode			9.3 EER _____
PTHPs Cooling mode			9.3 EER _____
Heating mode			2.5 COP _____
Room Air Conditioners (all)			9.7 EER _____
Furnace fired by gas/oil			78% AFUE _____
Groundwater-source Heat Pumps:			
Cooling Mode: <135,000 Btu/h			16.2 EER _____
Heating Mode: <135,000 Btu/h (cooling capacity)			3.6 COP _____
Ground-source Heat Pumps:			
Cooling Mode: <135,000 Btu/h			13.4 EER _____
Heating Mode: <135,000 Btu/h (cooling capacity)			3.1 COP _____

(There are no minimum efficiency requirements for groundwater/ ground-source heat pumps > 135,000 Btu/h)

Domestic Water-Heating System Requirements:

Water heater shall be new manufactured or comply with efficiencies listed in ASHRAE 90.1-2001 Table 7.2.2 _____

Heat traps provided at equipment _____

Pipe insulation: 1" - recirc. systems ½" - 1st 8 ft non recirc. _____

Recirculating systems require automatic shutoff control _____

Section 4 - Compliance Statement

The design represented in this document is consistent with the building plans, specifications, and other documents submitted for the construction permit and meets the Georgia State Energy Code requirements.

Principal Mechanical Designer	**Signature**	**Date**

NOTE: *This form is required to be on the plans.*

End of Amendments.

Errata to the January 1, 2003
Georgia Supplements and Amendments to the
2000 International Energy Conservation Code

Update your copy of the Revised January 1, 2003 Georgia Supplements and Amendments to the International Energy Conservation Code, 2000 Edition, by making the following correction(s):

* Change *MECCheck* where found in Georgia Supplements and Amendments to read *REScheck*

CHAPTER 5
RESIDENTIAL DESIGN BY COMPONENT
PERFORMANCE APPROACH

SECTION R502
BUILDING ENVELOPE REQUIREMENTS

TABLE 502.2.5
PRESCRIPTIVE ENVELOPE COMPONENT CRITERIA ADDITIONS TO AND REPLACEMENT WINDOWS FOR EXISTING TYPE A-1 RESIDENTIAL BUILDINGS

* Change "Gazing" Fenestration U-factor[a] to read "Glazing" Fenestration U factor[a]

TABLES 502.2.4(1) through 502.2.4(5)
PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS

* Change Note 2 for Tables 502.2.4(1) through 502.2.4(5) to read as follows:

Note 2: Sloped ceilings, such as cathedral & tray ceilings, which require batt insulation, may be insulated with R-19 batts, provided the R-19 portion does not exceed 25% of the total ceiling area.

CHAPTER 6
SIMPLIFIED PRESCRIPTIVE REQUIREMENTS FOR RESIDENTIAL BUILDINGS, TYPE A-1 AND A-2

TABLE 602.1
SIMPLIFIED PRESCRIPTIVE BUILDING ENVELOPE THERMAL COMPONENT CRITERIA MINIMUM REQUIRED THERMAL PERFORMANCE (*U*-FACTOR AND *R* VALUE)[1]

* Change "all0" in Note 2 to read "allow".

CHAPTER 7
BUILDING DESIGN FOR ALL COMMERCIAL BUILDINGS

SECTION 701
SCOPE

* Change Table 701 Minimum Thermal Components Requirements to read as follows:

Table 701
Minimum Thermal Components Requirements

Element	Type Nonresidential & Residential Conditioned	Min. R-value of Insulation	Maximum U-factor/SHGC
Roof	Metal Bldgs[1]	R-19 with Thermal Block	0.065
	Insulation Entirely above Deck except Metal Bldgs.	R-15	0.034
	Attic and Other[2]	R-30	
Walls above Grade	Metal Building	R-13	0.113
	Cavity walls[3]	R-13	N/A
	Mass walls[4]	R-7	
Glazed Fenestration	Any	N/A	U-0.65/SHGC 0.60

Note 1 Metal buildings with purlins 5' on center and 1" x 3" thermal block
Note 2: See appropriate ANSI/ASHRAE/IESN 90.1 Tables B-5, B-6, B-8, B-9, or B-11 and Tables A-1, A-2, A-3 or A-4 for Attic and Other Building Roof minimum Thermal requirements.
Note 3: Steel framed or Wood Framed and Other walls. See ANSI/ASHRAE/IESN 90.1-2001 Tables B-5, B-6, B-8, B-9 or B-11
Note 4: Masonry, concrete, CMU, or other solid walls with a minimum weight of 30 pounds per square foot. See ANSI/ASHRAE/IESN 90.1-2001 Definitions for mass wall.

CHAPTER 8
DESIGN BY ACCEPTABLE PRACTICE FOR COMMERCIAL BUILDINGS

SECTION 805
LIGHTING SYSTEMS

805.2.3 Additional controls.
* Change to read as follows: Each area that is required to have a manual control shall have additional controls that meet the requirements of Section 805.2.3.1 "**and**" 805.2.3.3 or 805.2.3.3.

Exceptions:
1. Areas that have only 1 luminaire.
2. Areas that are controlled by an occupant-sensing device
3. Corridors, storerooms, restrooms, or public lobbies.

APPENDIX B

CHECKLIST
Wood Framing
Low Rise Residential Use

Air Infiltration (see Section 502.3)
* Change Section 502.3 to read Section 502.1.4.

Duct insulation R-8 min. (list R-value)
* Change R-8 to read R-3.3-R-5 (see Table 503.3.3.3).

Building Envelope – Air Sealing Examples 1, 2 and 3

Ductwork sealed with mastic and insulated to R-8.
* Change R-8 to read R-3.3 - R-5.

GEORGIA COMMECIAL ENERGY CODE
Single Step Compliance – Mechanical Systems
Simplified HVAC Requirements:

Duct Insulation:
* Change minimum R-8 to read minimum R-6.

Pipe Insulation:
* Change to add the following: Exterior ducts shall be protected from weather.

End of Errata.