

ENERGY SYSTEMS LABORATORY

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Mr. Felix Lopez, P.E.:
Senior Engineer
State Energy Conservation Office
Comptroller of Public Accounts
111 East 17th Street, Room 1114
Austin, Texas 78701

Feb. 7, 2008

Dear Felix:

In accordance with the Health and Safety Code Section 388.003, as amended, the laboratory reviewed and considered the comments received and performed the technical analysis that compared the stringency of the Texas Building Energy Performance Standards based on the 2000 International Energy Conservation Code with the 2001 Supplement (2000/2001 IECC) to the unamended 2006 International Energy Conservation Code (2006 IECC). This analysis included the relevant 2006 IECC residential (Chapters 1-4) and commercial (Chapters 5 and 6) provisions of the code.

The analysis has determined that:

- 1) The residential provisions of 2006 IECC are less stringent than the Texas Building Energy Performance Standards adopted under the Health and Safety Code Section 388.
In addition, the Laboratory determined that the North Central Texas Council of Government's (NCTCOG) amendments to the 2006 IECC are as stringent as the Texas Building Energy Performance Standards.
- 2) The commercial provisions of the 2006 IECC are as stringent as the Texas Building Energy Performance Standards.

Sincerely,

Bahman Yazdani, P.E.
Associate Director

Charles Culp, P.E., Ph.D.
Associate Director

Cc: David Claridge, P.E., PhD., Director

**Recommended Amendments to the
2006 International Energy Conservation Code
North Central Texas Council of Governments region**

The following sections, paragraphs, and sentences of the *2006 International Energy Conservation Code* are hereby amended as follows: Standard type is text from the IECC. Underlined type is text inserted. ~~Lined through type is deleted text from IECC.~~ A double asterisk at the beginning of a section identifies an amendment carried over from the 2003 edition of the code and a triple asterisk identifies a new or revised amendment with the 2006 code.

*****Amend Section 101.4.2 Historic Buildings to read as follows:**

101.4.2 Historic Buildings. Any building or structure that is listed in the State or National Register of Historic Places; designated as a historic property under local or state designation law or survey; certified as a contributing resource with a National Register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the National or State Registers of

Historic Places either individually or as a contributing building to a historic district by the State Historic Preservation Officer of the Keeper of the National Register of Historic Places, ~~are exempt from~~ shall comply with all of the provisions of this code.

Exception: Whenever a provision or provisions shall invalidate or jeopardize the historical designation or listing, that provision or provisions may be exempted.

(Reason: This is less restrictive than the legislative mandates. It is reasonable to expect compliance with duct sealing, replacement lighting and the installation of insulation, for example, when possible.)

*****Amend Section 103.1.1 Above code programs. to read as follows:**

103.1.1 Alternative compliance. A building certified by a national, state, or local accredited energy efficiency program and determined by the Energy Systems Laboratory to be in compliance with the energy efficiency requirements of this section may, at the option of the Code Official, be considered in compliance. The United States Environmental Protection Agency's Energy Star Program certification of energy code equivalency shall be considered in compliance.

(Reason: This amendment is added to allow alternative compliance in accordance with Texas HB 1365, 78th Legislature.)

*****Amend SECTION 202 GENERAL DEFINITIONS by adding the following definition:**

GLAZING AREA. Total area of the glazed fenestration measured using the rough opening and including sash, curbing or other framing elements that enclose conditioned space. Glazing area includes the area of glazed fenestration assemblies in walls bounding conditioned basements. For doors where the daylight opening area is less than 50 percent of the door area, the glazing area is the daylight opening area. For all other doors, the glazing area is the rough opening area for the door including the door and the frame.

(Reason: Since the window to wall area ratios have been added to the prescriptive tables, it is necessary to define glazing area.)

***Amend Section 301.1 to read as follows:

301.1 General. Climate zones from Figure 301.1, Figure 301.2, or Table 301.1(1), Table 301.2(1), or Table 301.3(3) shall be used in determining the applicable requirements from Chapters 4 & 5. Locations not in Table 301.1 (outside the US) shall be assigned a climate zone based on Section 301.3.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Add FIGURE 301.2 –TEXAS CLIMATE ZONES immediately following Figure 301.1:

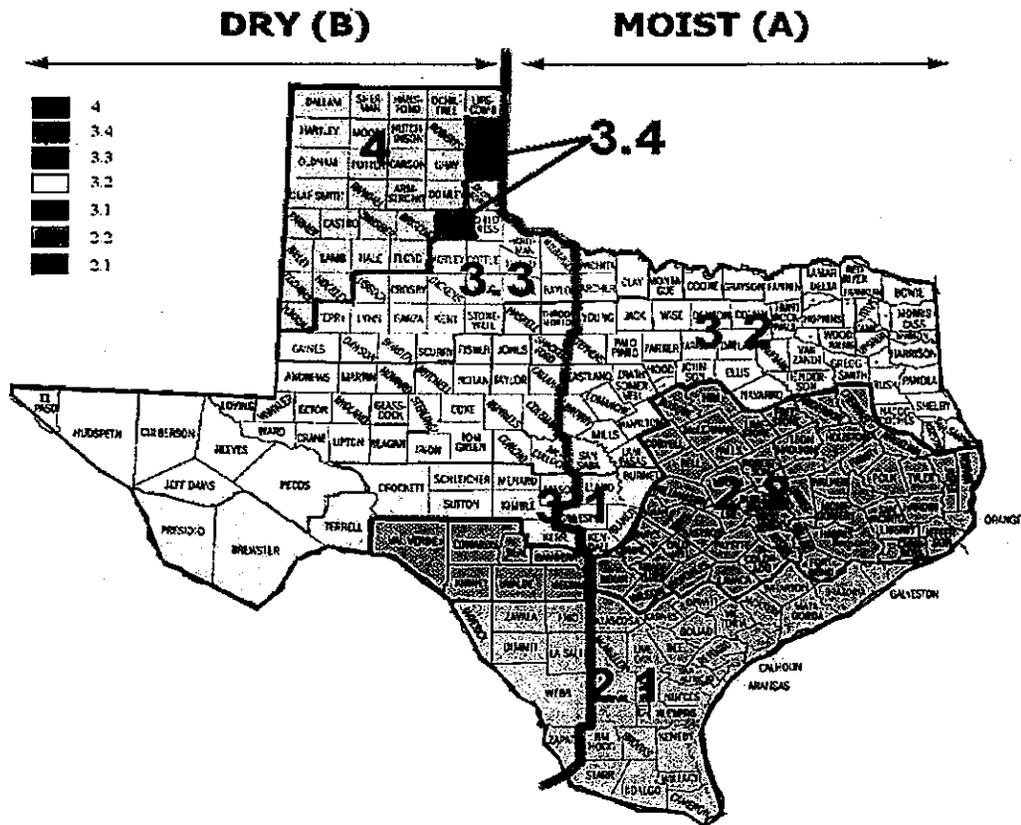


FIGURE 301.2: TEXAS CLIMATE ZONES

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Amend TABLE 301.1 by deleting the references to Texas and add TABLE 301.1(1) CLIMATE ZONES AND SUB CLIMATE ZONES FOR TEXAS:

TABLE 301.1(1) CLIMATE ZONES AND SUB CLIMATE ZONES FOR TEXAS

Zone 2							
ANDERSON	2.2	DE WITT	2.1	JIM HOGG	2.1	ORANGE	2.2
ANGELINA	2.2	DIMIT	2.1	JIM WELLS	2.1	POLK	2.2
ARANSAS	2.1	DUVAL	2.1	KARNES	2.1	REAL	2.2
ATASCOSA	2.1	EDWARDS	2.2	KENEDY	2.1	REFUGIO	2.1
AUSTIN	2.2	FALLS	2.2	KINNEY	2.2	ROBERTSON	2.2
BANDERA	2.2	FAYETTE	2.2	KLEBERG	2.1	SAN JACINTO	2.2
BASTROP	2.2	FORT BEND	2.2	LA SALLE	2.1	SAN PATRICIO	2.1
BEE	2.1	FREESTONE	2.2	LAVACA	2.2	STARR	2.1
BELL	2.2	FRIO	2.1	LEE	2.2	TRAVIS	2.2
BEXAR	2.2	GALVESTON	2.1	LEON	2.2	TRINITY	2.2
BOSQUE	2.2	GOLIAD	2.1	LIBERTY	2.2	TYLER	2.2
BRAZORIA	2.1	GONZALES	2.2	LIMESTONE	2.2	UVALDE	2.2
BRAZOS	2.2	GRIMES	2.2	LIVE OAK	2.1	VAL VERDE	2.2
BROOKS	2.1	GUADALUPE	2.2	MADISON	2.2	VICTORIA	2.1
BURLESON	2.2	HARDIN	2.2	MATAGORDA	2.1	WALKER	2.2
CALDWELL	2.2	HARRIS	2.2	MAVERICK	2.1	WALLER	2.2
CALHOUN	2.1	HAYS	2.2	MCLENNAN	2.2	WASHINGTON	2.2
CAMERON	2.1	HIDALGO	2.1	MCMULLEN	2.1	WEBB	2.1
CHAMBERS	2.2	HILL	2.2	MEDINA	2.2	WHARTON	2.1
CHEROKEE	2.2	HOUSTON	2.2	MILAM	2.2	WILLACY	2.1
COLORADO	2.2	JACKSON	2.1	MONTGOMERY	2.2	WILLIAMSON	2.2
COMAL	2.2	JASPER	2.2	NEWTON	2.2	WILSON	2.2
CORYELL	2.2	JEFFERSON	2.2	NUECES	2.1	ZAPATA	2.1
Zone 3							
ANDREWS	3.2	EL PASO	3.2	KERR	3.1	ROCKWALL	3.2
ARCHER	3.3	ELLIS	3.2	KIMBLE	3.1	RUNNELS	3.2
BAYLOR	3.3	ERATH	3.2	KING	3.3	RUSK	3.2
BLANCO	3.1	FANNIN	3.2	KNOX	3.3	SABINE	3.2
BORDEN	3.3	FISHER	3.2	LAMAR	3.2	SAN AUGUSTINE	3.2
BOWIE	3.2	FOARD	3.3	LAMPASAS	3.2	SAN SABA	3.2
BREWSTER	3.1	FRANKLIN	3.2	LLANO	3.1	SCHLEICHER	3.1
BROWN	3.2	GAINES	3.3	LOVING	3.2	SCURRY	3.3
BURNET	3.1	GARZA	3.3	LUBBOCK	3.3	SHACKELFORD	3.2
CALLAHAN	3.2	GILLESPIE	3.1	LYNN	3.3	SHELBY	3.2
CAMP	3.2	GLASSCOCK	3.2	MARION	3.2	SMITH	3.2
CASS	3.2	GRAYSON	3.2	MARTIN	3.2	SOMERVELL	3.2
CHILDRESS	3.3	GREGG	3.2	MASON	3.1	STEPHENS	3.2
CLAY	3.3	HALL	3.4	MCCULLOCH	3.2	STERLING	3.2
COKE	3.2	HAMILTON	3.2	MENARD	3.1	STONEWALL	3.3
COLEMAN	3.2	HARDEMAN	3.3	MIDLAND	3.2	SUTTON	3.1
COLLIN	3.2	HARRISON	3.2	MILLS	3.2	TARRANT	3.2
COLLINGSWORTH	3.3	HASKELL	3.2	MITCHELL	3.2	TAYLOR	3.2
COMANCHE	3.2	HEMPHILL	3.4	MONTAGUE	3.2	TERRELL	3.1
CONCHO	3.2	HENDERSON	3.2	MORRIS	3.2	TERRY	3.3
COOKE	3.2	HOOD	3.2	MOTLEY	3.3	THROCKMORTON	3.2
COTTLE	3.3	HOPKINS	3.2	NACOGDOCHES	3.2	TITUS	3.2
CRANE	3.2	HOWARD	3.2	NAVARRO	3.2	TOM GREEN	3.2
CROCKETT	3.1	HUDSPETH	3.2	NOLAN	3.2	UPSHUR	3.2
CROSBY	3.3	HUNT	3.2	PALO PINTO	3.2	UPTON	3.2
CULBERSON	3.2	IRION	3.2	PANOLA	3.2	VAN ZANDT	3.2
DALLAS	3.2	JACK	3.2	PARKER	3.2	WARD	3.2
DAWSON	3.3	JEFF DAVIS	3.2	PECOS	3.2	WHEELER	3.4
DELTA	3.2	JOHNSON	3.2	PRESIDIO	3.1	WICHITA	3.3

DENTON	3.2	JONES	3.2	RAINS	3.2	WILBARGER	3.3
DICKENS	3.3	KAUFMAN	3.2	REAGAN	3.2	WINKLER	3.2
EASTLAND	3.2	KENDALL	3.1	RED RIVER	3.2	WISE	3.2
ECTOR	3.2	KENT	3.3	REEVES	3.2	WOOD	3.2
						YOUNG	3.2

Zone 4

ARMSTRONG	DEAF SMITH	HOCKLEY	PARMER
BAILEY	DONLEY	HUTCHINSON	POTTER
BRISCOE	FLOYD	LAMB	RANDALL
CARSON	GRAY	LIPSCOMB	ROBERTS
CASTRO	HALE	MOORE	SHERMAN
COCHRAN	HANSFORD	OCHILTREE	SWISHER
DALLAM	HARTLEY	OLDHAM	YOAKUM

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***** Amend TABLE 301.2 by deleting the references to Texas and add TABLE 301.2(1) WARM HUMID COUNTIES FOR TEXAS**

TABLE 301.2(1) WARM HUMID COUNTIES FOR TEXAS

ANDERSON	2.2	DUVAL	2.1	KAUFMAN	3.2	RED RIVER	3.2
ANGELINA	2.2	EDWARDS	2.2	KENDALL	3.1	REAL	2.2
ARANSAS	2.1	ELLIS	3.2	KENEDY	2.1	REFUGIO	2.1
ATASCOSA	2.1	ERATH	3.2	KINNEY	2.2	ROBERTSON	2.2
AUSTIN	2.2	FALLS	2.2	KLEBERG	2.1	ROCKWALL	3.2
BANDERA	2.2	FAYETTE	2.2	LA SALLE	2.1	RUSK	3.2
BASTROP	2.2	FORT BEND	2.2	LAMAR	3.2	SABINE	3.2
BEE	2.1	FRANKLIN	3.2	LAMPASAS	3.2	SAN AUGUSTINE	3.2
BELL	2.2	FREESTONE	2.2	LAVACA	2.2	SAN JACINTO	2.2
BEXAR	2.2	FRIO	2.1	LEE	2.2	SAN PATRICIO	2.1
BLANCO	3.1	GALVESTON	2.1	LEON	2.2	SAN SABA	3.2
BOSQUE	2.2	GILLESPIE	3.1	LLANO	3.1	SHELBY	3.2
BOWIE	3.2	GOLIAD	2.1	LIBERTY	2.2	SMITH	3.2
BRAZORIA	2.1	GONZALES	2.2	LIMESTONE	2.2	STARR	2.1
BROWN	3.2	GREGG	3.2	LIVE OAK	2.1	SOMMERVELL	3.2
BRAZOS	2.2	GRIMES	2.2	MADISON	2.2	TARRANT	3.2
BROOKS	2.1	GUADALUPE	2.2	MARION	3.2	TITUS	3.2
BURLESON	2.2	HAMILTON	3.2	MATAGORDA	2.1	TRAVIS	2.2
BURNET	3.1	HARDIN	2.2	MAVERICK	2.1	TRINITY	2.2
CALDWELL	2.2	HARRIS	2.2	MCLENNAN	2.2	TYLER	2.2
CALHOUN	2.1	HARRISON	3.2	MCMULLEN	2.1	UPSHUR	3.2
CAMERON	2.1	HAYS	2.2	MEDINA	2.2	UVALDE	2.2
CHAMBERS	2.2	HENDERSON	3.2	MILAM	2.2	VAL VERDE	2.2
CAMP	3.2	HIDALGO	2.1	MILLS	3.2	VAN ZANDT	3.2
CASS	3.2	HOOD	3.2	MONTGOMERY	2.2	VICTORIA	2.1
CHEROKEE	2.2	HOPKINS	3.2	MORRIS	3.2	WALKER	2.2
COLLIN	3.2	HILL	2.2	NACOGDOCHES	3.2	WALLER	2.2
COLORADO	2.2	HOUSTON	2.2	NAVARRO	3.2	WASHINGTON	2.2
COMAL	2.2	HUNT	3.2	NEWTON	2.2	WEBB	2.1
COMANCHE	3.2	JACKSON	2.1	NUECES	2.1	WHARTON	2.1
CORYELL	2.2	JASPER	2.2	ORANGE	2.2	WILLACY	2.1
DALLAS	3.2	JEFFERSON	2.2	PALO PINTO	3.2	WILLIAMSON	2.2
DELTA	3.2	JIM HOGG	2.1	PANOLA	3.2	WILSON	2.2
DENTON	3.2	JIM WELLS	2.1	PARKER	3.2	WOOD	3.2
DE WITT	2.1	JOHNSON	3.2	POLK	2.2	ZAPATA	2.1
DIMITT	2.1	KARNES	2.1	RAINS	3.2	ZAVALA	2.1

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

*****Add Section 401.2.1. Compliance software tools. to read as follows:**

401.2.1. Compliance software tools. Software tools used to demonstrate energy code compliance that are deemed acceptable by the building official. The PNL program RES Check is not acceptable for residential compliance.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

*****Amend Section 402.1.1 Insulation and fenestration criteria. to read as follows:**

402.1.1 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. The use of REScheck™ shall not be an acceptable means of demonstrating envelope compliance.

When compliance using Table 402.1.1 is demonstrated with a ceiling R-value of R30 or less, no more than 33% of the total projected ceiling area may be of cathedral type construction (ceiling joist/roof rafter assembly) and the required insulation R-value may be reduced to a minimum of R22 insulation when the remaining ceiling area insulation is increased to R38.

(Reason: The use of REScheck™ to demonstrate energy code compliance does not satisfy the "less restrictive" requirement imposed by SB5, 77th Legislature.)

This amendment is compatible with the previous amendments increasing the number of builders who could use the "simplified prescriptive" approach of the IRC and incorporates the Home Builder Association prescriptive package proposal. The addition of "Ceiling Joist/Roof Rafter Assembly" requirements protect such assemblies from the damage likely to occur if greater amounts of insulation were attempted in such assemblies.)

*** Replace TABLE 402.1.1 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT to read as follows:

TABLE 402.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT (TEXAS)^a

CLIMATE - SUB CLIMATE ZONE	MAX GLAZED AREA TO WALL AREA RATIO	MAX GLAZED FENESTRATION U-FACTOR	MAX SKYLIGHT U-FACTOR ^b	MAX GLAZED FENESTRATION SHGC	MIN CEILING R-VALUE	MIN WOOD FRAME WALL R-VALUE ^d	MASS WALL R-VALUE	MIN FLOOR R-VALUE	MIN BASEMENT WALL R-VALUE	MIN SLAB R-VALUE & DEPTH ^f	MIN CRAWL SPACE WALL R-VALUE
2.1	15	0.75	0.75	0.38	19	13	6	19	0	0	5
	20	0.70	0.75	0.38	30	13	6	19	0	0	5
	25	0.65	0.75	0.35	30	13	6	19	0	0	5
	30	0.54	0.75	0.35	38	13	6	19	0	0	5
2.2	15	0.65	0.75	0.38	30	13	6	19	5	0	6
	20	0.65	0.75	0.38	38	13	6	19	6	0	6
	25	0.54	0.75	0.35	38	13	6	19	8	0	10
	30	0.46	0.75	0.35	38	16, 13 + 3.7 ^c	6	19	8	0	10
3.1	15	0.65	0.65	0.40	30	13	6	19	5	0	6
	20	0.55	0.65	0.40	38	13	6	19	5	0	6
	25	0.54	0.65	0.35	38	13	6	19	8	0	10
	30	0.46	0.65	0.35	38	16, 13 + 3.7 ^c	7	19	8	0	10
3.2	15	0.60	0.65	0.40	30	13	6	19	6	0	7
	20	0.54	0.65	0.40	38	13	6	19	6	0	7
	25	0.51	0.65	0.40	38	16, 13 + 3.7 ^c	7	19	6	0	7
	30	0.46	0.65	0.38	38	16, 13 + 3.7 ^c	7	19	6	0	7
3.3	15	0.51	0.65	0.40	30	13	6	19	7	0	8
	20	0.45	0.65	0.40	38	13	6	19	7	0	9
	25	0.40	0.65	0.40	38	16, 13 + 3.7 ^c	7	19	7	0	9
	30	0.40	0.65	0.40	38	19, 13 + 8.1 ^c	9	19	7	0	9
3.4	15	0.45	0.60	NR	38	13	6	19	8	5, 2 ft	11
	20	0.37	0.60	NR	38	13	6	19	8	6, 2 ft	13
	25	0.37	0.60	NR	38	19, 13 + 8.1 ^c	9	19	8	6, 2 ft	13
	30	0.37	0.60	NR	38	19, 13 + 8.1 ^c	9	30	8	6, 2 ft	13
4	15	0.45	0.60	NR	38	13	8	19	8	5, 2 ft	11
	20	0.37	0.60	NR	38	13	8	19	9	6, 2 ft	13
	25	0.37	0.60	NR	38	19, 13 + 8.1 ^c	10	19	9	6, 2 ft	13
	30	0.37	0.60	NR	38	19, 13 + 8.1 ^c	10	30	9	6, 2 ft	13

For SF: 1 foot = 304.8 mm.

- R-values are minimums. U-factors and SHGC are maximums. R-19 shall be permitted to be compressed into a 2 x 6 cavity.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- R-5 shall be added to the required slab edge R-values for heated slabs.
- The total R-value may be achieved with a combination of cavity insulation and insulating sheathing that covers 100% of the exterior wall.
- The wall insulation may be the sum of the two values where the first value is the cavity insulation and the second value is insulating sheathing. The combination of cavity insulation plus insulating sheathing may be used where structural sheathing covers not more than 25% of the exterior wall area and insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior wall area then the wall insulation requirement may only be satisfied with the single insulation value.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

*** Replace TABLE 402.1.3 EQUIVALENT U-FACTORS to read as follows:

**TABLE 402.1.3
EQUIVALENT U-FACTORS^a**

CLIMATE-SUB CLIMATE ZONE	MAX GLAZED AREA TO WALL AREA RATIO	MAX GLAZED FENESTRATION U-FACTOR	MAX SKYLIGHT U-FACTOR	MAX CEILING U-FACTOR	MAX WOOD FRAME WALL U-FACTOR	MAX MASS WALL U-FACTOR	MAX FLOOR U-FACTOR	MAX BASEMENT WALL U-FACTOR	MAX CRAWL SPACE WALL U-FACTOR
2.1	15	0.75	0.75	0.039	0.082	0.124	0.047	0.360	0.136
	20	0.70	0.75	0.034	0.082	0.124	0.047	0.360	0.136
	25	0.65	0.75	0.034	0.082	0.124	0.047	0.360	0.136
	30	0.54	0.75	0.030	0.082	0.124	0.047	0.360	0.136
2.2	15	0.65	0.75	0.034	0.082	0.124	0.047	0.210	0.100
	20	0.65	0.75	0.030	0.082	0.124	0.047	0.210	0.100
	25	0.54	0.75	0.030	0.082	0.124	0.047	0.119	0.065
	30	0.46	0.75	0.030	0.071	0.124	0.047	0.119	0.065
3.1	15	0.65	0.65	0.034	0.082	0.124	0.047	0.210	0.100
	20	0.55	0.65	0.030	0.082	0.124	0.047	0.210	0.100
	25	0.54	0.65	0.030	0.082	0.124	0.047	0.119	0.065
	30	0.46	0.65	0.030	0.071	0.112	0.047	0.119	0.065
3.2	15	0.60	0.65	0.034	0.082	0.124	0.047	0.179	0.075
	20	0.54	0.65	0.030	0.082	0.124	0.047	0.179	0.075
	25	0.51	0.65	0.030	0.071	0.112	0.047	0.179	0.075
	30	0.46	0.65	0.030	0.071	0.112	0.047	0.179	0.075
3.3	15	0.51	0.65	0.034	0.082	0.124	0.047	0.149	0.061
	20	0.45	0.65	0.030	0.082	0.124	0.047	0.149	0.058
	25	0.40	0.65	0.030	0.075	0.112	0.047	0.149	0.058
	30	0.40	0.65	0.030	0.061	0.094	0.047	0.149	0.058
3.4	15	0.45	0.60	0.030	0.082	0.124	0.047	0.119	0.083
	20	0.37	0.60	0.030	0.082	0.124	0.047	0.119	0.152
	25	0.37	0.60	0.030	0.061	0.094	0.047	0.119	0.152
	30	0.37	0.60	0.030	0.061	0.094	0.033	0.119	0.152
4	15	0.45	0.60	0.030	0.082	0.102	0.047	0.119	0.083
	20	0.37	0.60	0.030	0.082	0.102	0.047	0.089	0.152
	25	0.37	0.60	0.030	0.061	0.087	0.047	0.089	0.152
	30	0.37	0.60	0.030	0.061	0.087	0.033	0.089	0.152

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Add Section 402.2.11. Insulation installed in walls. to read as follow:

Section 402.2.11. Insulation installed in walls. Insulation batts installed in walls shall be totally surrounded by an enclosure on all sides consisting of framing lumber, gypsum, sheathing, wood structural panel sheathing or other equivalent material approved by the building official.

(Reason: This will increase the performance of the batt insulation by eliminating the potential for drafts and insure that the batt insulation stays in place)

***Amend Section 402.3.2 Glazed fenestration SHGC. to read as follows:

402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements. In sub climate zones 2.1, 2.2, 3.1, 3.2 and 3.3 the maximum area-weighted average and the maximum SHGC shall not exceed 0.40.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Amend Section 402.3.3 Glazed fenestration exemption. to read as follows:

402.3.3 Glazed fenestration exemption. Up to ~~15 square feet (1.4 m²)~~ 1 percent of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Amend Section 402.3.5 Thermally isolated sunroom U-factor. to read as follows:

Section 402.3.5 Thermally isolated sunroom U-factor. ~~For zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75.~~ New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

***Amend Section 402.3.6 Replacement fenestration. to read as follows:

Section 402.3.6 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.4 402.3.7.

Exceptions:

1. Replacement skylights shall have a maximum U-factor for 0.60 when installed in all sub climate zones except for 2.1.
2. For buildings constructed in conformance with an energy code as required by State of Texas Senate Bill Number 5, 77th Legislature, replacement fenestration units may comply with the original construction documents or applicable U-factor in Table 402.1.1.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature and to provide for reasonable compliance for structures built after the adoption of codes in accordance with SB 5, 77th Legislature.)

***Add Section 402.3.7 Prescriptive path for additions. to read as follows:

Section 402.3.7 Prescriptive path for additions. As an alternative for demonstrating compliance, additions with a conditioned floor area less than 500 square feet (46.5 m²) to existing single-family residential buildings and structures shall meet the prescriptive envelope component criteria in Table 402.3.7 for the sub climate zone applicable to the location. The U-factor of each individual fenestration product (windows, doors and skylights) shall be used to calculate and area-weighted average fenestration product U-factor for the addition, which shall not exceed the applicable listed values in Table 402.3.7. For

additions, other than sunroom 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 402.3.7.

Conditioned sunroom additions shall maintain thermal isolation; shall not be used as kitchens or sleeping rooms.

In sub climate zones 2.1, 2.2, 3.1, 3.2 and 3.3, the combined solar heat gain coefficient (the area weighted average) of all glazed fenestration products used in additions and as replacement windows in accordance with this section shall not exceed 0.40.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

*****Add Table 402.3.7 PRESCRIPTIVE ENVELOPE COMPONENT CRITERIA ADDITIONS TO AND REPLACEMENT WINDOWS FOR EXISTING DETACHED ONE- AND TWO-FAMILY DWELLINGS to read as follows:**

**Table 402.3.7 PRESCRIPTIVE ENVELOPE COMPONENT CRITERIA
ADDITIONS TO AND REPLACEMENT WINDOWS FOR EXISTING DETACHED
ONE- AND TWO-FAMILY DWELLINGS^d**

SUB CLIMATE ZONES	MAXIMUM	MINIMUM					
	Fenestration U-factor	Ceiling R-value ^{a, e}	Wall R-value ^e	Floor R-value	Basement wall R-value ^b	Slab perimeter R-value	Crawl space wall R-value
2.1	0.75	R-26	R-13	R-11	R-5	R-0	R-5
2.2, 3.1, 3.2, 3.3 and 3.4	0.50	R-30	R-13	R-19	R-8	R-0	R-10
4	0.50	R-38	R-13	R-21	R-10	R-0	R-19

- a. "Ceiling R-value" shall be required for flat or inclined (cathedral) ceilings. Floors over outside air shall meet "Ceiling R-value" requirements.
- b. Basement wall insulation to be installed in accordance with Section 402.2.6.
- c. "Crawl space wall R-value" shall apply to unventilated crawl spaces only. Crawl space insulation shall be installed in accordance with Section 402.2.8.
- d. Sunroom additions shall be required to have a maximum fenestration U-factor of 0.5. in all sub climate zones except sub climate zone 2.1. In all sub climate zones, the minimum ceiling R-value for sunroom additions shall be R-19 and the minimum wall R-value shall be R-13.

(Reason: This amendment is added to satisfy the "not less restrictive" requirement when adopting subsequent editions of energy codes in accordance with Texas SB 5, 77th Legislature.)

*****Add Exception No. 2. to Section 403.2.1. Insulation to read as follows:**

Section 403.2.1. Insulation. Supply and return ducts shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

Exceptions:

- 1. Ducts or portions thereof located completely inside the building thermal envelope.
- 2. Supply and return ducts can be insulated to a minimum of R-6, if the efficiency of the cooling equipment is upgraded to one SEER point above the NAECA (National Appliance Energy Conservation Act) Standard.

(Reason: To provide an equivalent tradeoff to permit the use of R-6 duct insulation.)

***Add Section 501.3. Compliance software tools. to read as follows:

Section 501.3. Compliance software tools. Software tools used to demonstrate energy code compliance that are deemed acceptable by the building official may only utilize the energy chapter of the 2006 International Energy Conservation Code or the 2004 Edition of ASHRAE 90.1 Energy Standard for Buildings Except Low-rise Residential Buildings when code edition and/or standard selection is available.

(Reason: The nonresidential provisions of the 2006 IECC are deemed "not less restrictive" in accordance with Texas SB 5, 77th Legislature.)

**Amend Section 505.2.1 Interior Lighting Controls. to read as follows:

505.2.1 Interior lighting controls. Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and their status. Each control device shall control a maximum of 2,500 square feet (232.26 square meters) of floor area for a space 10,000 square feet (929.03 square meters) or less and a maximum of 10,000 square feet (929.03 square meters) for a space greater than 10,000 square feet (929.03 square meters).

(Reason: This change is consistent with energy conservation measures in ASHRAE 90.1 - 2004, Section 9.4.1.2 (b) Space Control." This "zoning" is especially relevant for after-hours employees in office spaces.)

END