

(This foreword is provided for information only and is not part of the draft addendum.)

FOREWORD

Draft Addendum 90.1ak – Publication Draft. The conversion of U-factors from I-P to SI units was done incorrectly using the wrong multiplier.

For Table B-12, note also that the U-factors in the SI version of Table B-12 for 40-50% glazing for nonresidential and residential spaces are different from what was in the final committee working draft, and are inconsistent with those in the I-P version of Table B-12.

For Table B-14, note that the SHGC in the SI version of Table B-14 for 40-50% north glazing for nonresidential spaces are different from what was in the final committee working draft, and are inconsistent with those in the I-P version of Table B-12.

Addendum 90.1 ak

TABLES B-1 TO B-26 (SI Edition Only):

Revise all U-factors in the SI version of Tables B-1 to B-26, Building Envelope Requirements, by multiplying the I-P U-factors by 5.678.

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-1
Building Envelope Requirements (HDD18: 0-500, CDD10: 6001+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.273	R-3.5 ci	U-7.280	NR
Metal Building	U-0.369	R-3.3	U-0.312	R-2.3 + R-2.3	U-7.268	NR
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-3.483	NR
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-6.700	NR
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-1.825	NR	U-1.825	NR	U-1.825	NR
Steel Joist	U-1.986	NR	U-1.986	NR	U-1.986	NR
Wood Framed and Other	U-1.599	NR	U-1.599	NR	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93	SHGC _{all} - 0.19	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93	SHGC _{all} - 0.19	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93	SHGC _{all} - 0.19	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.44	Uoper-7.21	SHGC _{north} - 0.44	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93	SHGC _{all} - 0.19	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.44	Uoper-7.21	SHGC _{north} - 0.44	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93	SHGC _{all} - 0.14	Ufixed-6.93	SHGC _{all} - 0.19	Ufixed-5.54	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.34	Uoper-7.21	SHGC _{north} - 0.33	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - 0.16	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - 0.16	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						

0-2.0%	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	NR
2.1-5.0%	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet EnvCriteriaGenerator_8-7-01.xls

**Table B-2
Building Envelope Requirements (HDD18: 0-500, CDD10: 5001-6000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-7.280	NR
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-7.268	NR
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-3.483	NR
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-6.700	NR
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-1.825	NR	U-1.825	NR	U-1.825	NR
Steel Joist	U-1.986	NR	U-1.986	NR	U-1.986	NR
Wood Framed and Other	U-1.599	NR	U-1.599	NR	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
10.1-20.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
20.1-30.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
30.1-40.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.44	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.25 SHGC _{north-} 0.44	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
40.1-50.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.19 SHGC _{north-} 0.33	Ufixed-6.93 Uoper-7.21	SHGC _{all-} 0.19 SHGC _{north-} 0.33	Ufixed-5.54 Uoper-5.77	SHGC _{all-} NR SHGC _{north-} NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all-} 0.36	Uall-11.24	SHGC _{all-} 0.19	Uall-11.24	SHGC _{all-} NR

2.1-5.0%	Uall-11.24	SHGC _{all-}	0.19	Uall-11.24	SHGC _{all-}	0.16	Uall-11.24	SHGC _{all-}	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-10.79	SHGC _{all-}	0.34	Uall-10.79	SHGC _{all-}	0.27	Uall-10.79	SHGC _{all-}	NR
2.1-5.0%	Uall-10.79	SHGC _{all-}	0.27	Uall-10.79	SHGC _{all-}	0.27	Uall-10.79	SHGC _{all-}	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-7.72	SHGC _{all-}	0.36	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	NR
2.1-5.0%	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	0.19	Uall-7.72	SHGC _{all-}	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-3
Building Envelope Requirements (HDD18: 0-500, CDD10: 4001-5000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-7.280	NR
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-7.268	NR
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-3.483	NR
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-6.700	NR
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-1.825	NR	U-1.825	NR	U-1.825	NR
Steel Joist	U-1.986	NR	U-1.986	NR	U-1.986	NR
Wood Framed and Other	U-1.599	NR	U-1.599	NR	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93	SHGC _{all-} 0.40	Ufixed-6.93	SHGC _{all-} 0.40	Ufixed-6.93	SHGC _{all-} NR
	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} NR
10.1-20.0%	Ufixed-6.93	SHGC _{all-} 0.25	Ufixed-6.93	SHGC _{all-} 0.40	Ufixed-6.93	SHGC _{all-} NR
	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} NR
20.1-30.0%	Ufixed-6.93	SHGC _{all-} 0.25	Ufixed-6.93	SHGC _{all-} 0.40	Ufixed-6.93	SHGC _{all-} NR
	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} 0.61	Uoper-7.21	SHGC _{north-} NR
30.1-40.0%	Ufixed-6.93	SHGC _{all-} 0.25	Ufixed-6.93	SHGC _{all-} 0.40	Ufixed-6.93	SHGC _{all-} NR

	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	NR
40.1-50.0%	Ufixed-6.93	SHGC _{all} -	0.19	Ufixed-6.93	SHGC _{all} -	0.31	Ufixed-5.54	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	0.47	Uoper-7.21	SHGC _{north} -	0.47	Uoper-5.77	SHGC _{north} -	NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-11.24	SHGC _{all} -	0.36	Uall-11.24	SHGC _{all} -	0.19	Uall-11.24	SHGC _{all} -	NR
2.1-5.0%	Uall-11.24	SHGC _{all} -	0.19	Uall-11.24	SHGC _{all} -	0.19	Uall-11.24	SHGC _{all} -	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-10.79	SHGC _{all} -	0.39	Uall-10.79	SHGC _{all} -	0.27	Uall-10.79	SHGC _{all} -	NR
2.1-5.0%	Uall-10.79	SHGC _{all} -	0.34	Uall-10.79	SHGC _{all} -	0.27	Uall-10.79	SHGC _{all} -	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-7.72	SHGC _{all} -	0.36	Uall-7.72	SHGC _{all} -	0.19	Uall-7.72	SHGC _{all} -	NR
2.1-5.0%	Uall-7.72	SHGC _{all} -	0.19	Uall-7.72	SHGC _{all} -	0.19	Uall-7.72	SHGC _{all} -	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-4
Building Envelope Requirements (HDD18: 0-500, CDD10: 0-4000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.527	R-1.8 ci	U-0.360	R-2.6 ci	U-7.280	NR
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-7.268	NR
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-3.483	NR
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-3.293	NR	U-3.293	NR
Metal Building	U-0.698	R-1.9	U-0.642	R-2.3	U-6.700	NR
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-1.825	NR	U-1.825	NR	U-1.825	NR
Steel Joist	U-1.986	NR	U-1.986	NR	U-1.986	NR
Wood Framed and Other	U-1.599	NR	U-1.599	NR	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93	SHGC _{all} -	0.61	Ufixed-6.93	SHGC _{all} -	0.61
	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	0.61
	Ufixed-6.93	SHGC _{all} -	NR	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	NR	Uoper-7.21	SHGC _{north} -	NR

10.1-20.0%	Ufixed-6.93	SHGC _{all} -	0.40	Ufixed-6.93	SHGC _{all} -	0.44	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	NR
20.1-30.0%	Ufixed-6.93	SHGC _{all} -	0.40	Ufixed-6.93	SHGC _{all} -	0.44	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	NR
30.1-40.0%	Ufixed-6.93	SHGC _{all} -	0.40	Ufixed-6.93	SHGC _{all} -	0.40	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	0.61	Uoper-7.21	SHGC _{north} -	NR
40.1-50.0%	Ufixed-6.93	SHGC _{all} -	0.31	Ufixed-6.93	SHGC _{all} -	0.30	Ufixed-5.54	SHGC _{all} -	NR
	Uoper-7.21	SHGC _{north} -	0.46	Uoper-7.21	SHGC _{north} -	0.46	Uoper-5.77	SHGC _{north} -	NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-11.24	SHGC _{all} -	0.61	Uall-11.24	SHGC _{all} -	0.36	Uall-11.24	SHGC _{all} -	NR
2.1-5.0%	Uall-11.24	SHGC _{all} -	0.25	Uall-11.24	SHGC _{all} -	0.19	Uall-11.24	SHGC _{all} -	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-10.79	SHGC _{all} -	0.65	Uall-10.79	SHGC _{all} -	0.34	Uall-10.79	SHGC _{all} -	NR
2.1-5.0%	Uall-10.79	SHGC _{all} -	0.39	Uall-10.79	SHGC _{all} -	0.27	Uall-10.79	SHGC _{all} -	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-7.72	SHGC _{all} -	0.61	Uall-7.72	SHGC _{all} -	0.36	Uall-7.72	SHGC _{all} -	NR
2.1-5.0%	Uall-7.72	SHGC _{all} -	0.25	Uall-7.72	SHGC _{all} -	0.19	Uall-7.72	SHGC _{all} -	NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-5
Building Envelope Requirements (HDD18: 501-1000, CDD10: 4001+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.948	R-1.1
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.780	R-0.7	U-0.606	R-1.1	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-1.986	NR
Wood Framed and Other	U-0.288	R-3.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC

FENESTRATION	(Fixed/ Operable)	(All Orientations/ North-Oriented)	(Fixed/ Operable)	(All Orientations/ North-Oriented)	(Fixed/ Operable)	(All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i> 0-10.0%	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - 0.25	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93	SHGC _{all} - 0.17	Ufixed-6.93	SHGC _{all} - 0.17	Ufixed-5.54	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.44	Uoper-7.21	SHGC _{north} - 0.43	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i> 0-2.0%	Uall-11.24	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i> 0-2.0%	Uall-10.79	SHGC _{all} - 0.39	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
	Uall-10.79	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i> 0-2.0%	Uall-7.72	SHGC _{all} - 0.36	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR
	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-6
Building Envelope Requirements (HDD18: 501-1000, CDD10: 3001-4000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.948	R-1.1
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.780	R-0.7	U-0.606	R-1.1	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-1.986	NR
Wood Framed and Other	U-0.288	R-3.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						

Swinging Non-Swinging	U-3.975 U-8.233		U-3.975 U-8.233		U-3.975 U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.44 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.44 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.40 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.17 SHGC _{north} - 0.42	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.29 SHGC _{north} - 0.41	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.25	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-10.79	SHGC _{all} - 0.39	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - 0.36	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-7.72	SHGC _{all} - 0.25	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-7
Building Envelope Requirements (HDD18: 501-1000, CDD10: 0-3000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.527	R-1.8 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.409	R-2.8	U-0.369	R-3.3	U-0.948	R-1.1
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.780	R-0.7	U-0.780	R-0.7	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-1.986	NR

Wood Framed and Other	U-0.376	R-2.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.82	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.82	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.44 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.44 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.44 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.31 SHGC _{north} - 0.39	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.31 SHGC _{north} - 0.37	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all} - 0.61	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-10.79	SHGC _{all} - 0.39	Uall-10.79	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-7.72	SHGC _{all} - 0.61	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-8
Building Envelope Requirements (HDD18: 1001-1500, CDD10: 3001+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.948	R-1.1
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.701	R-1.3 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR

<i>Wall, Below Grade</i> Below Grade Wall	C-6.473 NR		C-6.473 NR		C-6.473 NR	
<i>Floors</i> Mass	U-0.780	R-0.7	U-0.606	R-1.1	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-1.986	NR
Wood Framed and Other	U-0.288	R-3.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i> Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i> Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i> 0-10.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.15 SHGC _{north} - 0.38	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.14 SHGC _{north} - 0.36	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i> 0-2.0%	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i> 0-2.0%	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-10.79	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i> 0-2.0%	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - 0.36	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-9
Building Envelope Requirements (HDD18: 1001-1500, CDD10: 0-3000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i> Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.948	R-1.1
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3

<i>Walls, Above Grade</i>						
Mass	U-3.293	NR	U-0.857*	R-1.0 ci*	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-1.660	NR
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.780	R-0.7	U-0.606	R-1.1	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-1.986	NR
Wood Framed and Other	U-0.288	R-3.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.82	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.82	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.61 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.39 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.34 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.34 SHGC _{north} - 0.61	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-6.93 Uoper-7.21	SHGC _{all} - 0.20 SHGC _{north} - 0.30	Ufixed-4.14 Uoper-4.60	SHGC _{all} - 0.25 SHGC _{north} - 0.61	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all} - 0.61	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-10.79	SHGC _{all} - 0.39	Uall-10.79	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-7.72	SHGC _{all} - 0.61	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-7.72	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-10
Building Envelope Requirements (HDD18: 1501-2000, CDD10: 3001+)**

	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly	Insulation	Assembly	Insulation	Assembly	Insulation

OPAQUE ELEMENTS	Maximum	Min. R-Value	Maximum	Min. R-Value	Maximum	Min. R-Value
Roofs						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.459	R-2.3
Walls, Above Grade						
Mass	U-0.857*	R-1.0 ci*	U-0.701	R-1.3 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
Wall, Below Grade						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
Floors						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-1.599	NR
Slab-On-Grade Floors						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.644	R-1.3 for 61.0 cm	F-1.766	R-1.3 for 30.5 cm
Opaque Doors						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
Vertical Glazing, % of Wall						
0-10.0%	U _{fixed} -3.24	SHGC _{all} - 0.39	U _{fixed} -3.24	SHGC _{all} - 0.39	U _{fixed} -6.93	SHGC _{all} - NR
	U _{oper} -3.80	SHGC _{north} - 0.49	U _{oper} -3.80	SHGC _{north} - 0.49	U _{oper} -7.21	SHGC _{north} - NR
10.1-20.0%	U _{fixed} -3.24	SHGC _{all} - 0.25	U _{fixed} -3.24	SHGC _{all} - 0.39	U _{fixed} -6.93	SHGC _{all} - NR
	U _{oper} -3.80	SHGC _{north} - 0.49	U _{oper} -3.80	SHGC _{north} - 0.49	U _{oper} -7.21	SHGC _{north} - NR
20.1-30.0%	U _{fixed} -3.24	SHGC _{all} - 0.25	U _{fixed} -3.24	SHGC _{all} - 0.25	U _{fixed} -6.93	SHGC _{all} - NR
	U _{oper} -3.80	SHGC _{north} - 0.39	U _{oper} -3.80	SHGC _{north} - 0.39	U _{oper} -7.21	SHGC _{north} - NR
30.1-40.0%	U _{fixed} -3.24	SHGC _{all} - 0.25	U _{fixed} -3.24	SHGC _{all} - 0.25	U _{fixed} -6.93	SHGC _{all} - NR
	U _{oper} -3.80	SHGC _{north} - 0.39	U _{oper} -3.80	SHGC _{north} - 0.39	U _{oper} -7.21	SHGC _{north} - NR
40.1-50.0%	U _{fixed} -2.61	SHGC _{all} - 0.19	U _{fixed} -2.61	SHGC _{all} - 0.19	U _{fixed} -5.54	SHGC _{all} - NR
	U _{oper} -2.67	SHGC _{north} - 0.26	U _{oper} -2.67	SHGC _{north} - 0.26	U _{oper} -5.77	SHGC _{north} - NR
Skylight with Curb, Glass, % of Roof						
0-2.0%	U _{all} -6.64	SHGC _{all} - 0.39	U _{all} -6.64	SHGC _{all} - 0.36	U _{all} -11.24	SHGC _{all} - NR
2.1-5.0%	U _{all} -6.64	SHGC _{all} - 0.19	U _{all} -6.64	SHGC _{all} - 0.19	U _{all} -11.24	SHGC _{all} - NR
Skylight with Curb, Plastic, % of Roof						
0-2.0%	U _{all} -7.38	SHGC _{all} - 0.65	U _{all} -7.38	SHGC _{all} - 0.27	U _{all} -10.79	SHGC _{all} - NR
2.1-5.0%	U _{all} -7.38	SHGC _{all} - 0.34	U _{all} -7.38	SHGC _{all} - 0.27	U _{all} -10.79	SHGC _{all} - NR
Skylight without Curb, All, % of Roof						
0-2.0%	U _{all} -3.92	SHGC _{all} - 0.39	U _{all} -3.92	SHGC _{all} - 0.36	U _{all} -7.72	SHGC _{all} - NR
2.1-5.0%	U _{all} -3.92	SHGC _{all} - 0.19	U _{all} -3.92	SHGC _{all} - 0.19	U _{all} -7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-11
Building Envelope Requirements (HDD18: 1501-2000, CDD10: 2001-3000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-0.857*	R-1.0 ci*	U-0.701	R-1.3 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.644	R-1.3 for 61.0 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.39	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.27 SHGC _{north} - 0.32	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.26 SHGC _{north} - 0.36	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-6.64	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.39	Uall-6.64	SHGC _{all} - 0.19	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-7.38	SHGC _{all} - 0.65	Uall-7.38	SHGC _{all} - 0.62	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-7.38	SHGC _{all} - 0.34	Uall-7.38	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.92	SHGC _{all} - 0.36	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.39	Uall-3.92	SHGC _{all} - 0.19	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-12
Building Envelope Requirements (HDD18: 1501-2000, CDD10: 0-2000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.527	R-1.8 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-0.857*	R-1.0 ci*	U-0.701	R-1.3 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-1.045	R-1.1
Steel Framed	U-0.705	R-2.3	U-0.705	R-2.3	U-1.998	NR
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.780	R-0.7	U-0.606	R-1.1	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.288	R-3.3	U-1.599	NR
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.766	R-1.3 for 30.5 cm	F-1.644	R-1.3 for 61.0 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-6.93	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - 0.61	Ufixed-6.93	SHGC _{all} - NR
	Uoper-7.21	SHGC _{north} - 0.61	Uoper-7.21	SHGC _{north} - 0.82	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-4.14	SHGC _{all} - 0.39	Ufixed-4.14	SHGC _{all} - 0.51	Ufixed-5.54	SHGC _{all} - NR
	Uoper-4.60	SHGC _{north} - 0.61	Uoper-4.60	SHGC _{north} - 0.72	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-11.24	SHGC _{all} - 0.82	Uall-6.64	SHGC _{all} - 0.49	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-11.24	SHGC _{all} - 0.61	Uall-6.64	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-7.38	SHGC _{all} - 0.65	Uall-7.38	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-7.38	SHGC _{all} - 0.65	Uall-7.38	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						

0-2.0%	Uall-7.72	SHGC _{all-}	0.61	Uall-3.92	SHGC _{all-}	0.49	Uall-7.72	SHGC _{all-}	NR
2.1-5.0%	Uall-7.72	SHGC _{all-}	0.61	Uall-3.92	SHGC _{all-}	0.39	Uall-7.72	SHGC _{all-}	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-13
Building Envelope Requirements (HDD18: 2001-3000, CDD10: 2001+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-0.857*	R-1.0 ci*	U-0.592	R-1.7 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-0.761	R-1.8
Steel Framed	U-0.705	R-2.3	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.214	R-5.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.644	R-1.3 for 61.0 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all-} 0.39 SHGC _{north-} 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all-} NR SHGC _{north-} NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all-} 0.25 SHGC _{north-} 0.36	Ufixed-2.61 Uoper-2.67	SHGC _{all-} 0.25 SHGC _{north-} 0.36	Ufixed-5.54 Uoper-5.77	SHGC _{all-} NR SHGC _{north-} NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all-} 0.49	Uall-5.56	SHGC _{all-} 0.36	Uall-11.24	SHGC _{all-} NR

2.1-5.0%	Uall-6.64	SHGC _{all} -	0.39	Uall-5.56	SHGC _{all} -	0.19	Uall-11.24	SHGC _{all} -	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-7.38	SHGC _{all} -	0.65	Uall-7.38	SHGC _{all} -	0.62	Uall-10.79	SHGC _{all} -	NR
2.1-5.0%	Uall-7.38	SHGC _{all} -	0.34	Uall-7.38	SHGC _{all} -	0.27	Uall-10.79	SHGC _{all} -	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-3.92	SHGC _{all} -	0.49	Uall-3.29	SHGC _{all} -	0.36	Uall-7.72	SHGC _{all} -	NR
2.1-5.0%	Uall-3.92	SHGC _{all} -	0.39	Uall-3.29	SHGC _{all} -	0.19	Uall-7.72	SHGC _{all} -	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-14
Building Envelope Requirements (HDD18: 2001-3000, CDD10: 1001-2000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-0.857*	R-1.0 ci*	U-0.592	R-1.7 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-0.761	R-1.8
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.644	R-1.3 for 61.0 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR

	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61	SHGC _{all} - 0.26	Ufixed-2.61	SHGC _{all} - 0.26	Ufixed-5.54	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.36	Uoper-2.67	SHGC _{north} - 0.36	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-6.64	SHGC _{all} - 0.49	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.39	Uall-6.64	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-7.38	SHGC _{all} - 0.77	Uall-7.38	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-7.38	SHGC _{all} - 0.62	Uall-7.38	SHGC _{all} - 0.34	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.92	SHGC _{all} - 0.49	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.39	Uall-3.92	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-15
Building Envelope Requirements (HDD18: 2001-3000, CDD10: 0-1000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-1.240	R-0.7 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.459	R-2.3
<i>Walls, Above Grade</i>						
Mass	U-0.857*	R-1.0 ci*	U-0.701	R-1.3 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-0.761	R-1.8
Steel Framed	U-0.705	R-2.3	U-0.479	R-2.3 + R-0.7 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.296	R-3.3	U-0.390	R-2.3
Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.644	R-1.3 for 61.0 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-8.233		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR

10.1-20.0%	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-3.80	SHGC _{north} -	0.49	Uoper-3.80	SHGC _{north} -	0.49	Uoper-7.21	SHGC _{north} -	NR
20.1-30.0%	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-3.80	SHGC _{north} -	0.49	Uoper-3.80	SHGC _{north} -	0.49	Uoper-7.21	SHGC _{north} -	NR
30.1-40.0%	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-3.24	SHGC _{all} -	0.49	Ufixed-6.93	SHGC _{all} -	NR
	Uoper-3.80	SHGC _{north} -	0.49	Uoper-3.80	SHGC _{north} -	0.49	Uoper-7.21	SHGC _{north} -	NR
40.1-50.0%	Ufixed-2.61	SHGC _{all} -	0.36	Ufixed-2.61	SHGC _{all} -	0.39	Ufixed-5.54	SHGC _{all} -	NR
	Uoper-2.67	SHGC _{north} -	0.49	Uoper-2.67	SHGC _{north} -	0.49	Uoper-5.77	SHGC _{north} -	NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-6.64	SHGC _{all} -	0.68	Uall-6.64	SHGC _{all} -	0.68	Uall-11.24	SHGC _{all} -	NR
2.1-5.0%	Uall-6.64	SHGC _{all} -	0.49	Uall-6.64	SHGC _{all} -	0.49	Uall-11.24	SHGC _{all} -	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-7.38	SHGC _{all} -	0.83	Uall-6.25	SHGC _{all} -	0.77	Uall-10.79	SHGC _{all} -	NR
2.1-5.0%	Uall-7.38	SHGC _{all} -	0.77	Uall-6.25	SHGC _{all} -	0.77	Uall-10.79	SHGC _{all} -	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-3.92	SHGC _{all} -	0.68	Uall-3.92	SHGC _{all} -	0.68	Uall-7.72	SHGC _{all} -	NR
2.1-5.0%	Uall-3.92	SHGC _{all} -	0.49	Uall-3.92	SHGC _{all} -	0.49	Uall-7.72	SHGC _{all} -	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-16
Building Envelope Requirements (HDD18: 3001-4000, CDD10: 2001+)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.701	R-1.3 ci	U-0.513	R-2.0 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.324	R-2.3 + R-2.3	U-0.698	R-1.9
Steel Framed	U-0.479	R-2.3 + R-0.7 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.365	R-2.3 + R-0.7 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.496	R-1.5	U-0.420	R-1.8	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.214	R-5.3	U-0.390	R-2.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-2.839		U-8.233	
	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC

FENESTRATION	(Fixed/ Operable)	(All Orientations/ North-Oriented)	(Fixed/ Operable)	(All Orientations/ North-Oriented)	(Fixed/ Operable)	(All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i> 0-10.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-3.24	SHGC _{all} - 0.39	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.49	Uoper-3.80	SHGC _{north} - 0.49	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61	SHGC _{all} - 0.23	Ufixed-2.61	SHGC _{all} - 0.26	Ufixed-5.54	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.36	Uoper-2.67	SHGC _{north} - 0.36	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i> 0-2.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-5.56	SHGC _{all} - 0.46	Uall-11.24	SHGC _{all} - NR
	Uall-6.64	SHGC _{all} - 0.39	Uall-5.56	SHGC _{all} - 0.32	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i> 0-2.0%	Uall-6.25	SHGC _{all} - 0.62	Uall-6.25	SHGC _{all} - 0.62	Uall-10.79	SHGC _{all} - NR
	Uall-6.25	SHGC _{all} - 0.34	Uall-6.25	SHGC _{all} - 0.27	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i> 0-2.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.29	SHGC _{all} - 0.46	Uall-7.72	SHGC _{all} - NR
	Uall-3.92	SHGC _{all} - 0.39	Uall-3.29	SHGC _{all} - 0.32	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-17
Building Envelope Requirements (HDD18: 3001-4000, CDD10: 1001-2000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.701	R-1.3 ci	U-0.513	R-2.0 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.324	R-2.3 + R-2.3	U-0.698	R-1.9
Steel Framed	U-0.479	R-2.3 + R-0.7 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.496	R-1.5	U-0.420	R-1.8	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.214	R-5.3	U-0.390	R-2.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						

Swinging Non-Swinging	U-3.975 U-8.233		U-3.975 U-2.839		U-3.975 U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.26 SHGC _{north} - 0.36	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.26 SHGC _{north} - 0.49	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-6.64	SHGC _{all} - 0.49	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.39	Uall-6.64	SHGC _{all} - 0.39	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-6.25	SHGC _{all} - 0.77	Uall-6.25	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-6.25	SHGC _{all} - 0.62	Uall-6.25	SHGC _{all} - 0.62	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.92	SHGC _{all} - 0.49	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.39	Uall-3.92	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-18
Building Envelope Requirements (HDD18: 3001-4000, CDD10: 0-1000)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.192	R-5.3	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.701	R-1.3 ci	U-0.513	R-2.0 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.642	R-2.3	U-0.698	R-1.9
Steel Framed	U-0.705	R-2.3	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.504	R-2.3	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-6.473	NR	C-6.473	NR
<i>Floors</i>						
Mass	U-0.606	R-1.1	U-0.496	R-1.5	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.214	R-5.3	U-0.390	R-2.3

Wood Framed and Other	U-0.288	R-3.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-1.264	NR	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-1.454	R-1.8 for 91.4 cm	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-8.233		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.36 SHGC _{north} - 0.49	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.36 SHGC _{north} - 0.49	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.68	Uall-6.64	SHGC _{all} - 0.68	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-6.64	SHGC _{all} - 0.49	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-6.25	SHGC _{all} - 0.77	Uall-6.25	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-6.25	SHGC _{all} - 0.77	Uall-6.25	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.68	Uall-3.92	SHGC _{all} - 0.68	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.92	SHGC _{all} - 0.49	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-19
Building Envelope Requirements (HDD18: 4001-5000, CDD10: 1001+)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.592	R-1.7 ci	U-0.513	R-2.0 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.479	R-2.3 + R-0.7 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.365	R-2.3 + R-0.7 ci	U-0.504	R-2.3

<i>Wall, Below Grade</i> Below Grade Wall	C-6.473	NR	C-0.678	R-1.3 ci	C-6.473	NR
<i>Floors</i> Mass	U-0.496	R-1.5	U-0.363	R-2.2	U-1.825	NR
Steel Joist	U-0.214	R-5.3	U-0.214	R-5.3	U-0.390	R-2.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i> Unheated	F-1.264	NR	F-0.935	R-1.8 for 61.0 cm	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-0.952	R-1.8 Full	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i> Swinging	U-3.975		U-2.839		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i> 0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.39 SHGC _{north} - 0.49	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.26 SHGC _{north} - 0.49	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.26 SHGC _{north} - 0.49	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i> 0-2.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-5.56	SHGC _{all} - 0.46	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-5.56	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i> 0-2.0%	Uall-4.94	SHGC _{all} - 0.71	Uall-4.20	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-4.94	SHGC _{all} - 0.58	Uall-4.20	SHGC _{all} - 0.55	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i> 0-2.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.29	SHGC _{all} - 0.49	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.29	SHGC _{all} - 0.39	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-20
Building Envelope Requirements (HDD18: 4001-5000, CDD10: 0-1000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i> Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.192	R-5.3	U-0.153	R-6.7	U-0.300	R-3.3

<i>Walls, Above Grade</i>						
Mass	U-0.592	R-1.7 ci	U-0.513	R-2.0 ci	U-3.293	NR
Metal Building	U-0.642	R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.479	R-2.3 + R-0.7 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.365	R-2.3 + R-0.7 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-6.473	NR	C-0.678	R-1.3 ci	C-6.473	NR
<i>Floors</i>						
Mass	U-0.496	R-1.5	U-0.420	R-1.8	U-1.825	NR
Steel Joist	U-0.296	R-3.3	U-0.214	R-5.3	U-0.390	R-2.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-0.935	R-1.8 for 61.0 cm	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-0.952	R-1.8 Full	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-3.975		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.64	Uoper-3.80	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.64	Uoper-3.80	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.64	Uoper-3.80	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-3.24	SHGC _{all} - 0.49	Ufixed-6.93	SHGC _{all} - NR
	Uoper-3.80	SHGC _{north} - 0.64	Uoper-3.80	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-5.54	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.64	Uoper-2.67	SHGC _{north} - 0.64	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.68	Uall-6.64	SHGC _{all} - 0.64	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.49	Uall-6.64	SHGC _{all} - 0.64	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-4.94	SHGC _{all} - 0.77	Uall-4.20	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-4.94	SHGC _{all} - 0.71	Uall-4.20	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.68	Uall-3.92	SHGC _{all} - 0.68	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.49	Uall-3.92	SHGC _{all} - 0.64	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-21
Building Envelope Requirements (HDD18: 5001-6000, CDD10: 1001+)**

	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly	Insulation	Assembly	Insulation	Assembly	Insulation

OPAQUE ELEMENTS	Maximum	Min. R-Value	Maximum	Min. R-Value	Maximum	Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.273	R-3.5 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.312	R-2.3 + R-2.3	U-0.551	R-1.8
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.513	R-2.0 ci	U-0.404	R-2.7 ci	U-3.293	NR
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.365	R-2.3 + R-1.3 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.291	R-2.3 + R-1.3 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-0.678	R-1.3 ci	C-0.678	R-1.3 ci	C-6.473	NR
<i>Floors</i>						
Mass	U-0.420	R-1.8	U-0.363	R-2.2	U-0.780	R-0.7 ci
Steel Joist	U-0.214	R-5.3	U-0.214	R-5.3	U-0.296	R-3.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-0.935	R-1.8 for 61.0 cm	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-0.952	R-1.8 Full	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-2.839		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-2.61	SHGC _{all} - 0.46	Ufixed-2.61	SHGC _{all} - 0.46	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.64	Uoper-2.67	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.46	Uoper-2.67	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.46	Uoper-2.67	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-2.61	SHGC _{all} - 0.36	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - 0.46	Uoper-2.67	SHGC _{north} - 0.64	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-1.99	SHGC _{all} - 0.32	Ufixed-1.99	SHGC _{all} - 0.32	Ufixed-5.54	SHGC _{all} - NR
	Uoper-2.21	SHGC _{north} - 0.46	Uoper-2.21	SHGC _{north} - 0.64	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-5.56	SHGC _{all} - 0.68	Uall-5.56	SHGC _{all} - 0.46	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-5.56	SHGC _{all} - 0.49	Uall-5.56	SHGC _{all} - 0.36	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-4.94	SHGC _{all} - 0.71	Uall-4.20	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-4.94	SHGC _{all} - 0.71	Uall-4.20	SHGC _{all} - 0.65	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.29	SHGC _{all} - 0.49	Uall-3.29	SHGC _{all} - 0.46	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.29	SHGC _{all} - 0.49	Uall-3.29	SHGC _{all} - 0.36	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-22
Building Envelope Requirements (HDD18: 5001-6000, CDD10: 0-1000)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.360	R-2.6 ci	U-0.982	R-0.9 ci
Metal Building	U-0.369	R-3.3	U-0.369	R-3.3	U-0.551	R-1.8
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.513	R-2.0 ci	U-0.453	R-2.3 ci	U-3.293	NR
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.365	R-2.3 + R-1.3 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.504	R-2.3	U-0.291	R-2.3 + R-1.3 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-0.678	R-1.3 ci	C-0.678	R-1.3 ci	C-6.473	NR
<i>Floors</i>						
Mass	U-0.496	R-1.5	U-0.363	R-2.2	U-0.780	R-0.7 ci
Steel Joist	U-0.214	R-5.3	U-0.214	R-5.3	U-0.296	R-3.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.376	R-2.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-1.264	NR	F-0.935	R-1.8 for 61.0 cm	F-1.264	NR
Heated	F-1.454	R-1.8 for 91.4 cm	F-0.952	R-1.8 Full	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-2.839		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
10.1-20.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
20.1-30.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
30.1-40.0%	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-3.24 Uoper-3.80	SHGC _{all} - 0.49 SHGC _{north} - 0.64	Ufixed-6.93 Uoper-7.21	SHGC _{all} - NR SHGC _{north} - NR
40.1-50.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.36 SHGC _{north} - 0.64	Ufixed-2.61 Uoper-2.67	SHGC _{all} - 0.36 SHGC _{north} - 0.64	Ufixed-5.54 Uoper-5.77	SHGC _{all} - NR SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-6.64	SHGC _{all} - 0.68	Uall-6.64	SHGC _{all} - 0.64	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-6.64	SHGC _{all} - 0.64	Uall-6.64	SHGC _{all} - 0.64	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-4.94	SHGC _{all} - 0.77	Uall-3.46	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
2.1-5.0%	Uall-4.94	SHGC _{all} - 0.71	Uall-3.46	SHGC _{all} - 0.77	Uall-10.79	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						
0-2.0%	Uall-3.92	SHGC _{all} - 0.68	Uall-3.92	SHGC _{all} - 0.64	Uall-7.72	SHGC _{all} - NR
2.1-5.0%	Uall-3.92	SHGC _{all} - 0.64	Uall-3.92	SHGC _{all} - 0.64	Uall-7.72	SHGC _{all} - NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-23
Building Envelope Requirements (HDD18: 6001-7000, CDD10: 0+)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.360	R-2.6 ci	U-0.273	R-3.5 ci	U-0.677	R-1.3 ci
Metal Building	U-0.312	R-2.3 + R-2.3	U-0.312	R-2.3 + R-2.3	U-0.471	R-2.3
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.300	R-3.3
<i>Walls, Above Grade</i>						
Mass	U-0.513	R-2.0 ci	U-0.404	R-2.7 ci	U-0.857*	R-1.0 ci*
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.365	R-2.3 + R-1.3 ci	U-0.365	R-2.3 + R-1.3 ci	U-0.705	R-2.3
Wood Framed and Other	U-0.365	R-2.3 + R-0.7 ci	U-0.291	R-2.3 + R-1.3 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-0.678	R-1.3 ci	C-0.678	R-1.3 ci	C-6.473	NR
<i>Floors</i>						
Mass	U-0.420	R-1.8	U-0.363	R-2.2	U-0.780	R-0.7 ci
Steel Joist	U-0.214	R-5.3	U-0.183	R-6.7	U-0.296	R-3.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.288	R-3.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-0.935	R-1.8 for 61.0 cm	F-0.900	R-2.6 for 61.0 cm	F-1.264	NR
Heated	F-0.952	R-1.8 Full	F-0.762	R-2.6 Full	F-1.766	R-1.3 for 30.5 cm
<i>Opaque Doors</i>						
Swinging	U-3.975		U-2.839		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-2.61	SHGC _{all} - NR	Ufixed-2.61	SHGC _{all} - NR	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - NR	Uoper-2.67	SHGC _{north} - NR	Uoper-7.21	SHGC _{north} - NR
10.1-20.0%	Ufixed-2.61	SHGC _{all} - NR	Ufixed-2.61	SHGC _{all} - NR	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - NR	Uoper-2.67	SHGC _{north} - NR	Uoper-7.21	SHGC _{north} - NR
20.1-30.0%	Ufixed-2.61	SHGC _{all} - NR	Ufixed-2.61	SHGC _{all} - NR	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - NR	Uoper-2.67	SHGC _{north} - NR	Uoper-7.21	SHGC _{north} - NR
30.1-40.0%	Ufixed-2.61	SHGC _{all} - NR	Ufixed-2.61	SHGC _{all} - NR	Ufixed-6.93	SHGC _{all} - NR
	Uoper-2.67	SHGC _{north} - NR	Uoper-2.67	SHGC _{north} - NR	Uoper-7.21	SHGC _{north} - NR
40.1-50.0%	Ufixed-1.99	SHGC _{all} - NR	Ufixed-1.99	SHGC _{all} - NR	Ufixed-5.54	SHGC _{all} - NR
	Uoper-2.21	SHGC _{north} - NR	Uoper-2.21	SHGC _{north} - NR	Uoper-5.77	SHGC _{north} - NR
<i>Skylight with Curb, Glass, % of Roof</i>						
0-2.0%	Uall-5.56	SHGC _{all} - NR	Uall-5.56	SHGC _{all} - NR	Uall-11.24	SHGC _{all} - NR
2.1-5.0%	Uall-5.56	SHGC _{all} - NR	Uall-5.56	SHGC _{all} - NR	Uall-11.24	SHGC _{all} - NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0-2.0%	Uall-4.94	SHGC _{all} - NR	Uall-3.46	SHGC _{all} - NR	Uall-7.38	SHGC _{all} - NR
2.1-5.0%	Uall-4.94	SHGC _{all} - NR	Uall-3.46	SHGC _{all} - NR	Uall-7.38	SHGC _{all} - NR
<i>Skylight without Curb, All, % of Roof</i>						

0-2.0%	Uall-3.29	SHGC _{all} ⁻	NR	Uall-3.29	SHGC _{all} ⁻	NR	Uall-7.72	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-3.29	SHGC _{all} ⁻	NR	Uall-3.29	SHGC _{all} ⁻	NR	Uall-7.72	SHGC _{all} ⁻	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-24
Building Envelope Requirements (HDD18: 7001-9000, CDD10: 0+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED				
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value			
<i>Roofs</i>									
Insulation Entirely above Deck	U-0.273	R-3.5 ci	U-0.273	R-3.5 ci	U-0.527	R-1.8 ci			
Metal Building	U-0.278	R-2.3 + R-3.3	U-0.278	R-2.3 + R-3.3	U-0.409	R-2.8			
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.192	R-5.3			
<i>Walls, Above Grade</i>									
Mass	U-0.453	R-2.3 ci	U-0.404	R-2.7 ci	U-0.857*	R-1.0 ci*			
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.324	R-2.3 + R-2.3	U-0.642	R-2.3			
Steel Framed	U-0.365	R-2.3 + R-1.3 ci	U-0.315	R-2.3 + R-1.8 ci	U-0.705	R-2.3			
Wood Framed and Other	U-0.291	R-2.3 + R-1.3 ci	U-0.291	R-2.3 + R-1.3 ci	U-0.504	R-2.3			
<i>Wall, Below Grade</i>									
Below Grade Wall	C-0.678	R-1.3 ci	C-0.678	R-1.3 ci	C-6.473	NR			
<i>Floors</i>									
Mass	U-0.363	R-2.2	U-0.321	R-2.6	U-0.780	R-0.7 ci			
Steel Joist	U-0.214	R-5.3	U-0.183	R-6.7	U-0.296	R-3.3			
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.288	R-3.3			
<i>Slab-On-Grade Floors</i>									
Unheated	F-0.935	R-1.8 for 61.0 cm	F-0.900	R-2.6 for 61.0 cm	F-1.264	NR			
Heated	F-0.952	R-1.8 Full	F-0.762	R-2.6 Full	F-1.644	R-1.3 for 61.0 cm			
<i>Opaque Doors</i>									
Swinging	U-2.839		U-2.839		U-3.975				
Non-Swinging	U-2.839		U-2.839		U-8.233				
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)			
<i>Vertical Glazing, % of Wall</i>									
0-10.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
10.1-20.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
20.1-30.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
30.1-40.0%	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.61 Uoper-2.67	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
40.1-50.0%	Ufixed-1.99 Uoper-2.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-1.99 Uoper-2.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-5.54 Uoper-5.77	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-5.56	SHGC _{all} ⁻	NR	Uall-5.56	SHGC _{all} ⁻	NR	Uall-7.38	SHGC _{all} ⁻	NR

2.1-5.0%	Uall-5.56	SHGC _{all} ⁻	NR	Uall-5.56	SHGC _{all} ⁻	NR	Uall-7.38	SHGC _{all} ⁻	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-3.46	SHGC _{all} ⁻	NR	Uall-3.46	SHGC _{all} ⁻	NR	Uall-6.25	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-3.46	SHGC _{all} ⁻	NR	Uall-3.46	SHGC _{all} ⁻	NR	Uall-6.25	SHGC _{all} ⁻	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-3.29	SHGC _{all} ⁻	NR	Uall-3.29	SHGC _{all} ⁻	NR	Uall-4.60	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-3.29	SHGC _{all} ⁻	NR	Uall-3.29	SHGC _{all} ⁻	NR	Uall-4.60	SHGC _{all} ⁻	NR

* Exception to 5.3.1.2a applies

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

**Table B-25
Building Envelope Requirements (HDD18: 9001-11000, CDD10: 0+)**

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED				
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value			
<i>Roofs</i>									
Insulation Entirely above Deck	U-0.273	R-3.5 ci	U-0.273	R-3.5 ci	U-0.527	R-1.8 ci			
Metal Building	U-0.278	R-2.3 + R-3.3	U-0.278	R-2.3 + R-3.3	U-0.409	R-2.8			
Attic and Other	U-0.153	R-6.7	U-0.153	R-6.7	U-0.192	R-5.3			
<i>Walls, Above Grade</i>									
Mass	U-0.404	R-2.7 ci	U-0.404	R-2.7 ci	U-0.701	R-1.3 ci			
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.312	R-2.8 + R-2.3	U-0.642	R-2.3			
Steel Framed	U-0.365	R-2.3 + R-1.3 ci	U-0.258	R-2.3 + R-3.2 ci	U-0.705	R-2.3			
Wood Framed and Other	U-0.291	R-2.3 + R-1.3 ci	U-0.291	R-2.3 + R-1.3 ci	U-0.504	R-2.3			
<i>Wall, Below Grade</i>									
Below Grade Wall	C-0.678	R-1.3 ci	C-0.425	R-2.2 ci	C-6.473	NR			
<i>Floors</i>									
Mass	U-0.363	R-2.2	U-0.287	R-2.9	U-0.606	R-1.1 ci			
Steel Joist	U-0.183	R-6.7	U-0.183	R-6.7	U-0.296	R-3.3			
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.288	R-3.3			
<i>Slab-On-Grade Floors</i>									
Unheated	F-0.900	R-2.6 for 61.0 cm	F-0.900	R-2.6 for 61.0 cm	F-1.264	NR			
Heated	F-0.762	R-2.6 Full	F-0.762	R-2.6 Full	F-1.644	R-1.3 for 61.0 cm			
<i>Opaque Doors</i>									
Swinging	U-2.839		U-2.839		U-3.975				
Non-Swinging	U-2.839		U-2.839		U-8.233				
FENESTRATION	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/ Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)			
<i>Vertical Glazing, % of Wall</i>									
0-10.0%	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
10.1-20.0%	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
20.1-30.0%	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-2.44 Uoper-2.50	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR	Ufixed-6.93 Uoper-7.21	SHGC _{all} ⁻ SHGC _{north} ⁻	NR NR
30.1-40.0%	Ufixed-2.44	SHGC _{all} ⁻	NR	Ufixed-2.44	SHGC _{all} ⁻	NR	Ufixed-6.93	SHGC _{all} ⁻	NR

	Uoper-2.50	SHGC _{north} ⁻	NR	Uoper-2.50	SHGC _{north} ⁻	NR	Uoper-7.21	SHGC _{north} ⁻	NR
40.1-50.0%	Ufixed-1.87	SHGC _{all} ⁻	NR	Ufixed-1.87	SHGC _{all} ⁻	NR	Ufixed-5.54	SHGC _{all} ⁻	NR
	Uoper-1.93	SHGC _{north} ⁻	NR	Uoper-1.93	SHGC _{north} ⁻	NR	Uoper-5.77	SHGC _{north} ⁻	NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-5.39	SHGC _{all} ⁻	NR	Uall-5.39	SHGC _{all} ⁻	NR	Uall-7.38	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-5.39	SHGC _{all} ⁻	NR	Uall-5.39	SHGC _{all} ⁻	NR	Uall-7.38	SHGC _{all} ⁻	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-3.46	SHGC _{all} ⁻	NR	Uall-3.46	SHGC _{all} ⁻	NR	Uall-6.25	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-3.46	SHGC _{all} ⁻	NR	Uall-3.46	SHGC _{all} ⁻	NR	Uall-6.25	SHGC _{all} ⁻	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-3.12	SHGC _{all} ⁻	NR	Uall-3.12	SHGC _{all} ⁻	NR	Uall-4.60	SHGC _{all} ⁻	NR
2.1-5.0%	Uall-3.12	SHGC _{all} ⁻	NR	Uall-3.12	SHGC _{all} ⁻	NR	Uall-4.60	SHGC _{all} ⁻	NR

Developed from spreadsheet

EnvCriteriaGenerator_8-7-01.xls

Table B-26
Building Envelope Requirements (HDD18: 11001+, CDD10: 0+)

OPAQUE ELEMENTS	NONRESIDENTIAL		RESIDENTIAL		SEMIHEATED	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.220	R-4.4 ci	U-0.273	R-3.5 ci	U-0.527	R-1.8 ci
Metal Building	U-0.267	R-2.8 + R-3.3	U-0.278	R-2.3 + R-3.3	U-0.369	R-3.3
Attic and Other	U-0.098	R-10.6	U-0.098	R-10.6	U-0.192	R-5.3
<i>Walls, Above Grade</i>						
Mass	U-0.404	R-2.7 ci	U-0.404	R-2.7 ci	U-0.592	R-1.7 ci
Metal Building	U-0.324	R-2.3 + R-2.3	U-0.312	R-2.8 + R-2.3	U-0.642	R-2.3
Steel Framed	U-0.315	R-2.3 + R-1.8 ci	U-0.228	R-2.3 + R-3.8 ci	U-0.479	R-2.3 + R-0.7 ci
Wood Framed and Other	U-0.291	R-2.3 + R-1.3 ci	U-0.257	R-2.3 + R-1.8 ci	U-0.504	R-2.3
<i>Wall, Below Grade</i>						
Below Grade Wall	C-0.678	R-1.3 ci	C-0.358	R-2.6 ci	C-6.473	NR
<i>Floors</i>						
Mass	U-0.321	R-2.6	U-0.287	R-2.9	U-0.606	R-1.1 ci
Steel Joist	U-0.183	R-6.7	U-0.183	R-6.7	U-0.296	R-3.3
Wood Framed and Other	U-0.188	R-5.3	U-0.188	R-5.3	U-0.288	R-3.3
<i>Slab-On-Grade Floors</i>						
Unheated	F-0.900	R-2.6 for 61.0 cm	F-0.882	R-3.5 for 61.0 cm	F-1.264	NR
Heated	F-0.762	R-2.6 Full	F-0.646	R-3.5 Full	F-1.454	R-1.8 for 91.4 cm
<i>Opaque Doors</i>						
Swinging	U-2.839		U-2.839		U-3.975	
Non-Swinging	U-2.839		U-2.839		U-8.233	
FENESTRATION	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)	Assembly Max. U (Fixed/Operable)	Assembly Max. SHGC (All Orientations/ North-Oriented)
<i>Vertical Glazing, % of Wall</i>						
0-10.0%	Ufixed-1.82	SHGC _{all} ⁻	NR	Ufixed-1.82	SHGC _{all} ⁻	NR
	Uoper-2.04	SHGC _{north} ⁻	NR	Uoper-2.04	SHGC _{north} ⁻	NR
					Ufixed-4.14	SHGC _{all} ⁻ NR
					Uoper-4.60	SHGC _{north} ⁻ NR

10.1-20.0%	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-4.14	SHGC _{all} -	NR
	Uoper-2.04	SHGC _{north} -	NR	Uoper-2.04	SHGC _{north} -	NR	Uoper-4.60	SHGC _{north} -	NR
20.1-30.0%	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-4.14	SHGC _{all} -	NR
	Uoper-2.04	SHGC _{north} -	NR	Uoper-2.04	SHGC _{north} -	NR	Uoper-4.60	SHGC _{north} -	NR
30.1-40.0%	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-1.82	SHGC _{all} -	NR	Ufixed-4.14	SHGC _{all} -	NR
	Uoper-2.04	SHGC _{north} -	NR	Uoper-2.04	SHGC _{north} -	NR	Uoper-4.60	SHGC _{north} -	NR
40.1-50.0%	Ufixed-1.42	SHGC _{all} -	NR	Ufixed-1.42	SHGC _{all} -	NR	Ufixed-3.32	SHGC _{all} -	NR
	Uoper-1.65	SHGC _{north} -	NR	Uoper-1.65	SHGC _{north} -	NR	Uoper-3.68	SHGC _{north} -	NR
<i>Skylight with Curb, Glass, % of Roof</i>									
0-2.0%	Uall-5.00	SHGC _{all} -	NR	Uall-5.00	SHGC _{all} -	NR	Uall-7.38	SHGC _{all} -	NR
2.1-5.0%	Uall-5.00	SHGC _{all} -	NR	Uall-5.00	SHGC _{all} -	NR	Uall-7.38	SHGC _{all} -	NR
<i>Skylight with Curb, Plastic, % of Roof</i>									
0-2.0%	Uall-3.46	SHGC _{all} -	NR	Uall-3.46	SHGC _{all} -	NR	Uall-6.25	SHGC _{all} -	NR
2.1-5.0%	Uall-3.46	SHGC _{all} -	NR	Uall-3.46	SHGC _{all} -	NR	Uall-6.25	SHGC _{all} -	NR
<i>Skylight without Curb, All, % of Roof</i>									
0-2.0%	Uall-3.12	SHGC _{all} -	NR	Uall-3.12	SHGC _{all} -	NR	Uall-4.60	SHGC _{all} -	NR
2.1-5.0%	Uall-3.12	SHGC _{all} -	NR	Uall-3.12	SHGC _{all} -	NR	Uall-4.60	SHGC _{all} -	NR