Envelope Summary — Climate Zone 1 — ENV-SUM

2006 Washington State Nonresidential Energy Code Compliance Forms — Revised July 2007

Project Info	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
	Applicant Phone:	

Project Description	☐ New Building ☐ Addition ☐ Alteration ☐ Change of Use

Compliance Option	☐ Prescriptive ☐ Component Performance (See Decision Flowchart (over) for qualifications) ☐ Seattle EnvStd ☐ Systems Analysis

Space Heat Type	○ Electric resistance		○ All other	(see over for definitions)	
Glazing Area Calculation Note: Below grade walls may be included in the Gross Exterior Wall Area if they are insulated to the level required for opaque walls.	Total Glazing Area (rough opening) (vertical & overhd)	divided by	Gross Exterior Wall Area	times 100 equals	**% Glazing**
		÷		X 100 =	
Concrete/Masonry Option	○ yes ○ no	Check here if using this option and if project meets all requirements for the Concrete/Masonry Option. See Decision Flowchart (over) for qualifications. Enter requirements for each qualifying assembly below.			
Semi-Heated Path	○ yes ○ no	Check here if using semi-heated path and if project meets all requirements for semi-heated spaces as defined in section 1310. Requires other fuel heating and qualifying thermostat. Only wall insulation requirement is reduced (2006 change). Only available in prescriptive path.			

Electronic version: these values are automatically taken from ENV-UA-1.

Envelope Requirements (enter values as applicable)	
	Minimum Insulation R-values
Roofs Over Attic	
All Other Roofs	
Opaque Walls[1]	
Below Grade Walls	
Floors Over Unconditioned Space	
Slabs-on-Grade	
Radiant Floors	
	Maximum U-factors
Opaque Doors	
Vertical Glazing	
Overhead Glazing	
	Maximum SHGC (or SC)
Vertical/Overhead Glazing	

1. Assemblies with metal framing must comply with overall U-factors

Opaque Concrete/Masonry Wall Requirements	
Wall Maximum U-factor is 0.15 (R5.7 continuous ins)	
CMU block walls with insulated cores comply	
If project qualifies for Concrete/Masonry Option, list walls with HC ≥ 9.0 Btu/ft²•°F below (other walls must meet Opaque Wall requirements). Use descriptions and values from Table 10-9 in the Code.	
Wall Description (including insulation R-value & position)	**U-factor**

Notes:

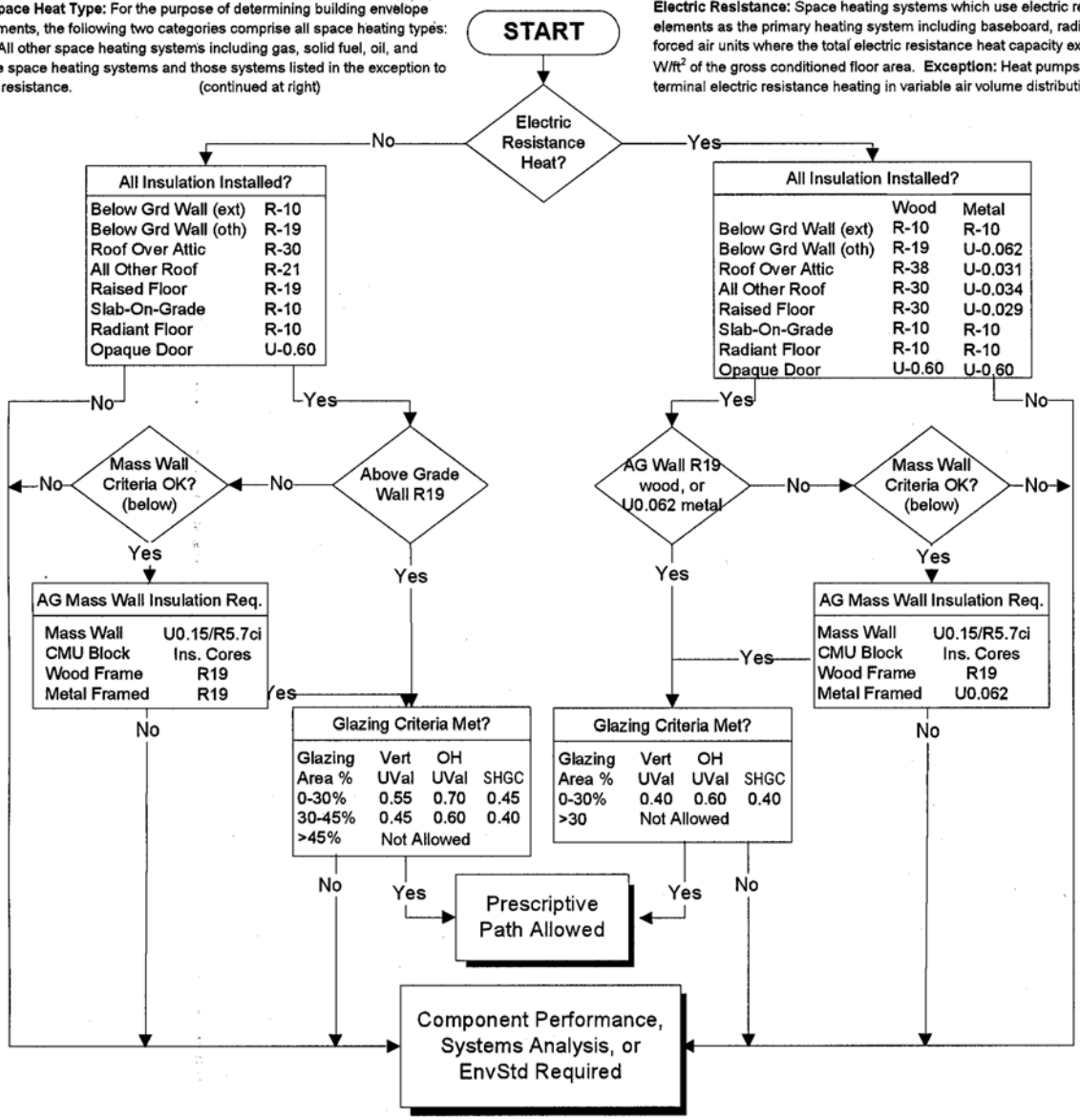
Envelope Summary (back) Climate Zone 1 ENV-SUM

Decision Flowchart
for Prescriptive Option

Use this flowchart to determine if project qualifies for the optional Prescriptive Option. If not, either the Component Performance or Systems Analysis Options must be used.

1302 Space Heat Type: For the purpose of determining building envelope requirements, the following two categories comprise all space heating types: **Other:** All other space heating systems including gas, solid fuel, oil, and propane space heating systems and those systems listed in the exception to electric resistance. (continued at right)

Electric Resistance: Space heating systems which use electric resistance elements as the primary heating system including baseboard, radiant, and forced air units where the total electric resistance heat capacity exceeds 1.0 W/ft^2 of the gross conditioned floor area. **Exception:** Heat pumps and terminal electric resistance heating in variable air volume distribution systems.



Concrete/Masonry Option*	Wall Heat Capacity (HC)			
Assembly Description	Assy.Tag	HC**	Area (sf)	HC x Area
			Totals	
			Area weighted HC: divide total of (HC x area) by Total Area	

*If the area weighted heat capacity (HC) of the total above grade wall is a minimum of 9.0, the Concrete Masonry Option may be used. **For framed walls, assume HC=1.0 unless calculations are provided; for all other walls, use Section 1009.

Envelope UA Calculations Climate Zone 1 ENV-UA

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Project Address		Date
Space Heat Type	○ Electric resistance ○ All other	For Building Department Use
Glazing Area as % gross exterior wall area	Prop. / Max.Target	
Concrete/Masonry Option	○ Yes ○ No	

Notes: If glazing area exceeds maximum allowed in Table, then calculate adjusted areas on back (over).

	Building Component List components by assembly ID & page #	Proposed UA U-factor x Area (A) = UA (U x A)	Target UA U-factor x Area (A) = UA (U x A)
Vertical Glazing	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		Glazing % / Electric Resist. / Other Heating 0-30% / 0.40 / 0.55 >30-45% / see note above / 0.45
Overhead Glazing – Over Attics	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		Glazing % / Electric Resist. / Other Heating 0-30% / 0.6 / 0.7 >30-45% / see note above / 0.6
Overhead Glazing – Oth.Roofs	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		
Opaque Doors	U= Plan ID: U= Plan ID: U= Plan ID:		Electric Resist. / Other Heating 0.60 / 0.60
Roofs Over Attics	R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.031 / 0.036
Other Roofs	R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.034 / 0.046
Opaque Walls*	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: **Note: sum of Target Areas here should equal Target Opaque Wall Area (see back)		** ** Electric Resist. / Other Heating Frame-Wd 0.062 / 0.062 Frame-Mtl 0.062 / 0.109 Mass Wall++ 0.15 / 0.15 ++ see mass wall Criteria
Below Grade Walls	R= Plan ID: R= Plan ID: R= Plan ID: Note: if insulated to levels required for opaque walls, list above with opaque walls		Electric Resist. / Other Heating Int Ins 0.062 / 0.062 Ext Ins 0.07 / 0.07
Floors Over Uncond. Sp.	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.029 / 0.056
Slab-on-grade Radiant	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating F=0.54 / F=0.54 (see Table 13-1 for radiant floor values)
	Totals		Totals

*For CMU walls, indicate core insulation material.

To comply: **1) Proposed Total UA shall not exceed Target Total UA.**
2) Proposed Total Area shall equal Target Total Area.

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	Glazing List components by assembly ID & page #	Proposed SHGC SHGC*	x Area (A)	= SHGC x A	Target SHGC SHGC	x Area (A)	= SHGC x A
Glazing	ID:						
	ID:				Glazing %	Electric Resist.	Other Heating
	ID:				0-30%	0.4	0.45
	ID:				>30-45%	not allowed	0.4
	ID:						
	ID:						
		Totals			Totals		

*Note: Manufacturer's SC may be used in lieu of SHGC.

For compliance: Proposed total SHGC x A shall not exceed Target total SHGC x A

NOTE: Since 1997 SHGC compliance for vertical and overhead glazing is allowed to be calculated together.

Target Area Adjustment Calculations

If the total amount of glazing area as a % of gross exterior wall area (calculated on ENV-SUM1) exceeds the maximum allowed in Table 13-1, then this calculation must be submitted Use the resulting areas in the Target UA and SHGC calculations above.

Proposed Areas: Numbered values are used in calculations below.

	Roofs over Attics	Other Roofs	Walls
Glazing Area	OG=	OG=	VG=
Opaque Area			

Note:
OG = overhead glazing
VG = vertical glazing

Gross Exterior Wall Area [ ] x Max Glazing Area (Table 13-1) [ ] ÷ 100 = Maximum Target Glazing Area [ ]

[ ] − Target OG Area in Roofs over Attics [ ] ⇕ lesser = Max OG Remaining [ ] − Target OG Area in Other Roofs [ ] ⇕ lesser = Target VG Area [ ]

For Target OG's, the lesser values are used both here and below.

	Proposed Opaque Area		Proposed OG Area		Target OG Area		Target Opaque Area
Roofs over Attics		+		−		=	
Other Roofs		+		−		=	

	Proposed Opaque Area		Proposed VG Area		Target VG Area		Target Opaque Area
Walls		+		−		=	

Target Areas OK

Note: If there is more than one type of wall, the Target VG Area may be distributed among them, and separate Target Opaque Areas found.
If the Target Areas for Opaque Walls listed on the front must equal the total calculated here.

Target values in shaded boxes are used in the applicable Target UA calculations on the front.
Target VG Area and Total Target OG Area are also used in the applicable Target SHGC calculations above.