WAC 51-11R-40215 Target/Proposed UA equations.

EQUATION 1 - GROUP R OCCUPANCY
TARGET UA

$$UA_T = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_D A_D + F_S P_S + F_{BGS} P_{BGS}$$

Where:

UA_T	=	The target combined thermal transmittance of the gross exterior wall, floor and roof/ceiling area.
U_W	=	The thermal transmittance value of the opaque above grade wall found in Table R402.1.3.
A_W	=	Opaque above grade wall area.
U_{BGW}	=	The thermal transmittance value of the below grade opaque wall found in Table R402.1.3.
A_{BGW}	=	Opaque below grade wall area.
U_{VG}	=	The thermal transmittance value of the fenestration found in Table R402.1.3.
A_{VG}	=	(a) The proposed glazing area; where proposed fenestration glazing area is less than 15 percent of the conditioned floor area, minus A_{OG}. (b) 15 percent of the conditioned floor area; where the proposed fenestration glazing area is 15 percent or more of the conditioned floor area, minus A_{OG}.
U_{OG}	=	The thermal transmittance value of the skylight glazing found in Table R402.1.3.
A_{OG}	=	Skylight glazing area (if the proposed A_{OG} exceeds 15 percent, the target A_{OG} shall be 15 percent of the total floor area of the conditioned space).
U_F	=	The thermal transmittance value of the floor found in Table R402.1.3.
A_F	=	Floor area over unconditioned space.
U_{RC}	=	The thermal transmittance value of the ceiling found in Table R402.1.3.
A_{RC}	=	Roof/ceiling area.
U_D	=	The thermal transmittance value of the fenestration found in Table R402.1.3.
A_D	=	Opaque door area.
F_S	=	Concrete slab on grade component *F*-factor found in Table R402.1.3.
P_S	=	Lineal ft. of concrete slab on grade perimeter.
F_{BGS}	=	Concrete below grade slab component *F*-factor found in Table R402.1.3.
P_{BGS}	=	Lineal ft. of concrete below grade slab perimeter.

EQUATION 2 - GROUP R OCCUPANCY
PROPOSED UA

$$UA = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_D A_D + F_S P_S + F_{BGS} P_{BGS}$$

Where:

UA	=	The combined thermal transmittance of the gross exterior wall, floor and roof/ceiling assembly area.
U_W	=	The thermal transmittance of the opaque above grade wall area.
A_W	=	Opaque above grade wall area.
U_{BGW}	=	The thermal transmittance value of the below grade opaque wall.
A_{BGW}	=	Opaque below grade wall area.
U_{VG}	=	The thermal transmittance value of the fenestration glazing.
A_{VG}	=	Fenestration glazing area, including windows in exterior doors.
U_{OG}	=	The thermal transmittance value of the skylight glazing.
A_{OG}	=	Skylight glazing area.
U_F	=	The thermal transmittance of the floor.
A_F	=	Floor area over unconditioned space.
U_{RC}	=	The thermal transmittance of the ceiling.

A_{RC} = Ceiling area.

U_D = The thermal transmittance value of the opaque door area.

A_D = Opaque door area.

F_S = Concrete slab on grade component *F*-factor.

P_S = Lineal ft. of concrete slab on grade perimeter.

F_{BGS} = Concrete below grade slab component *F*-factor.

P_{BGS} = Lineal ft. of concrete below grade slab perimeter.

NOTE: Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into subelements as:

$$U_{W1}A_{W1} + U_{W2}A_{W2} + U_{W3}A_{W3} + ...\text{etc.}$$

NOTE: Below grade walls: The wall is assumed to extend from the slab upward to the top of the mud sill for the distance specified in Table A104.1, with 6 inches of concrete wall extending above grade. This will be calculated separately from above grade walls using the wall height that best describes the system.

[Statutory Authority: RCW 19.27A.020, 19.27A.045, 19.27A.160 and chapter 19.27 RCW. WSR 20-01-047, § 51-11R-40215, filed 12/9/19, effective 7/1/20.]