



# Thermal Modelling Report



Revision 0 // 01/08/2024

## Slab NZBC R-Value and Passive House $\Psi$ and fRSI

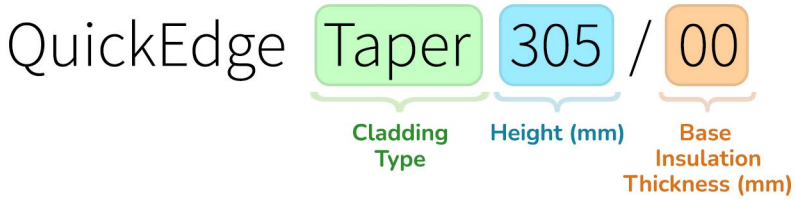


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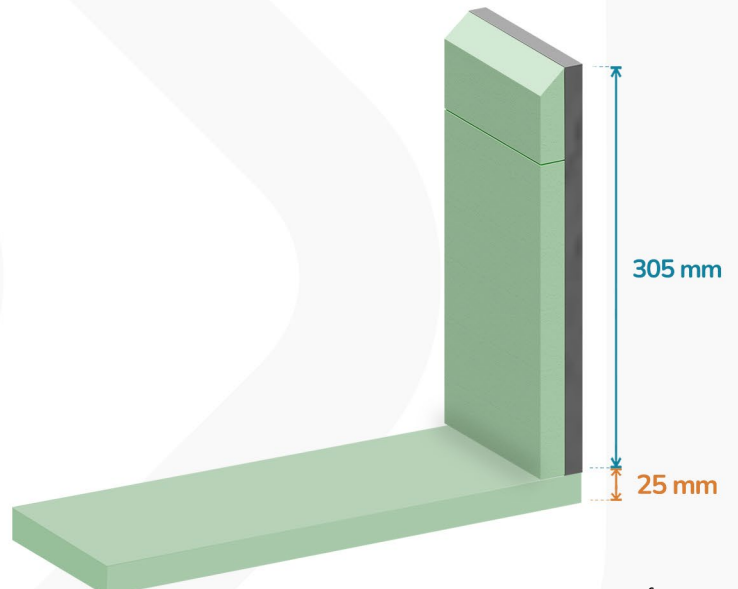
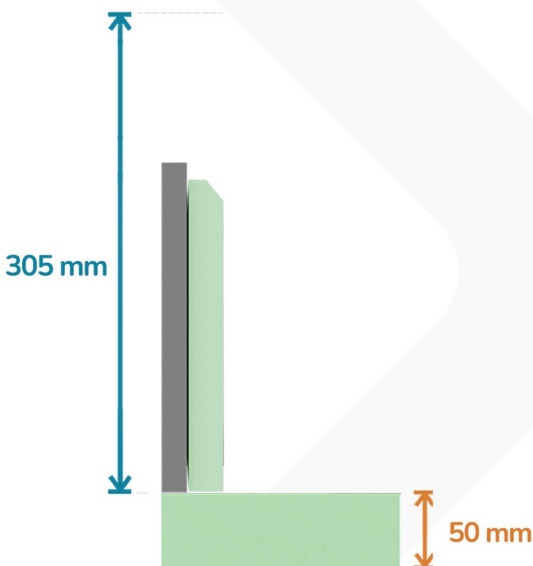
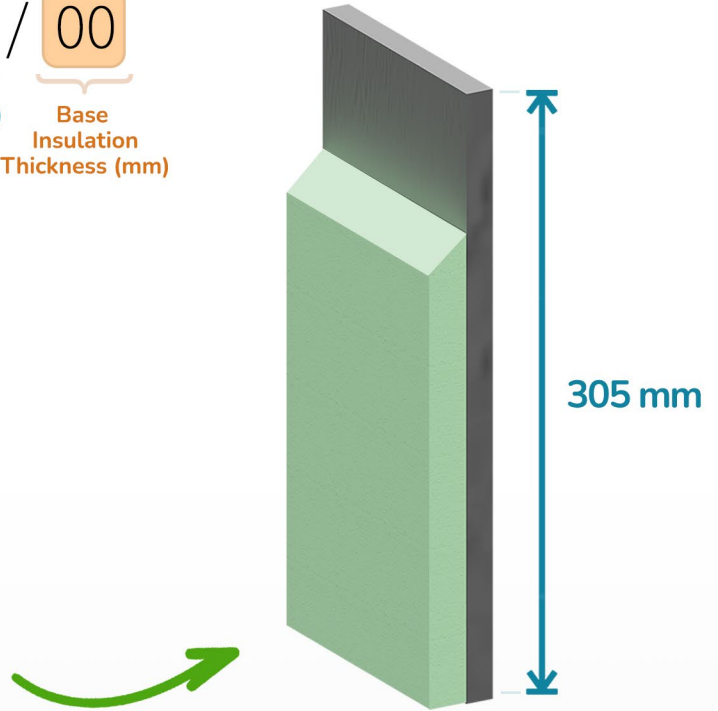
# QuickEdge Naming System



In our naming system, the cladding type refers to the type of QuickSet system, where:

- **Taper** is for standard cladding;
- **Ultra** is for standard cladding but features additional insulation for 140mm framing and above;
- **Brick** is for brick cladding.

The final values after the slash denote the base insulation thickness, where 00 denotes no base insulation, for example.



# QuickSet Naming System

QuickSet **Taper** **305** / **00**

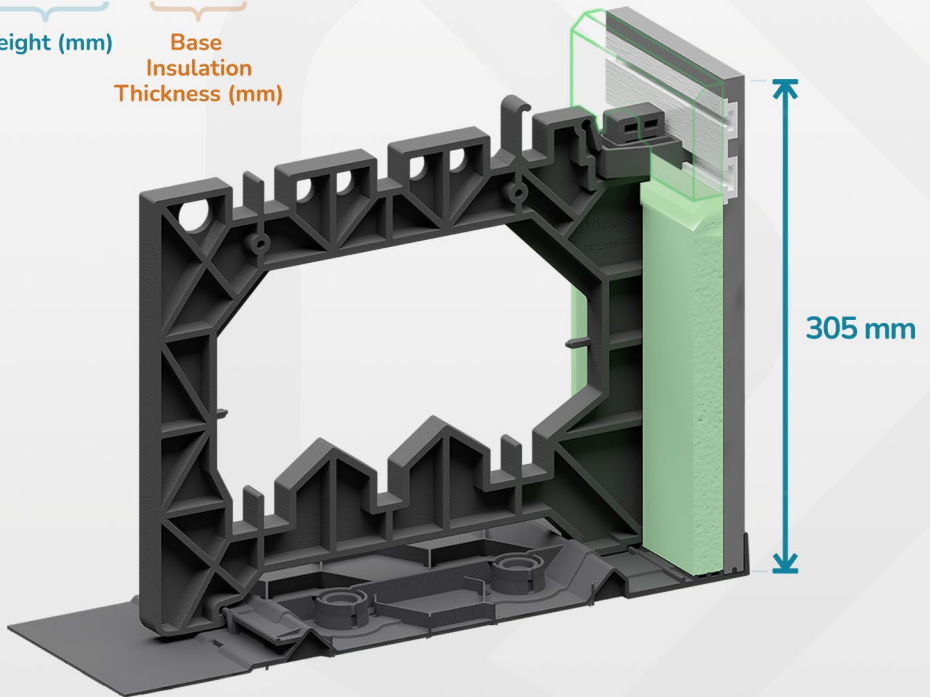
Cladding Type    Height (mm)    Base Insulation Thickness (mm)

In the naming system, the cladding type refers to the type of QuickSet system:

- **Taper** is for standard cladding;
- **Ultra** is for standard cladding but features an insulated top cap for 140mm framing and above;
- **Rebate** is for brick cladding.

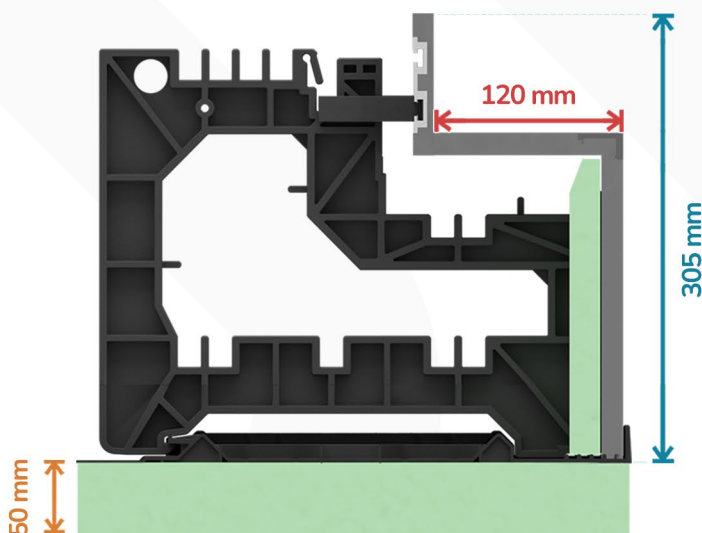
The height value refers to the height of the formwork.

The final values after the slash denote the base insulation thickness, where 00 denotes no base insulation.



QuickSet **Rebate** **120** / **305** / **50**

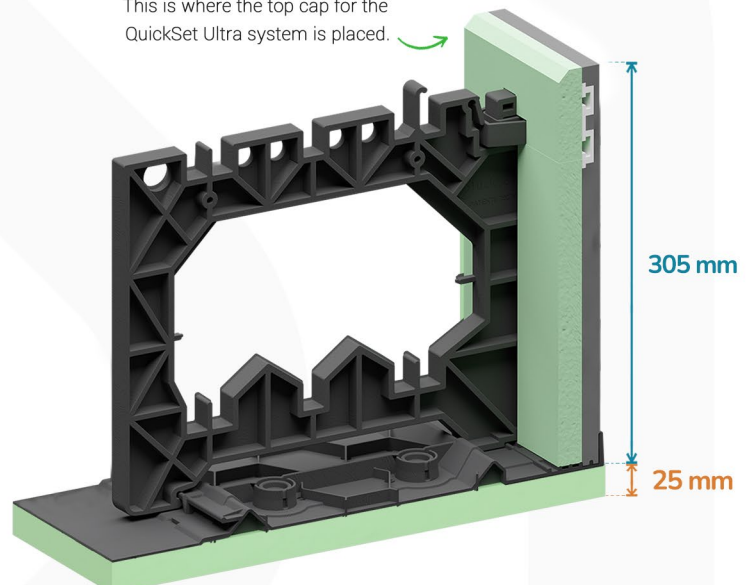
Cladding Type    Rebate Size (mm)    Height (mm)    Base Insulation Thickness (mm)



QuickSet **Ultra** **305** / **25**

Cladding Type    Height (mm)    Base Insulation Thickness (mm)

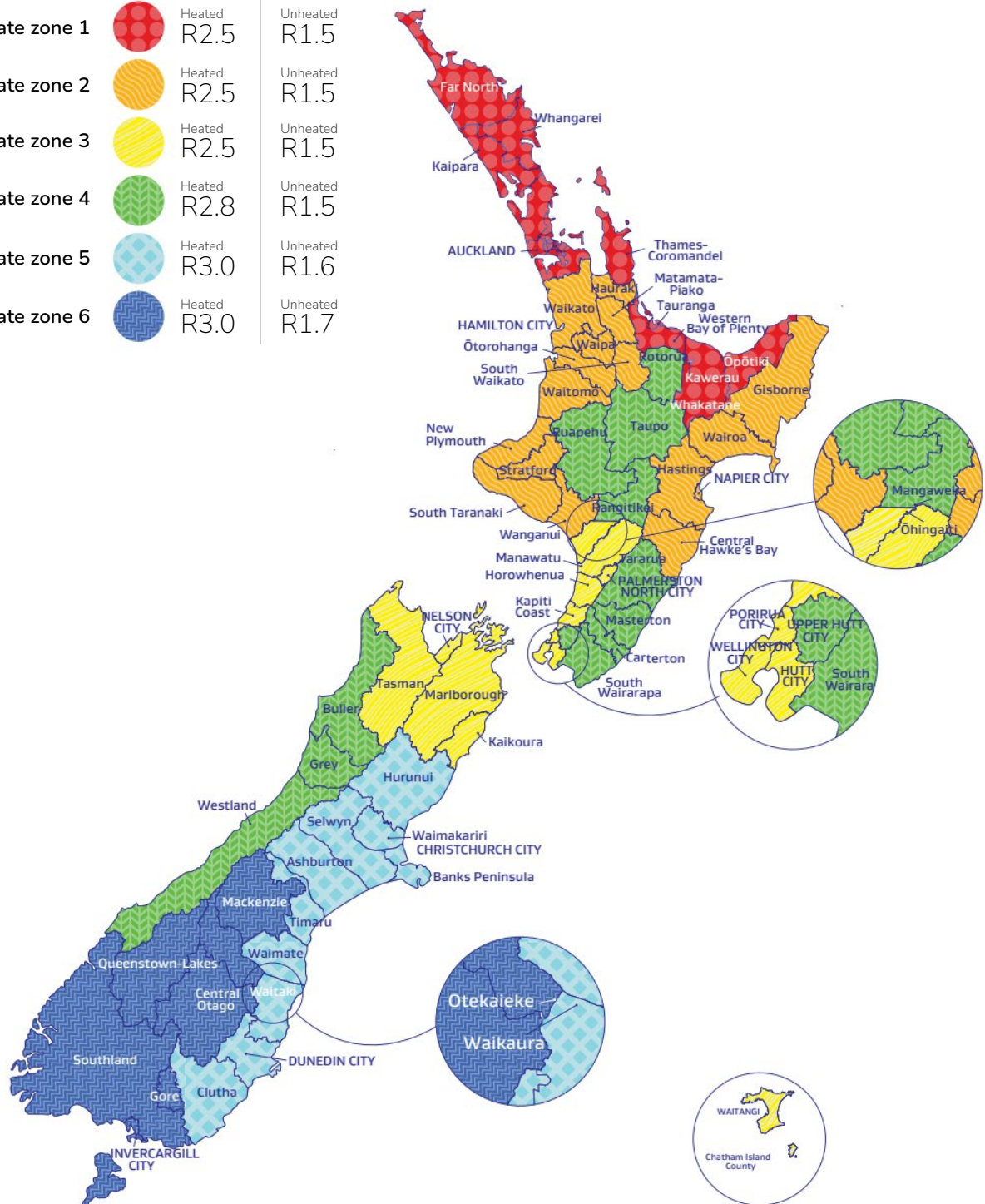
This is where the top cap for the QuickSet Ultra system is placed.





# Climate Zone Boundaries

Climate zone 1		Heated R2.5	Unheated R1.5
Climate zone 2		Heated R2.5	Unheated R1.5
Climate zone 3		Heated R2.5	Unheated R1.5
Climate zone 4		Heated R2.8	Unheated R1.5
Climate zone 5		Heated R3.0	Unheated R1.6
Climate zone 6		Heated R3.0	Unheated R1.7





# Product R-Value Summary

Please note that Taper and Ultra results are applicable to both QuickSet and QuickEdge.

Product	Area to Perimeter Ratio										
	1.0	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.6	4.0
Taper 305/00 with QPOD	0.74	0.96	1.03	1.11	1.18	1.24	1.31	1.37	1.44	1.63	1.76
Taper 305/00 with Polypod	0.89	1.15	1.24	1.33	1.40	1.48	1.55	1.63	1.70	1.91	2.05
Taper 305/25 with QPOD	1.06	1.36	1.46	1.55	1.63	1.71	1.79	1.87	1.95	2.17	2.32
Taper 305/25 with Polypod	1.07	1.40	1.52	1.63	1.71	1.80	1.88	1.97	2.05	2.28	2.43
Taper 305/50 with QPOD	1.21	1.57	1.70	1.82	1.92	2.03	2.13	2.23	2.34	2.59	2.76
Taper 305/50 with Polypod	1.28	1.68	1.81	1.95	2.06	2.17	2.29	2.40	2.51	2.78	2.95
Taper 305/75 with Polypod	1.35	1.81	1.96	2.12	2.22	2.33	2.44	2.55	2.66	2.94	3.12
Taper 305/100 with Polypod	1.42	1.90	2.06	2.22	2.33	2.45	2.57	2.69	2.81	3.16	3.39
Taper 305/150 (SlabX200) Polypod	1.60	2.24	2.45	2.66	2.83	2.99	3.15	3.32	3.48	3.89	4.16
Ultra 305/00 with QPOD	0.82	1.06	1.14	1.21	1.28	1.35	1.42	1.49	1.56	1.77	1.90
Ultra 305/00 with Polypod	0.97	1.24	1.33	1.42	1.50	1.58	1.65	1.73	1.81	2.02	2.17
Ultra 305/25 with QPOD	1.29	1.61	1.72	1.83	1.91	2.00	2.08	2.16	2.25	2.48	2.63
Ultra 305/25 with Polypod	1.42	1.79	1.92	2.04	2.13	2.22	2.31	2.40	2.49	2.74	2.90
Ultra 305/50 with QPOD	1.62	2.03	2.17	2.30	2.40	2.50	2.60	2.69	2.79	3.05	3.23
Ultra 305/50 with Polypod	1.73	2.15	2.30	2.44	2.56	2.67	2.79	2.91	3.02	3.30	3.48
Ultra 305/75 with QPOD	1.76	2.20	2.35	2.49	2.59	2.70	2.80	2.90	3.00	3.27	3.45
Ultra 305/75 with Polypod	1.95	2.46	2.62	2.79	2.93	3.07	3.21	3.34	3.48	3.79	4.00
Ultra 305/100 with Polypod	2.03	2.60	2.79	2.98	3.11	3.24	3.36	3.49	3.61	3.93	4.13
Ultra 305/150 (SlabX200) QPOD	2.17	2.81	3.03	3.24	3.39	3.54	3.69	3.84	3.99	4.35	4.60
Ultra 305/150 (SlabX200) Polypod	2.31	3.02	3.26	3.50	3.66	3.83	3.99	4.16	4.32	4.72	4.98
QS Rebate 120/305/00 with QPOD	0.81	1.05	1.13	1.21	1.28	1.35	1.42	1.49	1.56	1.76	1.90
QS Rebate 120/305/00 with Polypod	0.98	1.25	1.35	1.44	1.51	1.59	1.67	1.75	1.82	2.04	2.18
QS Rebate 120/305/25 with QPOD	1.22	1.53	1.63	1.74	1.82	1.90	1.99	2.07	2.16	2.39	2.54
QS Rebate 120/305/25 with Polypod	1.33	1.70	1.83	1.95	2.04	2.13	2.22	2.31	2.40	2.65	2.81
QS Rebate 120/305/50 with QPOD	1.48	1.84	1.96	2.08	2.19	2.30	2.41	2.52	2.63	2.89	3.06
QS Rebate 120/305/50 with Polypod	1.61	2.00	2.14	2.27	2.39	2.51	2.63	2.75	2.86	3.14	3.32
QS Rebate 120/305/75 with QPOD	1.54	1.98	2.13	2.28	2.38	2.49	2.59	2.69	2.80	3.07	3.25
QS Rebate 120/305/75 with Polypod	1.66	2.15	2.31	2.47	2.59	2.70	2.81	2.92	3.03	3.32	3.51
QS Rebate 120/305/100 with Polypod	1.78	2.30	2.47	2.65	2.79	2.93	3.07	3.21	3.35	3.67	3.88
QS Rebate w/ Ultra 120/305/150 (SlabX200) QPOD	1.99	2.63	2.84	3.05	3.20	3.35	3.50	3.65	3.80	4.16	4.41
QS Rebate w/ Ultra 120/305/150 (SlabX200) Polypod	2.21	2.92	3.15	3.39	3.55	3.72	3.88	4.04	4.21	4.61	4.87
QuickEdge Brick 305/00	0.95	1.21	1.30	1.39	1.47	1.54	1.62	1.70	1.77	1.99	2.13
QuickEdge Brick 305/25	1.27	1.62	1.73	1.85	1.94	2.03	2.12	2.21	2.30	2.55	2.72
QuickEdge Brick 305/50	1.42	1.84	1.98	2.11	2.22	2.32	2.42	2.53	2.63	2.90	3.09

# QuickSet Edge Insulation Equivalence to R1 Edge

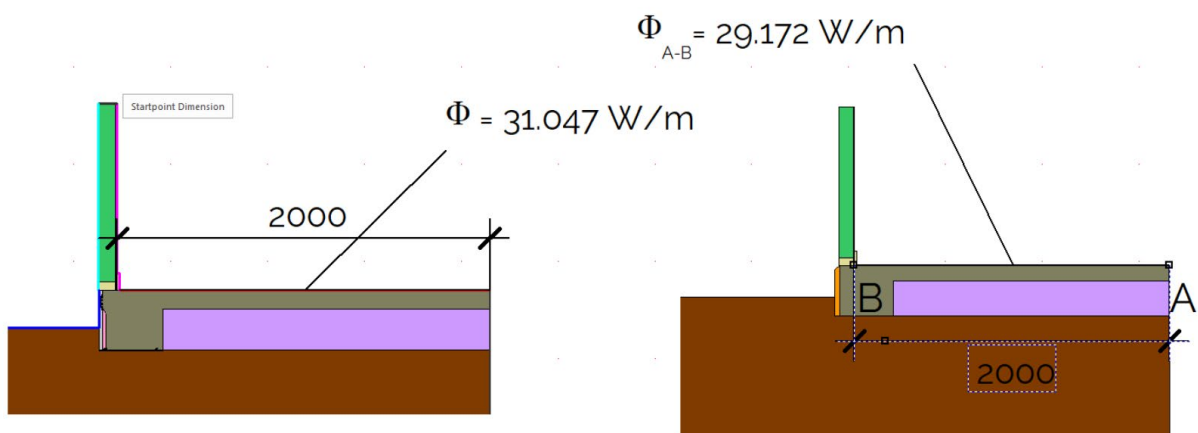
**We have reviewed the performance of the QuickSet Edge insulation and determined that the QuickSet Ultra edge insulation exceeds the H1/AS1 and H1/AS2 R1 Edge insulation.**

Note that we have also reviewed the QuickSet Taper insulation and found that its thermal performance is slightly less than that of R1 edge insulation as used to produce the tables in H1/AS1 and H1/AS2.

Although it is not published as part of H1/AS1 or H1/AS2 the waffle pod slabs with R1 edge insulation in Table H1/AS1 Table F.1.2.2D or H1/AS2 Table F.1.2.2D: Construction R-values for concrete raft foundation floors with R 1.0 vertical edge insulation, where the external walls do not have masonry veneer cladding is for a 300 mm tall waffle pod and thus the edge insulation stick further into the ground. As most of the QuickSet slab designs use a 220-mm-tall waffle pod (referred to as a poly pod) this means that for a direct comparison the QuickSet edge insulation needs to be compared to an R1 edge insulation on the same size pod. These calculations follow the H1/VM1 Appendix F methodology.

This calculation was completed for an A/P = 2 m aspect ratio 220 mm tall waffle pod slab comparing **A. QuickSet Taper** and **B. QuickSet Ultra**.

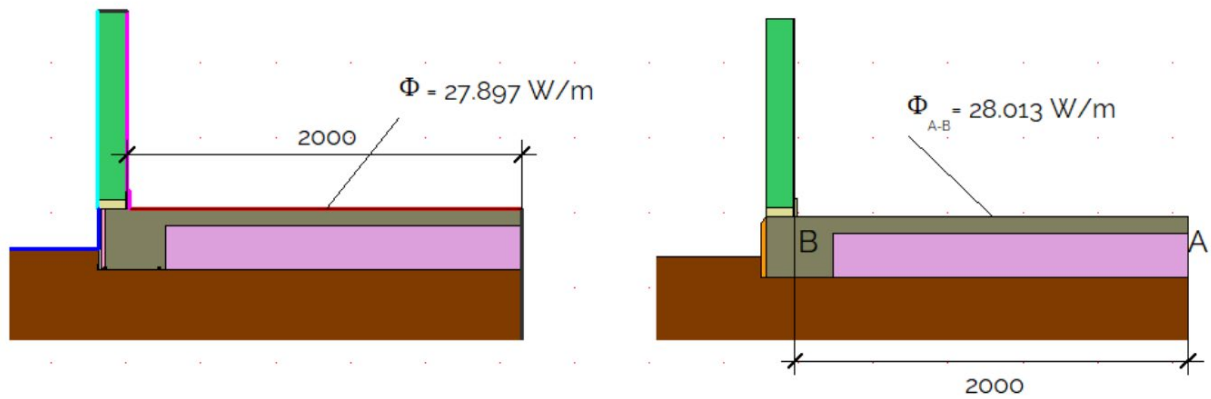
**A.** QuickSet Taper with a 90 mm timber stud wall with poly pods to a R1 edge insulation using the same wall and slab dimensions. The QuickSet Taper has a heat loss of 31.05 W/m while the R1 code slab only has a heat loss of 29.17 W/m, which means the R1 edge insulation has less heat loss (higher performance), which demonstrates that QuickSet Taper is not quite equivalent to R1 edge insulation.



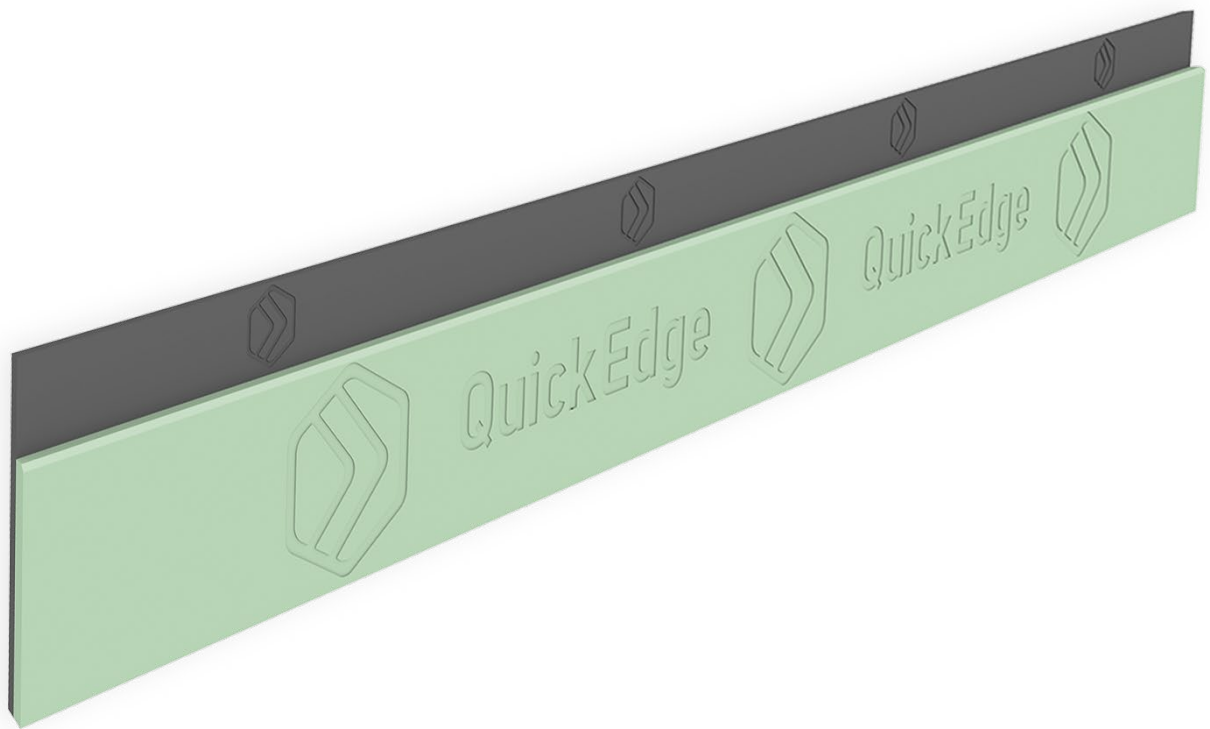


10 April 2024

**B.** QuickSet Ultra with a 140 mm timber stud wall with poly pods to a R1 edge insulation using the same wall and slab dimensions. QuickSet Ultra has a heat loss of 27.90 W/m, while the R1 code slab only has a heat loss of 28.01W/m, which means the R1 edge insulation has heat more loss (lower performance), which demonstrates that QuickSet Ultra exceeds R1 edge insulation.



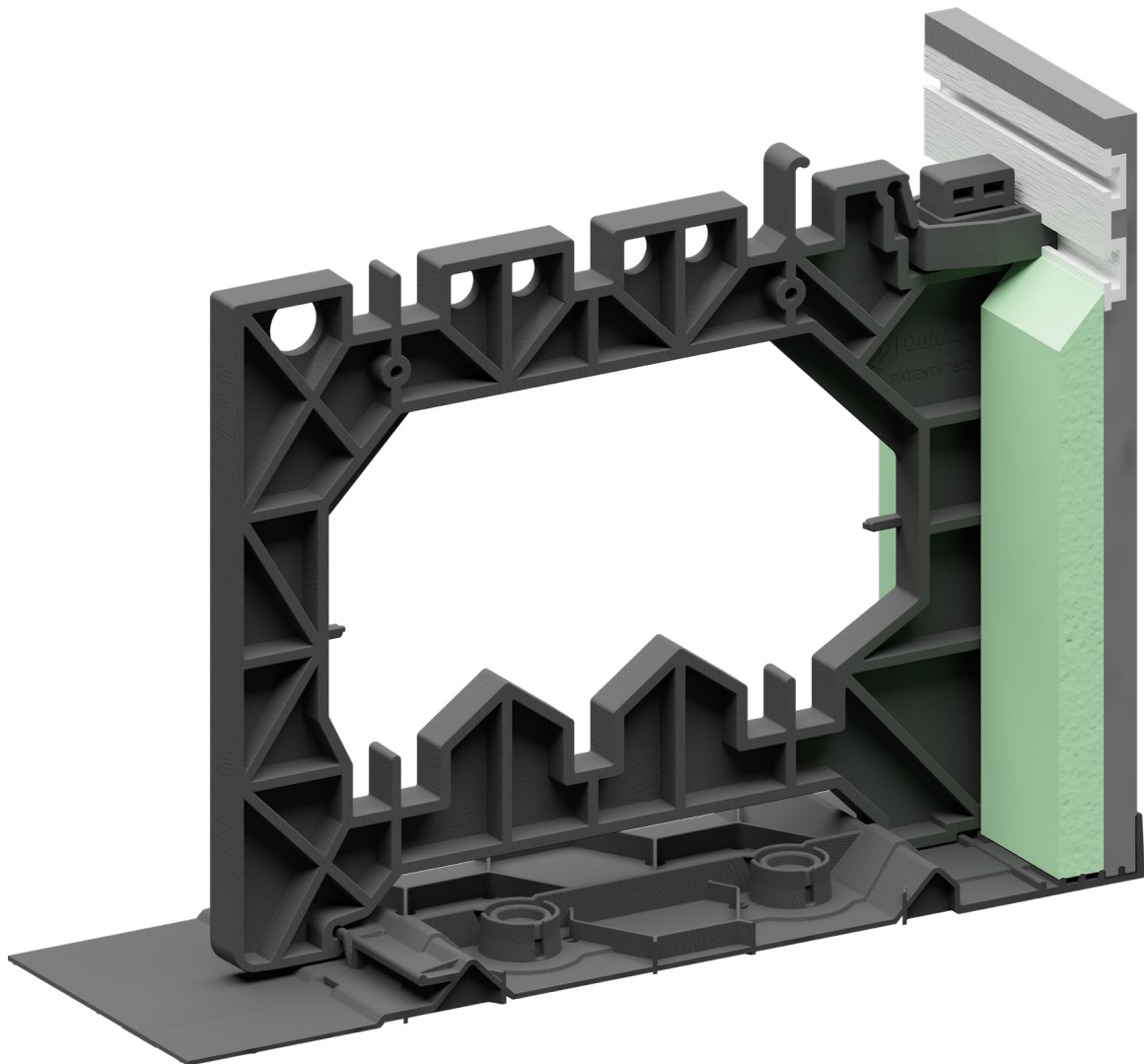
# QuickEdge Taper



- QuickEdge Taper supports height options of 305, 320, 340, 385, 400, 420, 600, and 1200 mm;
- Suitable for all pod systems as well as slabs on grade;
- Compatible with 90 mm framing and above.

**Please note that the thermal results in this section correspond to both QuickSet Taper and QuickEdge Taper.**

# QuickSet Taper

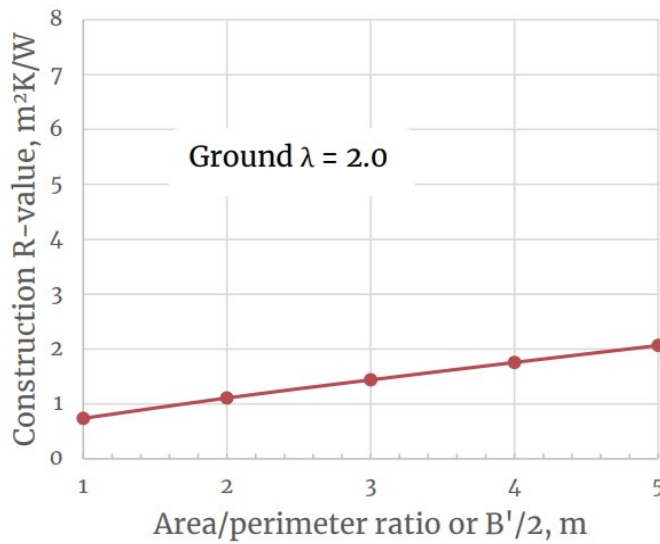
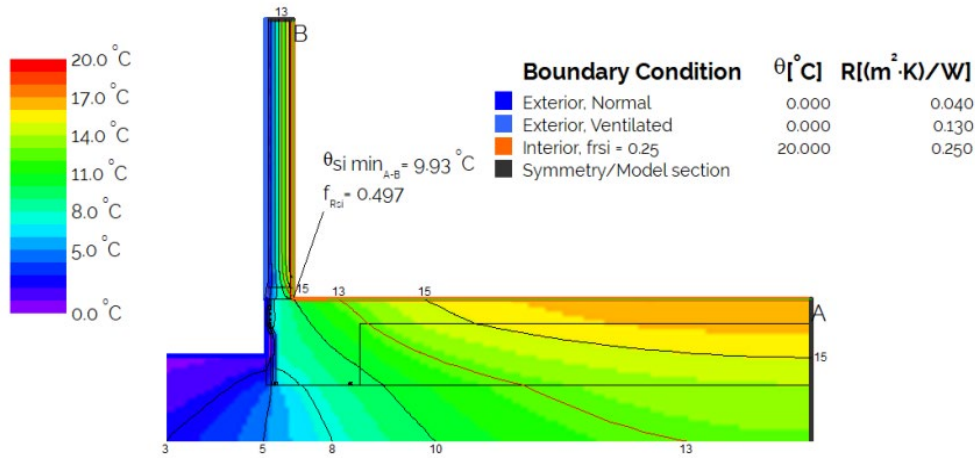


- QuickSet Taper supports height options of 300, 305, 320, 340, 385, and 400 mm;
- Suitable for 220 mm and 300 mm pod systems;
- Compatible with 90 mm framing and above.

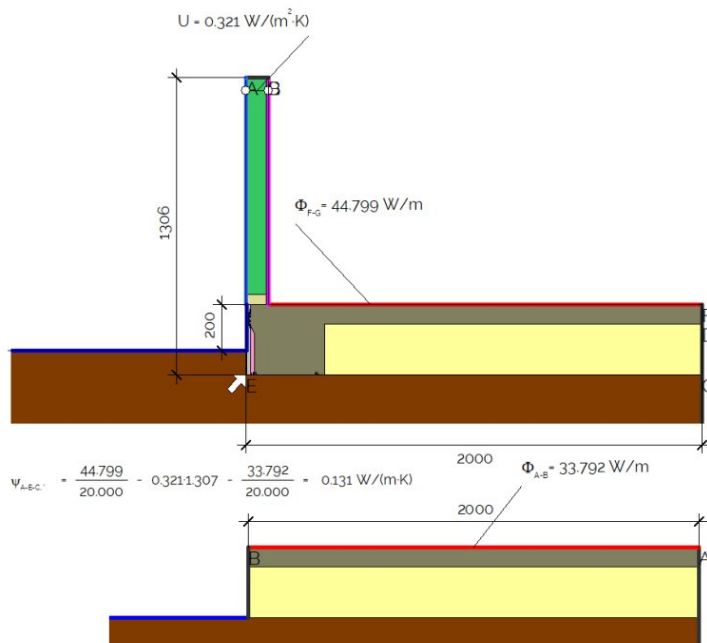
**Please note that the thermal results in this section correspond to both QuickSet Taper and QuickEdge Taper.**



# Taper 305/00 with QPOD



A/P, m	R-value, m²K/W
1	0.74
1.6	0.96
1.8	1.03
2	1.11
2.2	1.18
2.4	1.24
2.6	1.31
2.8	1.37
3	1.44
3.2	1.50
3.4	1.57
3.6	1.63
3.8	1.69
4	1.76
5	2.06

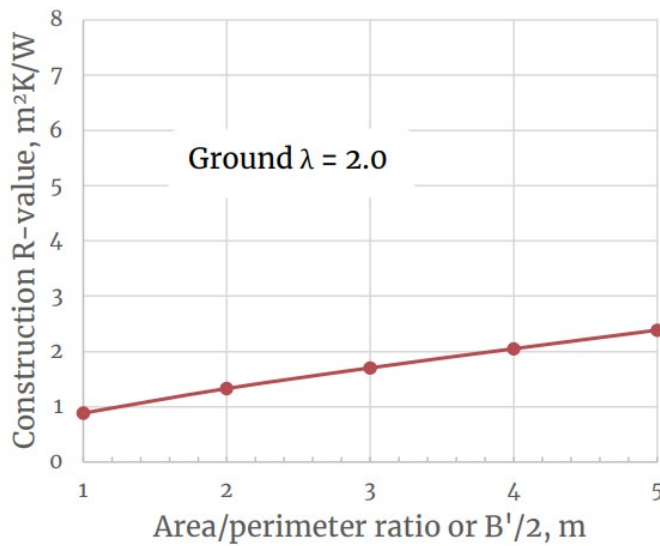
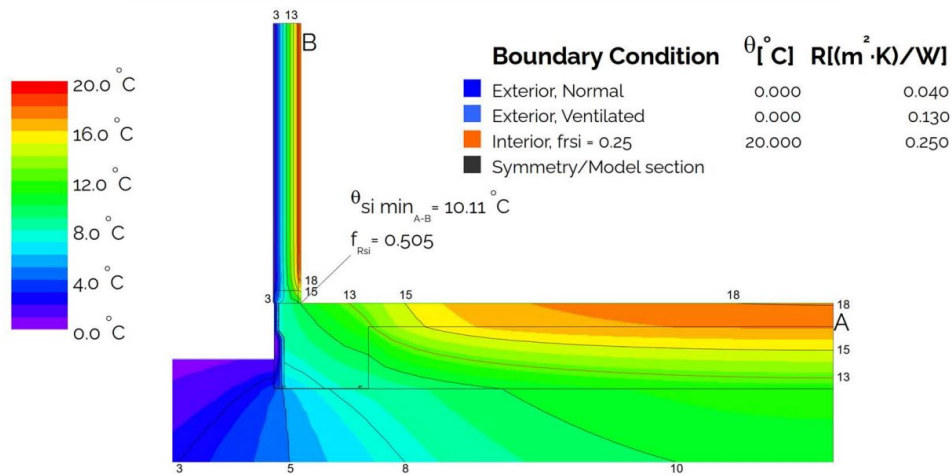


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

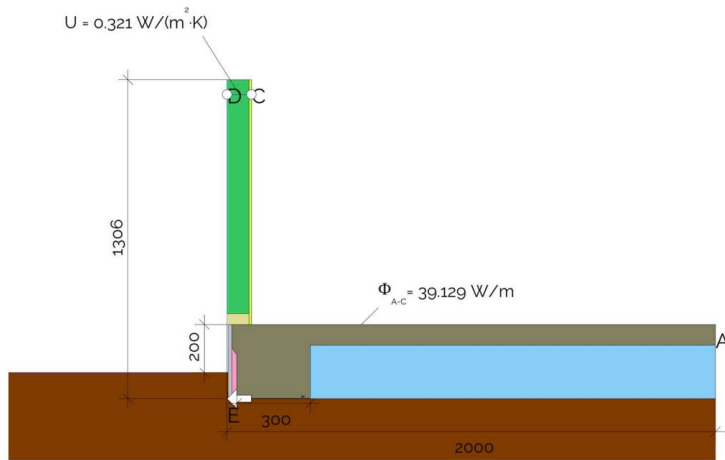
  

Material	λ [W/(m·K)]
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028

# Taper 305/00 with Polypod



A/P, m	R-value, m²K/W
<b>1</b>	<b>0.89</b>
1.6	1.15
1.8	1.24
<b>2</b>	<b>1.33</b>
2.2	1.40
2.4	1.48
2.6	1.55
2.8	1.63
<b>3</b>	<b>1.70</b>
3.2	1.77
3.4	1.84
3.6	1.91
3.8	1.98
<b>4</b>	<b>2.05</b>
<b>5</b>	<b>2.39</b>

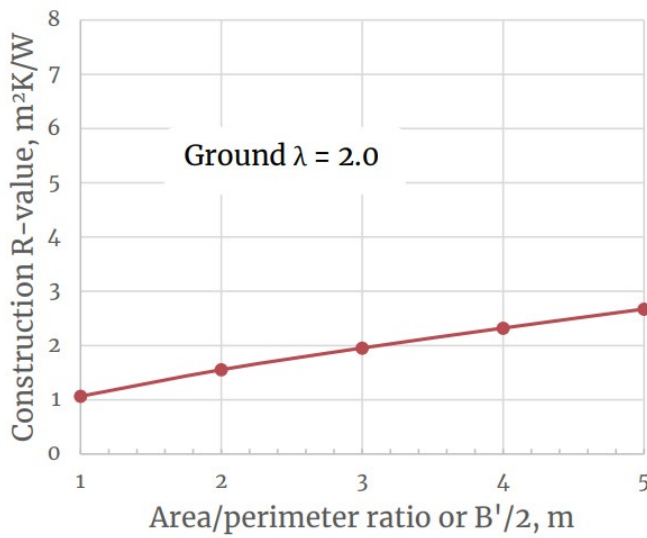
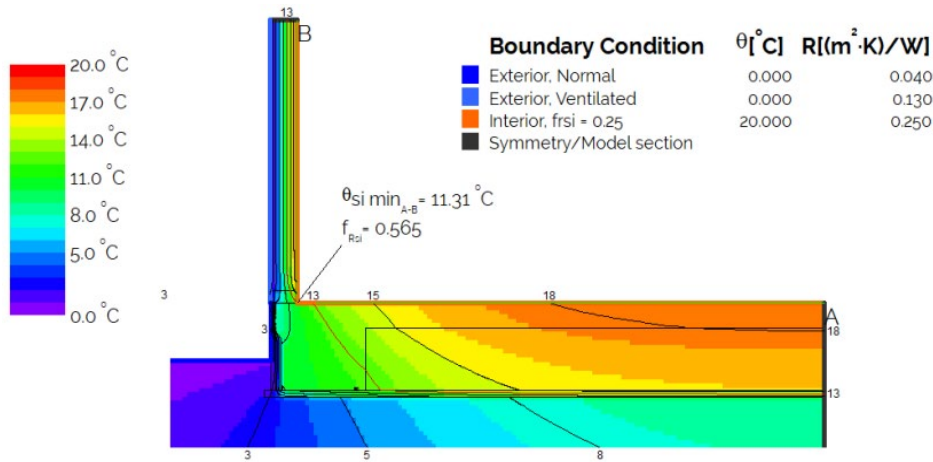


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

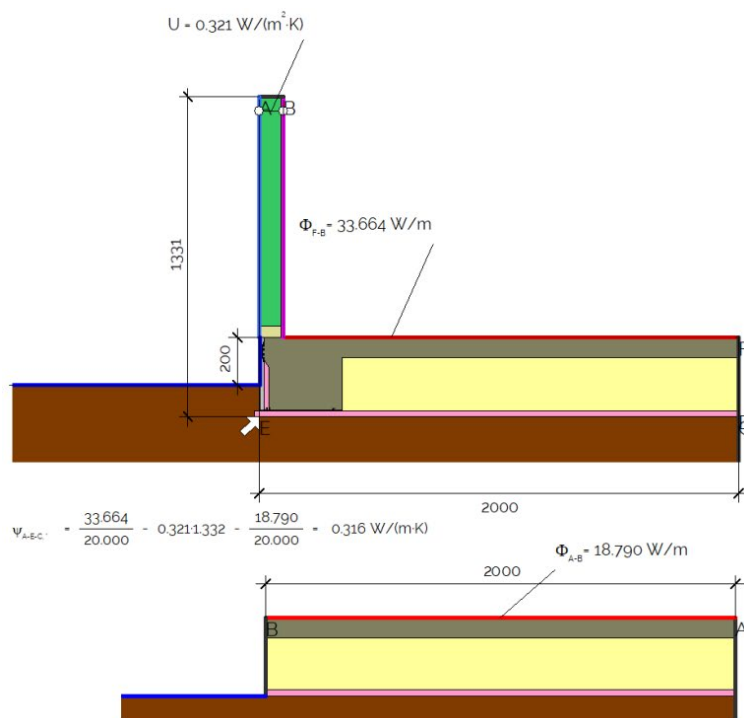
Material	λ [W/(m·K)]
85C2SL_0.038-220-1100-WFP8x8_100R-SOIL	0.382
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsul_L0.028	0.028

$$\psi_{A-E-C} = \frac{39.129}{20.0} - \frac{25.186}{20.0} - 0.321 \cdot 1.307 = 0.277 \text{ W/(m·K)}$$

# Taper 305/25 with QPOD



A/P, m	R-value, m²K/W
1	1.06
1.6	1.36
1.8	1.46
2	1.55
2.2	1.63
2.4	1.71
2.6	1.79
2.8	1.87
3	1.95
3.2	2.03
3.4	2.10
3.6	2.17
3.8	2.25
4	2.32
5	2.67



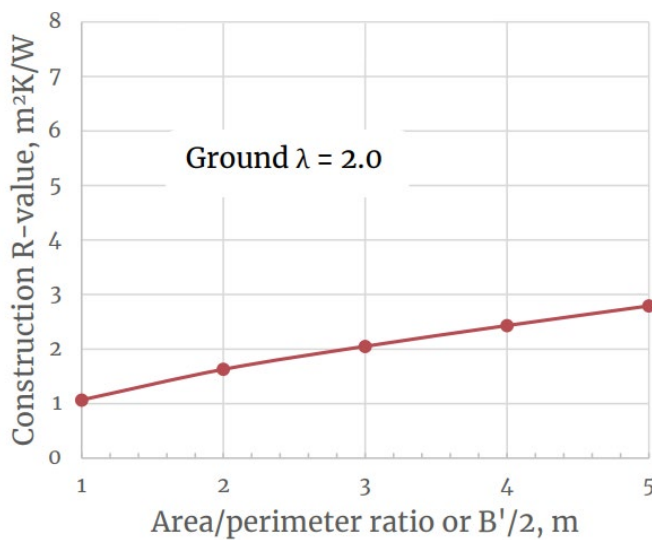
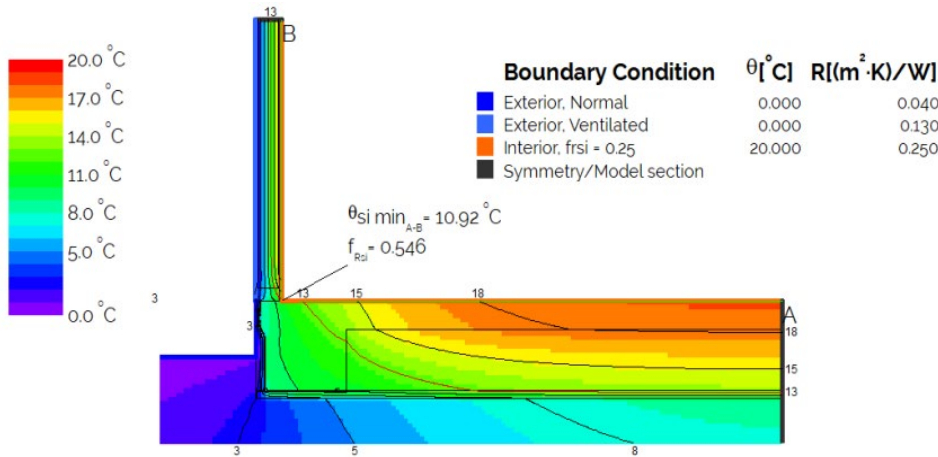
Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

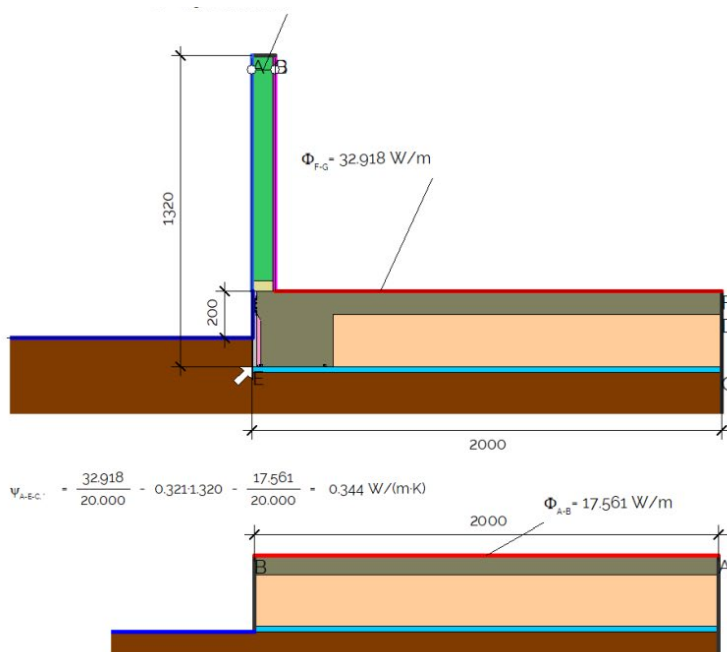
Material	λ [W/(m·K)]
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L.0.028	0.028



# Taper 305/25 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.07
1.6	1.40
1.8	1.52
2	1.63
2.2	1.71
2.4	1.80
2.6	1.88
2.8	1.97
3	2.05
3.2	2.13
3.4	2.20
3.6	2.28
3.8	2.36
4	2.43
5	2.79

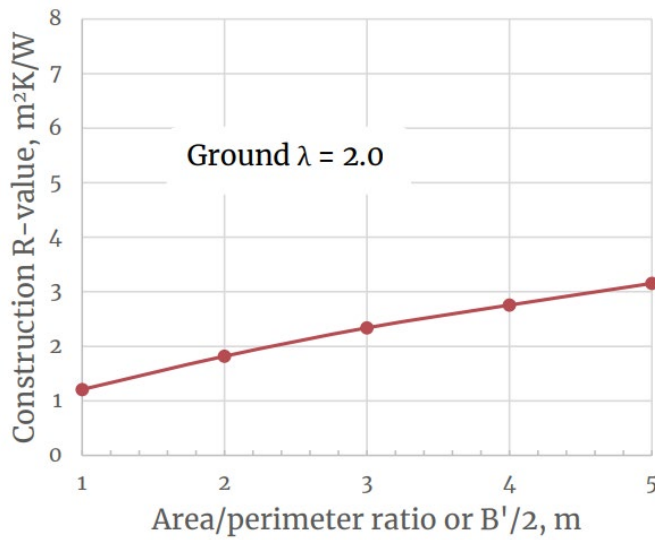
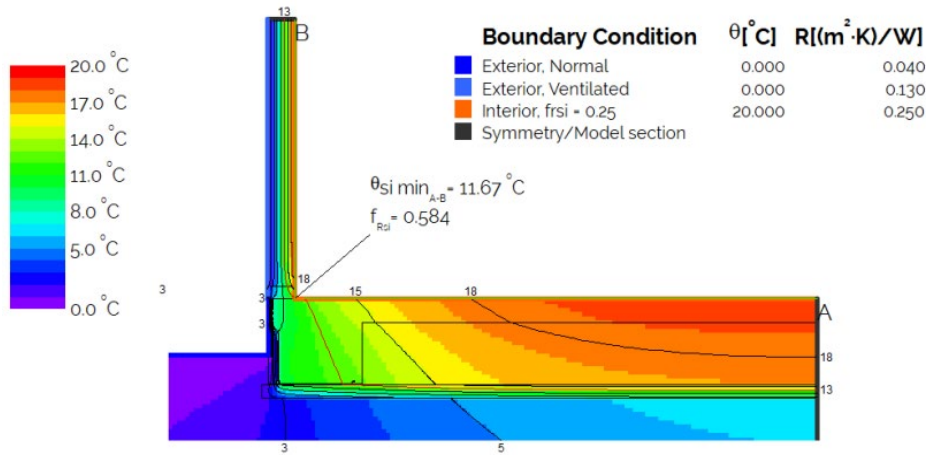


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2\cdot\text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

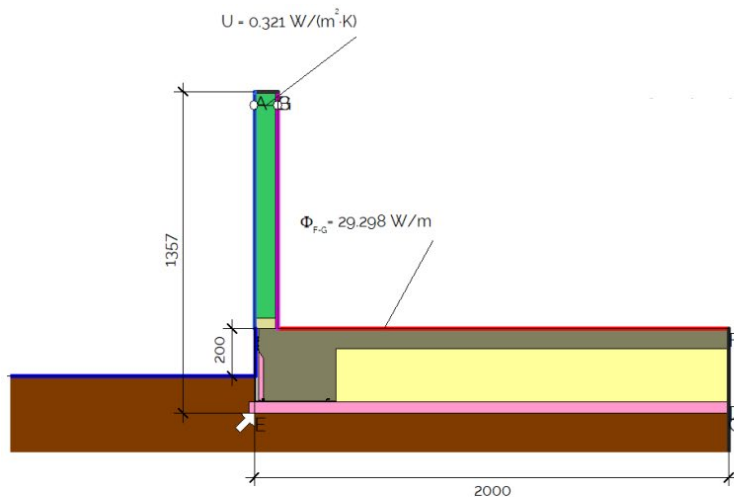
  

Material	$\lambda[\text{W}/(\text{m}\cdot\text{K})]$
Aluminium	160.000
Concrete	2.000
EPS H	0.036
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Poly Pod	0.395
Polypropylene	0.220
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028

# Taper 305/50 with QPOD



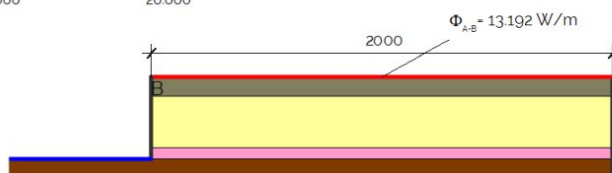
A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.21
1.6	1.57
1.8	1.70
2	1.82
2.2	1.92
2.4	2.03
2.6	2.13
2.8	2.23
3	2.34
3.2	2.42
3.4	2.51
3.6	2.59
3.8	2.67
4	2.76
5	3.15



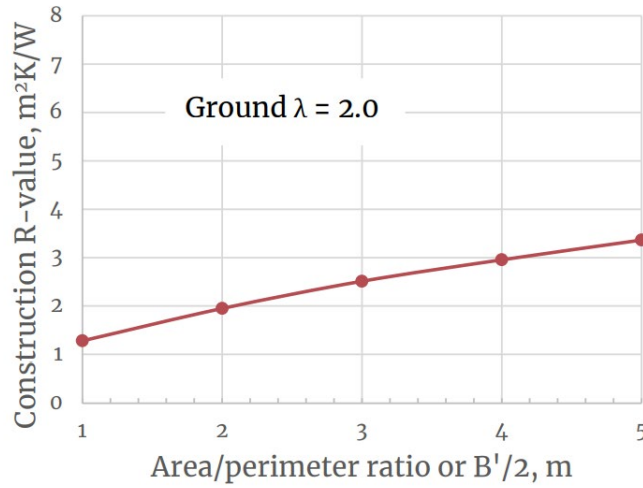
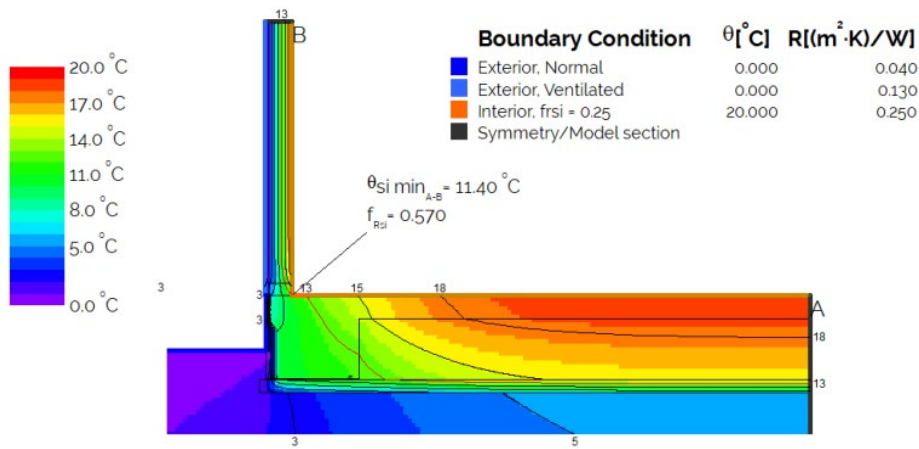
Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsul_L0.028	0.028

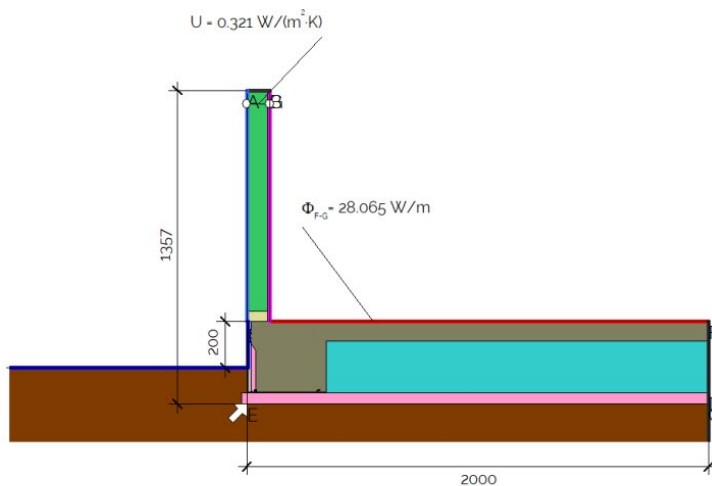
$$U_{A-B-C} = \frac{29.298}{20.000} = 0.321 + \frac{1357}{20.000} = 0.369 \text{ W/(m}^2\text{K)}$$



# Taper 305/50 with Polypod



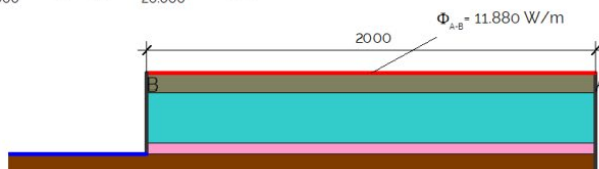
A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.28
1.6	1.68
1.8	1.81
2	1.95
2.2	2.06
2.4	2.17
2.6	2.29
2.8	2.40
3	2.51
3.2	2.60
3.4	2.69
3.6	2.78
3.8	2.87
4	2.95
5	3.36



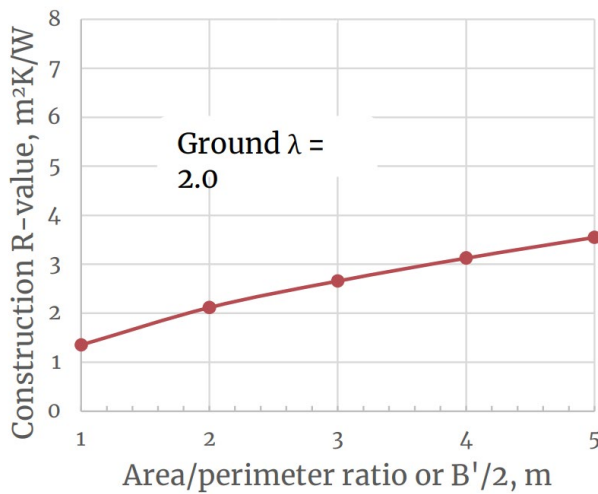
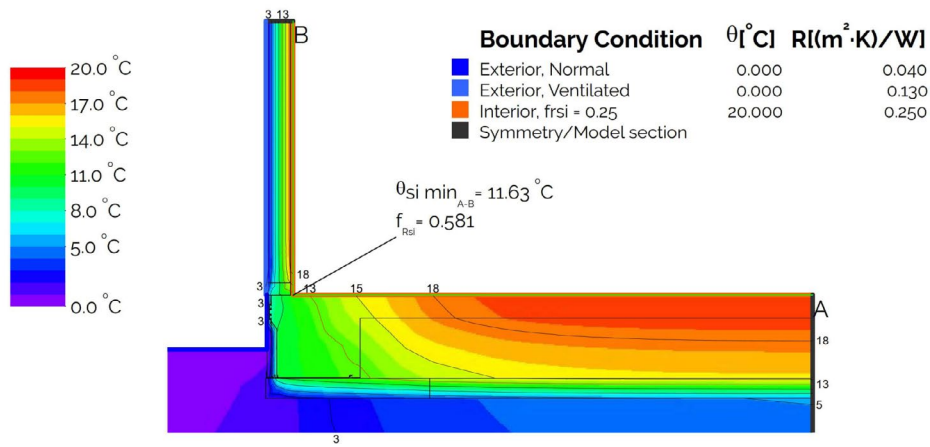
Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	$\lambda [(\text{W}/(\text{m} \cdot \text{K}))]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPgx9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsu_L0.028	0.028

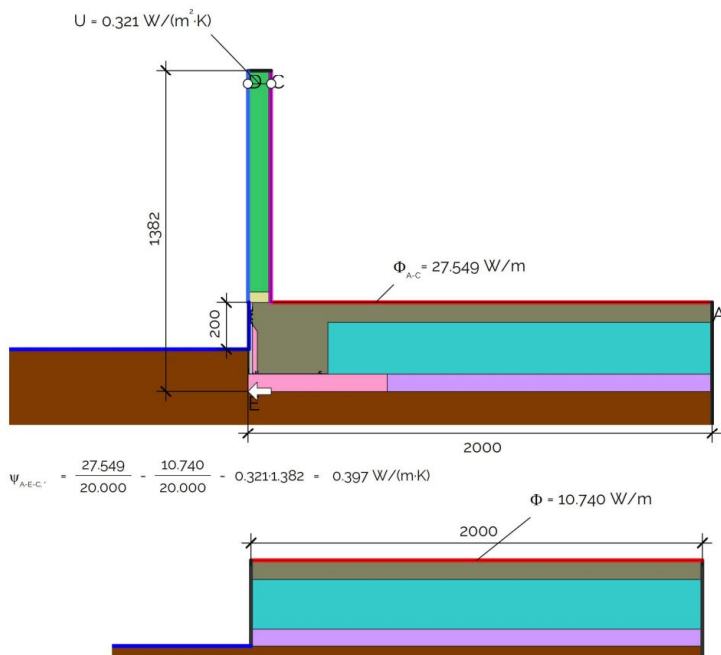
$$\Psi_{a-e-c} = \frac{28.065}{20.000} - 0.321 \cdot 1357 - \frac{11.880}{20.000} = 0.373 \text{ W}/(\text{m} \cdot \text{K})$$



# Taper 305/75 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.35
1.6	1.81
1.8	1.96
2	2.12
2.2	2.22
2.4	2.33
2.6	2.44
2.8	2.55
3	2.66
3.2	2.75
3.4	2.84
3.6	2.94
3.8	3.03
4	3.12
5	3.55



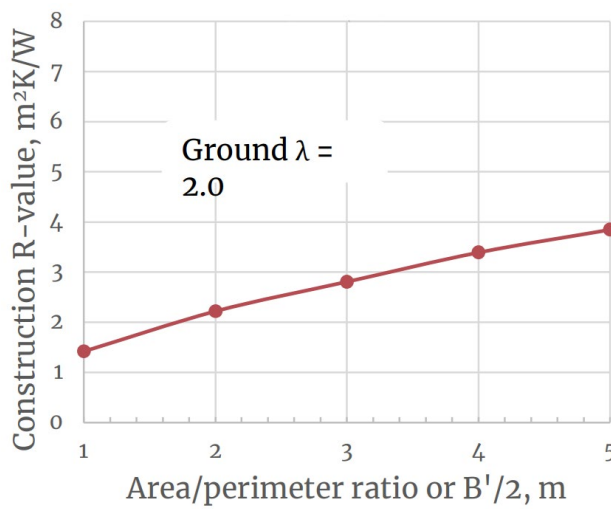
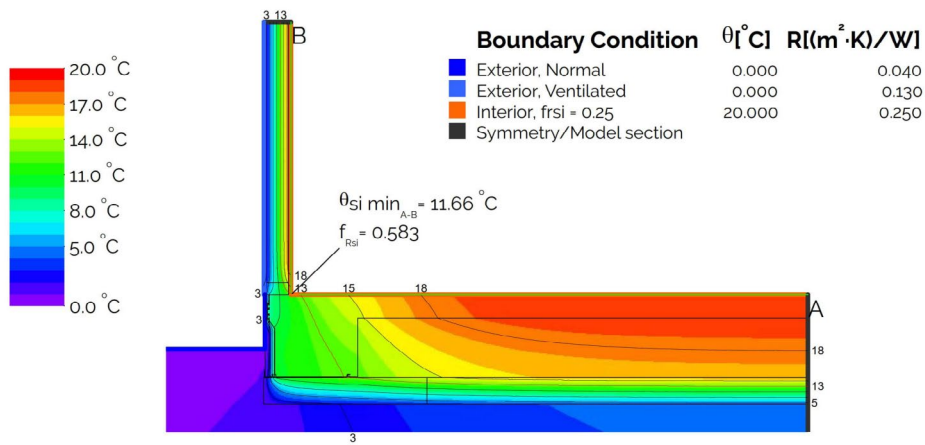
Boundary Condition	$\theta_i [^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

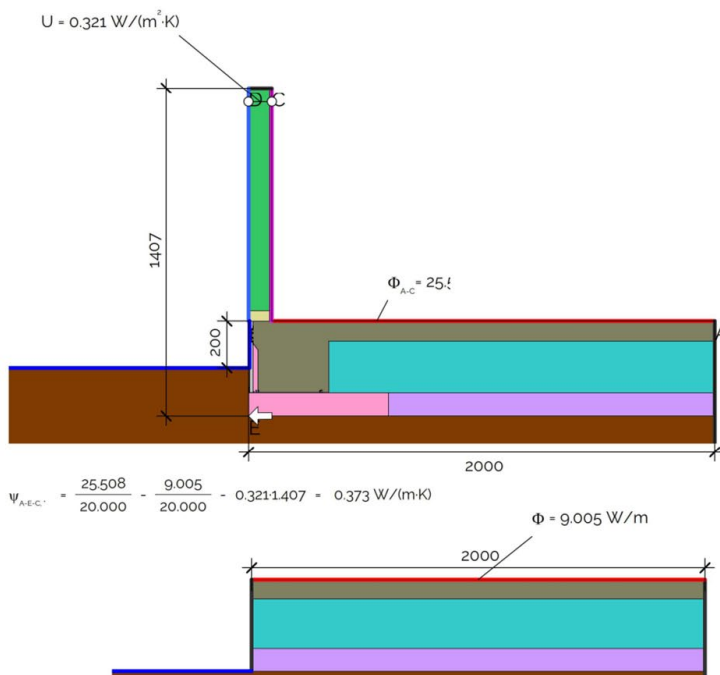
Material	$\lambda [\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Concrete	2.000
EPS VH-grade	0.035
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFP9x9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSInsul_L0.028	0.028



# Taper 305/100 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.42
1.6	1.90
1.8	2.06
2	2.22
2.2	2.33
2.4	2.45
2.6	2.57
2.8	2.69
3	2.81
3.2	2.92
3.4	3.04
3.6	3.16
3.8	3.27
4	3.39
5	3.85

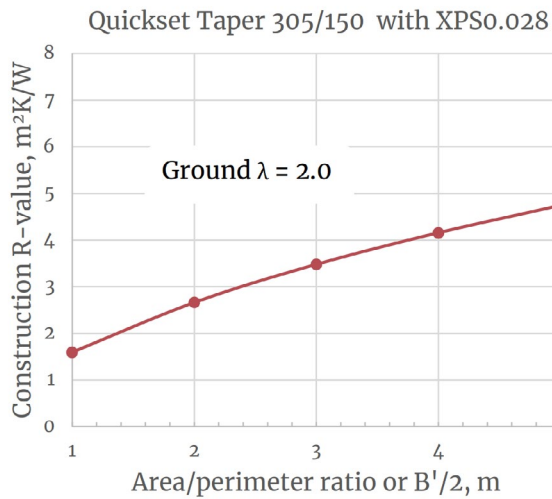
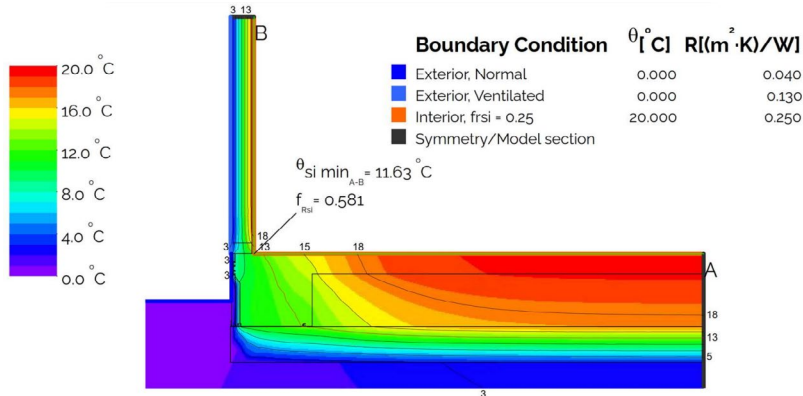


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

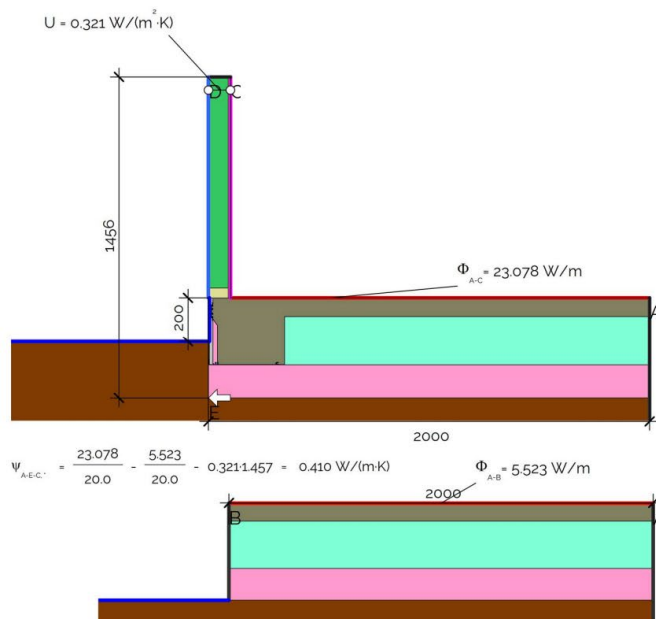
Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
EPS VH-grade	0.035
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFP9x9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L0.028	0.028

308 W/m

# Taper 305/150 (Continuous SlabX200) with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.60
1.6	2.24
1.8	2.45
2	2.66
2.2	2.83
2.4	2.99
2.6	3.15
2.8	3.32
3	3.48
3.2	3.61
3.4	3.75
3.6	3.89
3.8	4.02
4	4.16
5	4.74



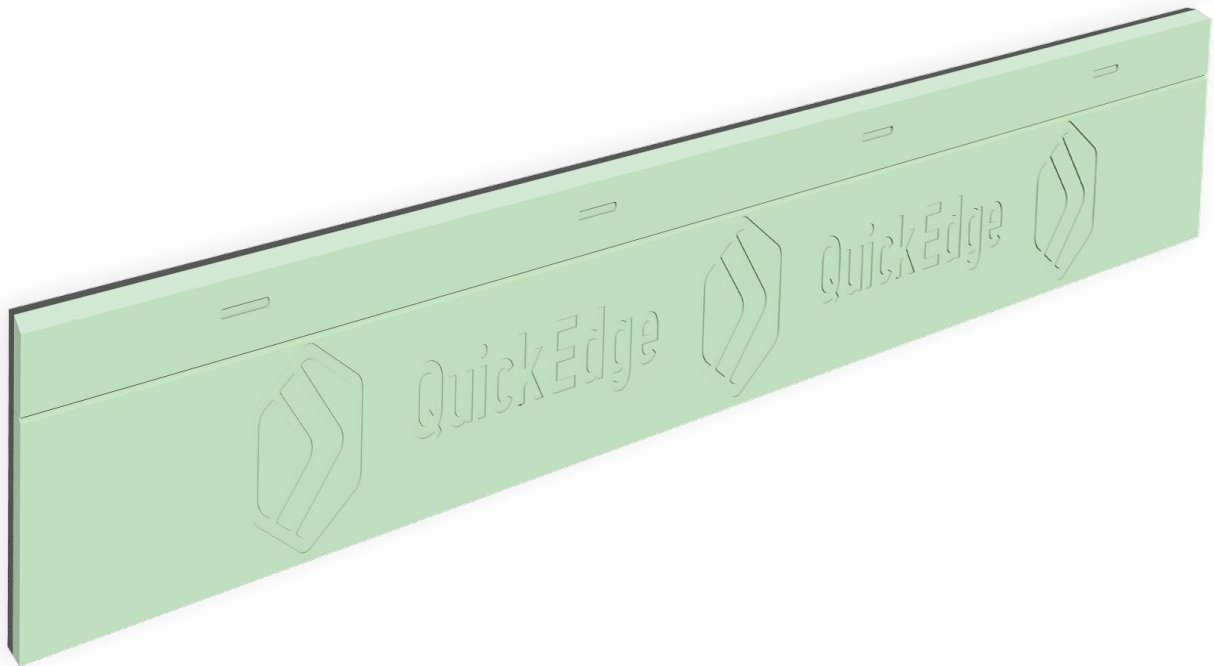
**Boundary Condition**

Boundary Condition	$\theta_i [^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

**Material**

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
85C2SL_0.038-220-1100-WFPgXg_100R-onCont150XPS0.028	0.266
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsu_Lo.028	0.028

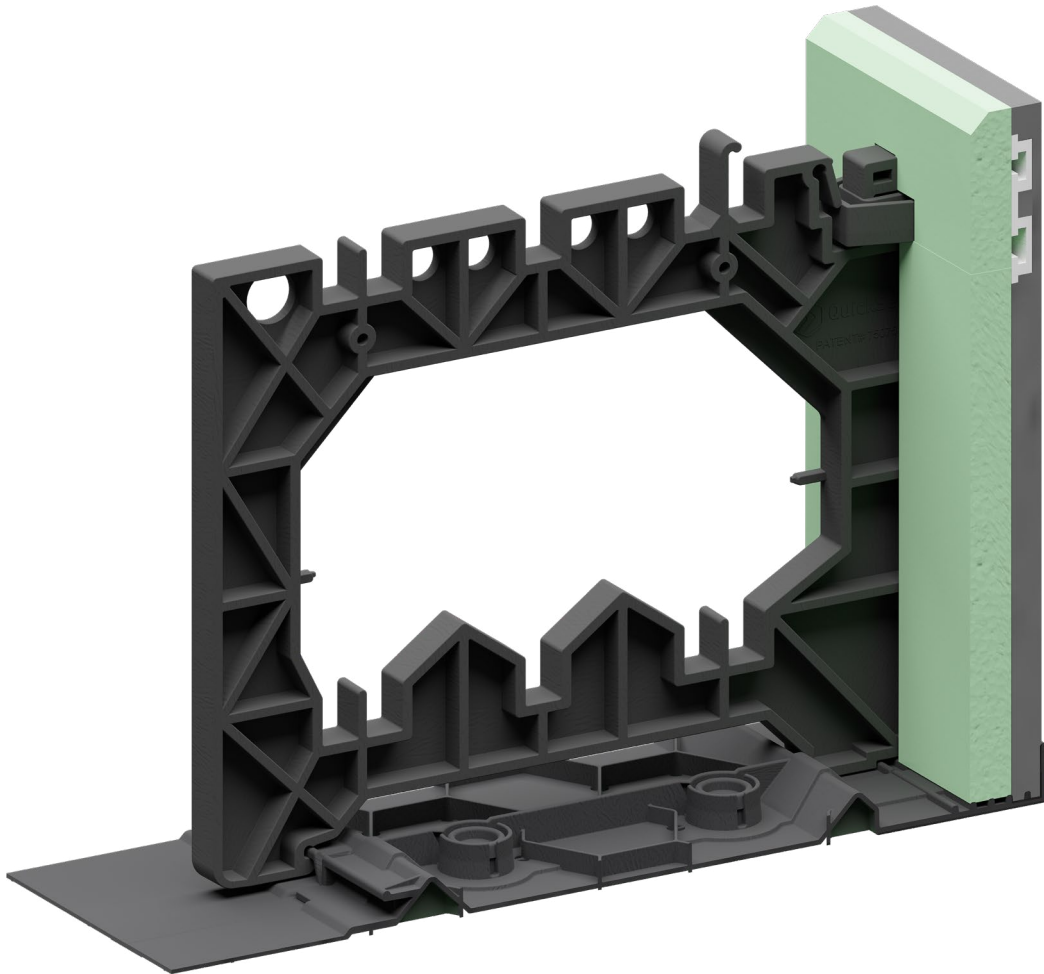
# QuickEdge Ultra



- QuickEdge Ultra supports height options of 305, 320, 340, 385, 400, 420, 600, and 1200 mm;
- Suitable for all pod systems and slabs on grade;
- Compatible with 140 mm framing and above;
- Additional back insulation.

**Please note that the thermal results in this section correspond to both QuickSet Ultra and QuickEdge Ultra.**

# QuickSet Ultra

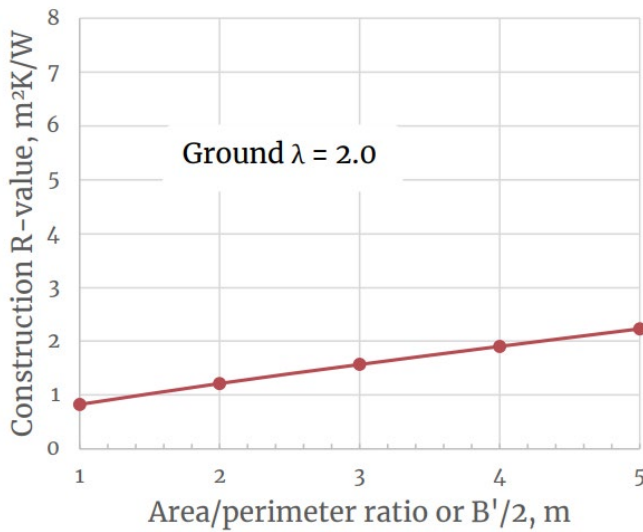
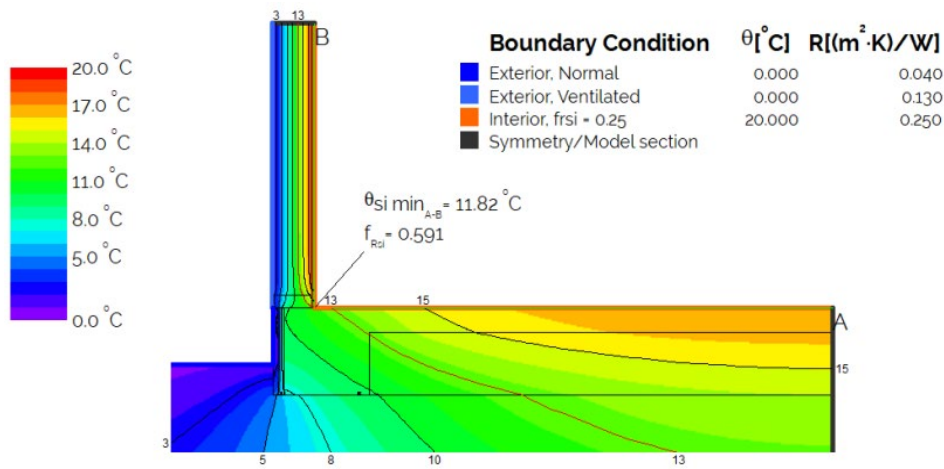


- QuickSet Ultra supports height options of 305, 320, 340, 385, and 400 mm;
- Suitable for 220 mm and 300 mm pod systems;
- Compatible with 140 mm framing and above;
- Additional back insulation;

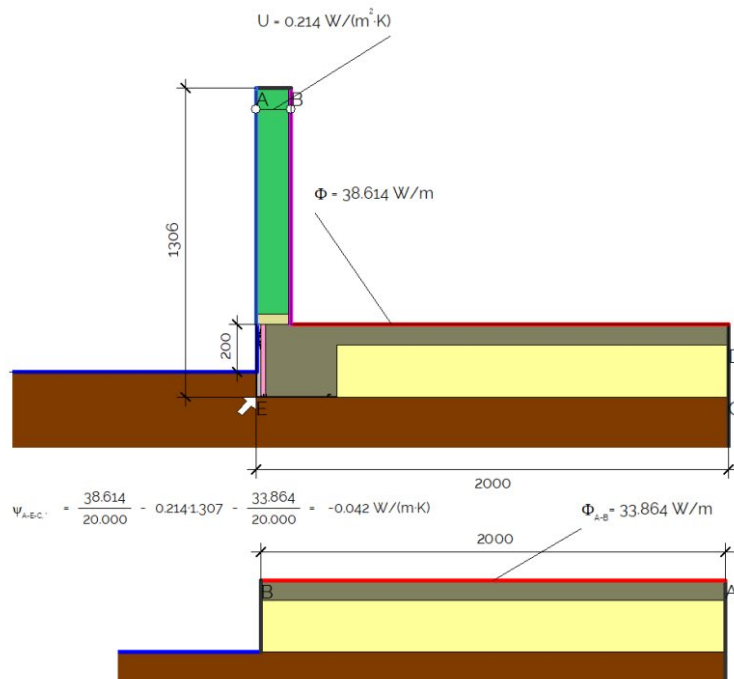
**Please note that the thermal results in this section correspond to both QuickSet Ultra and QuickEdge Ultra.**



# Ultra 305/00 with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	0.82
1.6	1.06
1.8	1.14
2	1.21
2.2	1.28
2.4	1.35
2.6	1.42
2.8	1.49
3	1.56
3.2	1.63
3.4	1.70
3.6	1.77
3.8	1.83
4	1.90
5	2.23

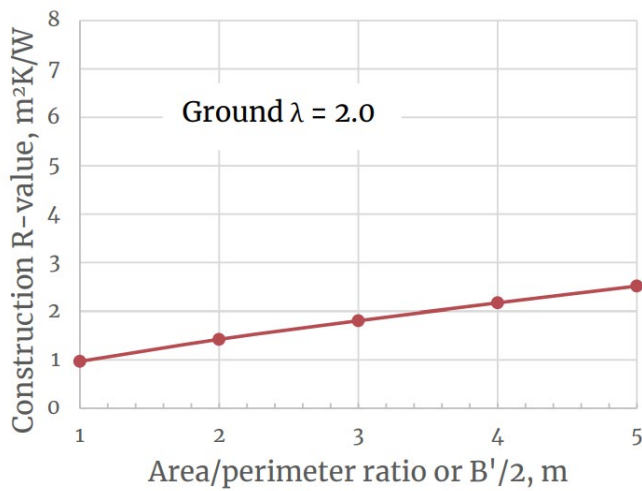
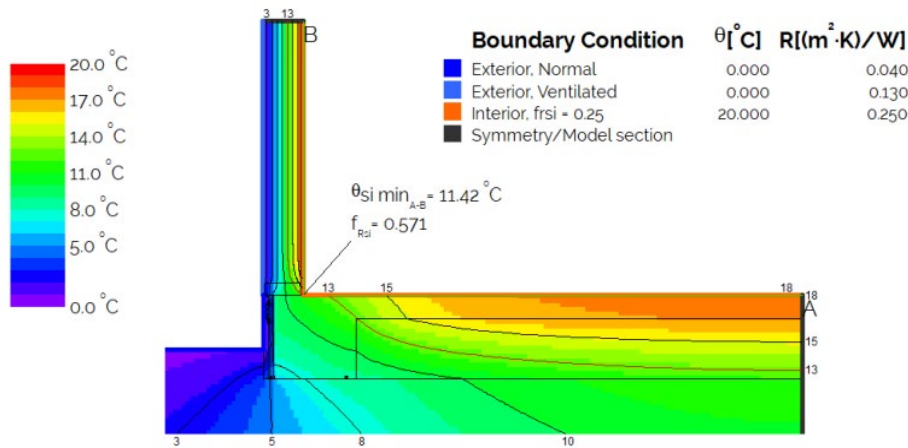


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

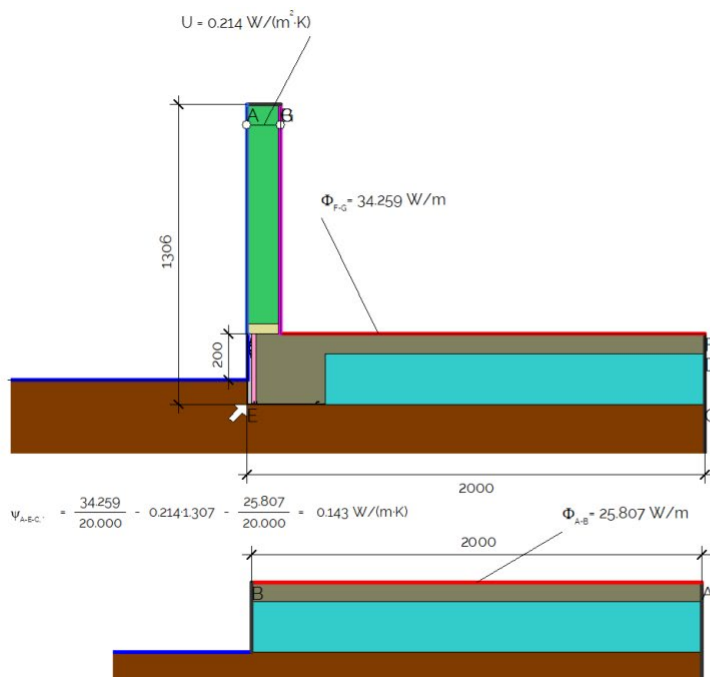
  

Material	$\lambda [W]/(\text{m} \cdot \text{K})$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L.0.028	0.028
Unventilated air cavity *	
* Simplified approach	

# Ultra 305/00 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	0.97
1.6	1.24
1.8	1.33
2	1.42
2.2	1.50
2.4	1.58
2.6	1.65
2.8	1.73
3	1.81
3.2	1.88
3.4	1.95
3.6	2.02
3.8	2.10
4	2.17
5	2.51

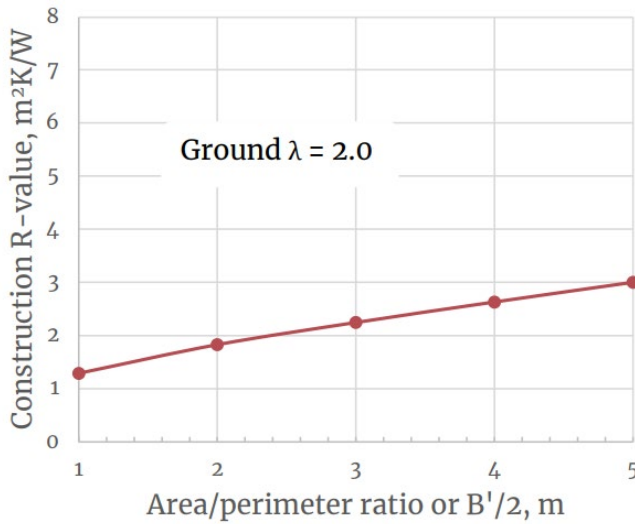
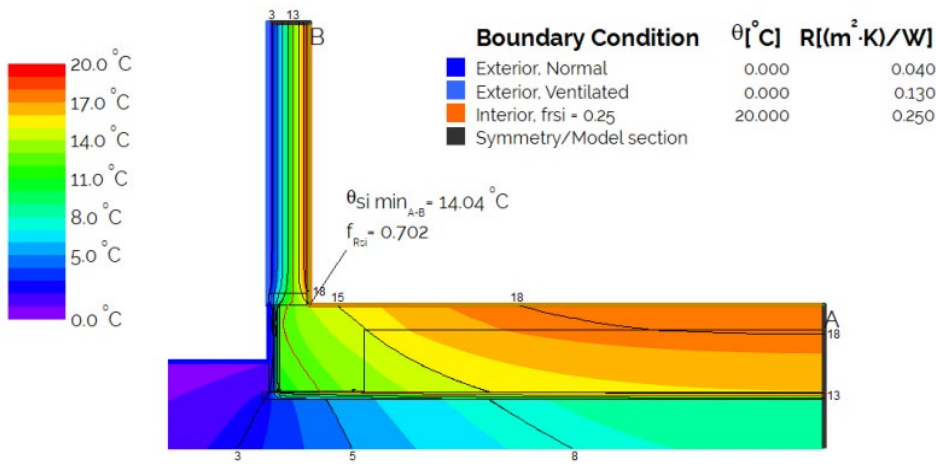


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

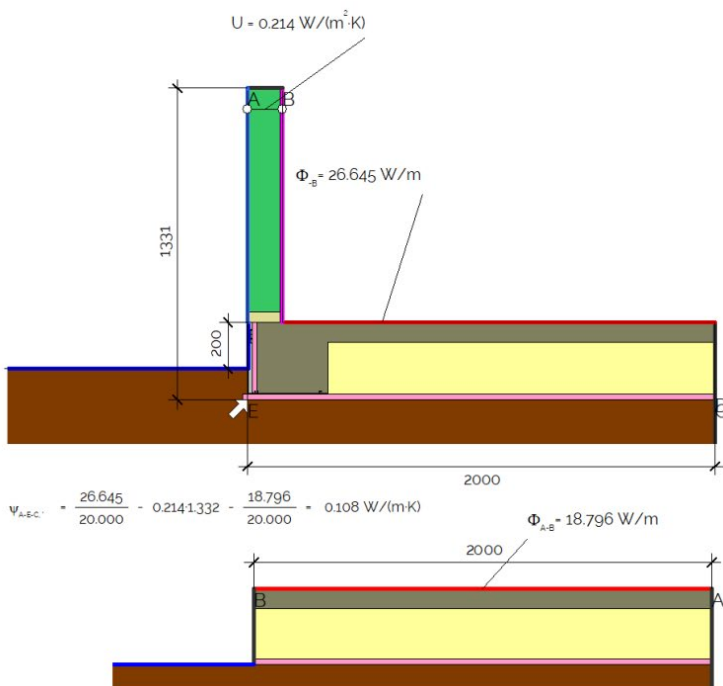
  

Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPg9g-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L0.028	0.028
Unventilated air cavity *	
* Simplified approach	

# Ultra 305/25 with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.29
1.6	1.61
1.8	1.72
2	1.83
2.2	1.91
2.4	2.00
2.6	2.08
2.8	2.16
3	2.25
3.2	2.32
3.4	2.40
3.6	2.48
3.8	2.55
4	2.63
5	3.00

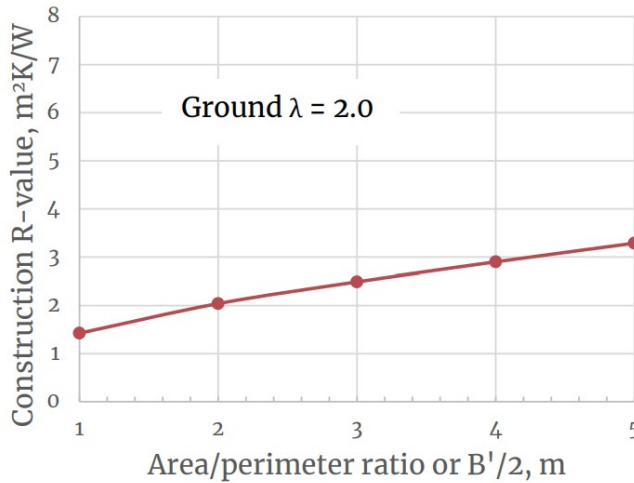
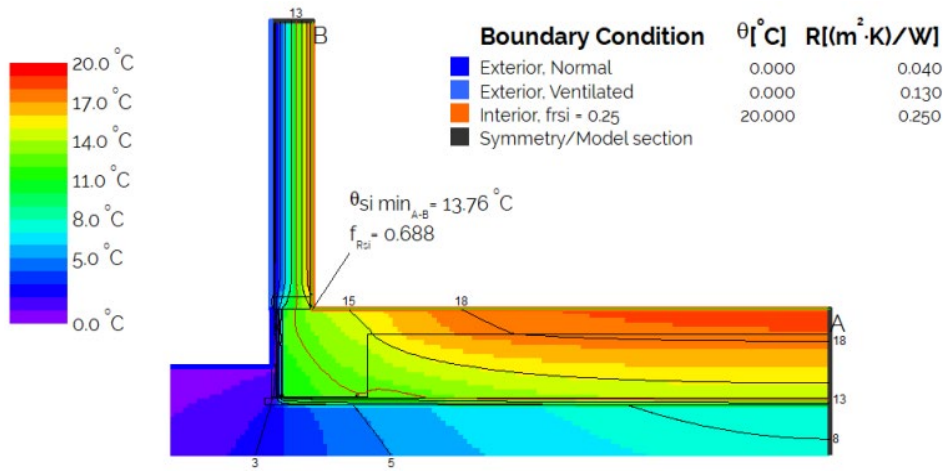


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

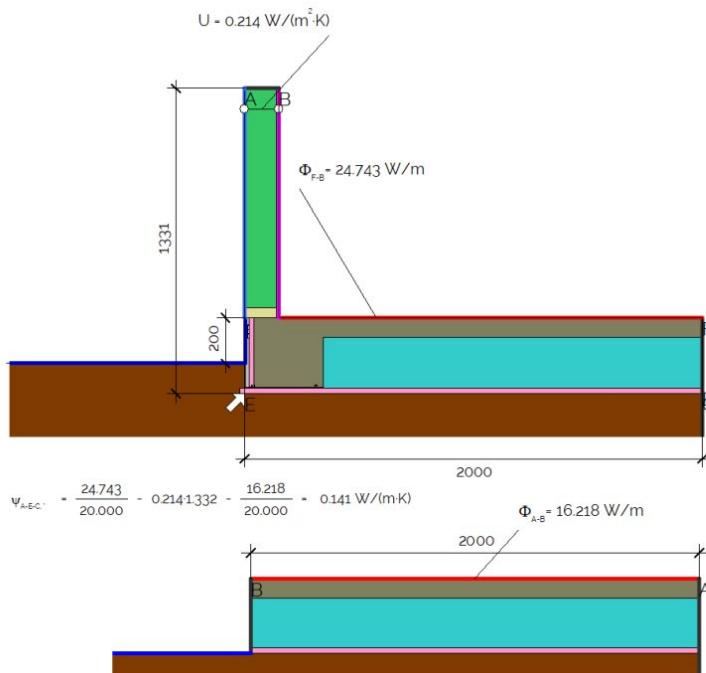
  

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028
Unventilated air cavity	
* Simplified approach	

# Ultra 305/25 with Polypod



A/P, m	R-value, m²K/W
1	1.42
1.6	1.79
1.8	1.92
2	2.04
2.2	2.13
2.4	2.22
2.6	2.31
2.8	2.40
3	2.49
3.2	2.57
3.4	2.65
3.6	2.74
3.8	2.82
4	2.90
5	3.29



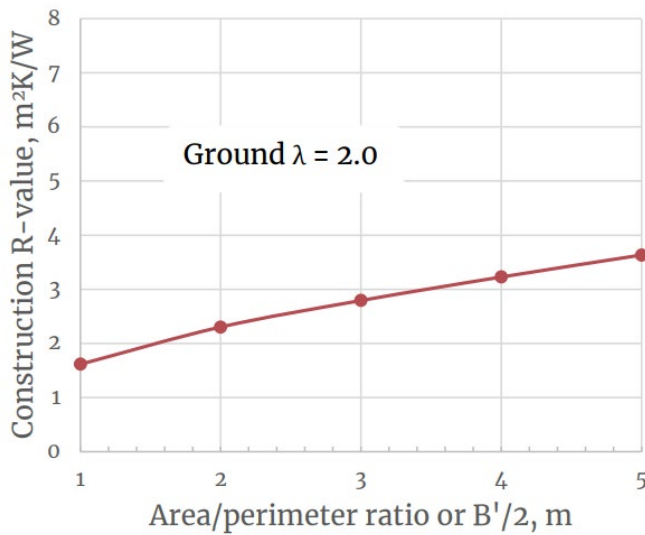
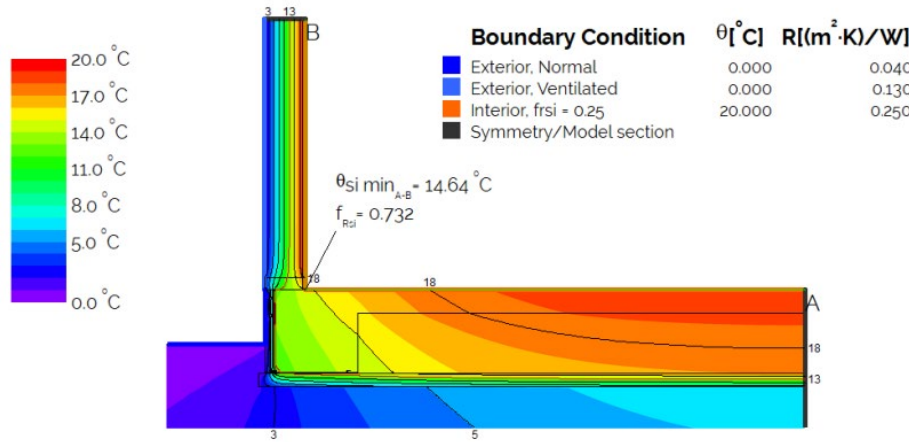
Boundary Condition	$\theta_i [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

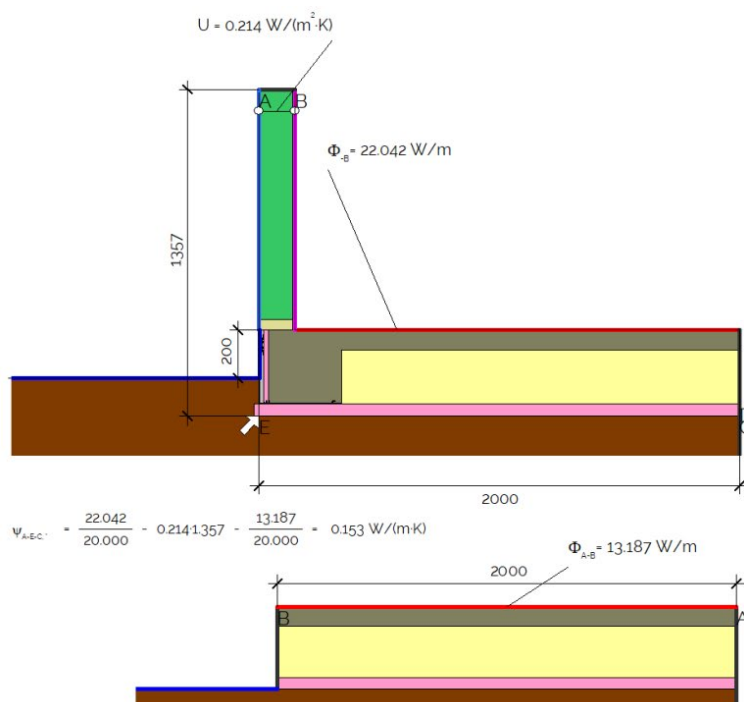
Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPgxg-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L_0.028	0.028
Unventilated air cavity *	
* Simplified approach	



# Ultra 305/50 with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.62
1.6	2.03
1.8	2.17
2	2.30
2.2	2.40
2.4	2.50
2.6	2.60
2.8	2.69
3	2.79
3.2	2.88
3.4	2.97
3.6	3.05
3.8	3.14
4	3.23
5	3.63

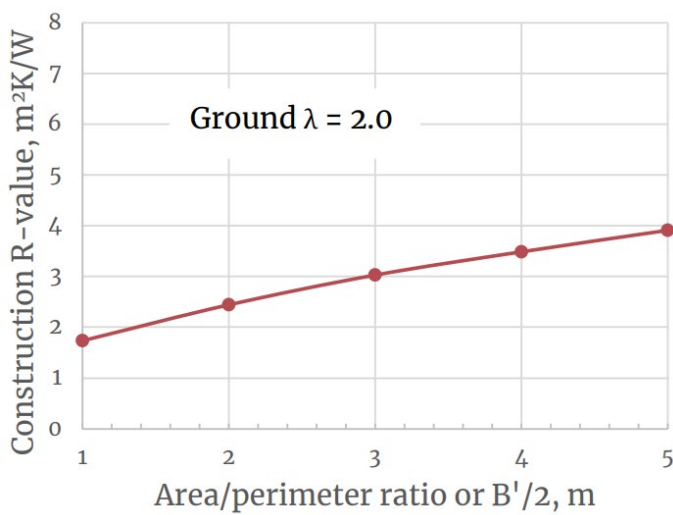
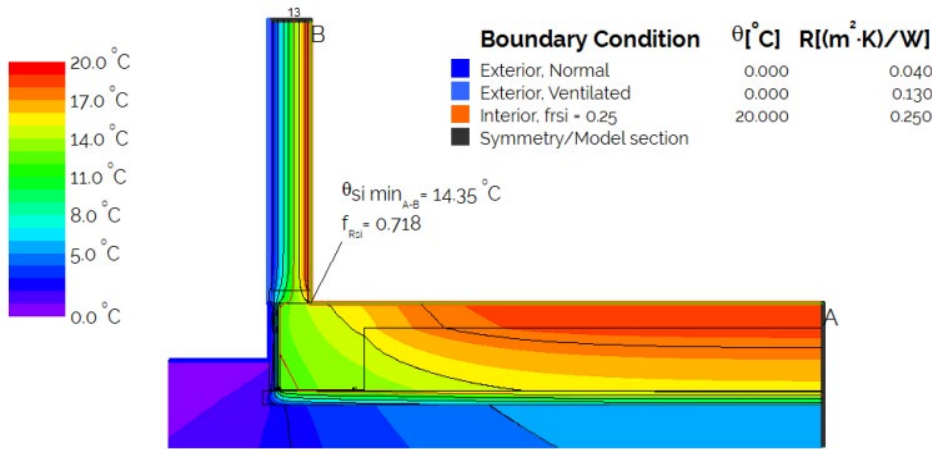


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

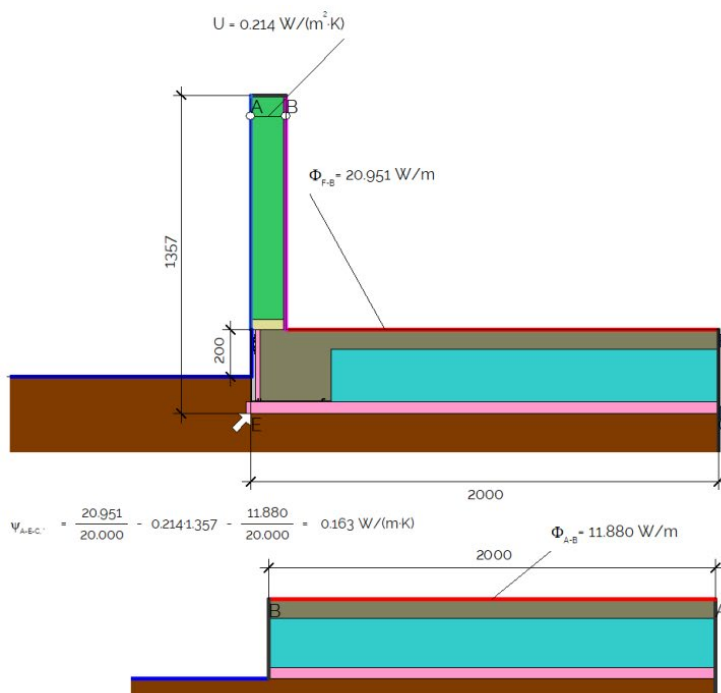
  

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028
Unventilated air cavity	
* Simplified approach	

# Ultra 305/50 with Polypod



A/P, m	R-value, $m^2K/W$
1	1.73
1.6	2.15
1.8	2.30
2	2.44
2.2	2.56
2.4	2.67
2.6	2.79
2.8	2.91
3	3.02
3.2	3.12
3.4	3.21
3.6	3.30
3.8	3.39
4	3.48
5	3.91

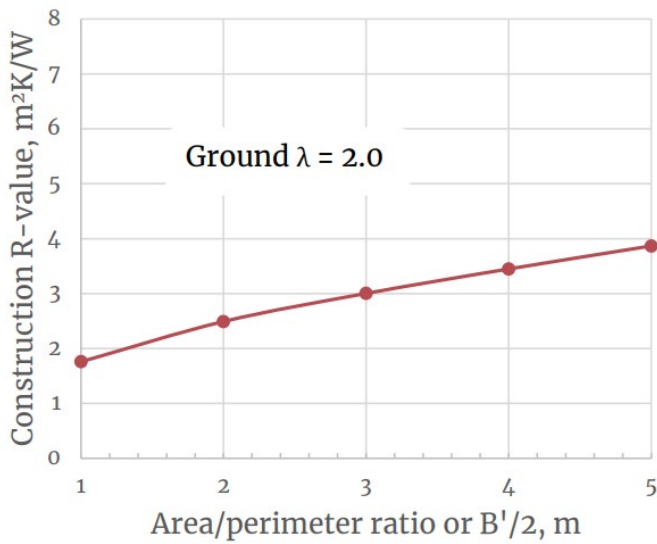
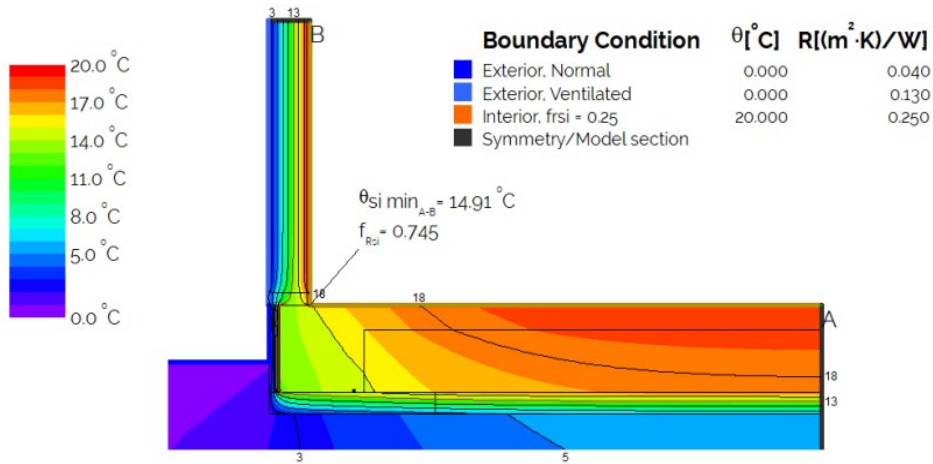


Boundary Condition	$\theta [^\circ C]$	$R [(m^2 \cdot K)/W]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

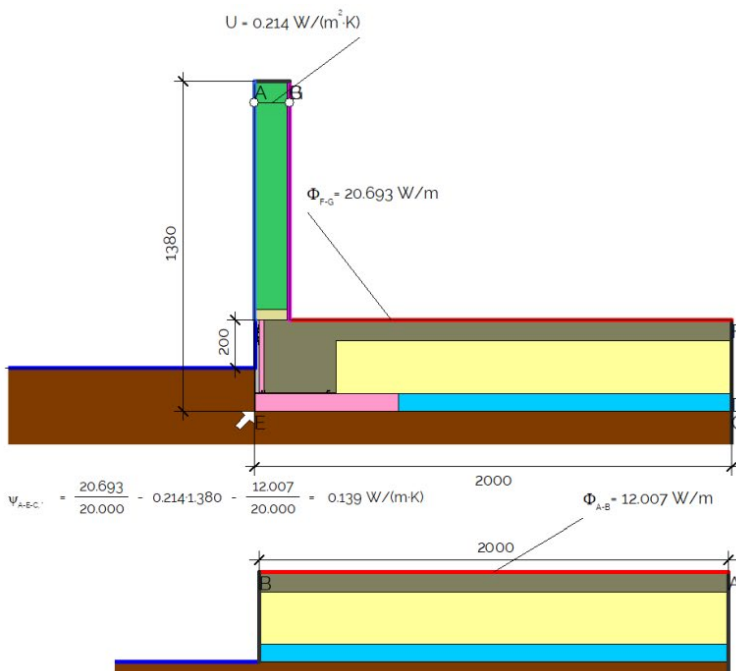
  

Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPgxg-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_Lo.028	0.028
Unventilated air cavity *	
* Simplified approach	

# Ultra 305/75 with QPOD



A/P, m	R-value, m²K/W
1	1.76
1.6	2.20
1.8	2.35
2	2.49
2.2	2.59
2.4	2.70
2.6	2.80
2.8	2.90
3	3.00
3.2	3.09
3.4	3.18
3.6	3.27
3.8	3.36
4	3.45
5	3.87

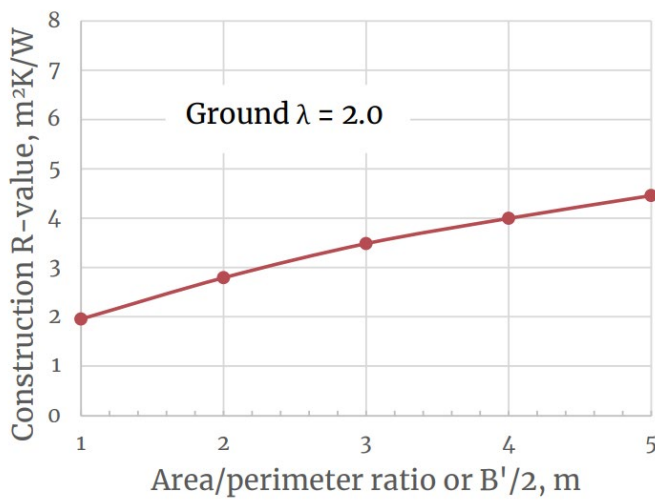
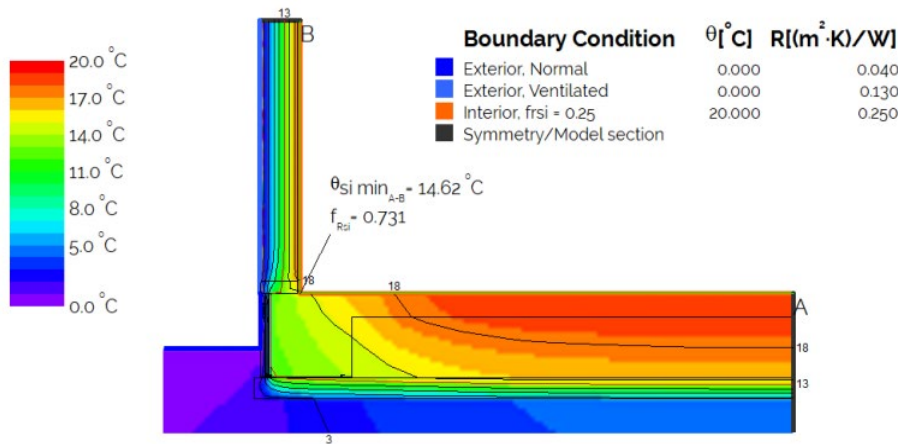


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

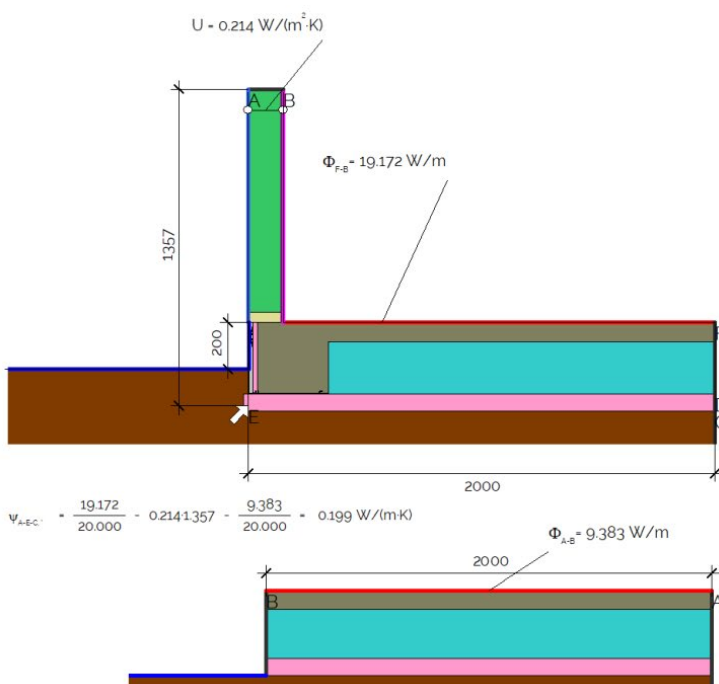
  

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Concrete	2.000
EPS H	0.036
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028
Unventilated air cavity *	
* Simplified approach	

# Ultra 305/75 with Polypod



A/P, m	R-value, m²K/W
1	1.95
1.6	2.46
1.8	2.62
2	2.79
2.2	2.93
2.4	3.07
2.6	3.21
2.8	3.34
3	3.48
3.2	3.59
3.4	3.69
3.6	3.79
3.8	3.89
4	4.00
5	4.46



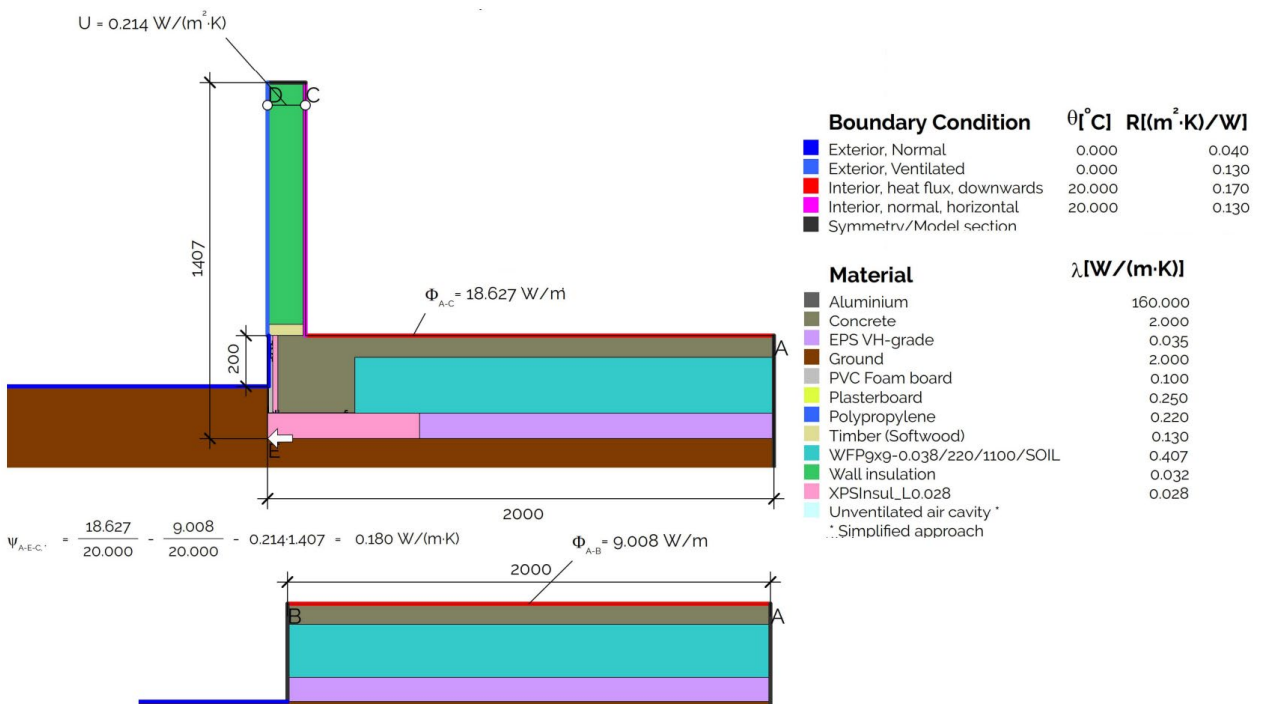
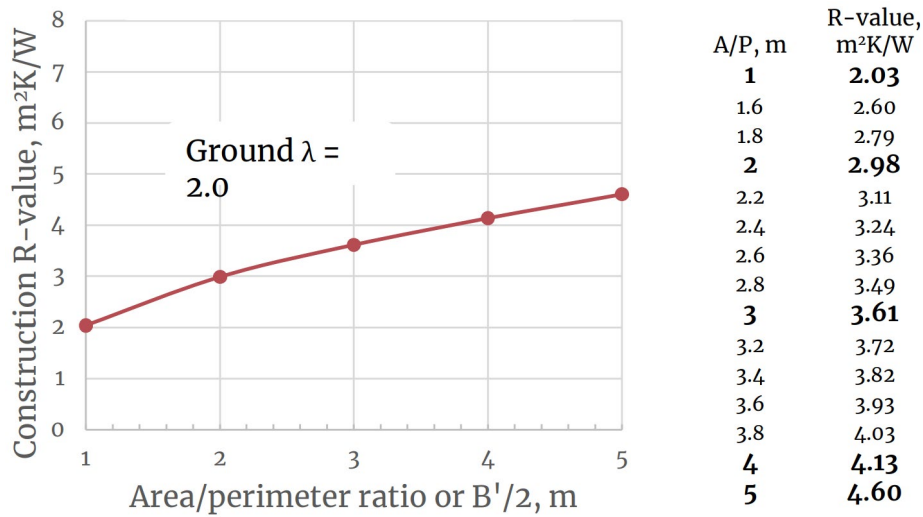
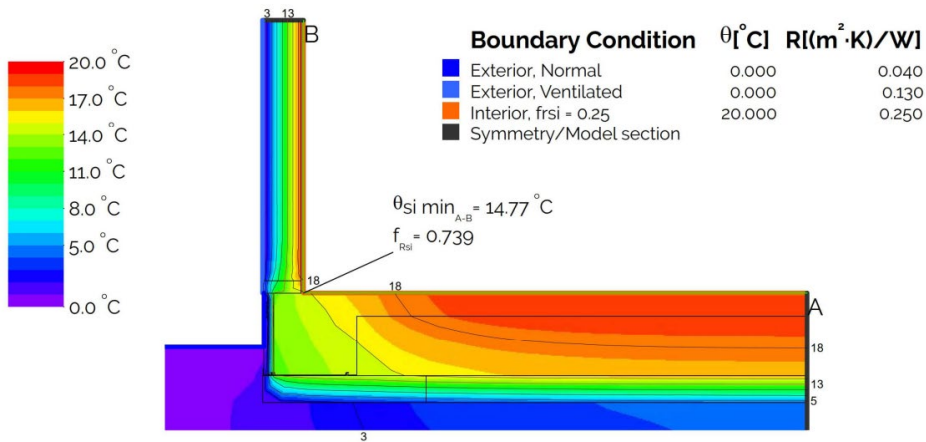
Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

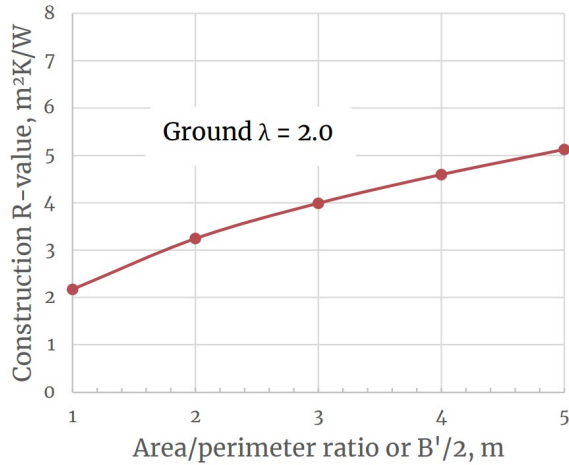
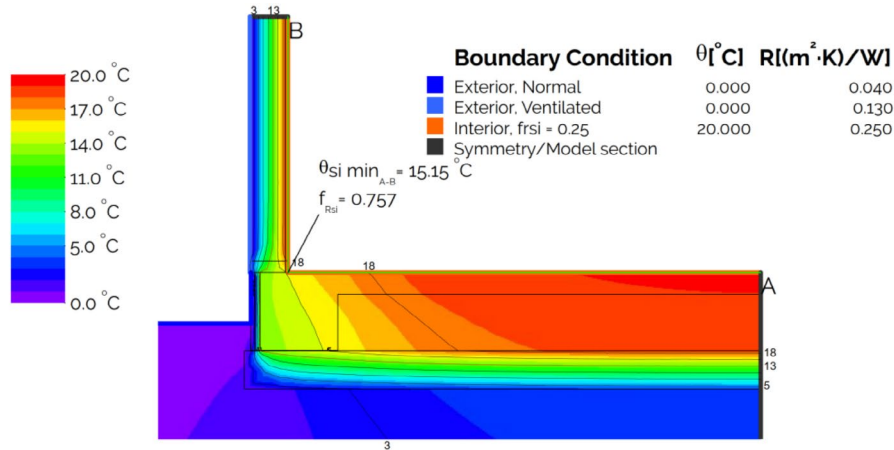
Material	$\lambda [W/(m \cdot K)]$
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFP9x9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L0.028	0.028
Unventilated air cavity *	
* Simplified approach	



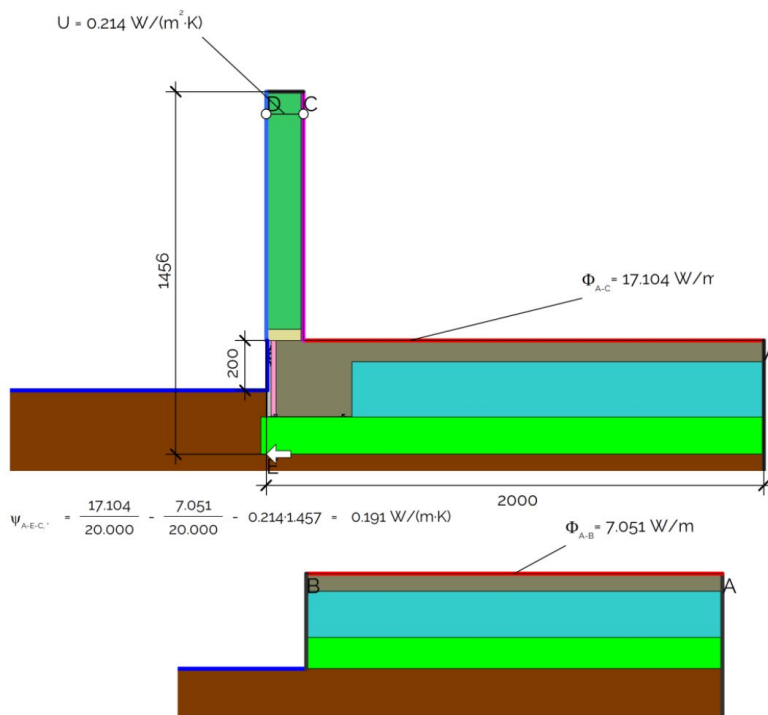
# Ultra 305/100 with Polypod



# Ultra 305/150 (Continuous SlabX200) with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	2.17
1.6	2.81
1.8	3.03
2	3.24
2.2	3.39
2.4	3.54
2.6	3.69
2.8	3.84
3	3.99
3.2	4.11
3.4	4.23
3.6	4.35
3.8	4.47
4	4.60
5	5.13

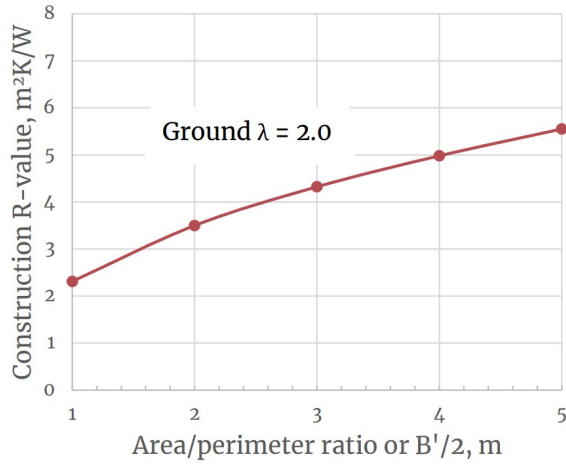
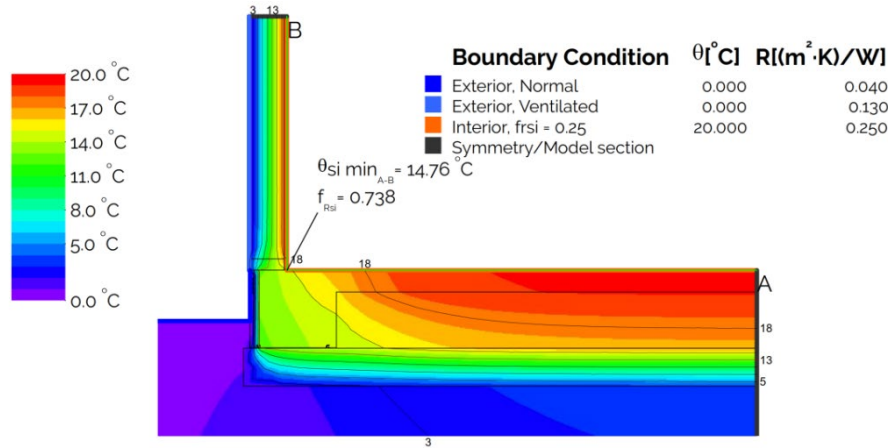


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

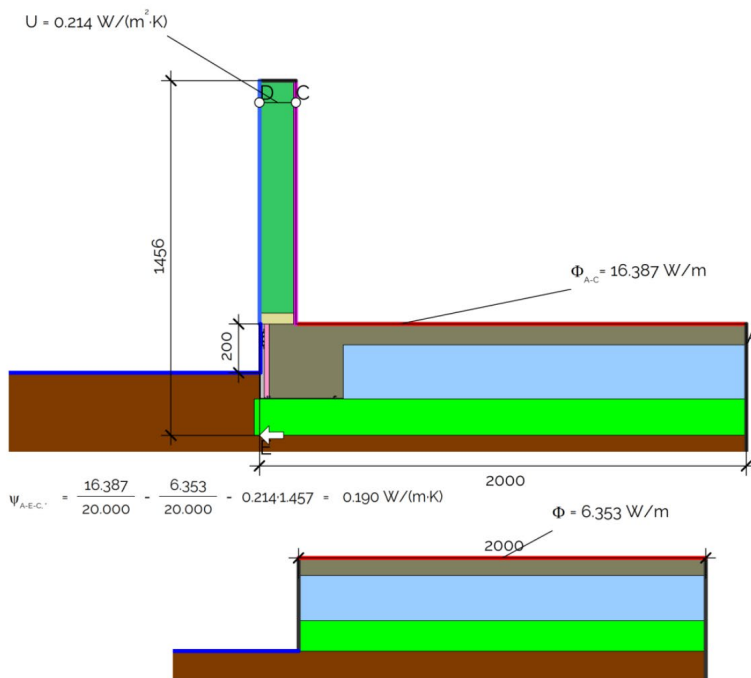
  

Material	$\lambda [\text{W}/(\text{m} \cdot \text{K})]$
SlabX200	1.052
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
SlabX200	0.034
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_Lo.028	0.028
Unventilated air cavity *	
* Simplified approach	

# Ultra 305/150 (Continuous SlabX200) with Polypod



A/P, m	R-value, m²K/W
1	2.31
1.6	3.02
1.8	3.26
2	3.50
2.2	3.66
2.4	3.83
2.6	3.99
2.8	4.16
3	4.32
3.2	4.45
3.4	4.59
3.6	4.72
3.8	4.85
4	4.98
5	5.55

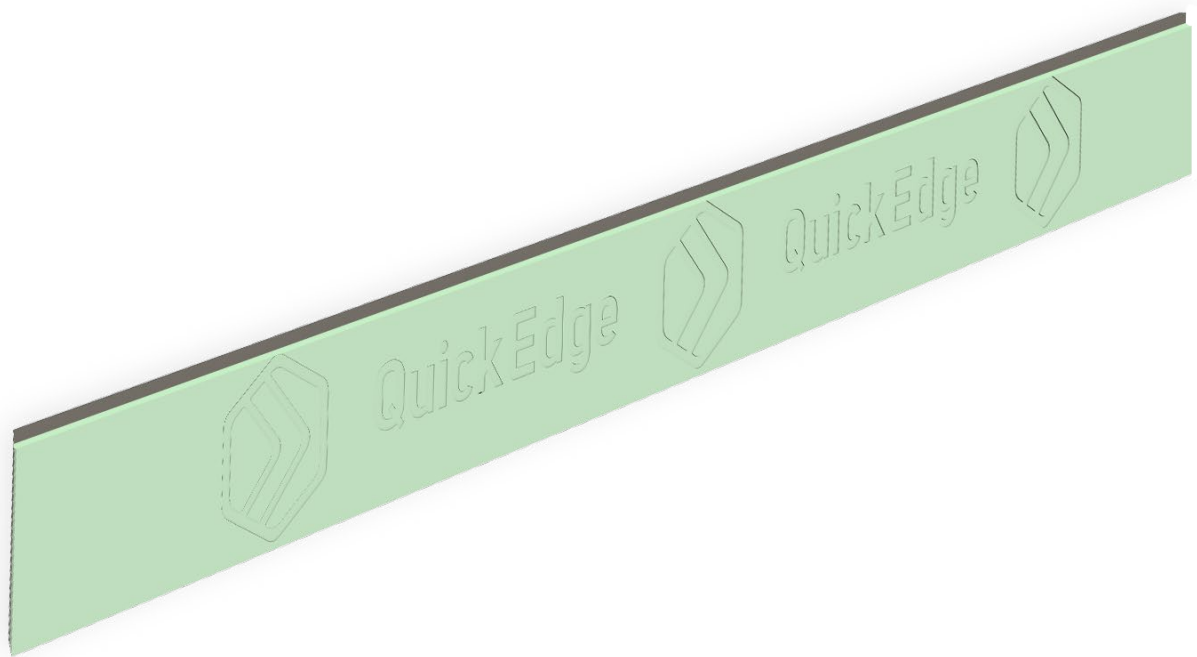


Boundary Condition	theta [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	lambda [W/(m·K)]
SlabX200	0.266
Aluminium	160.000
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
SlabX200	0.034
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsul_L0.028	0.028
Unventilated air cavity	0.028

\* Simplified approach

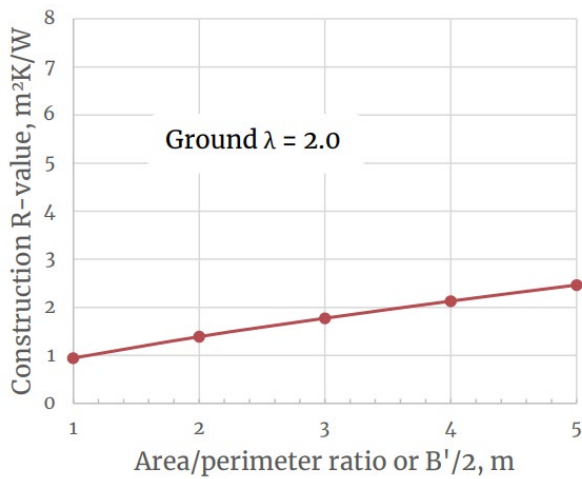
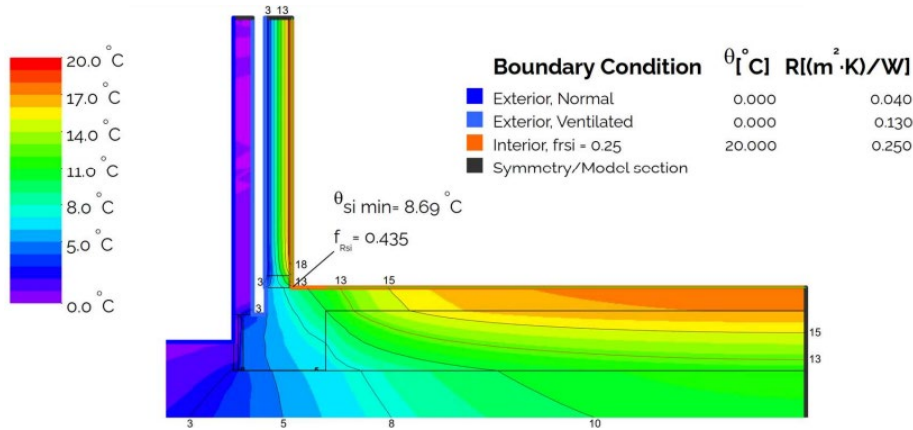
# QuickEdge Brick



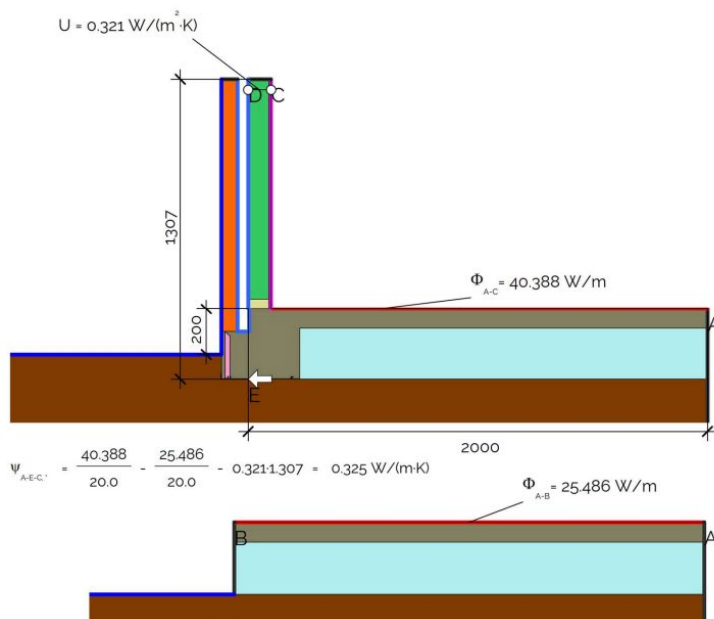
- Height options of 305, 320, 340, 385, 400, or 420 mm;
- Suitable for 220 mm and 300 mm pod systems;
- Compatible with all framing sizes.

**Please note that the thermal results in this section only correspond to QuickEdge Brick.**

# QuickEdge Brick 305/00

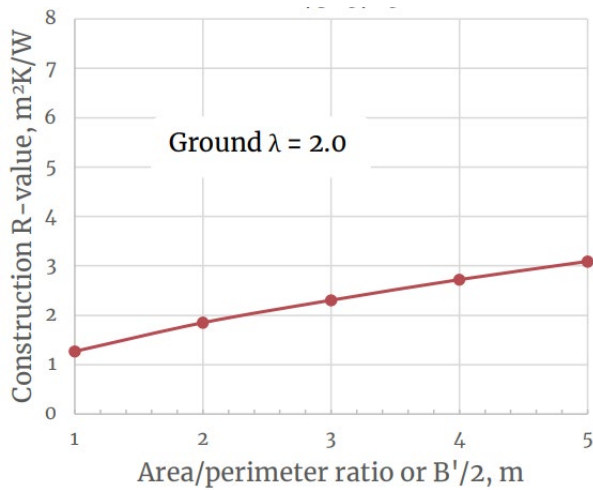
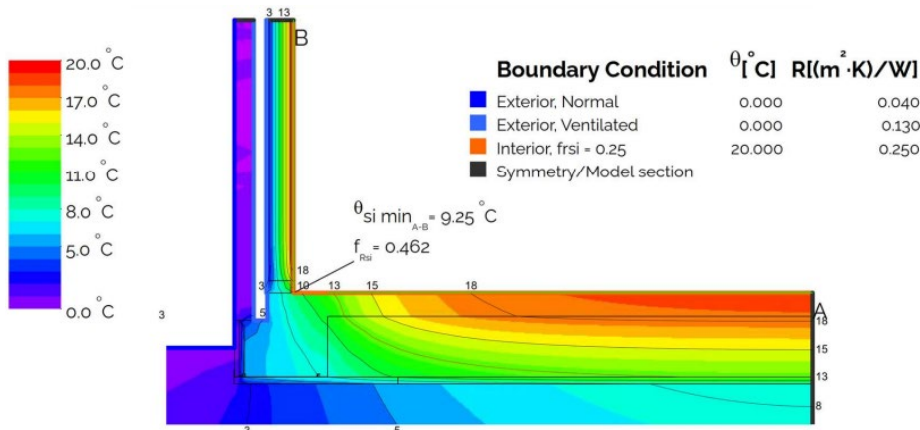


A/P, m	R-value, m <sup>2</sup> K/W
1	0.95
1.6	1.21
1.8	1.30
2	1.39
2.2	1.47
2.4	1.54
2.6	1.62
2.8	1.70
3	1.77
3.2	1.84
3.4	1.92
3.6	1.99
3.8	2.06
4	2.13
5	2.47

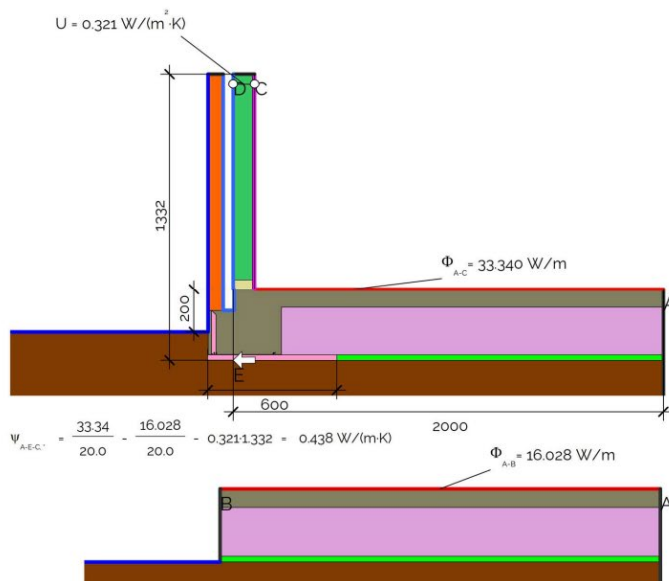




# QuickEdge Brick 305/25



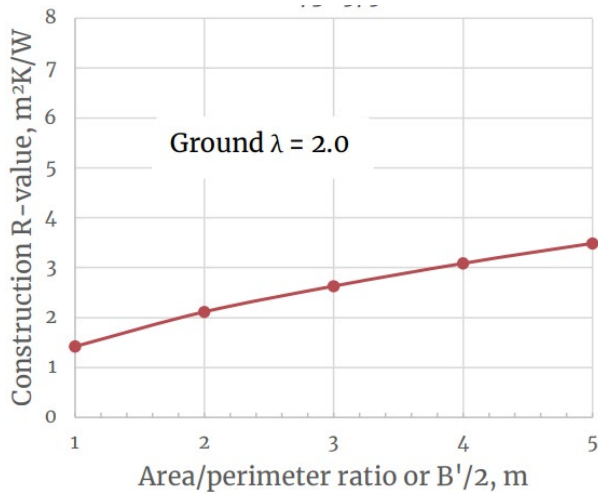
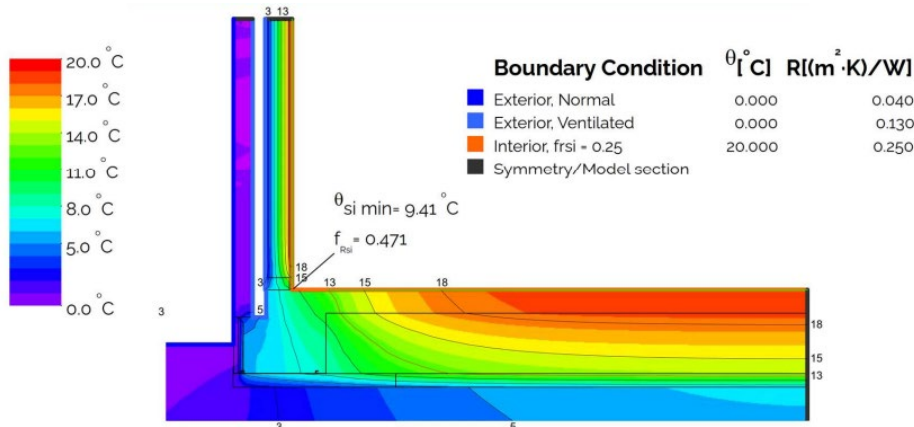
A/P, m	R-value, m <sup>2</sup> K/W
1	1.27
1.6	1.62
1.8	1.73
2	1.85
2.2	1.94
2.4	2.03
2.6	2.12
2.8	2.21
3	2.30
3.2	2.39
3.4	2.47
3.6	2.55
3.8	2.64
4	2.72
5	3.09



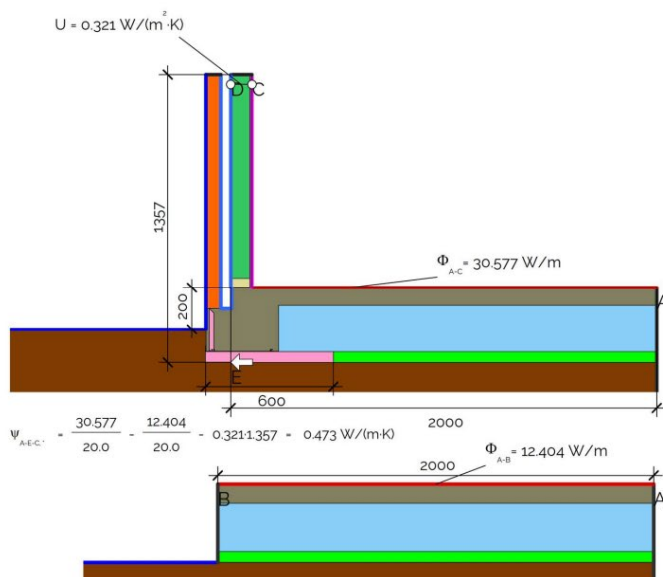
Boundary Condition	$\theta_i$ [°C]	R [(m <sup>2</sup> ·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	$\lambda$ [W/(m·K)]
85C2SL_0.038-220-1100-WFPg9_100R-onCont25EPS0.036	0.289
Brick	0.350
Concrete	2.000
EPS H-grade	0.036
Ground	2.000
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028

# QuickEdge Brick 305/50



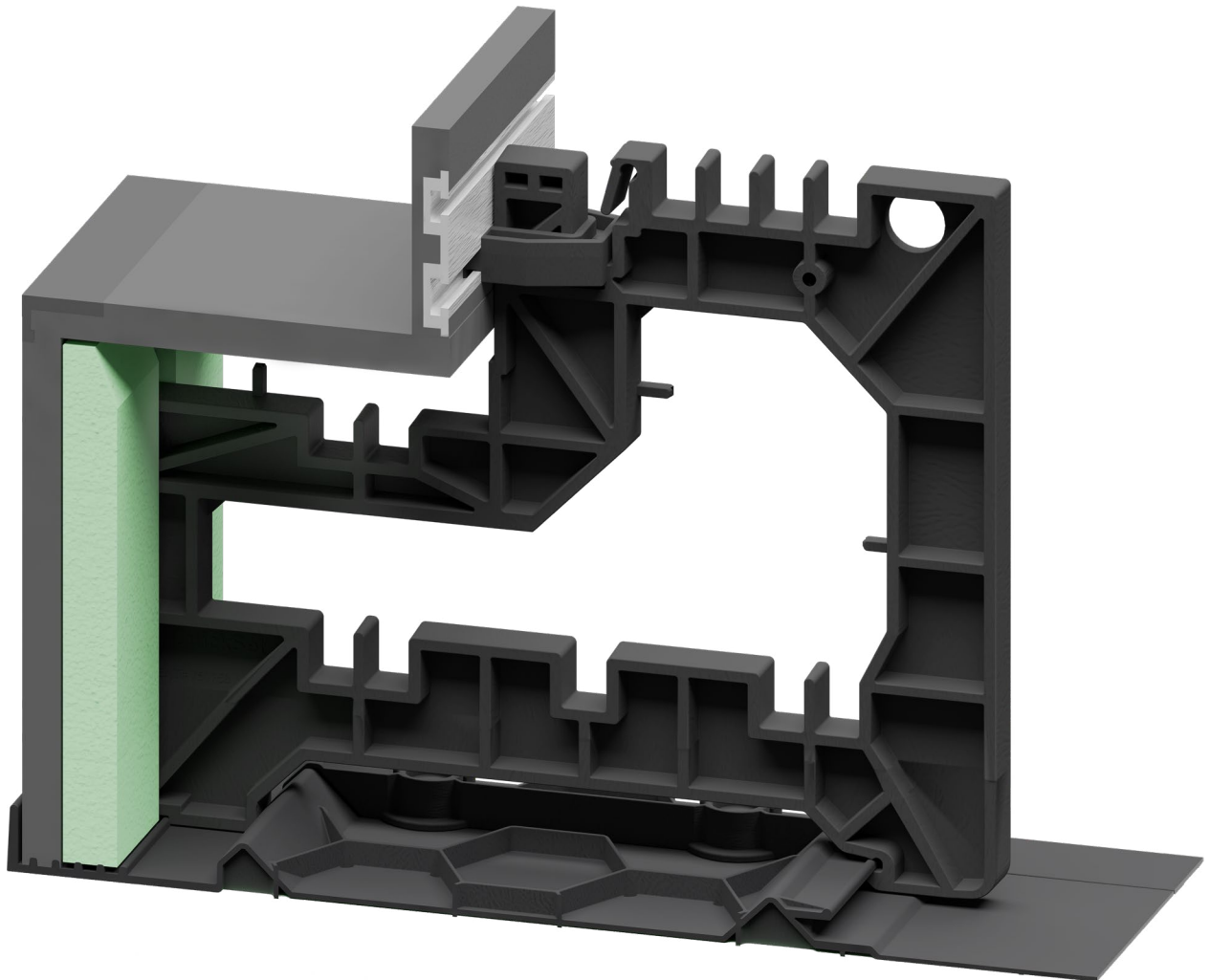
A/P, m	R-value, m²K/W
1	1.42
1.6	1.84
1.8	1.98
2	2.11
2.2	2.22
2.4	2.32
2.6	2.42
2.8	2.53
3	2.63
3.2	2.72
3.4	2.81
3.6	2.90
3.8	3.00
4	3.09
5	3.49



Boundary Condition	θ [°C]	R[(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	λ [W/(m·K)]
85C2SL_0.038-220-1100-WFPgXg_100R-onCont50EPS0.036	0.279
Brick	0.350
Concrete	2.000
EPS H-grade	0.036
Ground	2.000
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsu_L0.028	0.028

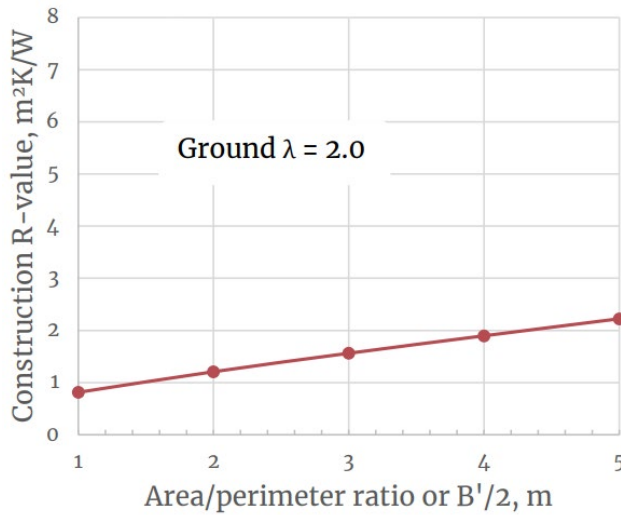
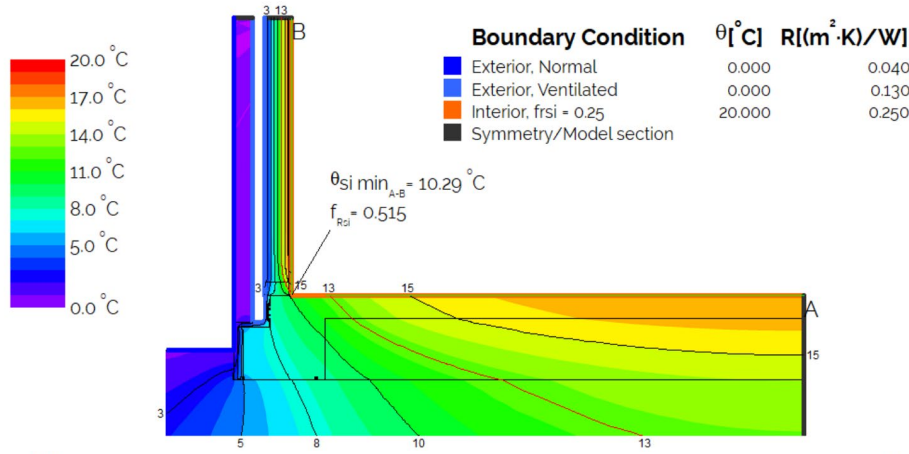
# QuickSet Rebate



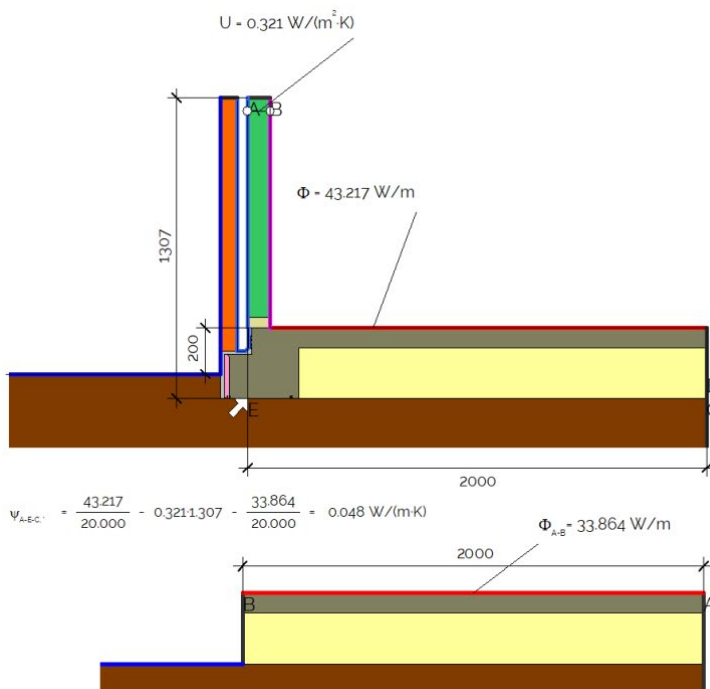
- Height options of 305, 320, 385, or 400 mm;
- Suitable for 220 mm and 300 mm pod systems;
- Compatible with 90 mm, 140 mm framing, and above.

**Please note that the thermal results in this section only correspond to QuickSet Rebate.**

# QuickSet Rebate 120/305/00 with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	0.81
1.6	1.05
1.8	1.13
2	1.21
2.2	1.28
2.4	1.35
2.6	1.42
2.8	1.49
3	1.56
3.2	1.63
3.4	1.70
3.6	1.76
3.8	1.83
4	1.90
4	1.90
5	2.22

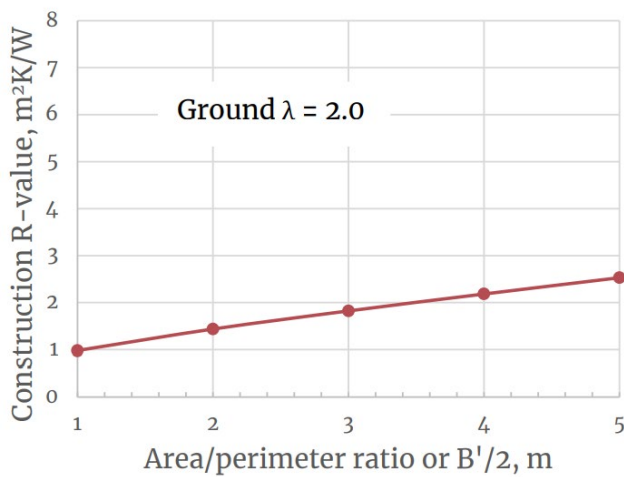
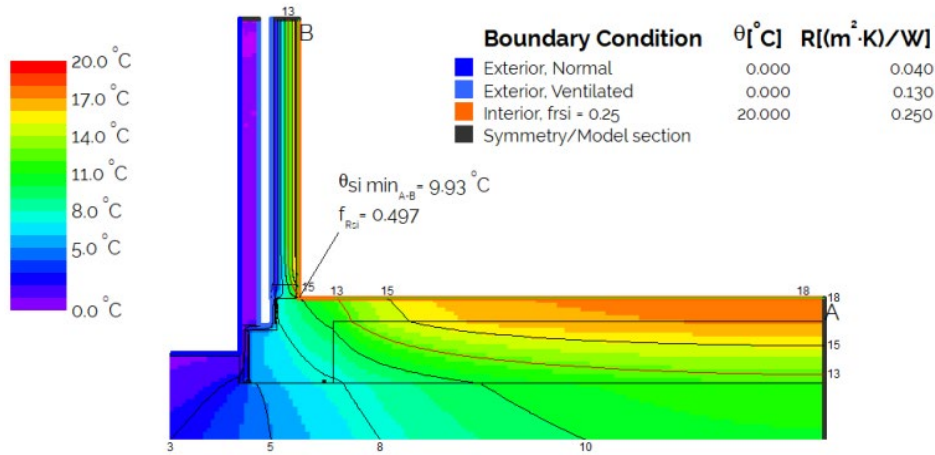


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

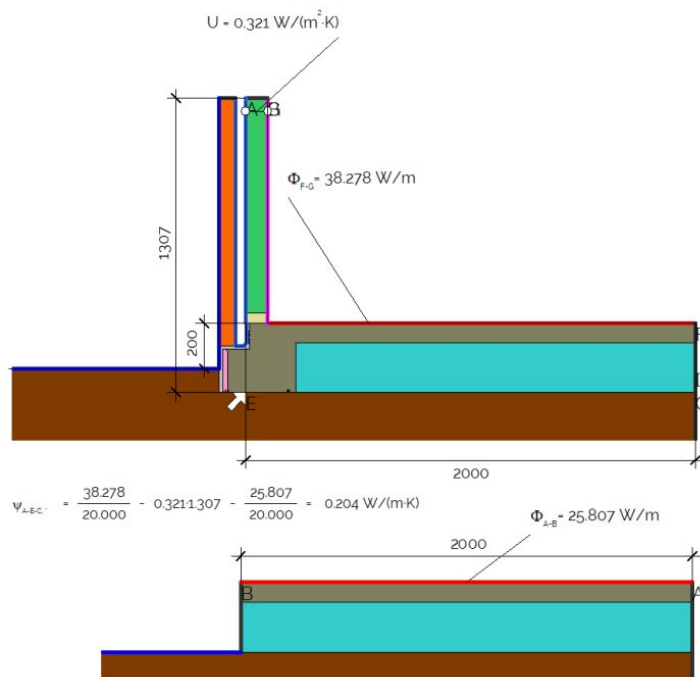
  

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_Lo.028	0.028

# QuickSet Rebate 120/305/00 with Polypod



A/P, m	R-value, m²K/W
1	0.98
1.6	1.25
1.8	1.35
2	1.44
2.2	1.51
2.4	1.59
2.6	1.67
2.8	1.75
3	1.82
3.2	1.89
3.4	1.97
3.6	2.04
3.8	2.11
4	2.18
5	2.53



Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

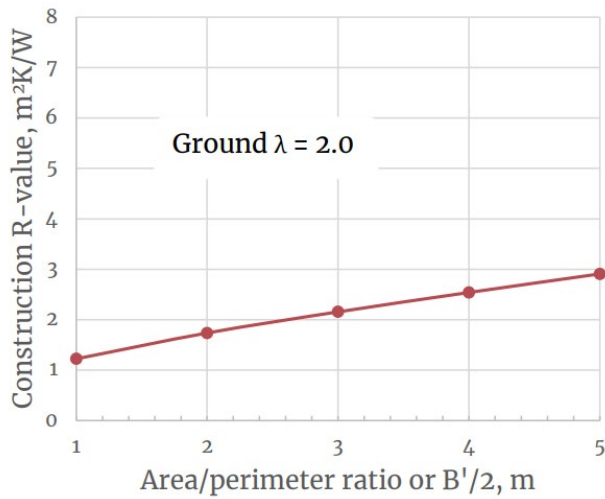
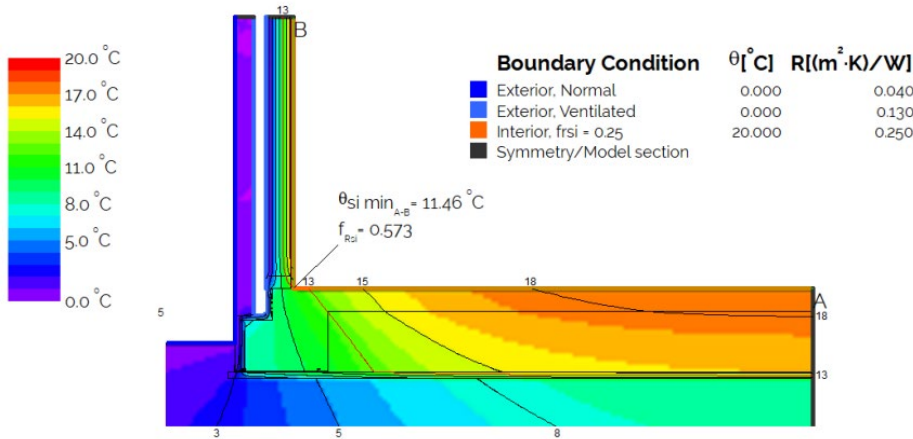
  

Material	λ [W/(m·K)]
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFFPg9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsu_L0.028	0.028

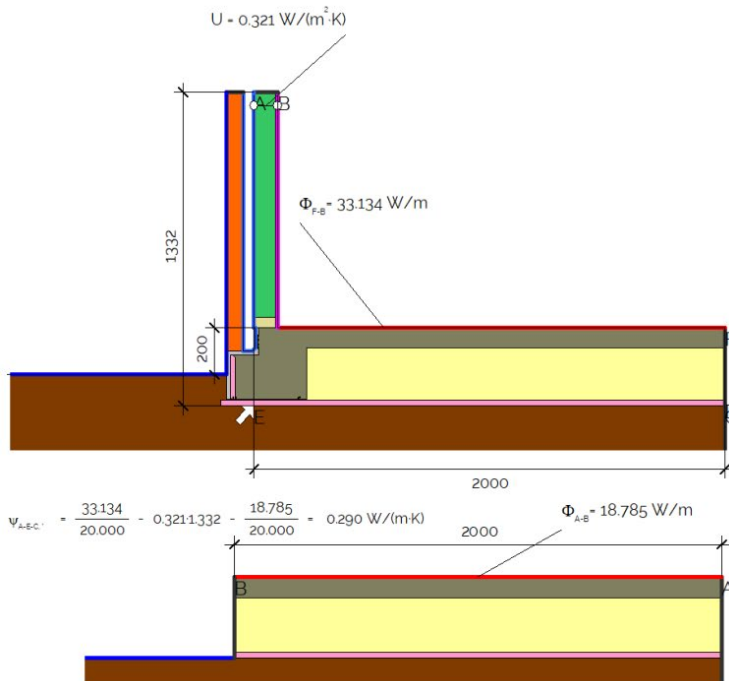
$$V_{A-B-C} = \frac{38.278}{20.000} - 0.321 \cdot 1.307 - \frac{25.807}{20.000} = 0.204 \text{ W}/(\text{m} \cdot \text{K})$$



# QuickSet Rebate 120/305/25 with QPOD



A/P, m	R-value, $m^2K/W$
1	1.22
1.6	1.53
1.8	1.63
2	1.74
2.2	1.82
2.4	1.90
2.6	1.99
2.8	2.07
3	2.16
3.2	2.23
3.4	2.31
3.6	2.39
3.8	2.46
4	2.54
5	2.91

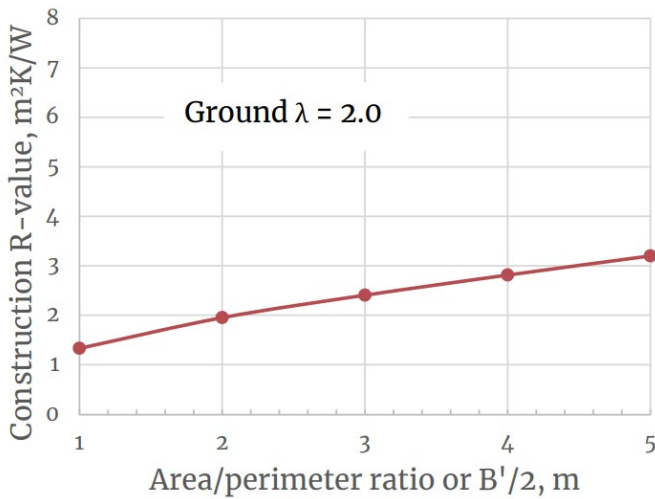
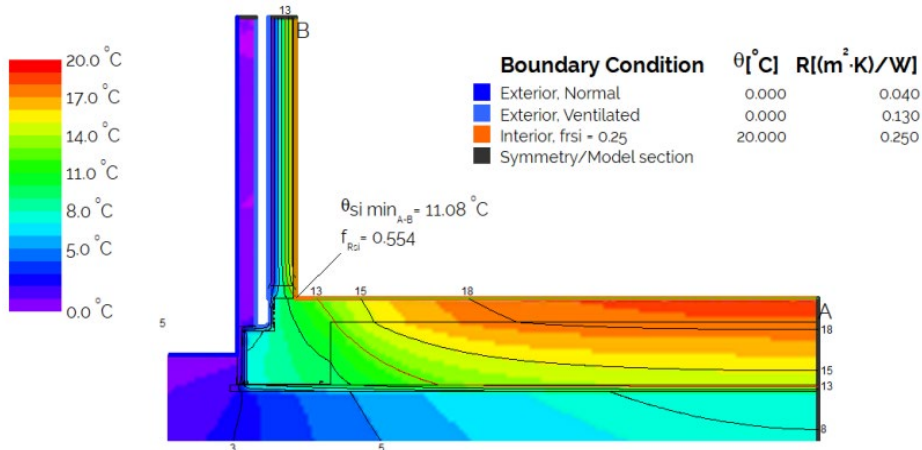


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

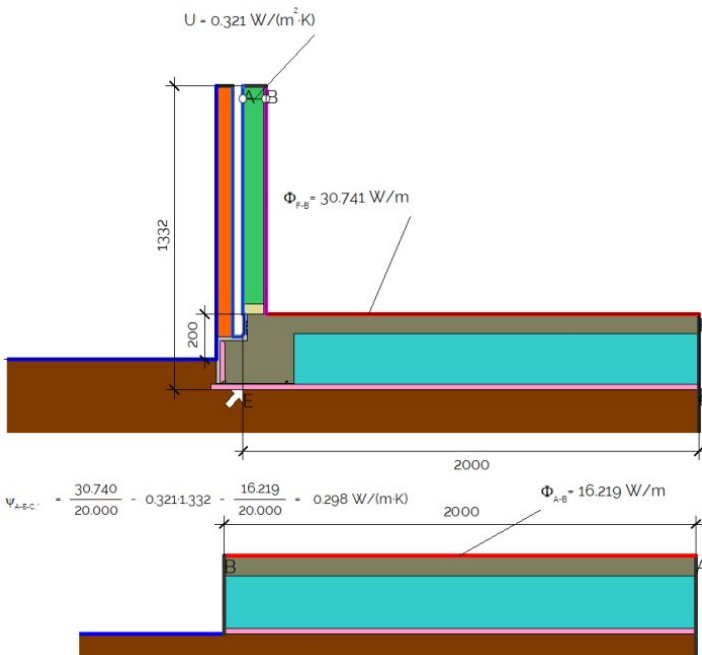
  

Material	λ [W/(m·K)]
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028

# QuickSet Rebate 120/305/25 with Polypod



A/P, m	R-value, m²K/W
1	1.33
1.6	1.70
1.8	1.83
2	1.95
2.2	2.04
2.4	2.13
2.6	2.22
2.8	2.31
3	2.40
3.2	2.49
3.4	2.57
3.6	2.65
3.8	2.73
4	2.81
5	3.20

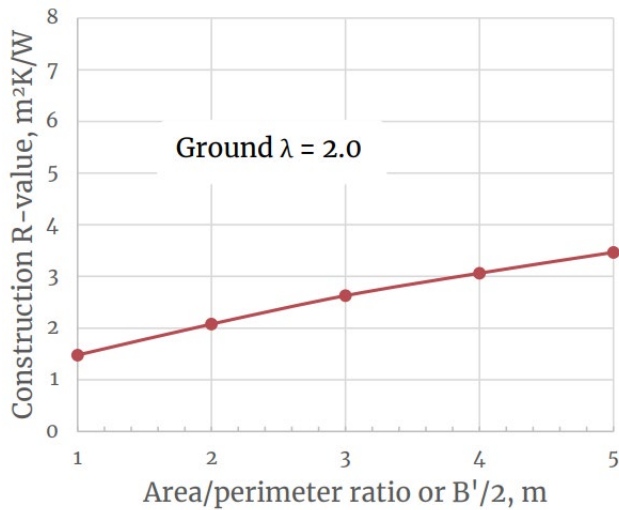
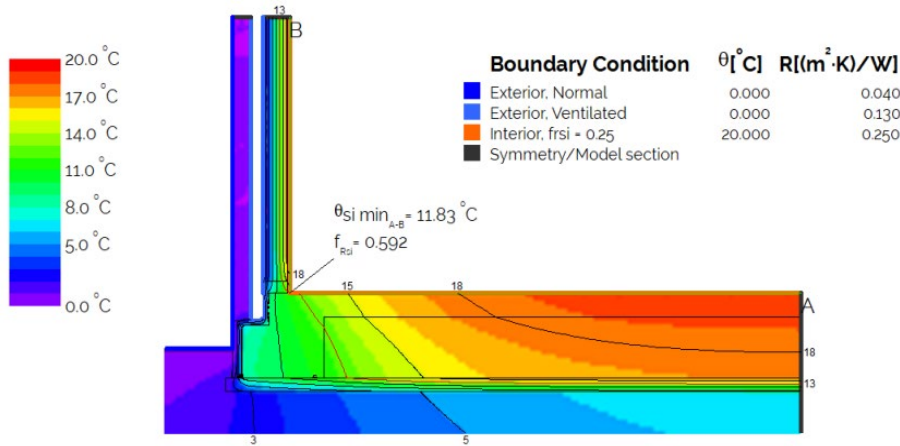


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

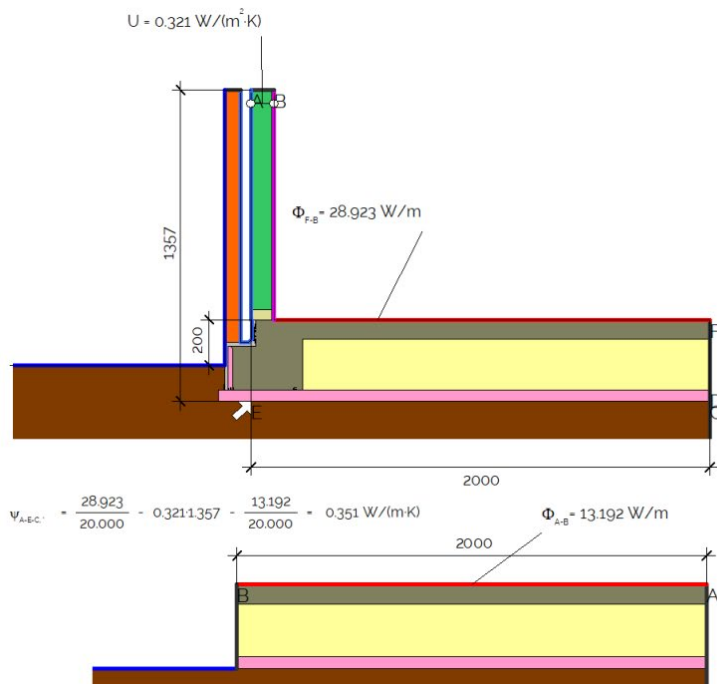
  

Material	λ [W/(m·K)]
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPg9g-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L.0.028	0.028

# QuickSet Rebate 120/305/50 with QPOD



A/P, m	R-value, m²K/W
1	1.48
1.6	1.84
1.8	1.96
2	2.08
2.2	2.19
2.4	2.30
2.6	2.41
2.8	2.52
3	2.63
3.2	2.71
3.4	2.80
3.6	2.89
3.8	2.98
4	3.06
5	3.47

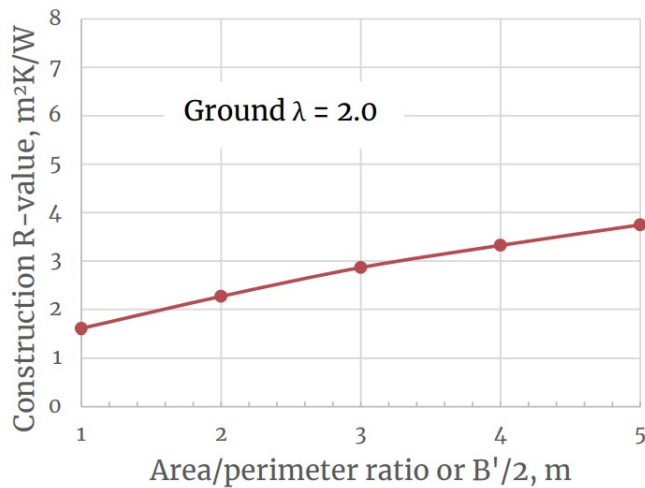
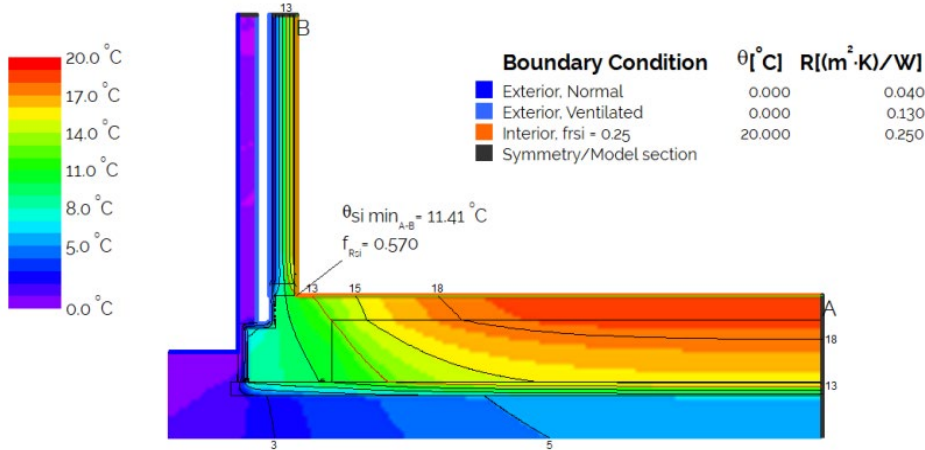


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

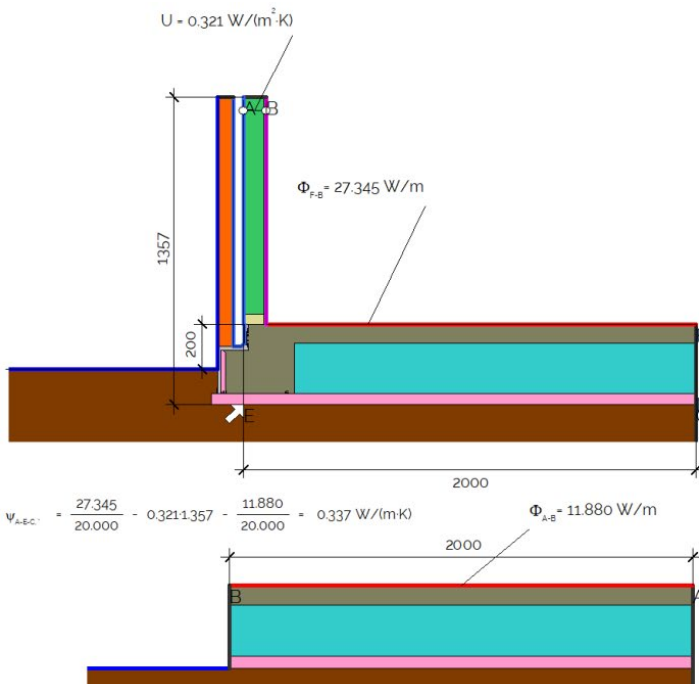
  

Material	λ [W/(m·K)]
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L0.028	0.028

# QuickSet Rebate 120/305/50 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.61
1.6	2.00
1.8	2.14
2	2.27
2.2	2.39
2.4	2.51
2.6	2.63
2.8	2.75
3	2.86
3.2	2.96
3.4	3.05
3.6	3.14
3.8	3.23
4	3.32
5	3.75

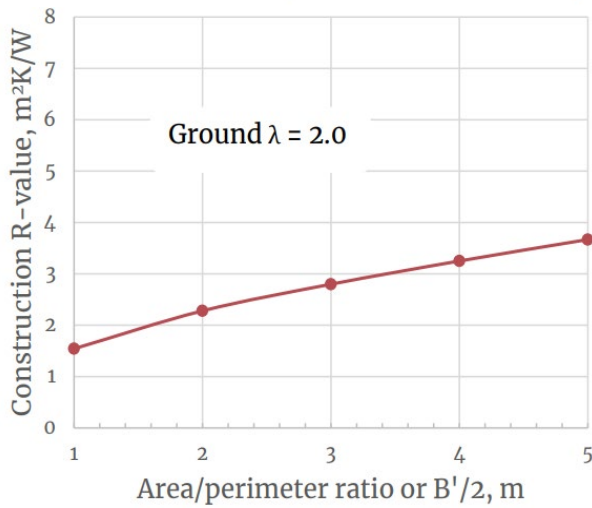
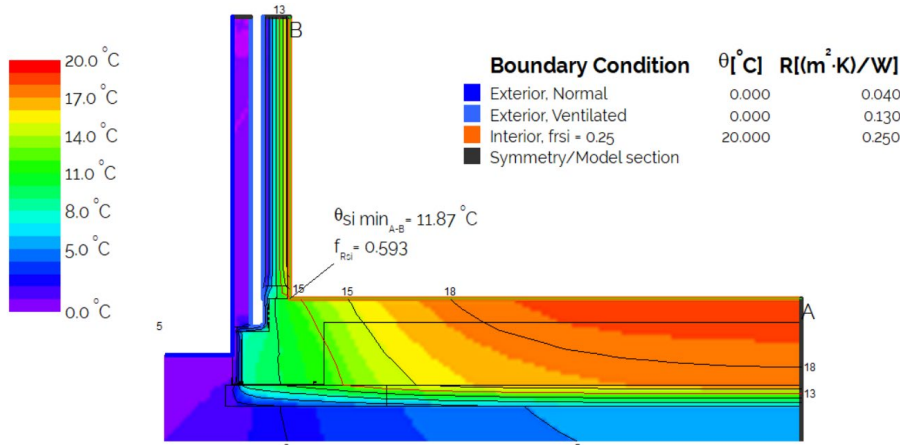


Boundary Condition	$\theta [^{\circ}\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

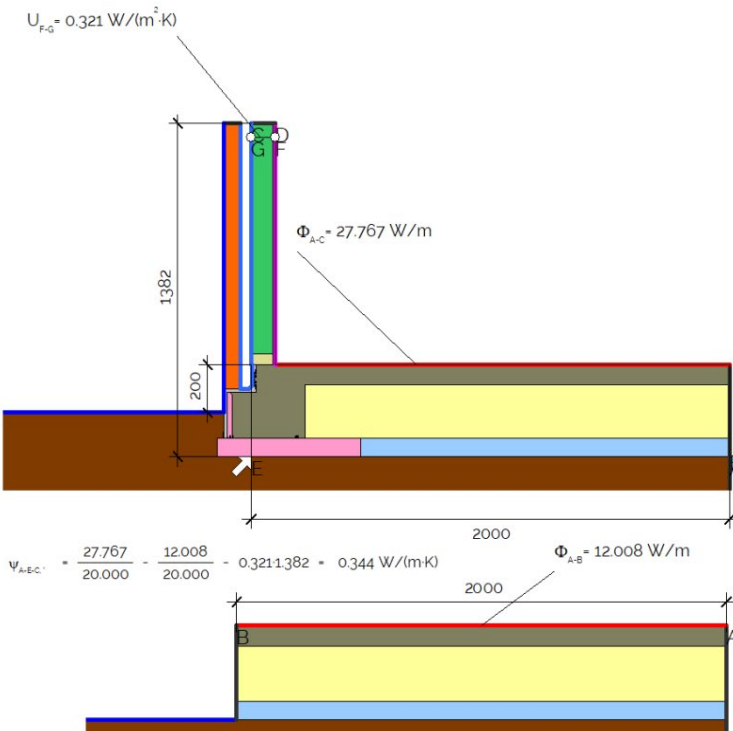
  

Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPg9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSinsul_L0.028	0.028

# QuickSet Rebate 120/305/75 with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.54
1.6	1.98
1.8	2.13
2	2.28
2.2	2.38
2.4	2.49
2.6	2.59
2.8	2.69
3	2.80
3.2	2.89
3.4	2.98
3.6	3.07
3.8	3.16
4	3.25
5	3.67



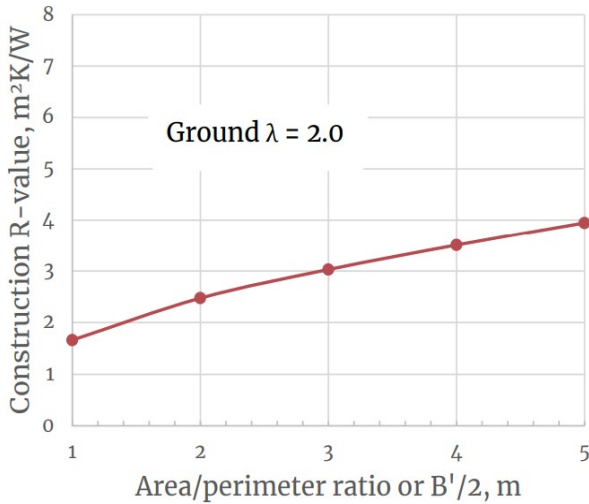
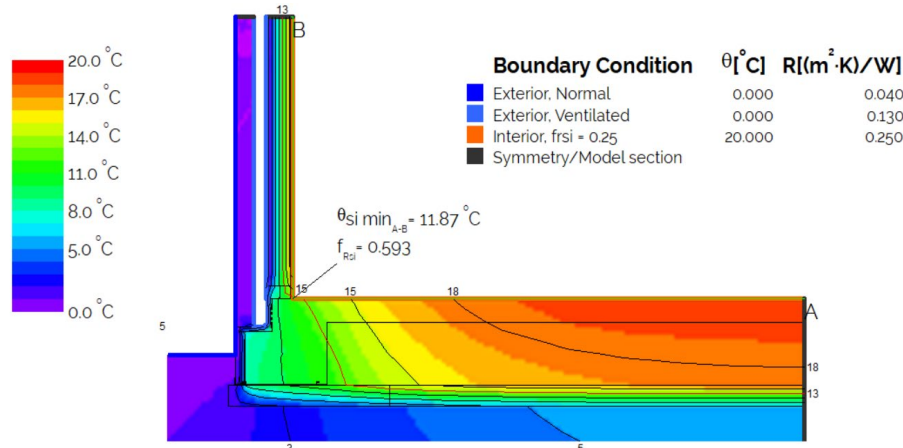
Boundary Condition	$\theta_i [^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

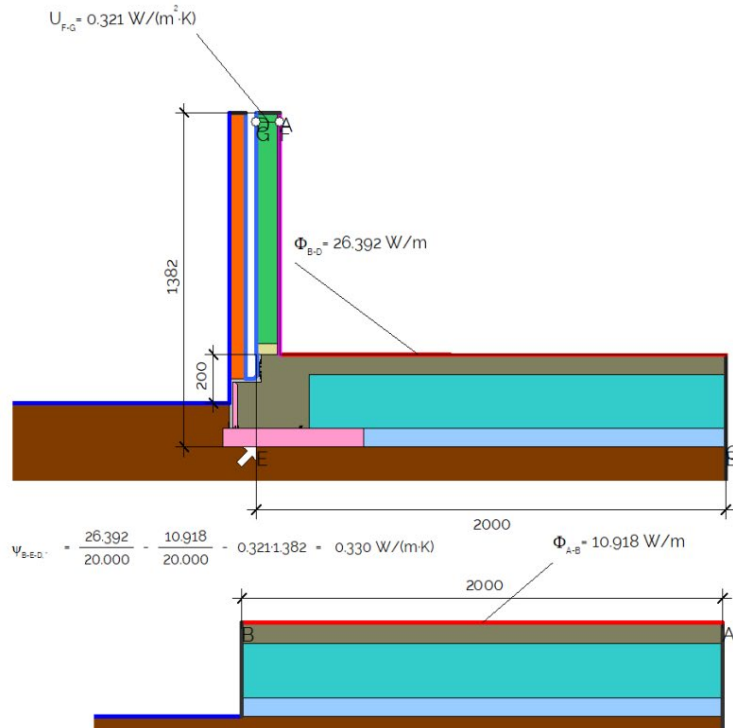
Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminium	160.000
Brick	0.350
Concrete	2.000
EPS H	0.036
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
QPod_4open	1.050
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsul_L0.028	0.028



# QuickSet Rebate 120/305/75 with Polypod



A/P, m	R-value, m²K/W
1	1.66
1.6	2.15
1.8	2.31
2	2.47
2.2	2.59
2.4	2.70
2.6	2.81
2.8	2.92
3	3.03
3.2	3.13
3.4	3.22
3.6	3.32
3.8	3.41
4	3.51
5	3.95

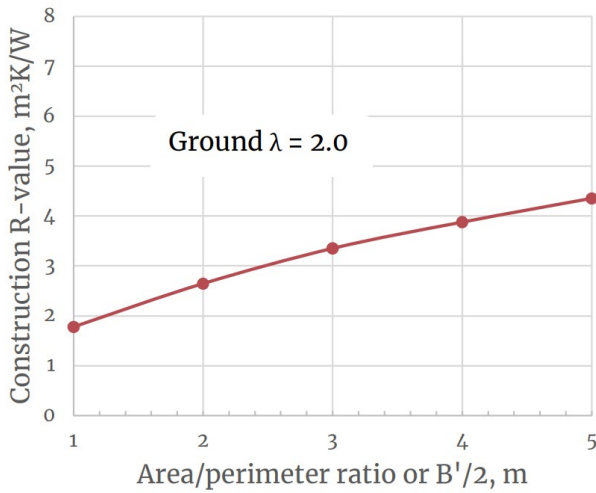
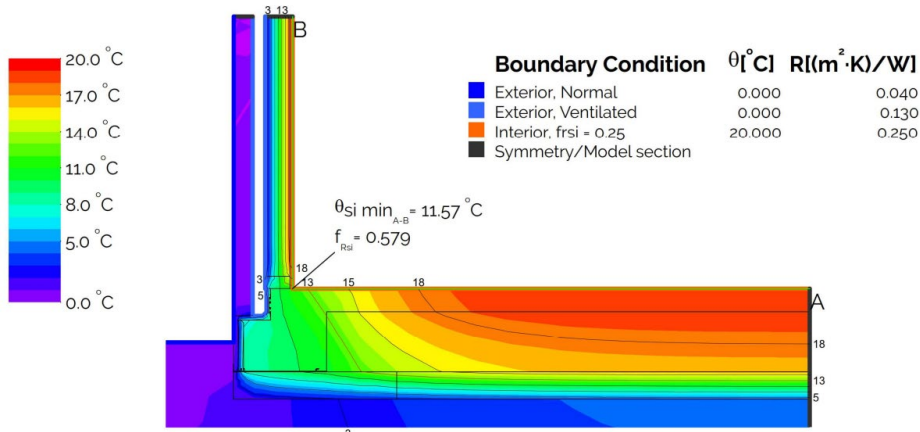


Boundary Condition	θ [°C]	R [(m²·K)/W]
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

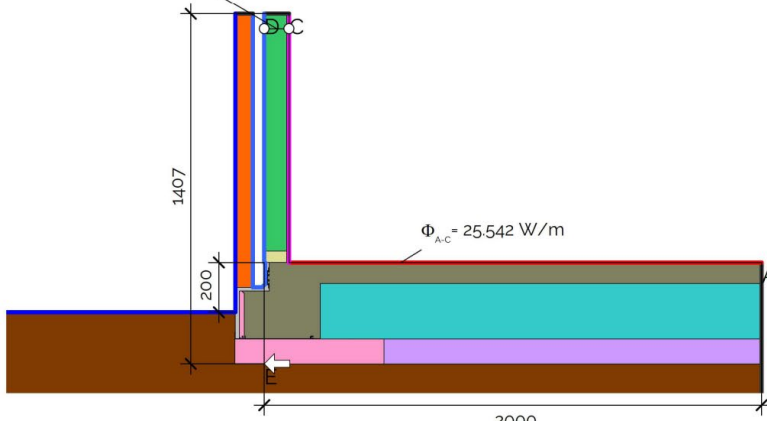
Material	λ [W/(m·K)]
Aluminium	160.000
Brick	0.350
Concrete	2.000
EPS H	0.036
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFPg99-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSInsul_L0.028	0.028

# QuickSet Rebate 120/305/100 with Polypod



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.78
1.6	2.30
1.8	2.47
2	2.65
2.2	2.79
2.4	2.93
2.6	3.07
2.8	3.21
3	3.35
3.2	3.46
3.4	3.56
3.6	3.67
3.8	3.77
4	3.88
5	4.35

$U = 0.321 \text{ W}/(\text{m}^2 \cdot \text{K})$



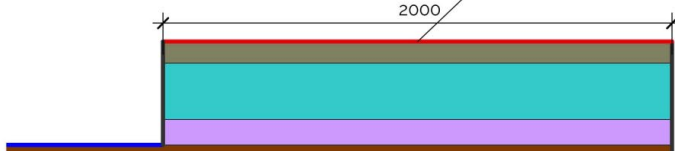
Boundary Condition	$\theta [^{\circ}\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

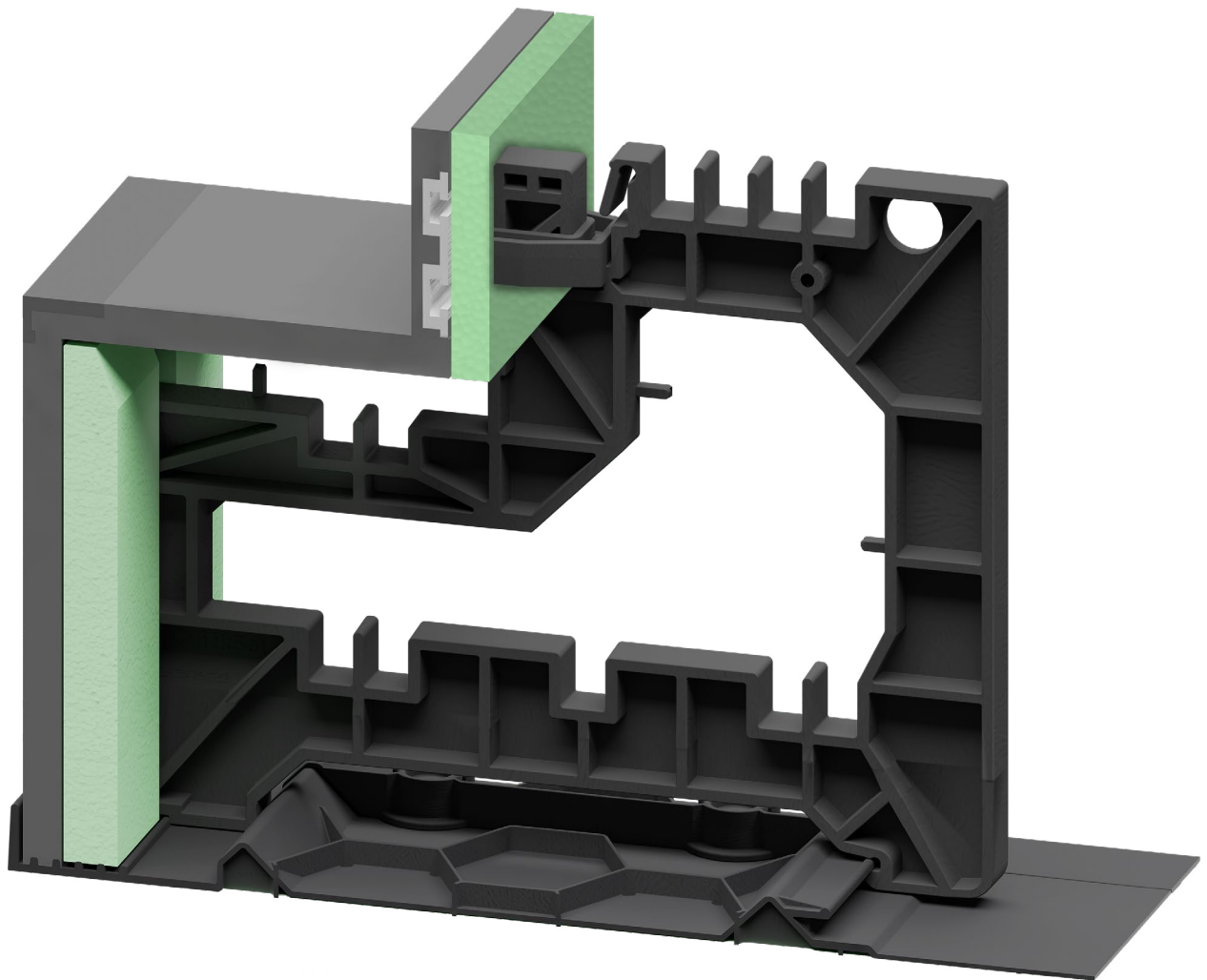
Material	$\lambda [(\text{W}/\text{m} \cdot \text{K})]$
Aluminium	160.000
Brick	0.350
Concrete	2.000
EPS VH-grade	0.035
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
Timber (Softwood)	0.130
WFP9x9-0.038/220/1100/SOIL	0.407
Wall insulation	0.032
XPSInsul_L0.028	0.028

$$\psi_{A-E-C} = \frac{25542}{20.000} - \frac{9.005}{20.000} - 0.321 \cdot 1407 = 0.375 \text{ W}/(\text{m} \cdot \text{K})$$

$\Phi = 9,005 \text{ W}/\text{m}$



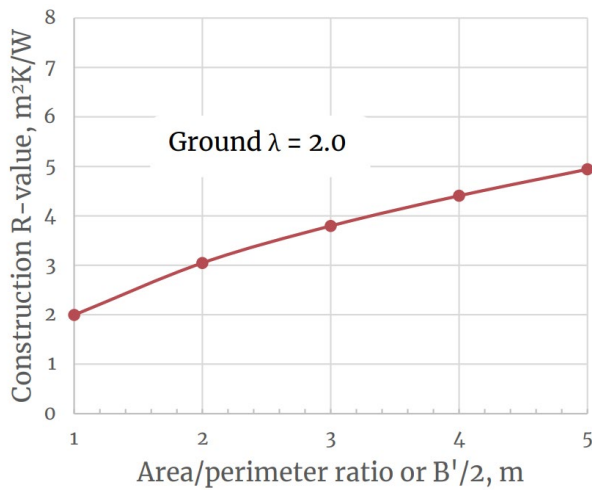
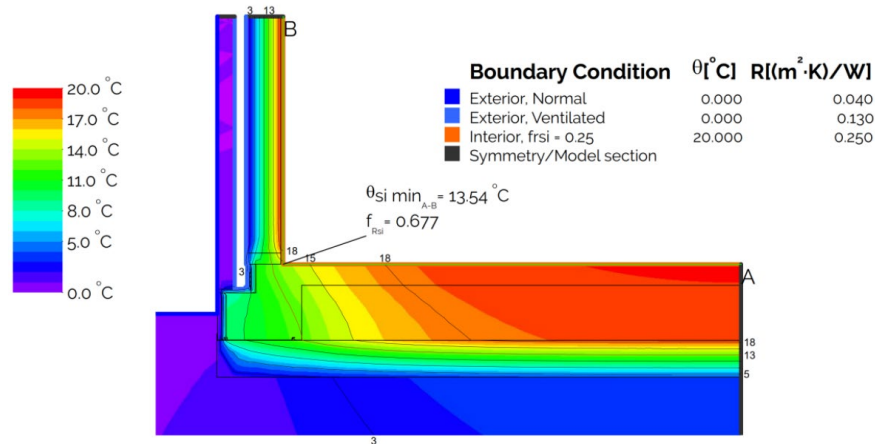
# QuickSet Rebate Ultra



- Height options of 305, 320, 385, or 400 mm;
- Suitable for 220 mm and 300 mm pod systems;
- Compatible with 140 mm framing and above.

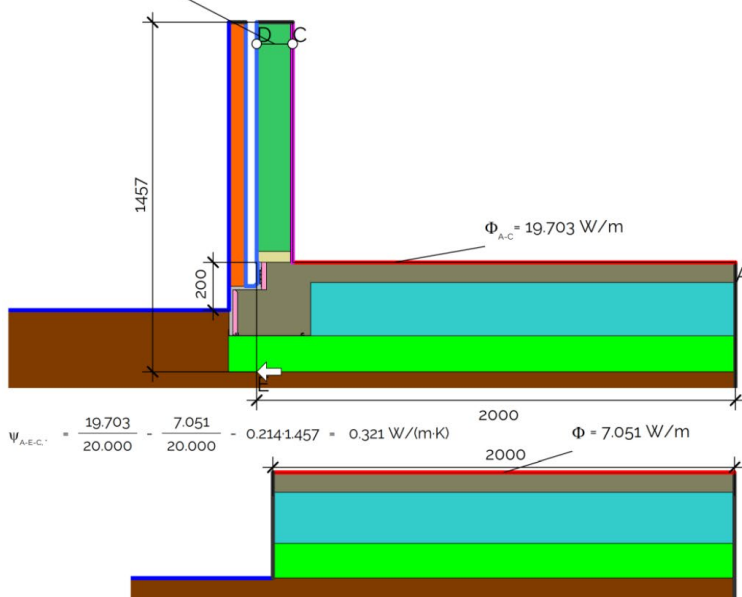
**Please note that the thermal results in this section only correspond to QuickSet Rebate Ultra.**

# QuickSet Rebate with Ultra 120/305/150 (Continuous SlabX200) with QPOD



A/P, m	R-value, $\text{m}^2\text{K}/\text{W}$
1	1.99
1.6	2.63
1.8	2.84
2	3.05
2.2	3.20
2.4	3.35
2.6	3.50
2.8	3.65
3	3.80
3.2	3.92
3.4	4.04
3.6	4.16
3.8	4.28
4	4.41
5	4.94

$U = 0.214 \text{ W}/(\text{m}^2 \cdot \text{K})$

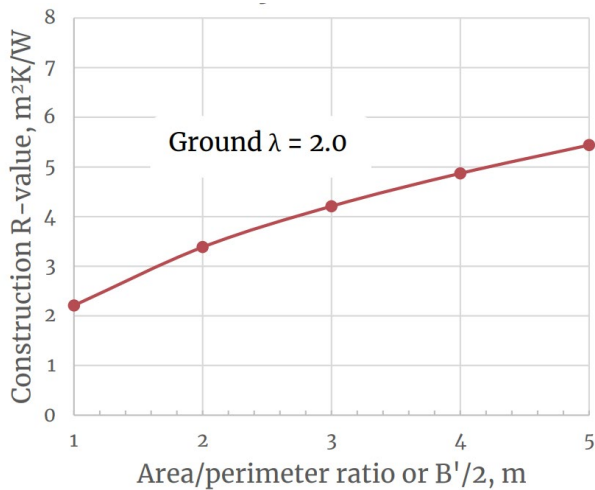
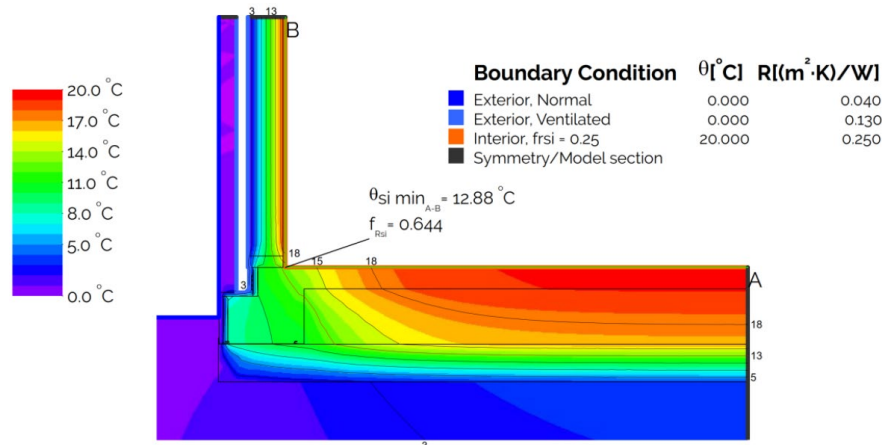


Boundary Condition	$\theta_i [^{\circ}\text{C}]$	$R_i (\text{m}^2 \cdot \text{K}) / \text{W}$
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

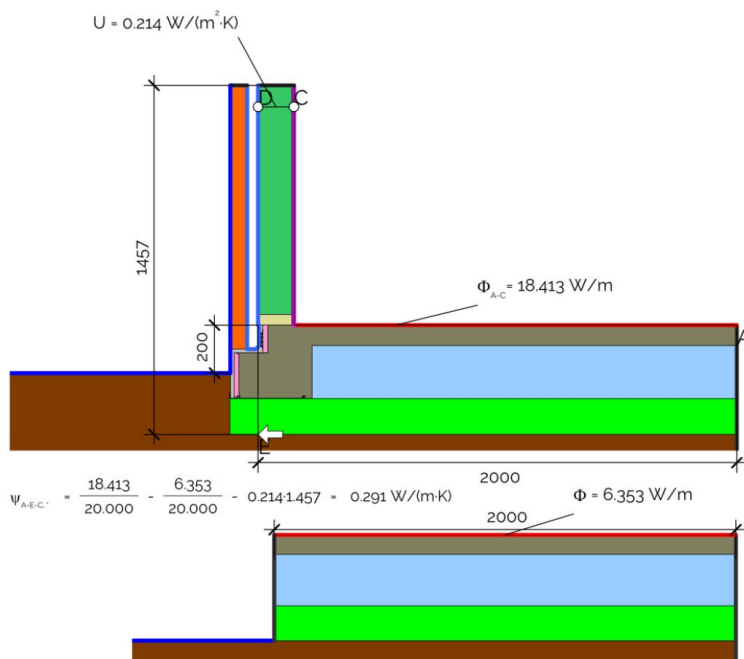
  

Material	$\lambda [\text{W}/(\text{m} \cdot \text{K})]$
SlabX200	1.052
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
SlabX200	0.034
Timber (Softwood)	0.130
Wall insulation	0.032
XPSInsuL_L0.028	0.028

# QuickSet Rebate with Ultra 120/305/150 (Continuous SlabX200) with Polypod



A/P, m	R-value, m²K/W
1	2.21
1.6	2.92
1.8	3.15
2	3.39
2.2	3.55
2.4	3.72
2.6	3.88
2.8	4.04
3	4.21
3.2	4.34
3.4	4.47
3.6	4.61
3.8	4.74
4	4.87
5	5.44



Boundary Condition	θ [°C]	RI (m²·K)/W
Exterior, Normal	0.000	0.040
Exterior, Ventilated	0.000	0.130
Interior, heat flux, downwards	20.000	0.170
Interior, normal, horizontal	20.000	0.130
Symmetry/Model section		

Material	λ [W/(m·K)]
SlabX200	0.266
Aluminium	160.000
Brick	0.350
Concrete	2.000
Ground	2.000
PVC Foam board	0.100
Plasterboard	0.250
Polypropylene	0.220
SlabX200	0.034
Timber (Softwood)	0.130
Wall insulation	0.032
XPSinsul_L.0.028	0.028



# Methodology

NZBC calculations are per the TBD NZBC H1 standard Verification Method H1/VM1 Appendix F summarized here:

Using internal slab dimensions in accordance with Equation 1 from this standard.

$$\text{Equation 1: } \text{slab area to perimeter ratio} = A_{\text{slab (internal)}} / P_{\text{slab (internal)}}$$

where  $A_{\text{slab (internal)}}$  is the area of the slab-on-ground floor that is part of the thermal envelope, measured between the interior surfaces of the walls that form the thermal envelope (m<sup>2</sup>) and  $P_{\text{slab (internal)}}$  is the perimeter of the slab-on-ground floor that is part of the thermal envelope, measured along the interior surfaces of the walls that form the thermal envelope, including the length of any wall(s) between conditioned and unconditioned spaces (m).

This is done using a two-dimensional numerical calculation in accordance with ISO 13370 Section 5.2b), a geometrical model in accordance with ISO 10211 Sections 7.3, 12.4.1 and 12.4.2 shall be used. The model shall have a floor width equal to half the characteristic dimension of the floor.

## COMMENTS:

1. The characteristic dimension of the floor (B, see ISO 13370) equals the area of the floor divided by half the perimeter of the floor and should be determined using internal dimensions.
2. A two-dimensional geometrical model with a floor width equal to half the characteristic dimension of the floor represents a floor that is infinitely long and has a width equal to the characteristic dimension of the floor, as required by ISO 13370 Section 5.2 b).

### F.1.2.5.

The calculation shall use the default values for the thermal properties of the ground from ISO 13370 Table 7, category 2. For other materials, thermal conductivity values from ISO 10456 shall be used and, for materials used below ground level, reflect the moisture and temperature conditions of the application. Values of surface resistance shall conform to ISO 13370 Section 6.4.3.

Note: Soil or Ground thermal conductivity = 2 W/(mK). The remaining thermal conductivities are shown in the results.

### F.1.2.6.

The construction R-value of the slab-on-ground floor shall be calculated according to Equation F.1.

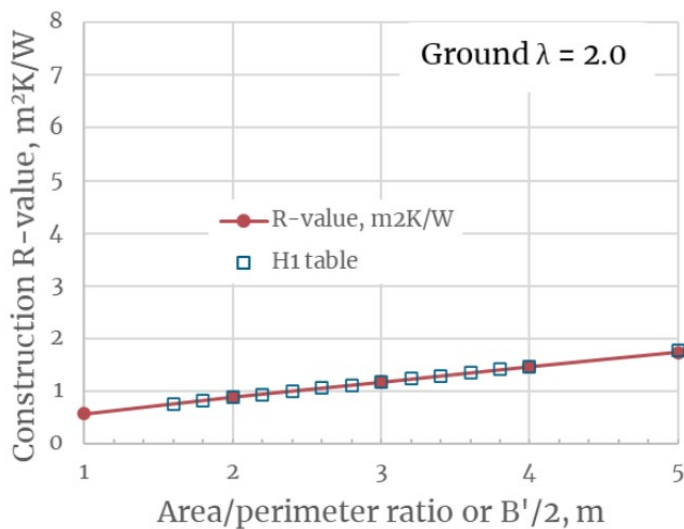
$$\text{Equation F.1: } R_{\text{floor}} = 1 / U$$

where U is the temperature-specific heat flux through the internal floor surface of the two- or three-dimensional geometrical model, with the internal floor surface extending from the internal surface of the external wall to the cut-off plane of the floor (W/(m<sup>2</sup> · K)), determined by a numerical

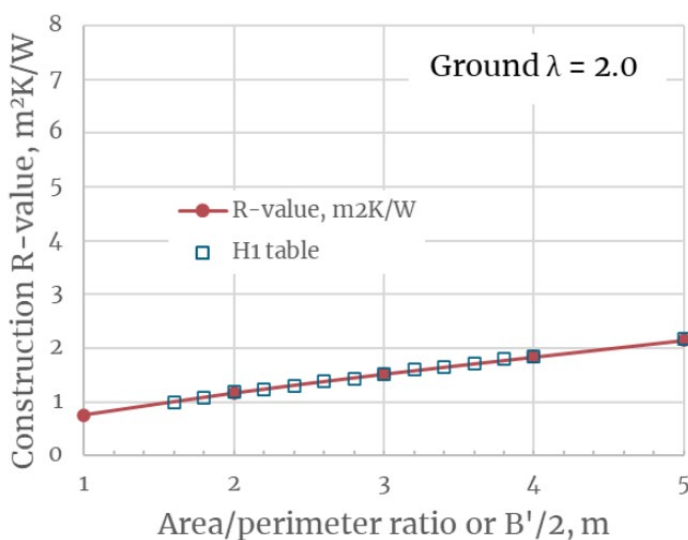
calculation as per F.1.2.1 to F.1.2.5.

The below two graphs compare our implementation of the H1 methodology as compared to the BRANZ calculated table values in H1/AS1. They agree to within less than 2%. The small variation is from different finite element meshing routines. The results are given to two decimal places to help with interpolation but the accuracy only justifies a single decimal place and we'd recommend tables provided to designers show only a single decimal place (ie R1.33 show as R1.3).

### NZBC R-values for an Uninsulated Plain Concrete Slab



### NZBC R-values for an Uninsulated Raft (Waffle) Concrete Slab



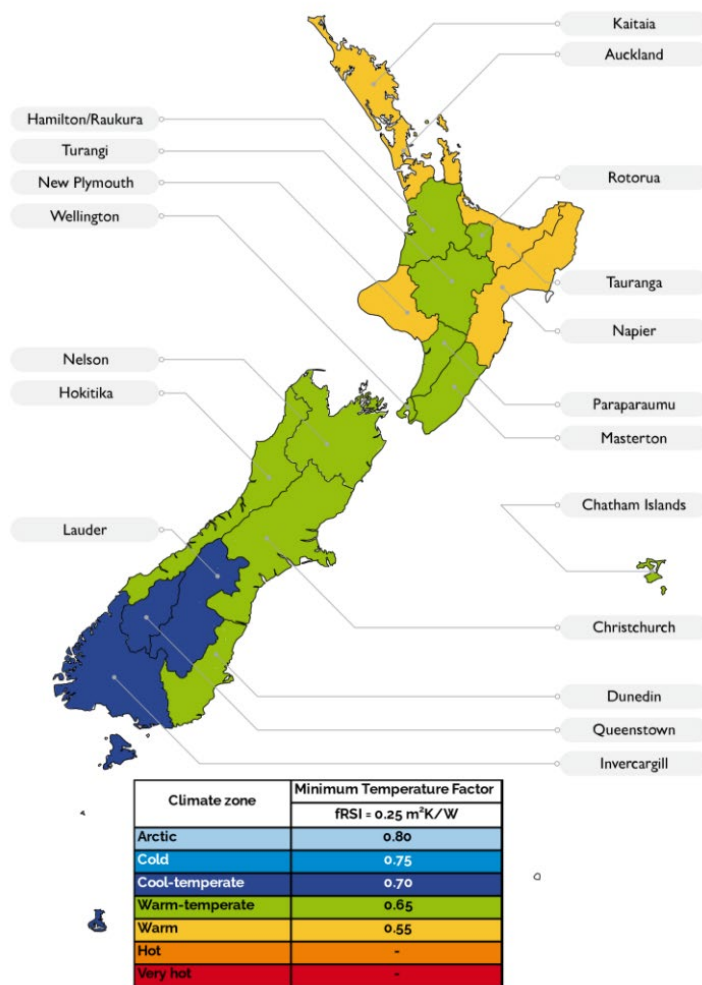
Both examples feature 90mm stud + 10mm gypsum wall board or 100mm wall.

Please note that the bottom waffle slab example has been created using a 300 mm pod system.

## Passive House $\Psi$ and fRSI

Slab Passive House calculations of  $\Psi$  are in accordance with ISO10211:2017 with Passive House Institute (PHI) modifications and the fRSI criteria. These use external dimensions and the heat loss at the sill plate (which should not be neglected) is included in this  $\Psi$  calculation. The NZBC has no official requirements for a particular fRSI value, but NZGBC Homestar V5 does have requirements intended to parallel the Passive House requirements. In PHPP10, these will be calculated via a moisture balance for each specific building to allow lower fRSI values to be used as less conservative criteria are appropriate with more detailed knowledge of the building ventilation rates, loads, and heating setpoints.

## fRSI Requirements for NZ Regions for Passive Homes



This map shows the three different fRSI zones at the weather station altitudes. The climate zone and thus the fRSI requirements also vary with altitude as the average temperatures typically drop by 0.6C per 100m of elevation gain. In general, these zones can be used without considering the elevation change.

Illustration from Sustainable Engineering Ltd.

fRSI requirements from the PHI Passive House Standard Building Criteria.