



Certification report | Zertifizierungsbericht

Passive House Institute

Wall system Wandsystem



for cold climate
für kalte Klima

Product | Produkt:

ThermalWall System

Client | Auftraggeber:

Legalet

Construction | Konstruktion

**Lightweight timber construction |
Holzleichtbau**

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Introduction

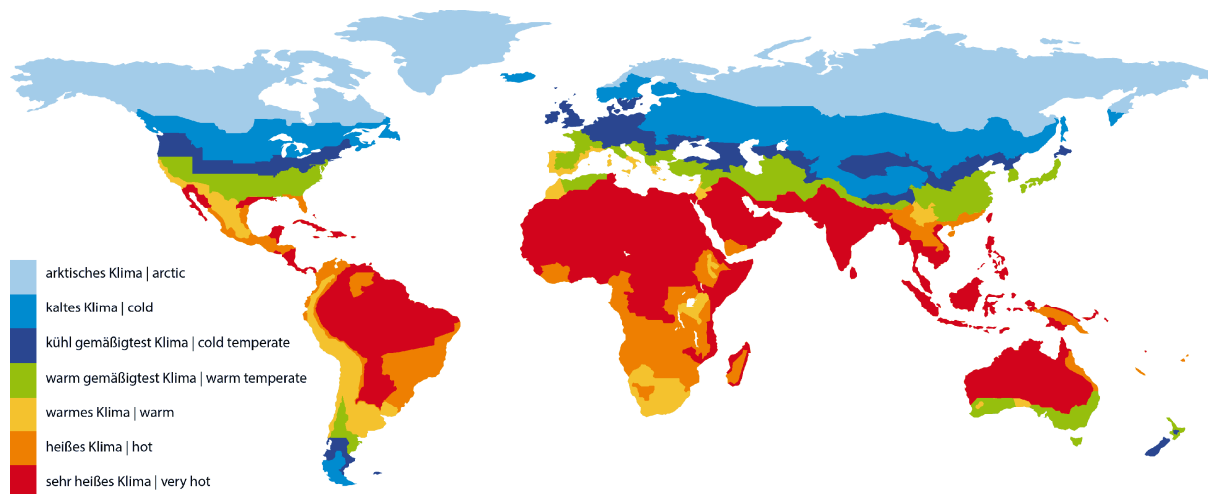
Because a separate heating system is not necessarily required in Passive Houses, high demands are placed on the quality of the building components used. The colder the climate, the higher the requirements for the components. To cover this, PHI has identified regions of similar requirements, and defined certification criteria. These criteria are available for free download at the website of the Passive House Institute.

If the below summarized requirements are met and a well-designed airtightness layer is proven, the label "Certified Passive House Component" can be awarded by the Passive House Institute (PHI)

Table 1: Adequate certification criteria

Climate zone	Hygiene criterion $f_{Rsi=0.25} \text{ m}^2\text{K/W} \geq^3$	Comfort criterion U-value of the installed window ¹ \leq	Efficiency criteria		
			U-value opaque to ambient $U_{opaque} * f_{PHI}^2 \leq$	Purely opaque details $f_{Rsi=0.25} \text{ m}^2\text{K/W} \geq$	Absence of thermal bridges $\Psi_a \leq^4$
	[-]	[W/(m ² K)]	[W/(m ² K)]	[-]	[W/(mK)]
1 Arctic	0.80	0.45 (0.35)	0.09	0.90	0.01
2 Cold	0.75	0.65 (0.52)	0.12	0.88	
3 Cool, temperate	0.70	0.85 (0.70)	0.15	0.86	
4 Warm, temperate	0.65	1.05 (0.90)	0.25	0.82	

1 applies for vertical windows with a test size of 1.23*1.48 m. The criteria for other transparent building components can be taken from the relevant certification criteria. Value in brackets: respective reference glazing.
 2 $f_{R, PHI}$: Reduction factor: always 1, exception: areas in contact with the ground and towards the unheated basement: 0.6
 4 as a thermal bridge loss coefficient based on external dimensions and length. Specific constructions such as inner edges are exempted from this criterion.



1 Description of the certified system

1.1 Opaque building envelope

Lightweight timber wall system of 1.5" by 5.5" timber studs at 17.5" centers, enclosing Roxul Rockwool insulation (0.036 W/(mK)) and covered to the exterior with 8" of EPS (0.036 W/(mK), Type 2 according to CAN/ULC-S701-05 and -011). Typical timber roof by others with typical insulation at 0,040 W/(mK). Floor slab of 8" of reinforced concrete with 8" of EPS (0.036 W/(mK), Type 2 according to CAN/ULC-S701-05 and

-011) to the underside. Point fixings have been modelled three-dimensionally and taken into account in the certified U-value. The system has undergone analysis by the Passive House Institute against the thermal performance criteria for wall systems and has been deemed suitable for the construction of passive houses in both cold and cool-temperate climates.

1.2 Windows

Analysis was undertaken using a high quality Passive House window with a U_w -value of 0,60 W/(m²K) using a U_g of 0,52 W/(m²K), a Super-Spacer Triseal and polysulfide secondary seal. The installed U-

value meets the comfort requirement of Passive House buildings using a reference size of 1,23 m by 1,48 m.

1.3 Airtightness concept

The airtightness of the system is achieved through the use of an airtight membrane, fixed to the inside of the structural layer and behind the service cavity. Joints are secured with specialist air tightness tape.

The system also includes a wind- and waterproof membrane, fixed to the outside of the exterior insulation, with joints secured as above. Windows are installed with suitable air tightness sealing tapes.

2 Evaluation

The examined building system with the indicated details meets the PHI criteria for Certified Passive House Components.



3 Using the results in the PHPP

The following points are relevant for working with the here presented results in the Passive House Planning Package (PHPP):

- For the system being certified here, the thermal bridges in the regular construction of the buildings shell resulting from regularly occurring interruptions are already included in the U-values by using equivalent thermal conductivities for the

materials of the interrupted layers. They do not have to be considered further.

- The results of the calculation of the linear thermal transmittance are always determined based on the external dimensions.
- Additional point thermal bridges may have to be taken into account.

4 Legal information

The following information should be kept in mind when planning and executing the detail solutions documented in this report:

The detail drawings in this documentation are schematic and might be adapted for specific constructions. Sealing of the construction against moisture and the absence of condensation as well as the check of hygrothermal matters was not the subject of this examination. Where necessary, this should be carried out in accordance with the accepted technical standards. The responsibility for checking the above mentioned points lies with the applicant for the certification procedure and/or the user.

The present documentation does not allow conclusions to be drawn regarding other characteristics of the examined construction that may determine its performance and quality. In particular, this documentation is not a substitute for building authority approval.

The scope of the examination and accountability of the certification is limited to the testing routines with regard to compliance with the stated criteria of the Passive House Institute. A legal basis for making any claims against the Passive House Institute Darmstadt based on the information provided in this report is excluded.



Appendix 1: U-value of building assemblies

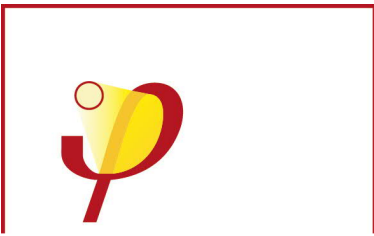
Legalität: ThermalWall System ID: 1632wa02 for cold climate



Acronym	Building assembly description		Interior insulation?
RO01	Roof		<input type="checkbox"/>
Heat transmission resistance [m ² K/W]			
Orientation of building element	1-Roof	Adjacent to 3-Ventilated	interior R _{si} 0,10 exterior R _{se} 0,10
U-value determined by thermal simulation (see appendix 2)			
length of model [m]	Δθ [K]	thermal flux [W/m]	U-value [W/(m²K)]
0,406	30	1,2324	0,101
U-value determined according to PHPP			
Material of Layer	λ [W/(mK)]	Description	Thickness [mm]
Gypsum board	0,250	Value according to ISO 10456	12,5
Insulation 040 + timber	0,047	Equivalent value to match thermal simulation	140,0
Insulation 040	0,040	Typical value	267,0
Percentage of sec. 1 Percentage of sec. 2 Percentage of sec. Total			42,0 cm
U-value supplement	<input type="text"/>	W/(m ² K)	U-value: 0,101 W/(m ² K)

Acronym	Building assembly description		Interior insulation?
EW01	External wall		<input type="checkbox"/>
Heat transmission resistance [m ² K/W]			
Orientation of building element	2-Wall	Adjacent to 3-Ventilated	interior R _{si} 0,13 exterior R _{se} 0,13
U-value determined by thermal simulation (see appendix 2)			
length of model [m]	Δθ [K]	thermal flux [W/m]	U-value [W/(m²K)]
0,406	30	1,3153	0,108
U-value determined according to PHPP			
Material of Layer	λ [W/(mK)]	Description	Thickness [mm]
Gypsum board	0,250	Value according to ISO 10456	12,5
Roxul Rockwool 0,036 + timber	0,044	Equivalent value to match thermal simulation	140,0
Softwood board	0,130	Value according to ISO 10456	12,5
EPS Type 2	0,036	CAN/ULC-S701-05 and -11	203,0
Percentage of sec. 1 Percentage of sec. 2 Percentage of sec. Total			36,8 cm
U-value supplement	0,004	W/(m ² K)	U-value: 0,112 W/(m ² K)
The U-value supplement is provided by Peel Passive House Consulting, see separate report			

Acronym	Building assembly description		Interior insulation?
FS01	Floor slab		<input type="checkbox"/>
Heat transmission resistance [m ² K/W]			
Orientation of building element	3-Ground	Adjacent to 2-Ground	interior R _{si} 0,17 exterior R _{se} 0,00
U-value determined by thermal simulation (see appendix 2)			
length of model [m]	Δθ [K]	thermal flux [W/m]	U-value [W/(m²K)]
1,000	30	5,0780	0,169
U-value determined according to PHPP			
Material of Layer	λ [W/(mK)]	Description	Thickness [mm]
Ceramic tile	2,000	Value according to ISO 10456	10
Reinforced concrete	2,300	Value according to ISO 10456	203
EPS Type 2	0,036	CAN/ULC-S701-05 and -11	203
Total			41,6 cm
U-value supplement	<input type="text"/>	W/(m ² K)	U-value: 0,169 W/(m ² K)



Appendix 2: Thermal simulations | Wärmestromsimulationen

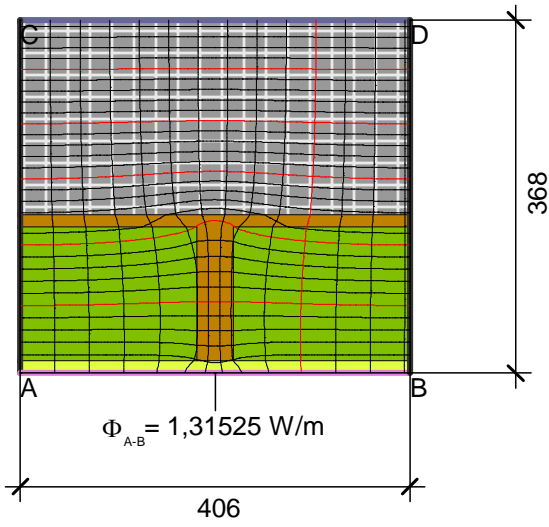
Passive House Institute

Wall, roof, ground | Wand, Dach, Boden
Windows | Fenster



Wall, roof, ground | Wand, Dach, Boden

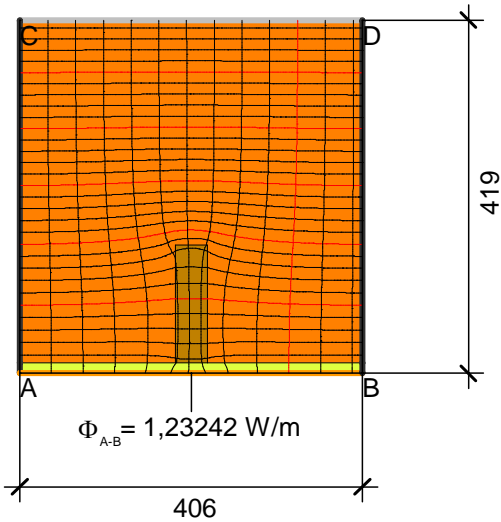




Material	λ [W/(m·K)]
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m3 10456	0,250
Roxul Rockwool k=0.036	0,036
Softwood (500kg/m3) k=0.13 [Default]	0,130

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Interior Innen		20,000	0,130

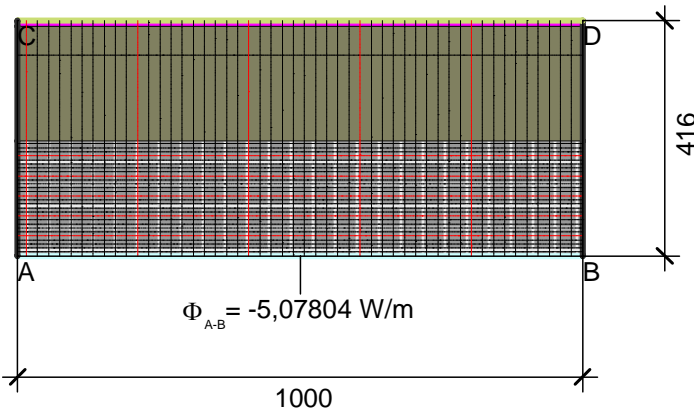
$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$



Material	λ [W/(m·K)]
Gypsum board Gipskartonplatten 900 kg/m3 10456	0,250
Insulation Wärmedämmung 040	0,040
Softwood (500kg/m3) k=0.13 [Default]	0,130

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior roof Außen Dach		-10,000	0,100
Interior up. Innen auf.		20,000	0,100

$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,232}{30,000 \cdot 0,406} = 0,101 \text{ W}/(\text{m}^2 \cdot \text{K})$$

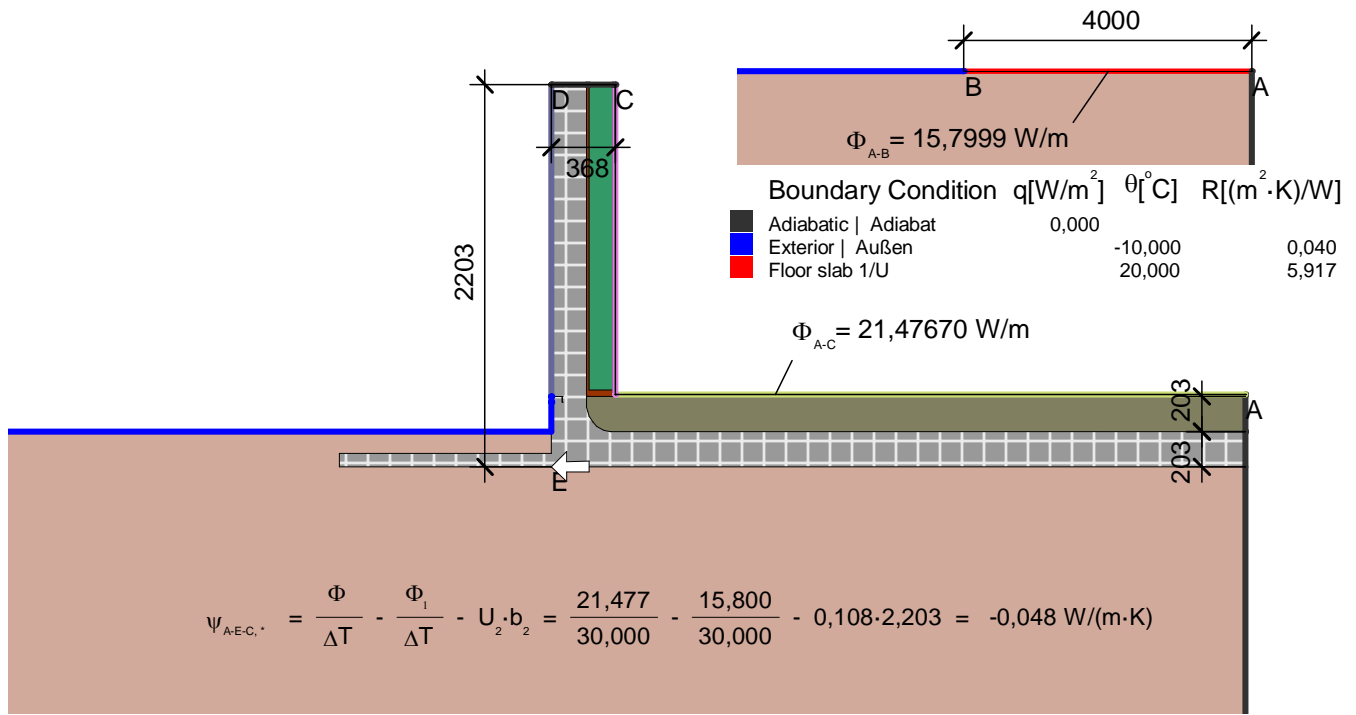


Material	λ [W/(m·K)]
Ceramic Tile	2,000
Concrete, 1% Steel Beton, 1% Stahl 10456	2,300
EPS Type 2 k=0.036	0,036

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Gorund Erdreich		-10,000	
Int. flux down Innen abwärts		20,000	0,170

$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{5,078}{30,000 \cdot 1,000} = 0,169 \text{ W}/(\text{m}^2 \cdot \text{K})$$



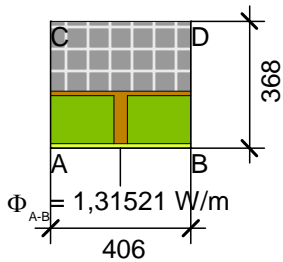


$$\psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - \frac{\Phi_1}{\Delta T} - U_2 \cdot b_2 = \frac{21,477}{30,000} - \frac{15,800}{30,000} - 0,108 \cdot 2,203 = -0,048 \text{ W}/(\text{m} \cdot \text{K})$$

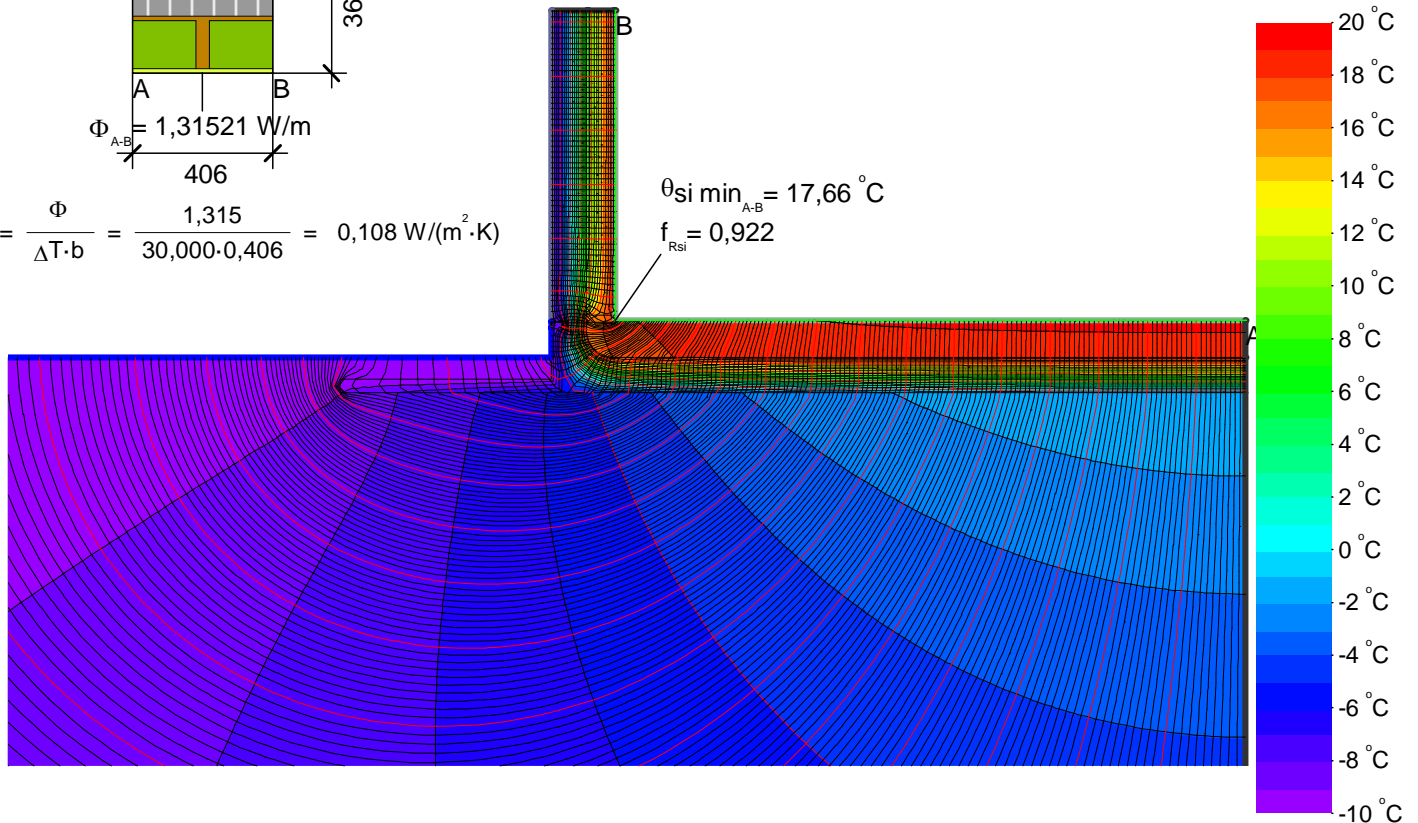
Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
B1 Equiv. Cond.	0,044
Ceramic Tile	2,000
Concrete, 1% Steel Beton, 1% Stahl 10456 (1)	2,300
EPS Type 2 $k=0.036$	0,036
Ground Erdreich	2,000
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Steel Stahl	50,000
Timber 500 kg/m ³ (softwoods)	0,130

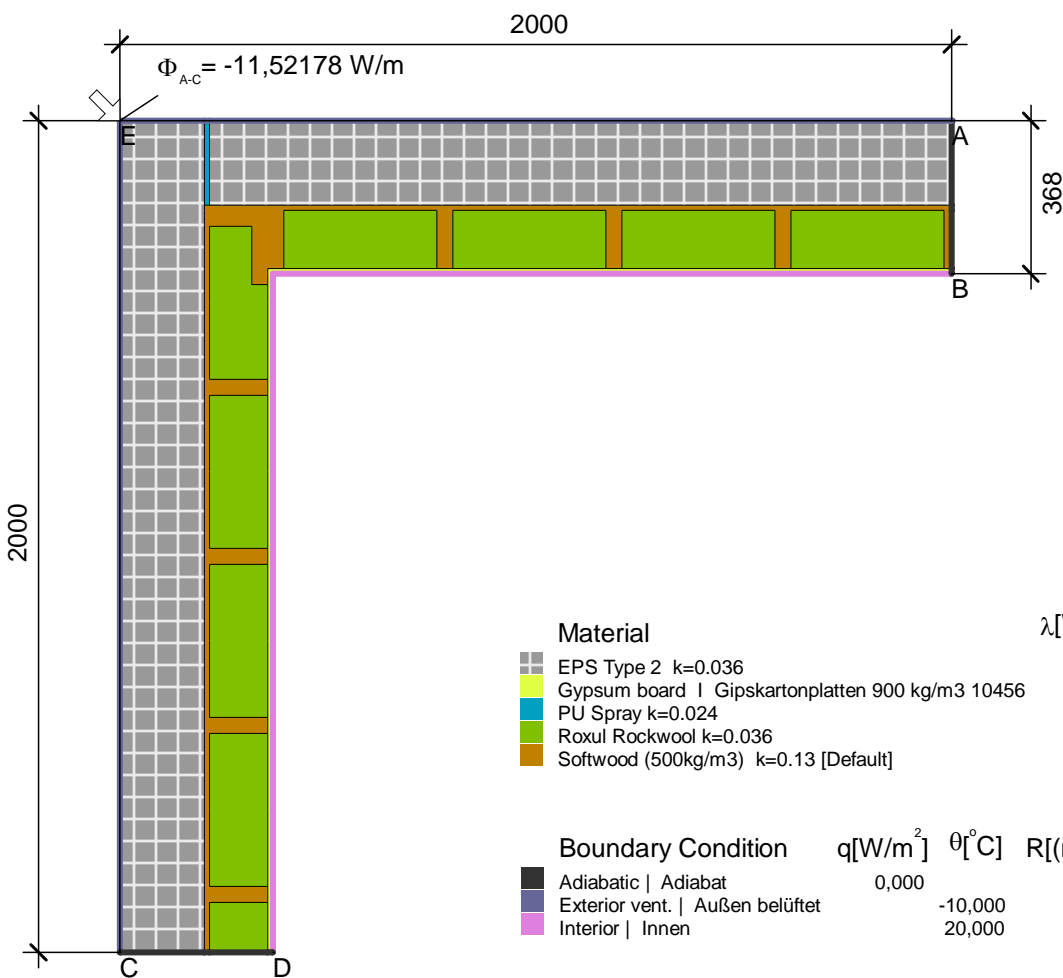
Boundary Condition	$q[\text{W/m}^2]$	$\theta[^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Adiabatic Adiabat	0,000		
Exterior vent. Außen belüftet	-10,000		0,130
Exterior Außen	-10,000		0,040
Int. flux down Innen abwärts	20,000		0,170
Interior Innen	20,000		0,130

Boundary Condition	$q[\text{W/m}^2]$	$\theta[^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Adiabatic Adiabat	0,000		
Exterior vent. Außen belüftet	-10,000		0,130
Exterior Außen	-10,000		0,040
fRsi: Interior Innen	20,000		0,250

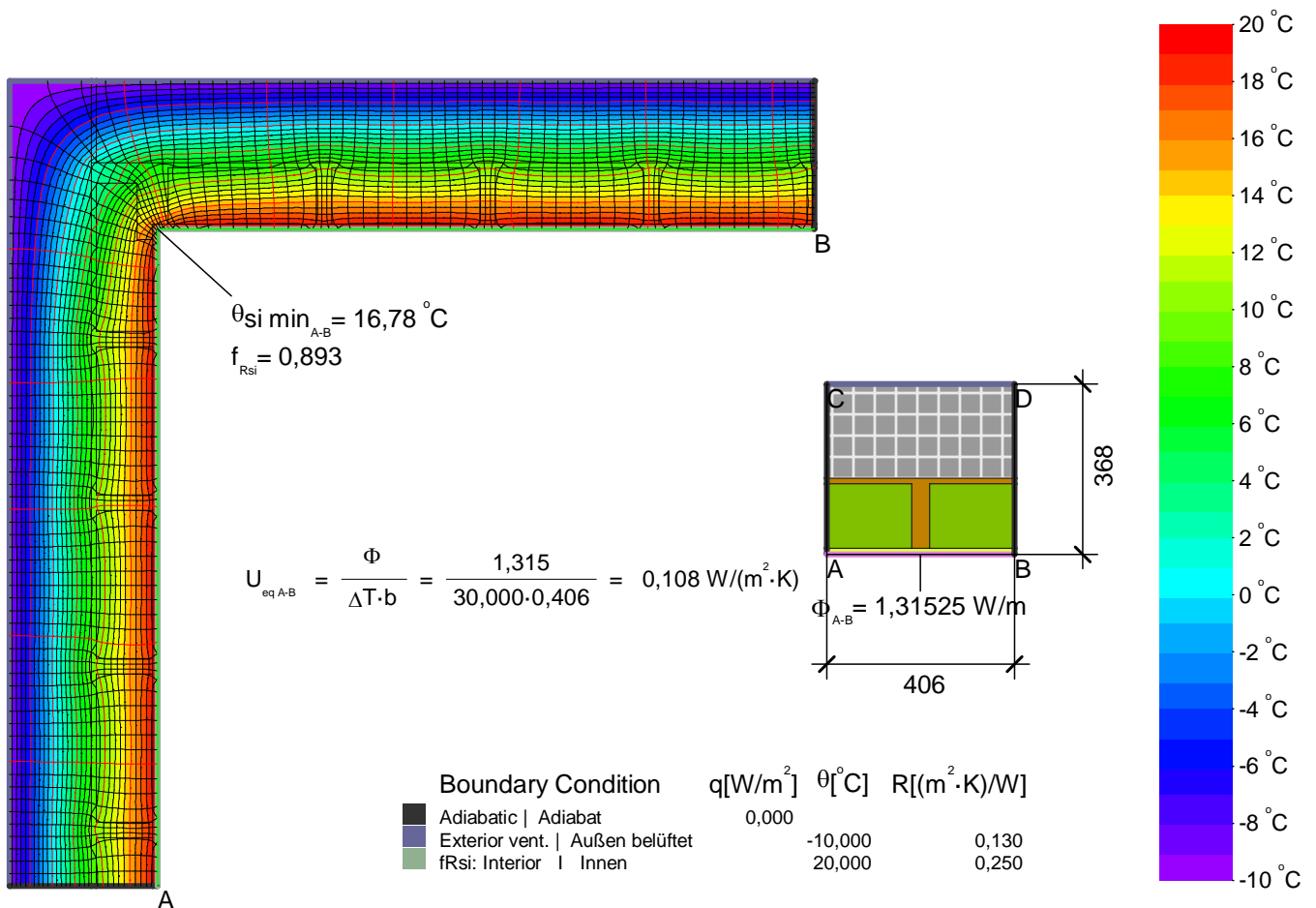


$$U_{\text{eq},A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$



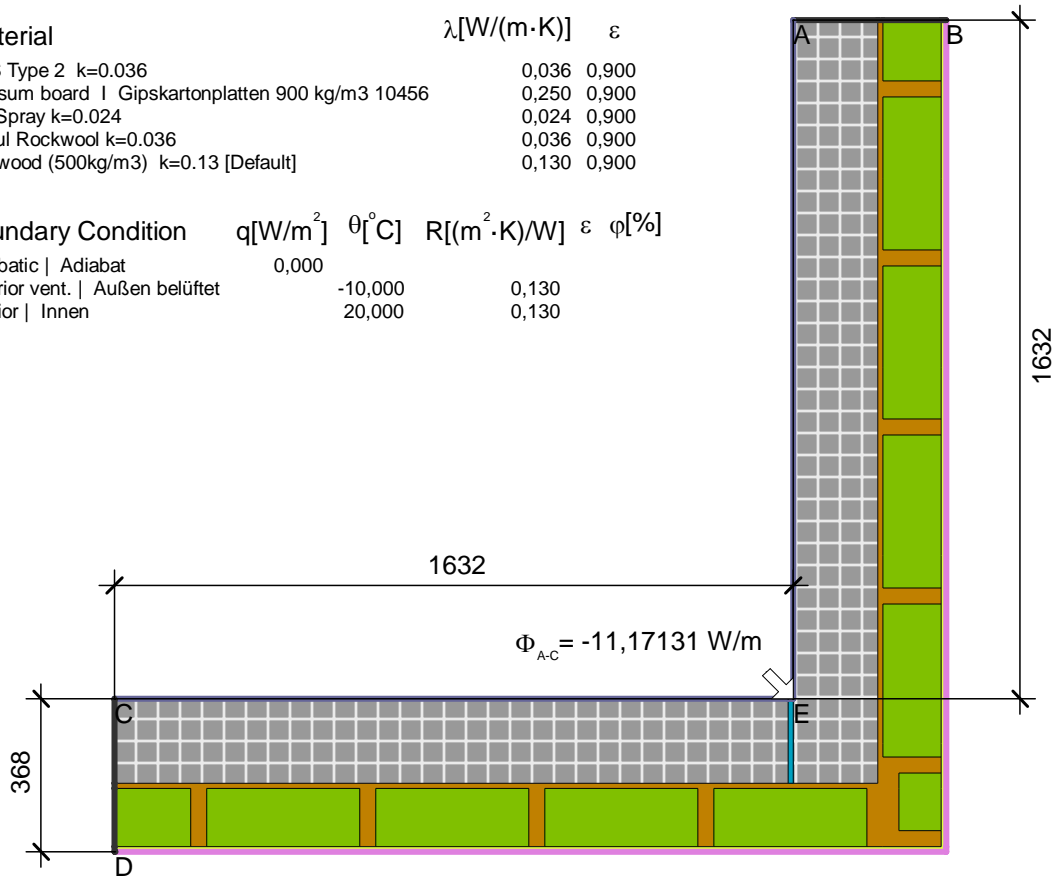


$$\psi_{A-E-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{11,522}{30,000} - 0,108 \cdot 2,000 - 0,108 \cdot 2,000 = -0,047 \text{ W}/(\text{m} \cdot \text{K})$$

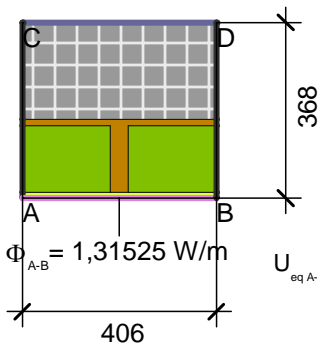


Material	λ [W/(m·K)]	ϵ
EPS Type 2 k=0.036	0,036	0,900
Gypsum board I Gipskartonplatten 900 kg/m ³ 10456	0,250	0,900
PU Spray k=0.024	0,024	0,900
Roxul Rockwool k=0.036	0,036	0,900
Softwood (500kg/m ³) k=0.13 [Default]	0,130	0,900

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]	ϵ	ϕ [%]
Adiabatic Adiatat	0,000				
Exterior vent. Außen belüftet	-10,000		0,130		
Interior Innen	20,000		0,130		

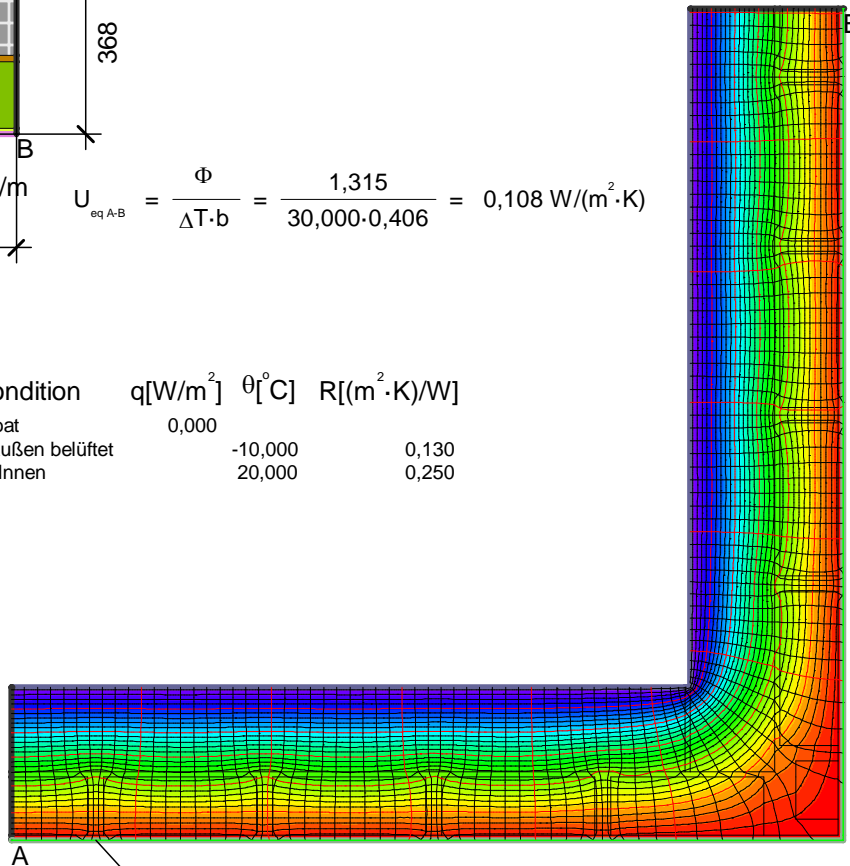


$$\Psi_{A-E-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{11,171}{30,000} - 0,108 \cdot 1,632 - 0,108 \cdot 1,632 = 0,020 \text{ W/(m·K)}$$



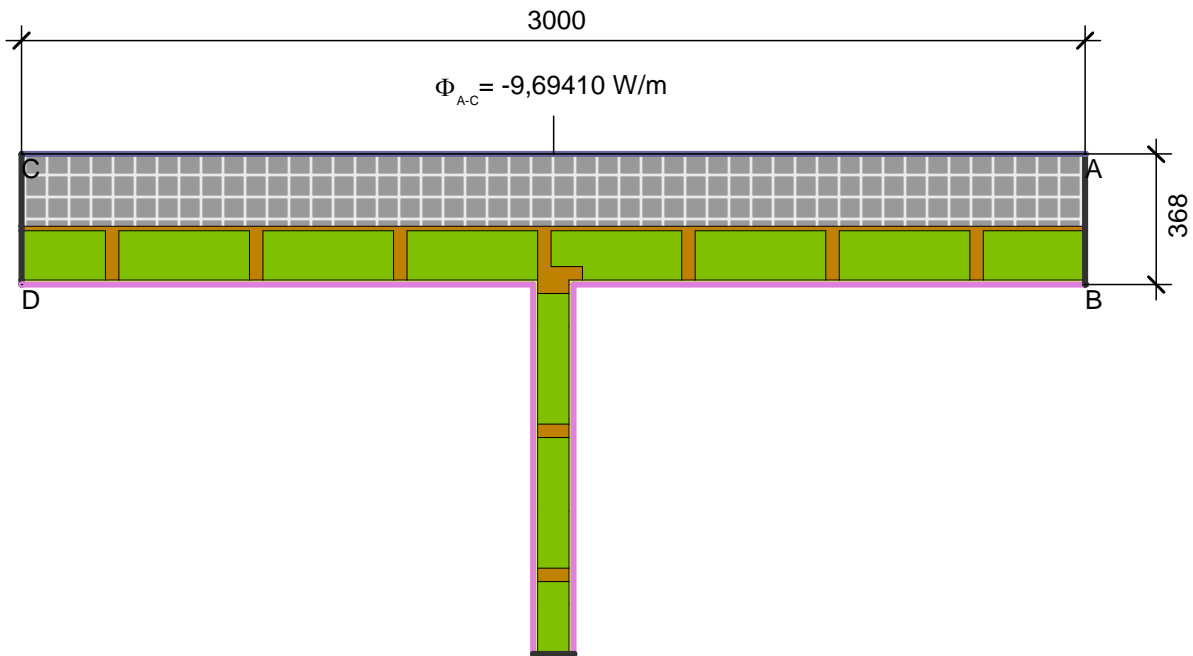
$$U_{eq \ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W/(m}^2 \cdot \text{K)}$$

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiatat	0,000		
Exterior vent. Außen belüftet	-10,000		0,130
fRsi: Interior Innen	20,000		0,250



$\theta_{si \ min} = 18,77 \text{ } ^\circ\text{C}$
 $f_{Rsi} = 0,959$



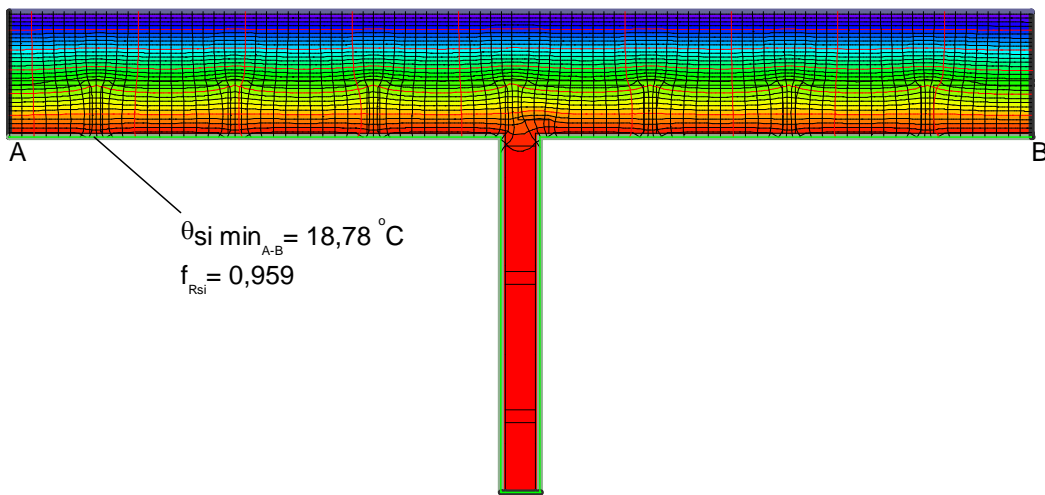
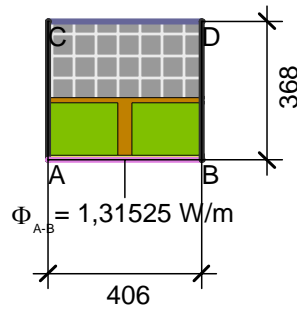


$$\Psi_{A-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 = \frac{9,694}{30,000} - 0,108 \cdot 3,000 = 0,000 \text{ W}/(\text{m} \cdot \text{K})$$

$$U_{\text{eq A-B}} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$

Material	λ [W/(m·K)]
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Roxul Rockwool k=0.036	0,036
Softwood (500kg/m ³) k=0.13 [Default]	0,130

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet	-10,000		0,130
Interior Innen	20,000		0,130

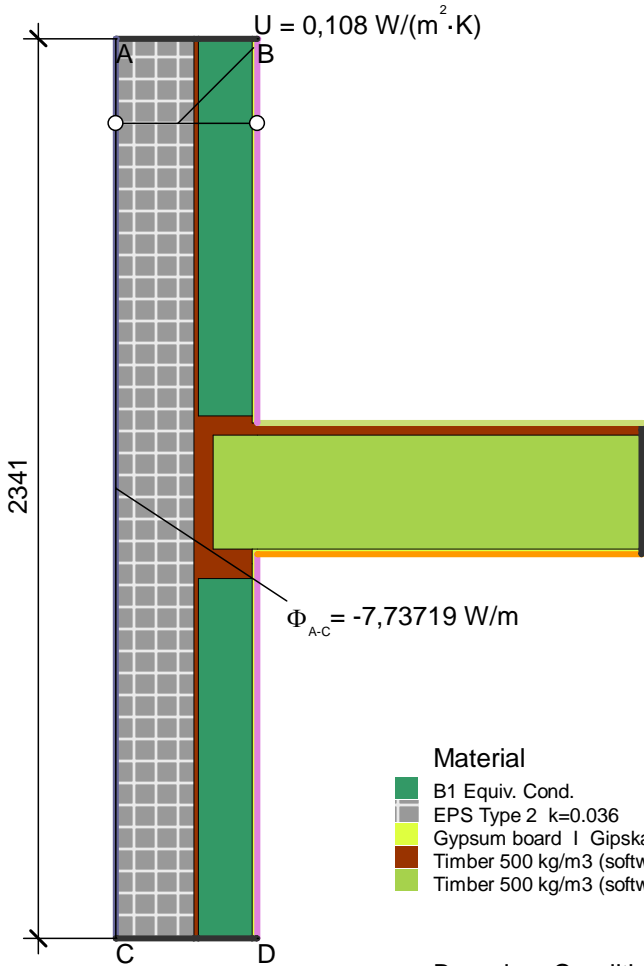


$$\theta_{\text{si min}} = 18,78 \text{ } ^\circ\text{C}$$

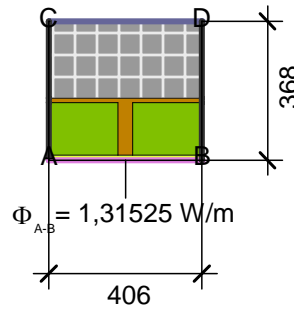
$$f_{\text{Rsi}} = 0,959$$

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet	-10,000		0,130
fRsi: Interior Innen	20,000		0,250





$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$



$$\psi_{A-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 = \frac{7,737}{30,000} - 0,108 \cdot 2,341 = 0,005 \text{ W}/(\text{m} \cdot \text{K})$$

$\Phi_{A-C} = -7,73719 \text{ W/m}$

Material

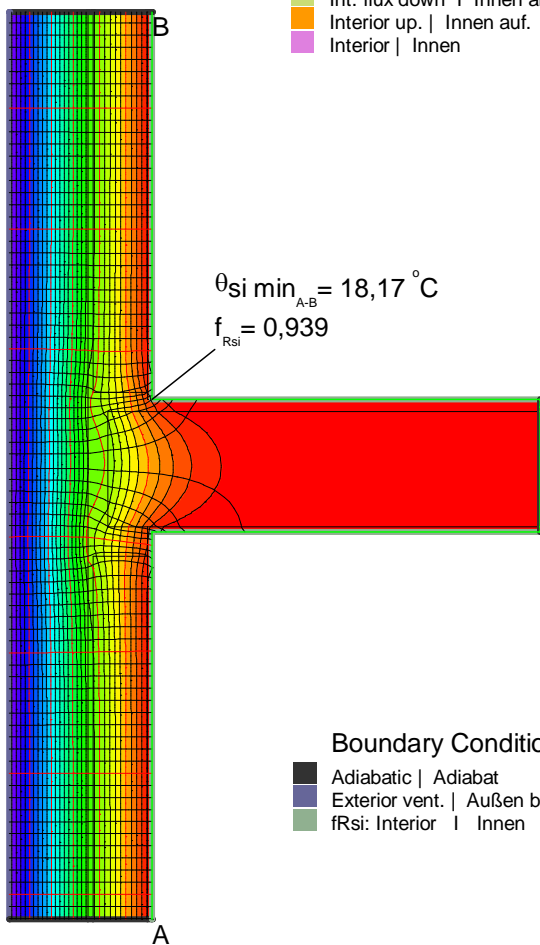
- B1 Equiv. Cond.
- EPS Type 2 k=0.036
- Gypsum board | Gipskartonplatten 900 kg/m³ 10456
- Timber 500 kg/m³ (softwoods)
- Timber 500 kg/m³ (softwoods) / Roxul Rockwool k=0.036, 3D äquivalent R 38,1-406,4

λ[W/(m·K)]

- 0,044
- 0,036
- 0,250
- 0,130
- 0,045

Boundary Condition

Boundary Condition	q[W/m ²]	θ[°C]	R[(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Int. flux down Innen abwärts		20,000	0,170
Interior up. Innen auf.		20,000	0,100
Interior Innen		20,000	0,130

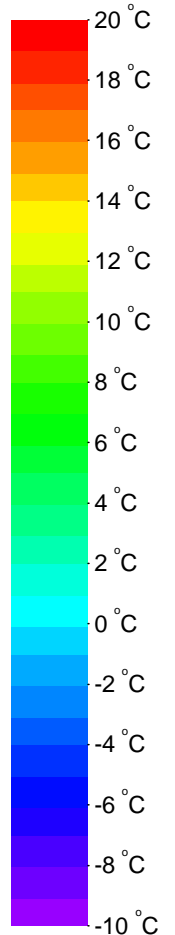


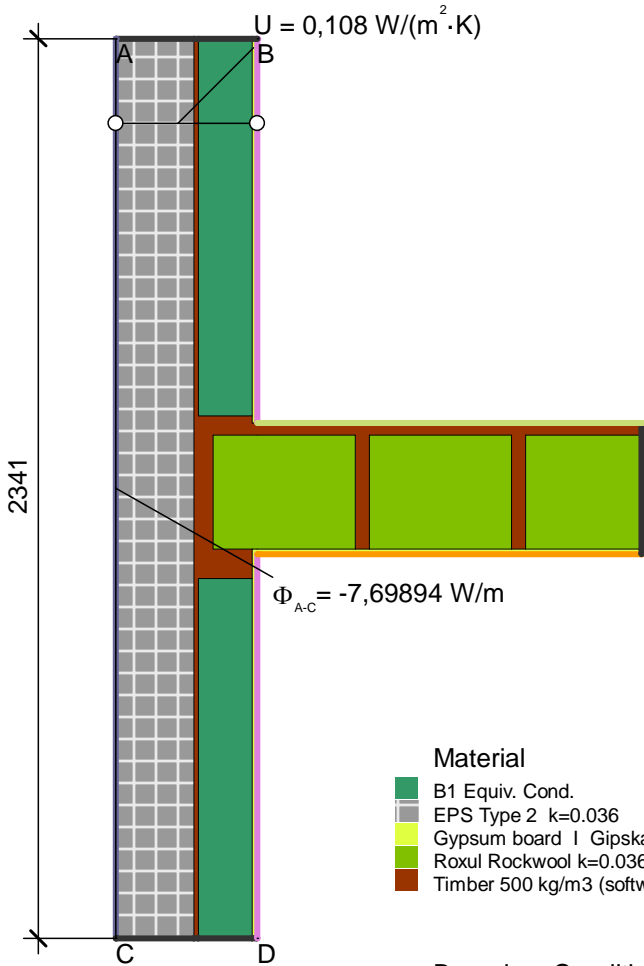
$\theta_{si\ min, A-B} = 18,17 \text{ }^\circ\text{C}$

$f_{Rsi} = 0,939$

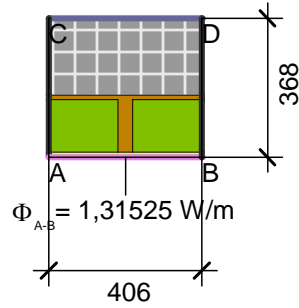
Boundary Condition

Boundary Condition	q[W/m ²]	θ[°C]	R[(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
fRsi: Interior Innen		20,000	0,250





$$U_{eq A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$

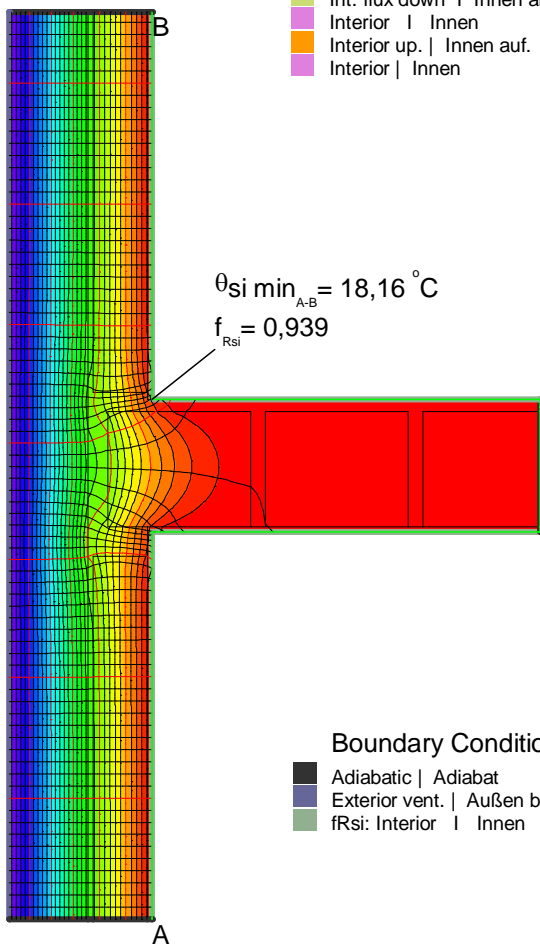


$$\psi_{A-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 = \frac{7,699}{30,000} - 0,108 \cdot 2,341 = 0,003 \text{ W}/(\text{m} \cdot \text{K})$$

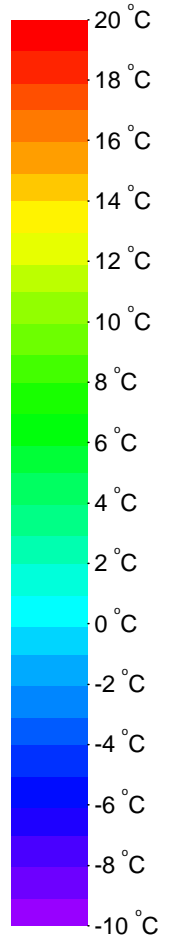
$$\Phi_{A-C} = -7,69894 \text{ W/m}$$

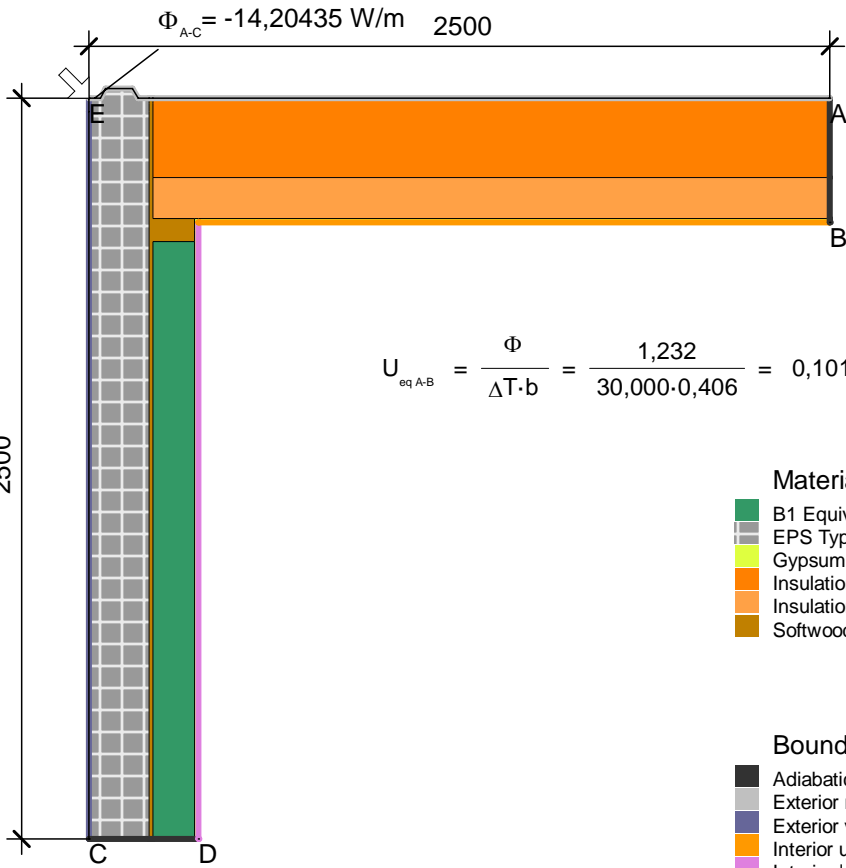
Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Roxul Rockwool k=0.036	0,036
Timber 500 kg/m ³ (softwoods)	0,130

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Int. flux down Innen abwärts		20,000	0,170
Interior Innen		20,000	0,130
Interior up. Innen auf.		20,000	0,100
Interior Innen		20,000	0,130

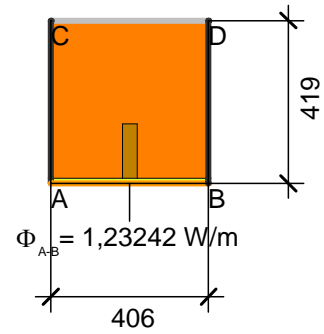


Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
fRsi: Interior Innen		20,000	0,250





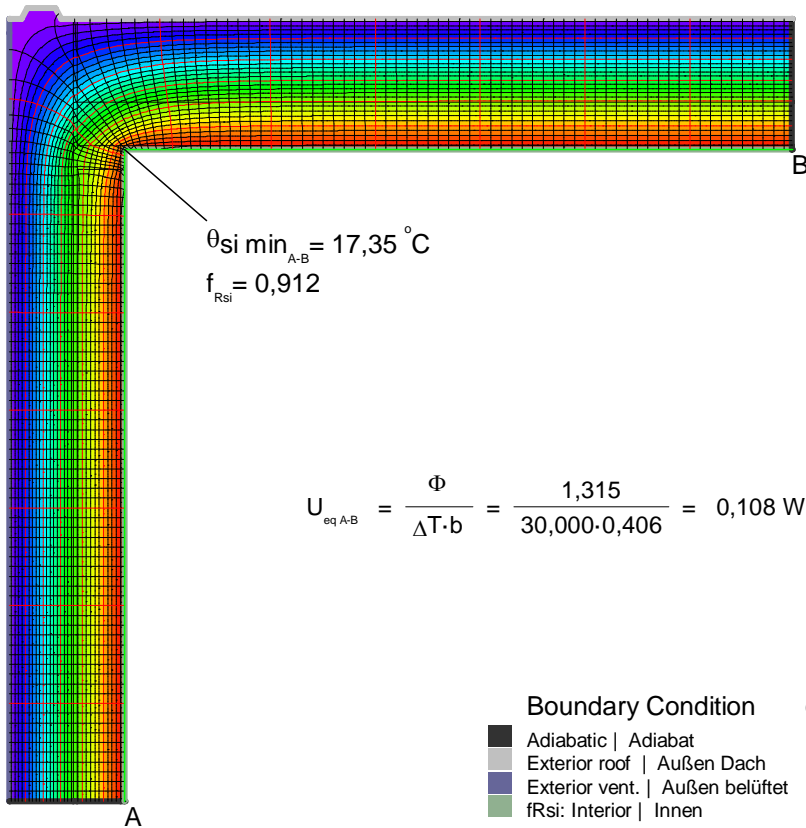
$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,232}{30,000 \cdot 0,406} = 0,101 \text{ W}/(\text{m}^2 \cdot \text{K})$$



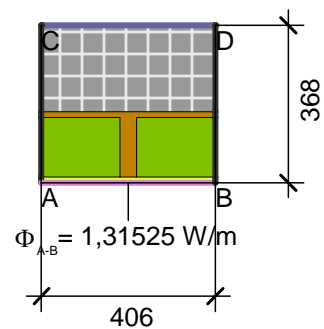
Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m3 10456	0,250
Insulation Wärmedämmung 040	0,040
Insulation Wärmedämmung 040 (2)	0,047
Softwood (500kg/m3) k=0.13 [Default]	0,130

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior roof Außen Dach		-10,000	0,100
Exterior vent. Außen belüftet		-10,000	0,130
Interior up. Innen auf.		20,000	0,100
Interior Innen		20,000	0,130

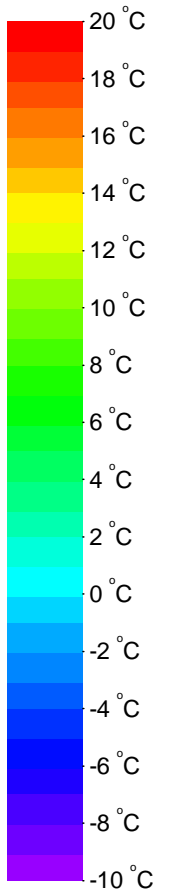
$$\psi_{A-E-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{14,204}{30,000} - 0,101 \cdot 2,500 - 0,108 \cdot 2,500 = -0,049 \text{ W}/(\text{m} \cdot \text{K})$$

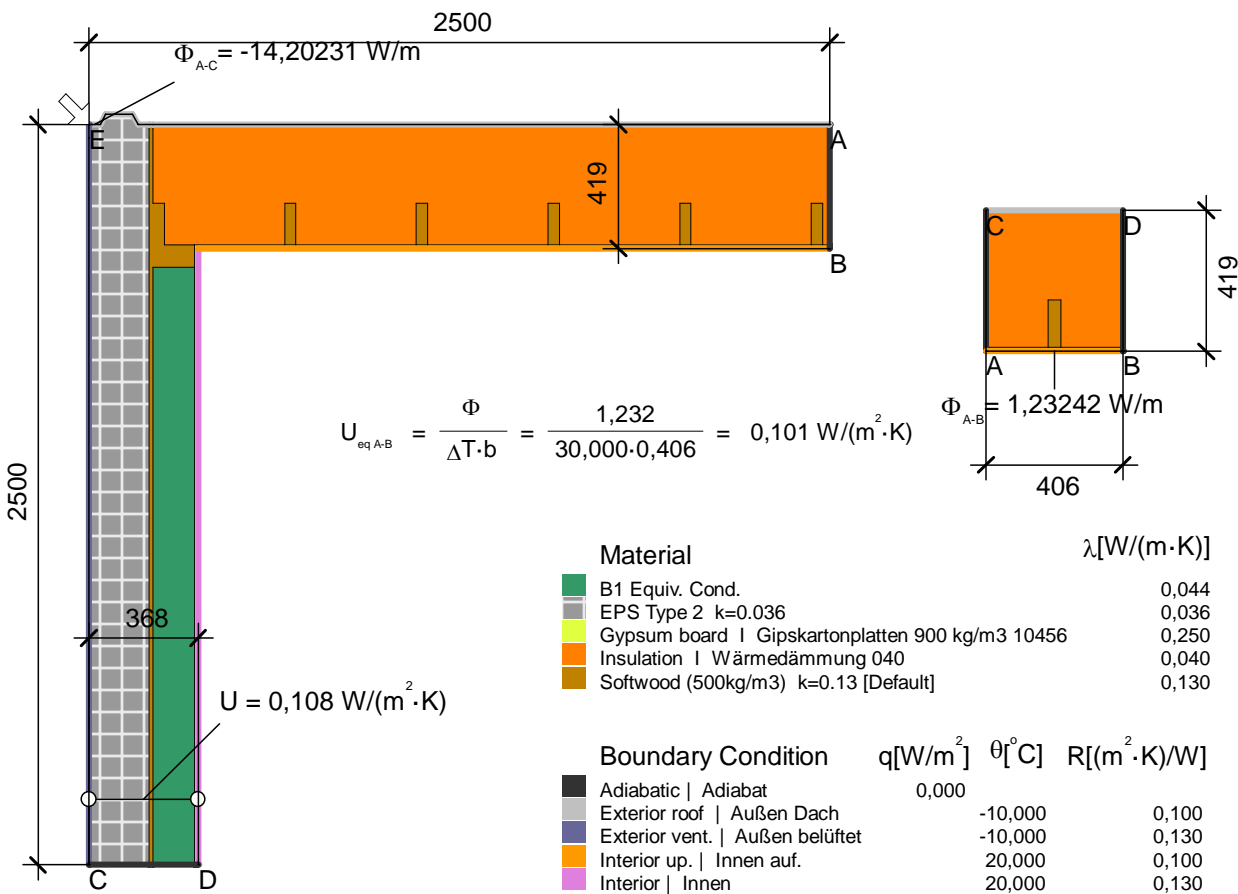


$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$

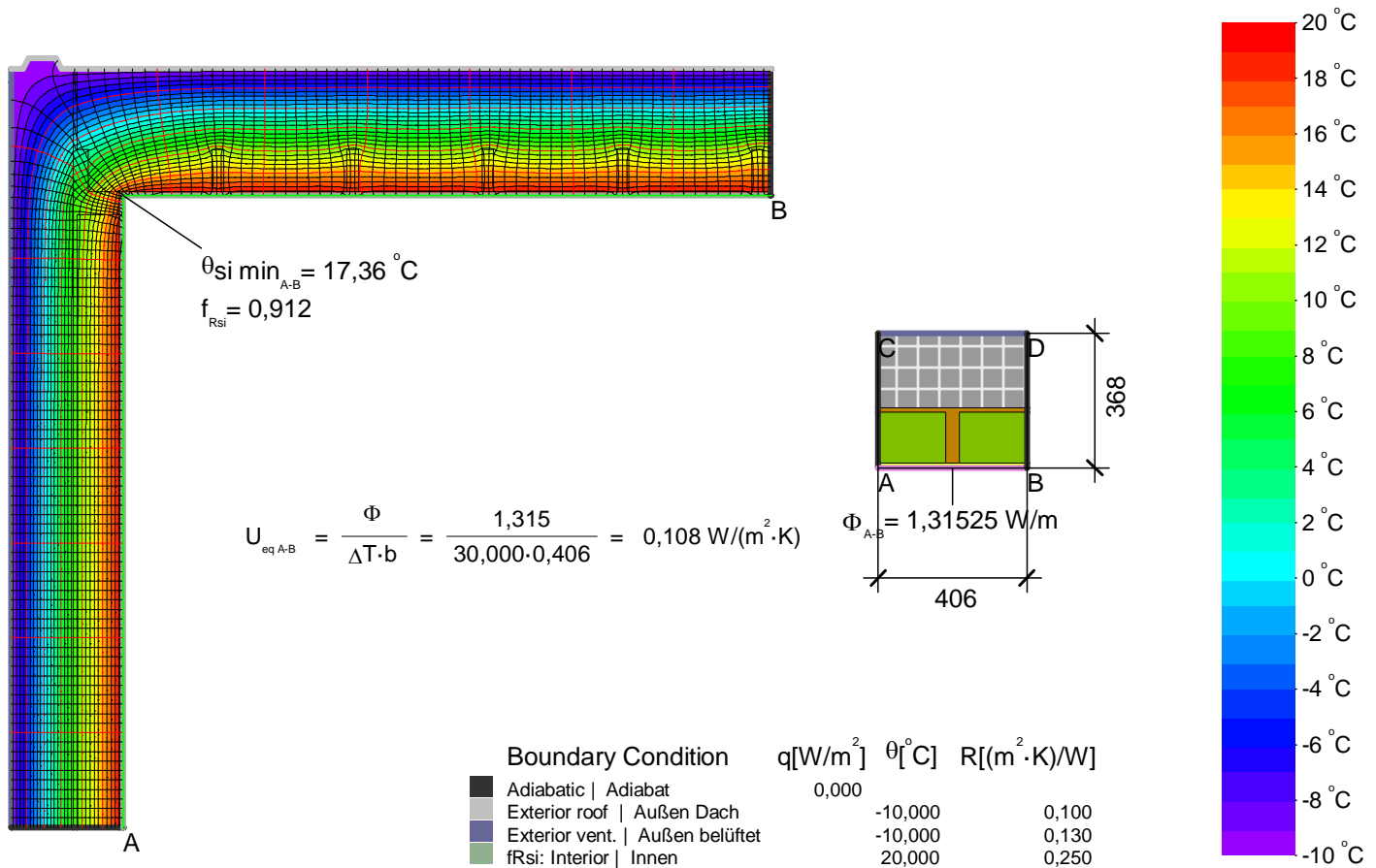


Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior roof Außen Dach		-10,000	0,100
Exterior vent. Außen belüftet		-10,000	0,130
fRsi: Interior Innen		20,000	0,250


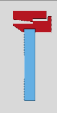












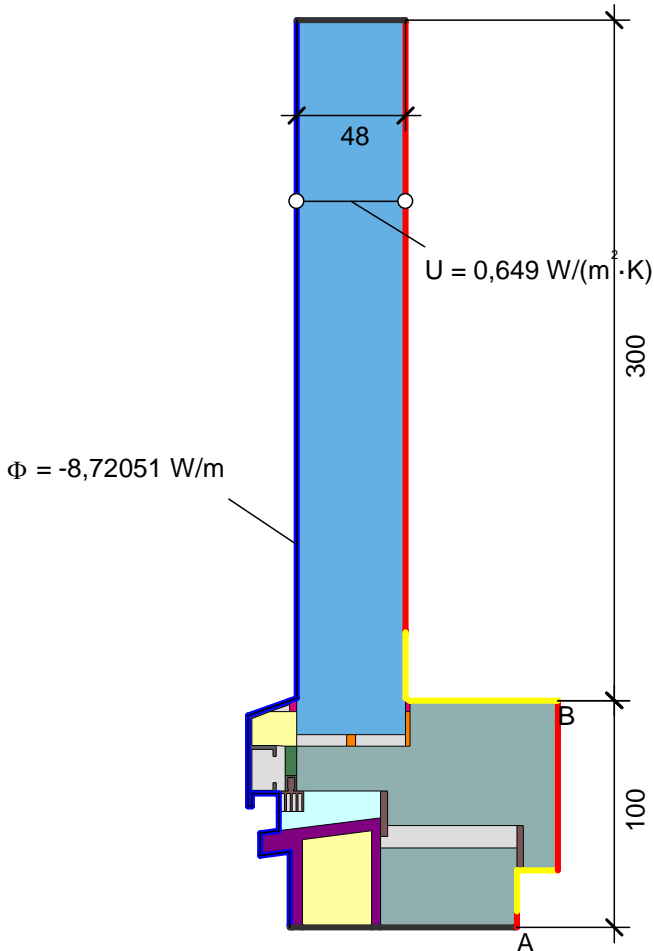
$$\Psi_{A-E-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{14,202}{30,000} - 0,101 \cdot 2,500 - 0,108 \cdot 2,500 = -0,050 \text{ W/(m} \cdot \text{K)}$$



Windows | Fenster

Passivhaus Fenster		01 (Timber)			02 (PVC)			03			01	
frame values Rahmenwerte	Spacer Abstandhalter: SuperSpacer Tri-Seal		Bottom	Top	Side	Bottom	Top	Side	Bottom	Top	Side	Bottom barrier-free
			Unten	Oben	Seitl.	Unten	Oben	Seitl.	Unten	Oben	Seitl.	Unten barrierefrei
												
	Frame width Rahmenbreite	b_f [mm]	100	100	100	0,115	115	115				100
	U-value frame Rahmen-U-Wert	U_f [W/(m²K)]	0,74	0,56	0,56	0,79	0,79	0,79				0,96
	Ψ-glass edge Glasrand-Ψ-Wert	Ψ_g [W/(mK)]	0,020	0,021	0,021	0,026	0,026	0,026				0,023
	U-value window Fenster-U-Wert	U_w [W/(m²K)] @ U _g = 0,52 W/(m²K)	0,60			0,67						
	Passive House efficiency class Passivhaus Effizienzklasse		phA			phB						
Installation Einbau												
	f_{Rsi=0,25m²K/W}		0,801	0,849	0,850	0,798	0,765	0,765				0,798
	Ψ_{install} [W/(mK)]		0,032	0,000	0,000	0,068	0,028	0,032				0,068
U_{w, installed} [W/(m²K)]		0,62			0,78							





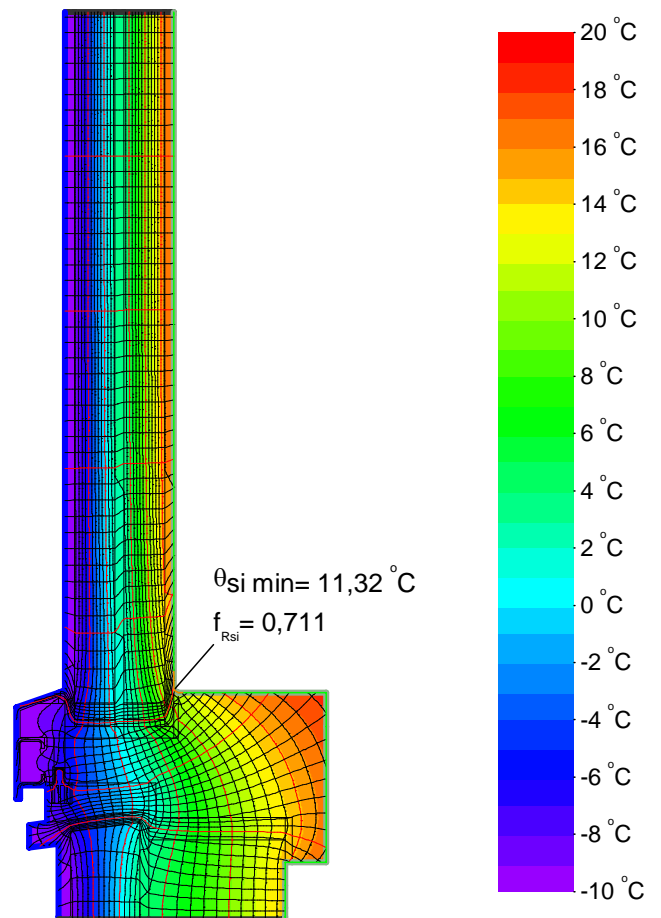
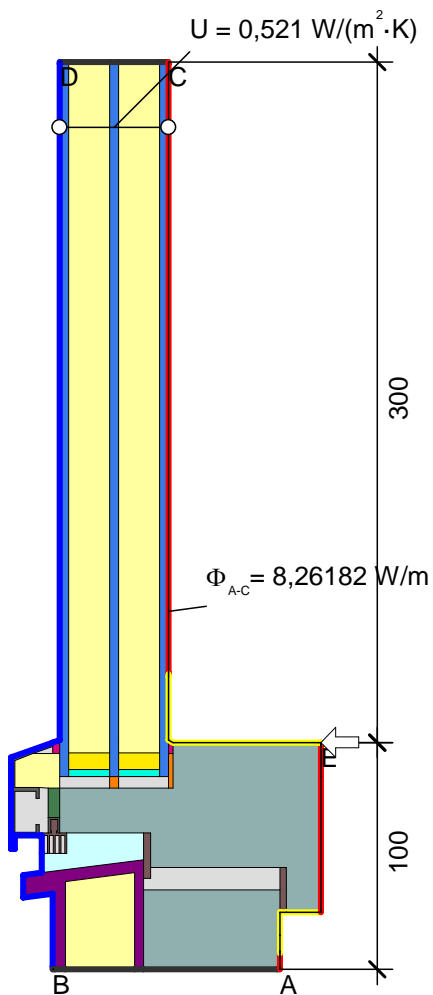
Material	λ [W/(m·K)]	ϵ
Aluminum Aluminium 10456 (3)	160,000	0,900
Compacfoam 100	0,040	0,900
EPDM (9)	0,250	0,900
GRP, >50% GFK >50% (1)	0,630	0,900
Insulation Wärmedämmung 040 (1)	0,040	0,900
Kingspan Kooltherm K103 <45mm	0,022	0,900
Panel Maske (5)	0,035	0,900
Silicone Silikon	0,350	0,900
Slightly vent. cav. leicht bel. Hohlr. *		
Spruce, Fir Fichte, Tanne	0,110	0,900
Unvent. cavity unbel. Hohlr. *		

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior Außen	-10,000		0,040
Interior, frame, normal	20,000		0,130
Interior, frame, reduced	20,000		0,200

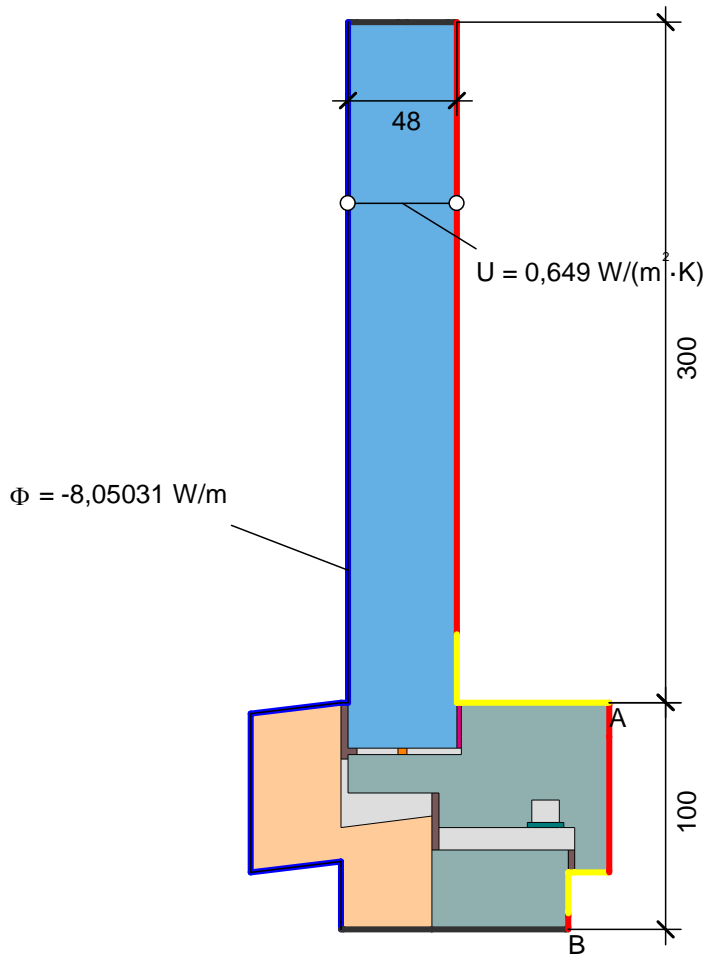
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior Außen	-10,000		0,040
fRsi: Interior Innen (3)	20,000		0,250

$$U_{fB,A} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{8,721}{30,000} - 0,649 \cdot 0,300}{0,100} = 0,961 \text{ W/(m}^2 \cdot \text{K)}$$



$$\Psi_{A-E,C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{8,262}{30,000} - 0,961 \cdot 0,100 - 0,521 \cdot 0,300 = 0,023 \text{ W/(m}^2 \cdot \text{K)}$$





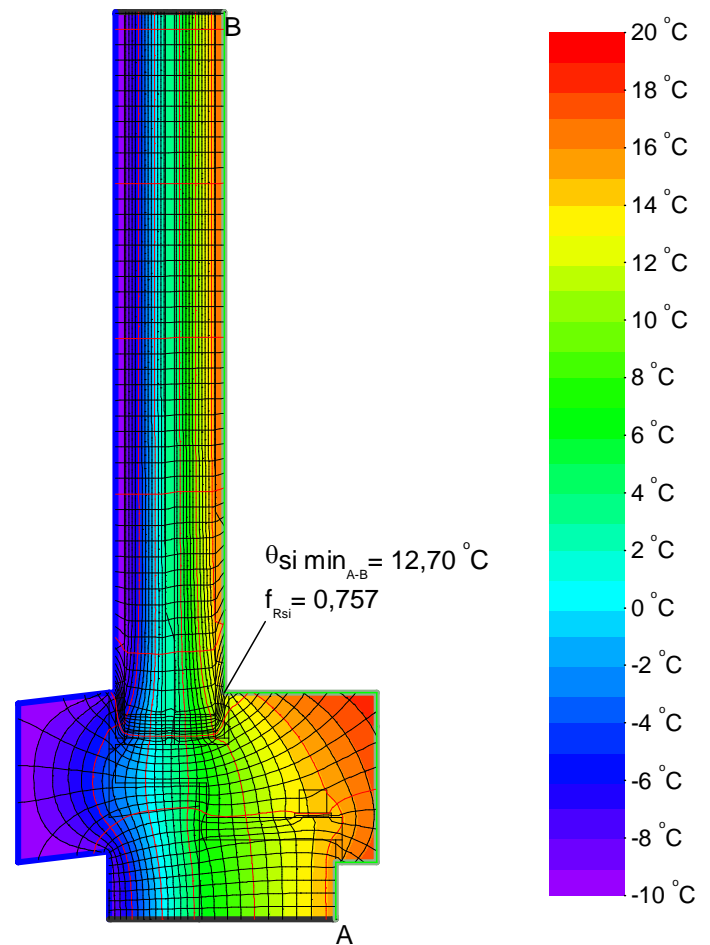
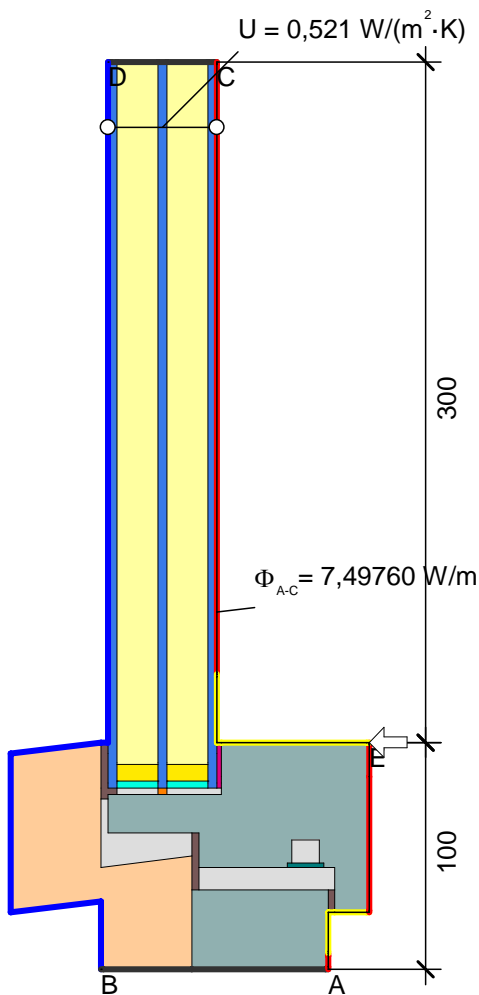
Material	λ [W/(m·K)]	ϵ
EPDM (3)	0,250	0,900
Insulation I Wärmedämmung 040 (1)	0,040	0,900
PVC-Schaum	0,060	0,900
Panel I Maske (3)	0,035	0,900
Silicone I Silikon	0,350	0,900
Spruce, Fir I Fichte, Tanne (1)	0,110	0,900
Steel I Stahl (1)	50,000	0,900
Unvent. cavity I unbel. Hohlr. *		

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior Außen		-10,000	0,040
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200

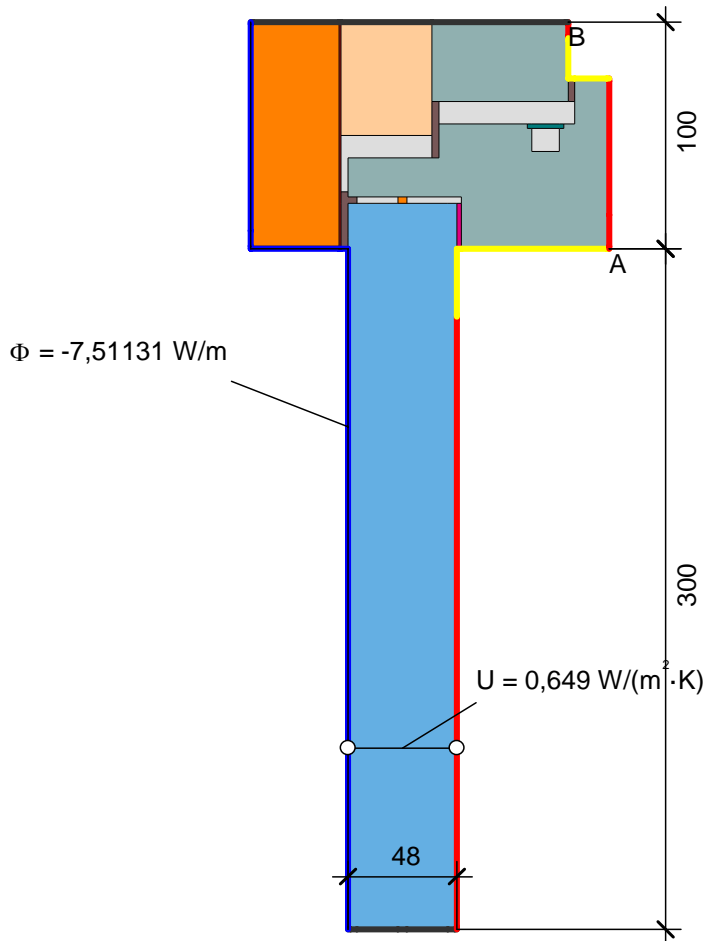
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior Außen		-10,000	0,040
fRsi: Interior Innen		20,000	0,250

$$U_{f,A,B} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{8,050}{30,000} - 0,649 \cdot 0,300}{0,100} = 0,737 \text{ W/(m}^2 \cdot \text{K)}$$



$$\Psi_{A-E,C,*} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{7,498}{30,000} - 0,737 \cdot 0,100 - 0,521 \cdot 0,300 = 0,020 \text{ W/(m}^2 \cdot \text{K)}$$





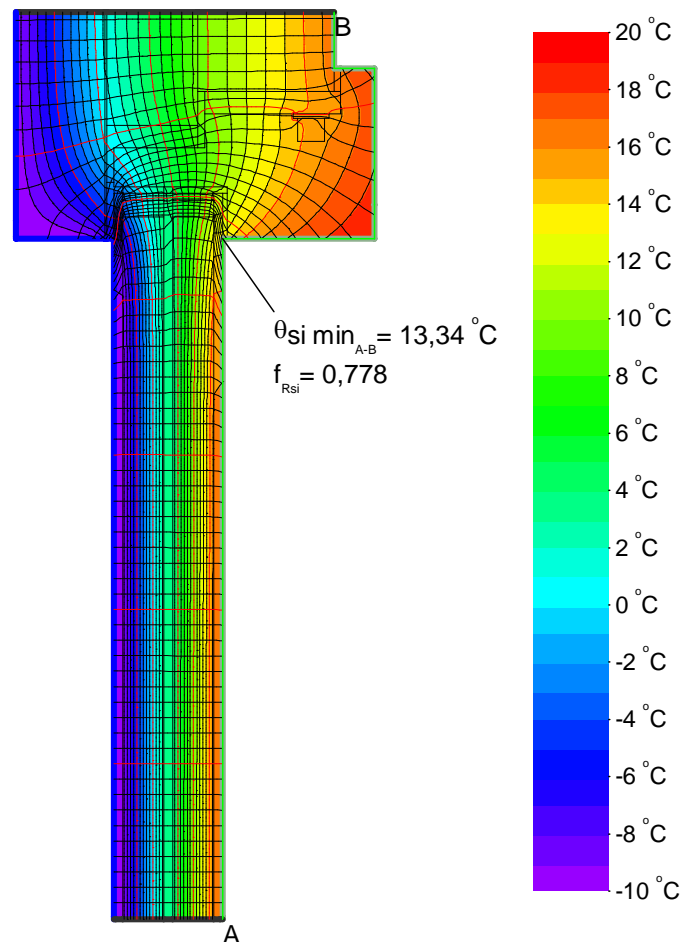
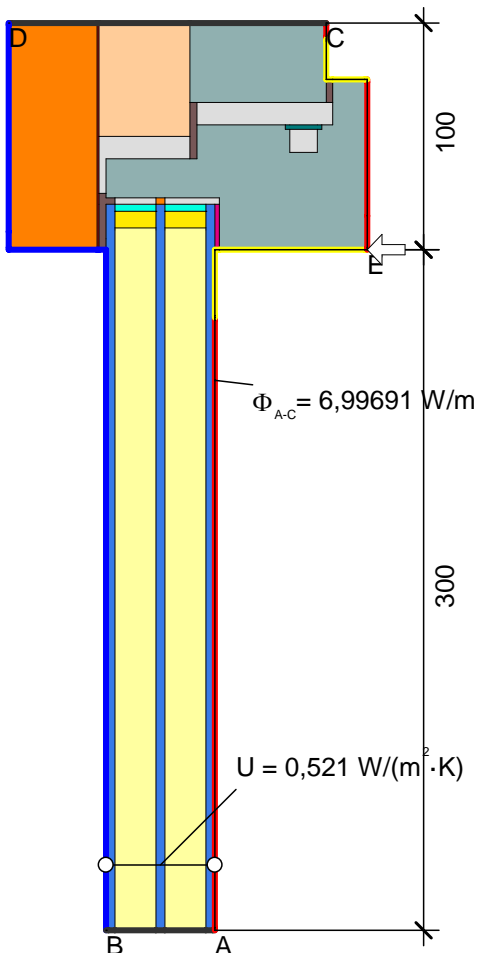
Material	λ [W/(m·K)]
EPDM (6)	0,250
Insulation I Wärmedämmung 040 (1)	0,040
PVC-Schaum	0,060
Panel I Maske (4)	0,035
Polyvinylchlorid (PVC)	0,170
Silicone I Silikon	0,350
Spruce, Fir I Fichte, Tanne (4)	0,110
Steel I Stahl (1)	50,000
Unvent. cavity I unbel. Hohlr. *	

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
Interior, frame, normal	20,000		0,130
Interior, frame, reduced	20,000		0,200

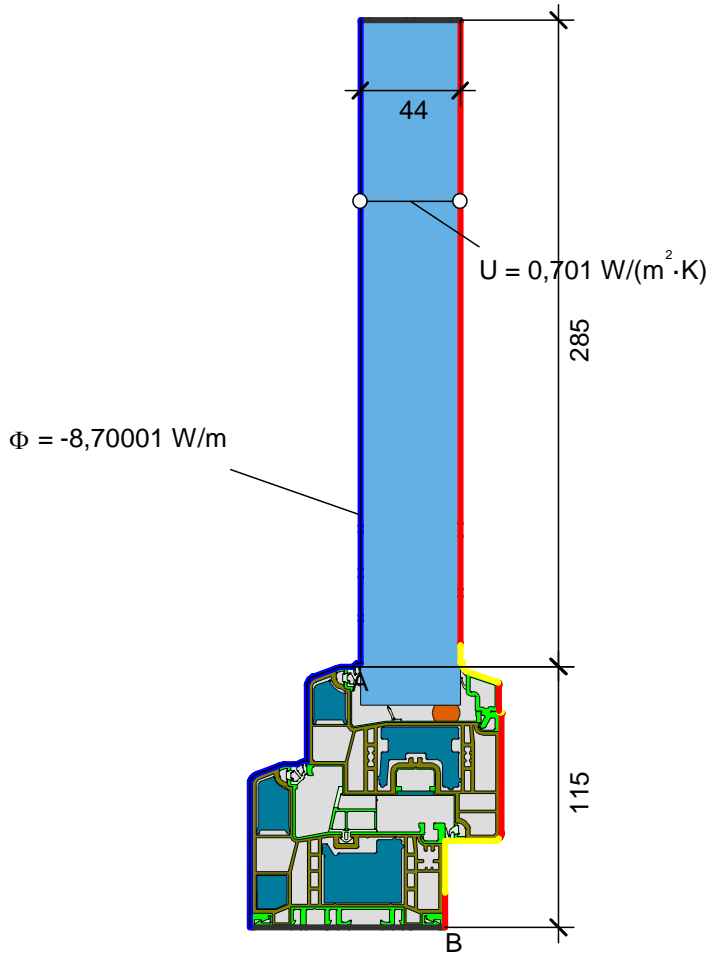
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
fRsi: Interior Innen (2)	20,000		0,250

$$U_{f,AB} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{7,511}{30,000} - 0,649 \cdot 0,300}{0,100} = 0,558 \text{ W/(m}^2 \cdot \text{K)}$$



$$\Psi_{A-E-C, \cdot} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{6,997}{30,000} - 0,521 \cdot 0,300 - 0,558 \cdot 0,100 = 0,021 \text{ W/(m}^2 \cdot \text{K)}$$





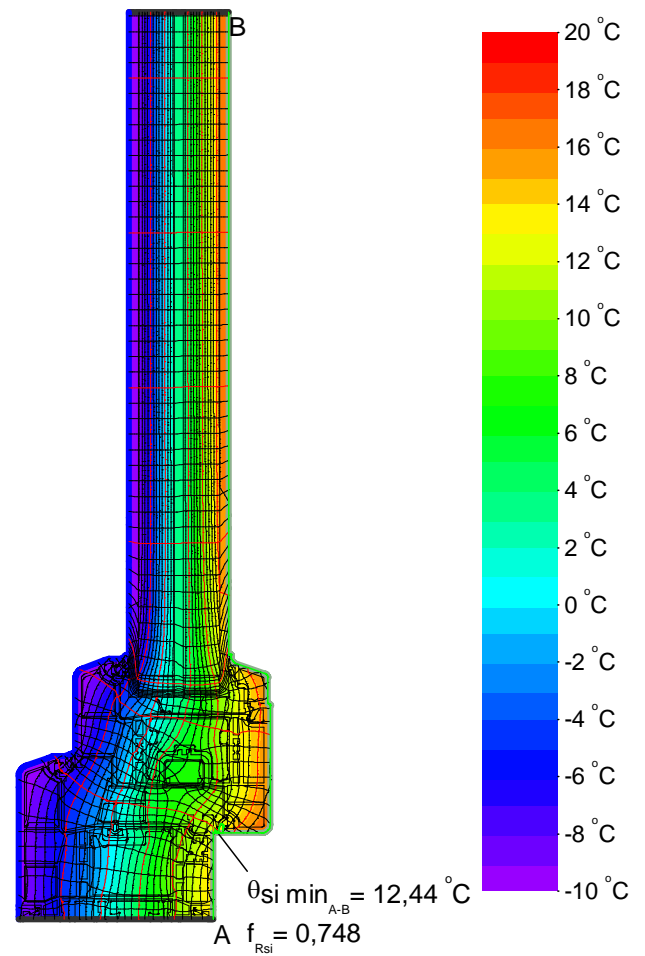
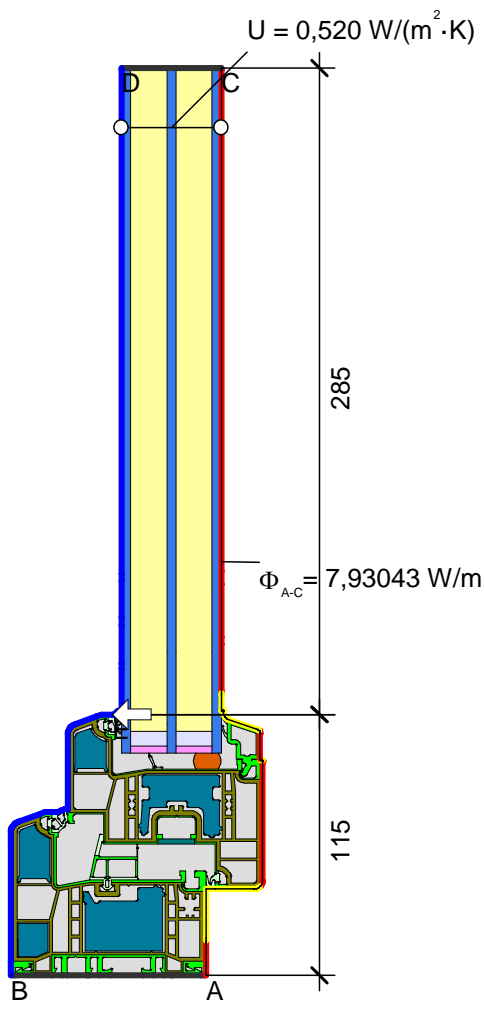
Material	λ [W/(m·K)]
Insulation I Wärmedämmung 031	0,031
Insulation I Wärmedämmung 050	0,050
Panel I Maske (1)	0,035
Polyvinylchloride (PVC)	0,170
RAU-FIPRO	0,170
Soft PVC I Weich-PVC	0,140
Steel I Stahl	50,000
Unvent. cavity I unbel. Hohlr. *	
slightly vent. cav. I leicht bel. Hohlr. *	

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
Interior, frame, normal	20,000		0,130
Interior, frame, reduced	20,000		0,200

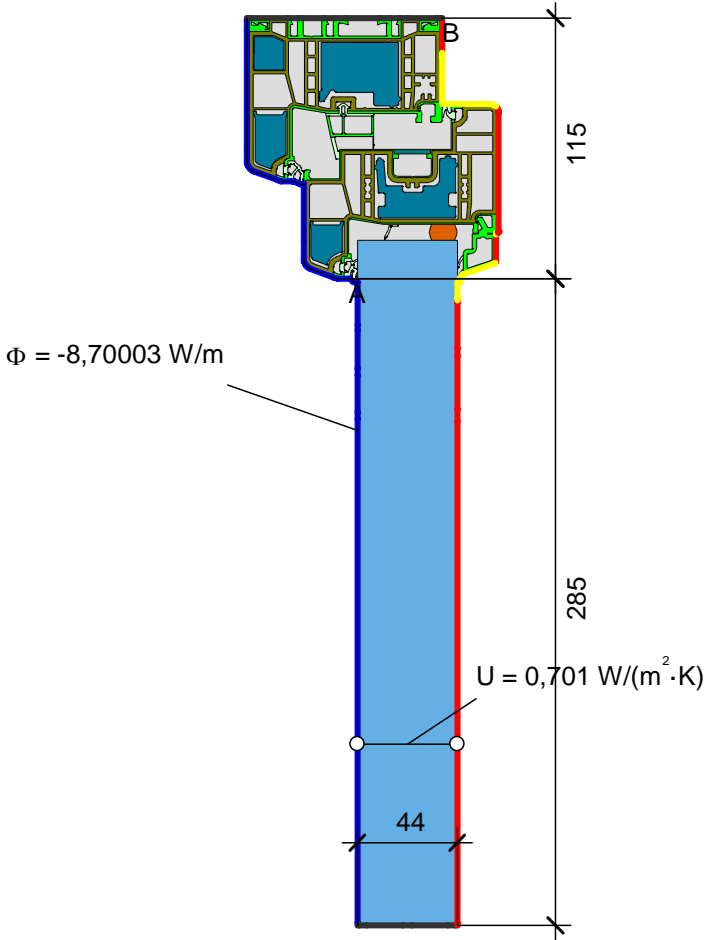
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
fRsi: Interior Innen	20,000		0,250

$$U_{fAB} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_i} = \frac{\frac{8,700}{30,000} - 0,701 \cdot 0,285}{0,115} = 0,785 \text{ W}/(\text{m}^2 \cdot \text{K})$$



$$\psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{7,930}{30,000} - 0,785 \cdot 0,115 - 0,520 \cdot 0,285 = 0,026 \text{ W}/(\text{m} \cdot \text{K})$$





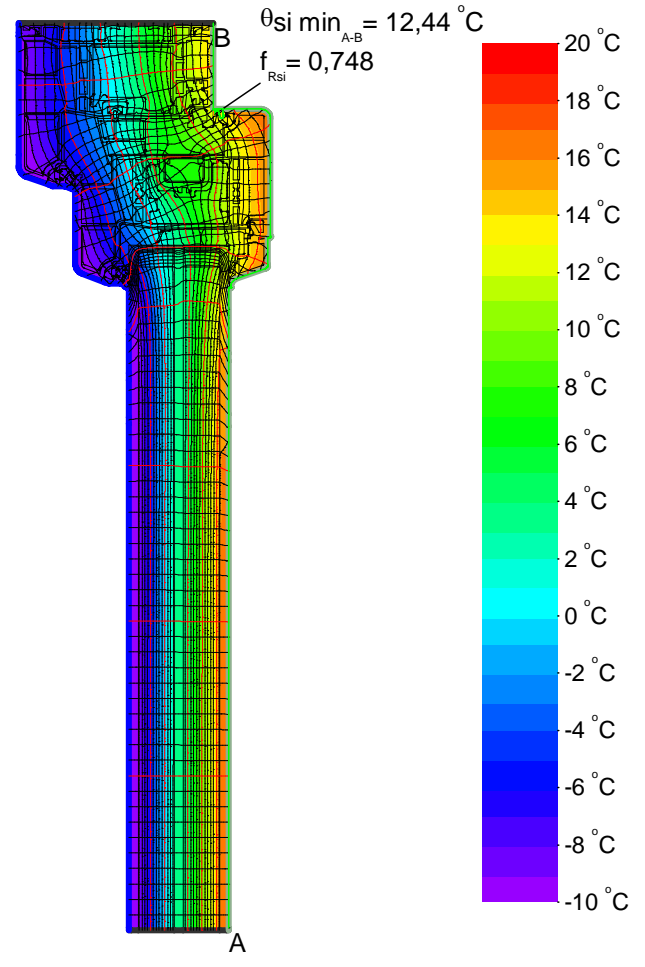
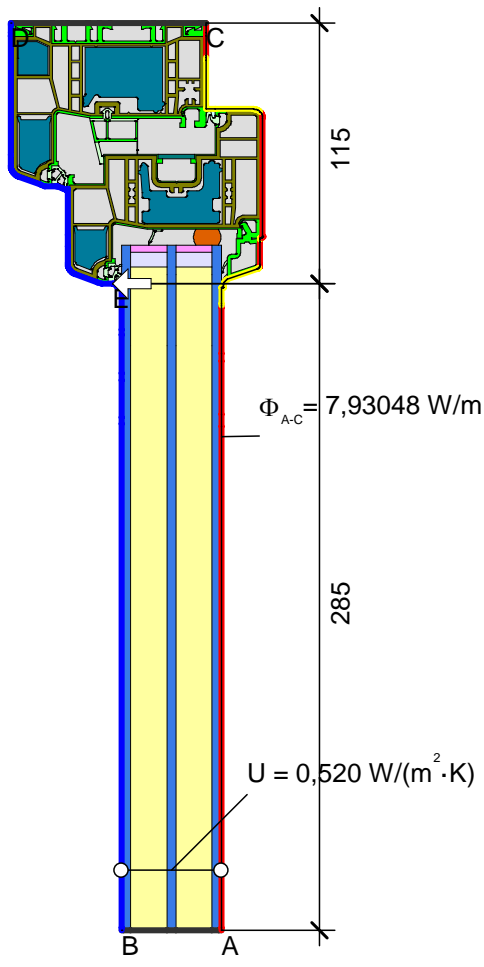
Material	λ [W/(m·K)]
Insulation I Wärmedämmung 031	0,031
Insulation I Wärmedämmung 050	0,050
Panel I Maske (1)	0,035
Polyvinylchloride (PVC)	0,170
RAU-FIPRO	0,170
Soft PVC I Weich-PVC	0,140
Steel I Stahl	50,000
Unvent. cavity I unbel. Hohlr. *	
slightly vent. cav. I leicht bel. Hohlr. *	

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
Interior, frame, normal	20,000		0,130
Interior, frame, reduced	20,000		0,200

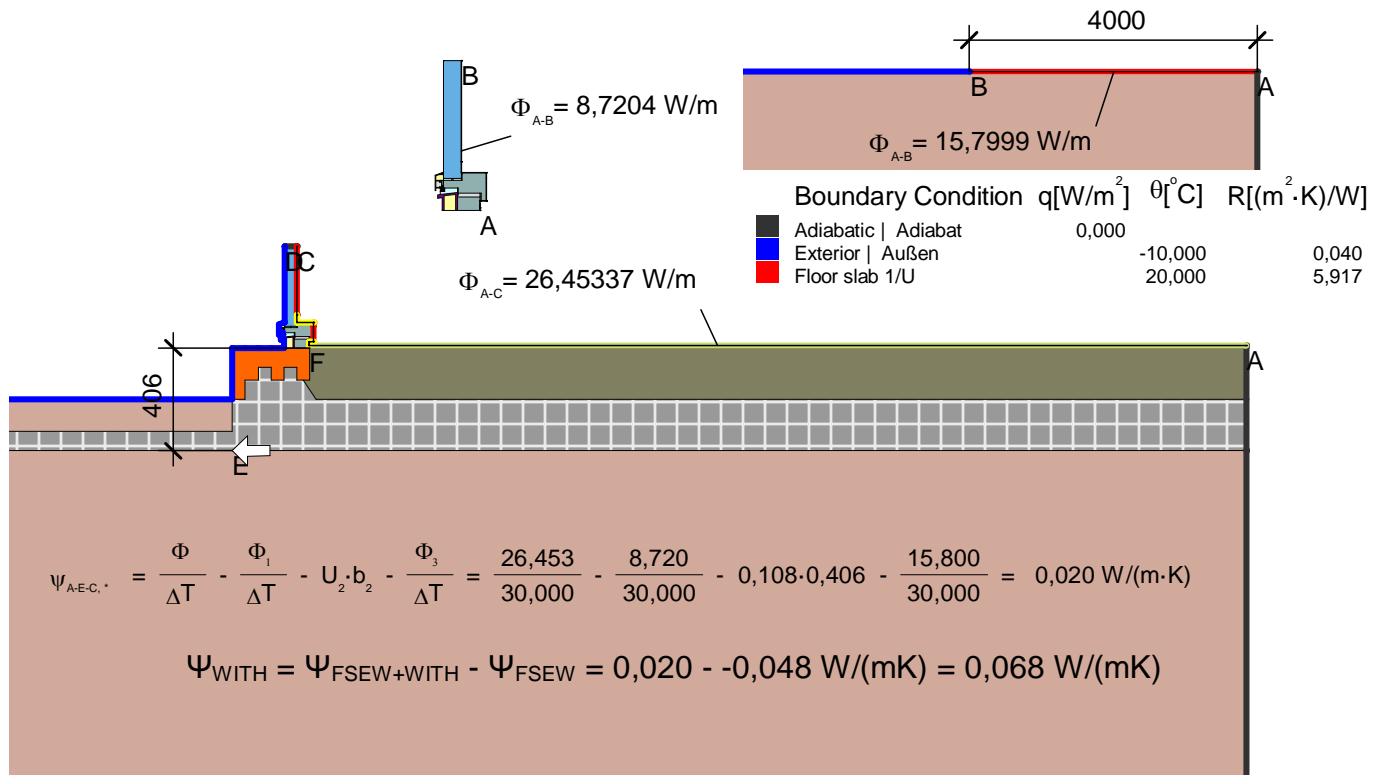
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior Außen	-10,000		0,040
fRsi: Interior Innen	20,000		0,250

$$U_{f,A,B} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{8,700}{30,000} - 0,701 \cdot 0,285}{0,115} = 0,785 \text{ W/(m}^2 \cdot \text{K)}$$



$$\psi_{A-E,C,*} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{7,930}{30,000} - 0,520 \cdot 0,285 - 0,785 \cdot 0,115 = 0,026 \text{ W/(m}^2 \cdot \text{K)}$$

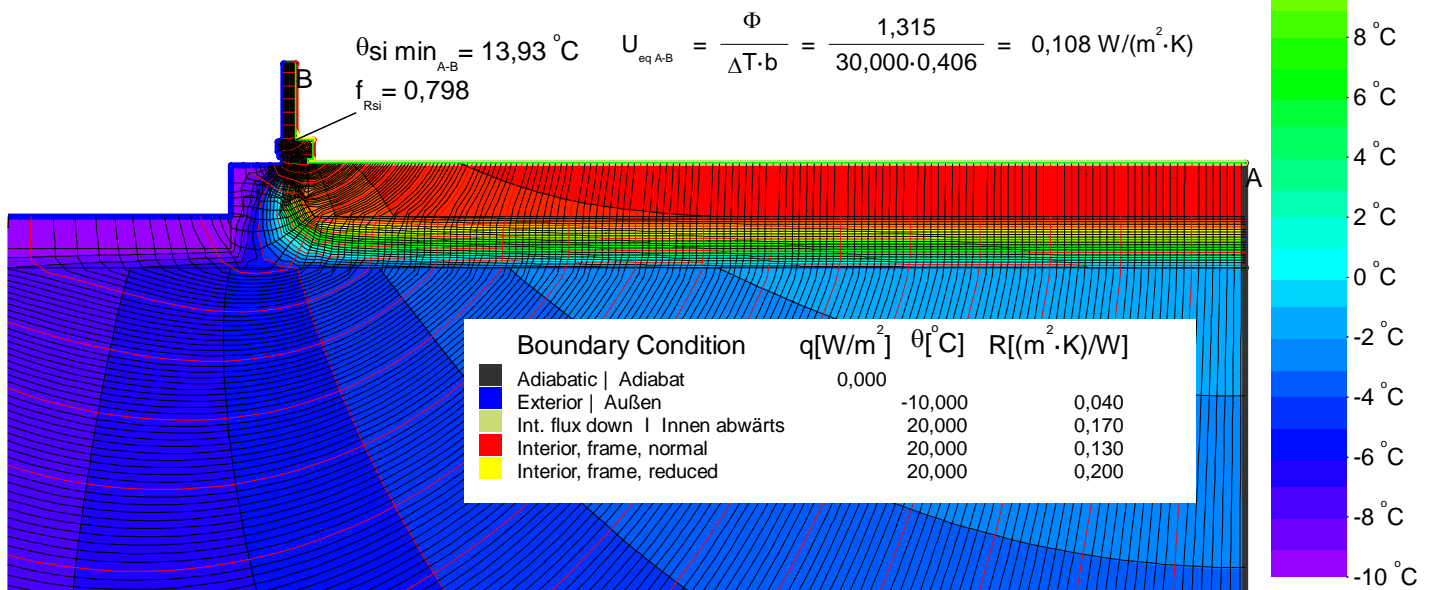
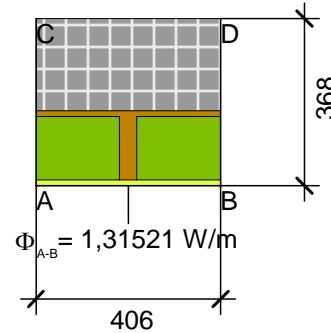


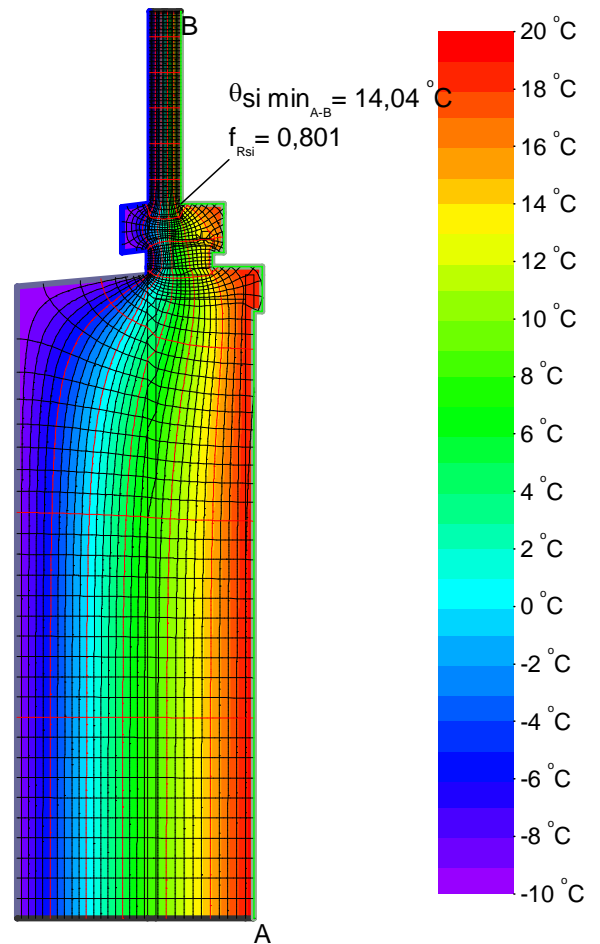
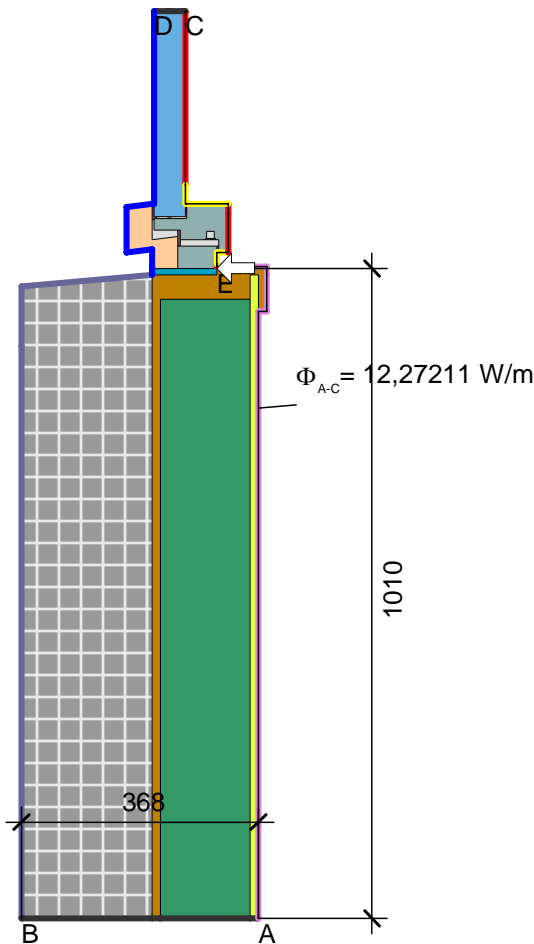


Material	$\lambda[\text{W}/(\text{m} \cdot \text{K})]$
Aluminum Aluminium 10456 (3)	160,000
Ceramic Tile	2,000
Compacfoam 100	0,040
Concrete, 1% Steel Beton, 1% Stahl 10456	2,300
EPDM (9)	0,250
EPS Type 2 $k=0.036$	0,036
GRP, >50% GFK >50% (1)	0,630
Ground Erdreich	2,000
Insulation Wärmedämmung 040 (1)	0,040
Kingspan Kooltherm K103 <45mm	0,022
Panel Maske (5)	0,035
Silicone Silikon	0,350
Slightly vent. cav. leicht bel. Hohlr. *	
Spruce, Fir Fichte, Tanne (7)	0,110
Thermasill 16 (1)	0,160
Unvent. cavity unbel. Hohlr. *	

* Vereinfachtes Verfahren

Boundary Condition	$q[\text{W/m}^2]$	$\theta[^\circ\text{C}]$	$R[(\text{m}^2 \cdot \text{K})/\text{W}]$
Adiabatic Adiabat	0,000		
Exterior Außen		-10,000	0,040
Int. flux down Innen abwärts		20,000	0,170
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200

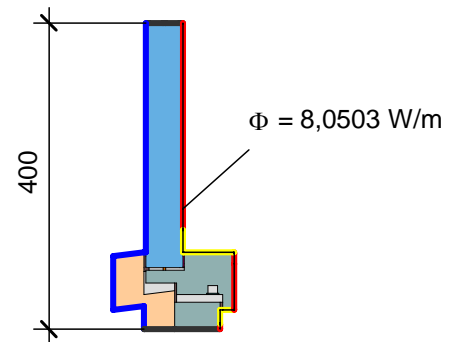




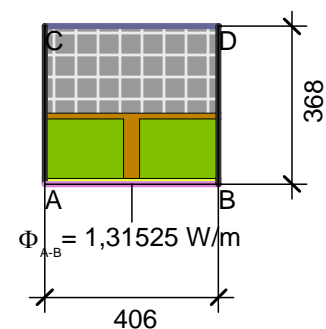
$$\Psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - \frac{\Phi_2}{\Delta T} = \frac{12,272}{30,000} - 0,108 \cdot 1,010 - \frac{8,050}{30,000} = 0,032 \text{ W/(m}\cdot\text{K)}$$

Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPDM (3)	0,250
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m3 10456	0,250
Insulation Wärmedämmung 040 (1)	0,040
PU Spray k=0.024	0,024
PVC-Schaum	0,060
Panel Maske (3)	0,035
Silicone Silikon	0,350
Softwood (500kg/m3) k=0.13 [Default]	0,130
Spruce, Fir Fichte, Tanne (1)	0,110
Steel Stahl (1)	50,000
Unvent. cavity unbel. Hohlr. *	

* Vereinfachtes Verfahren

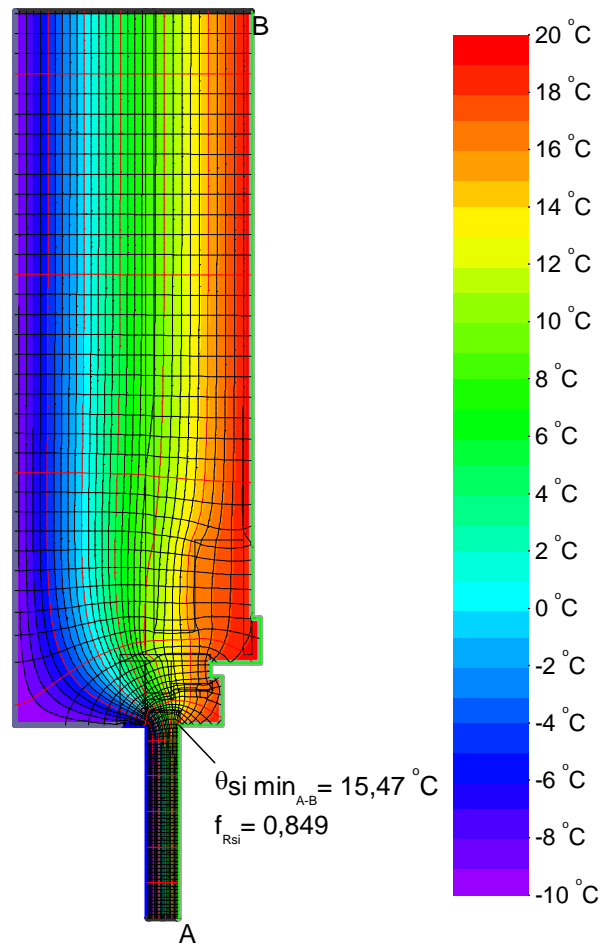
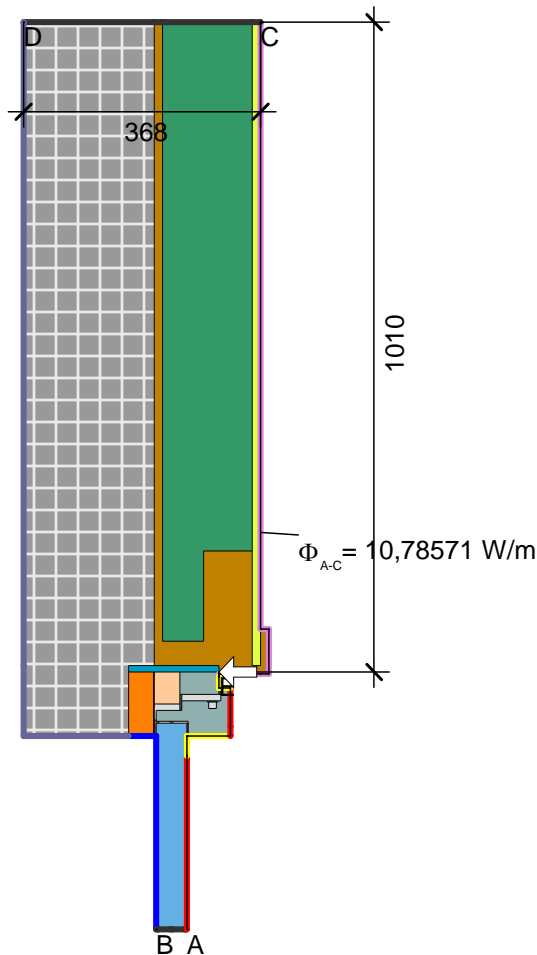


Boundary Condition	q[W/m ²]	θ[°C]	R[(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200



$$U_{eq A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W/(m}^2\cdot\text{K)}$$

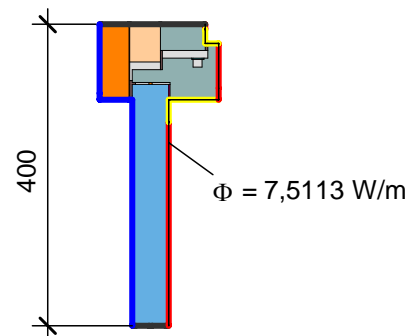




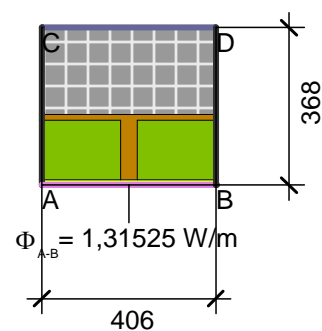
$$\psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - \frac{\Phi_1}{\Delta T} - U_2 \cdot b_2 = \frac{10,786}{30,000} - \frac{7,511}{30,000} - 0,108 \cdot 1,010 = 0,000 \text{ W}/(\text{m} \cdot \text{K})$$

Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPDM (6)	0,250
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Insulation Wärmedämmung 040 (1)	0,040
PU Spray k=0.024	0,024
PVC-Schaum	0,060
Panel Maske (4)	0,035
Polyvinylchlorid (PVC)	0,170
Silicone Silikon	0,350
Softwood (500kg/m ³) k=0.13 [Default]	0,130
Spruce, Fir Fichte, Tanne (4)	0,110
Steel Stahl (1)	50,000
Unvent. cavity unbel. Hohlr. *	

* Vereinfachtes Verfahren

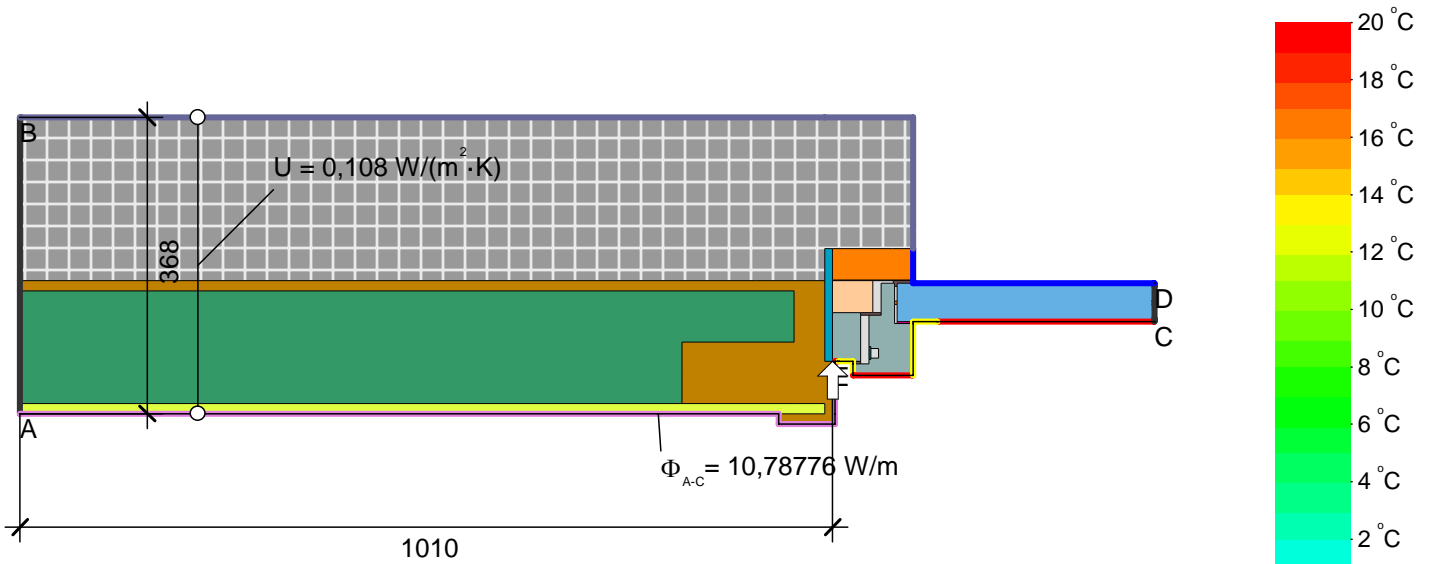


Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiatat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200

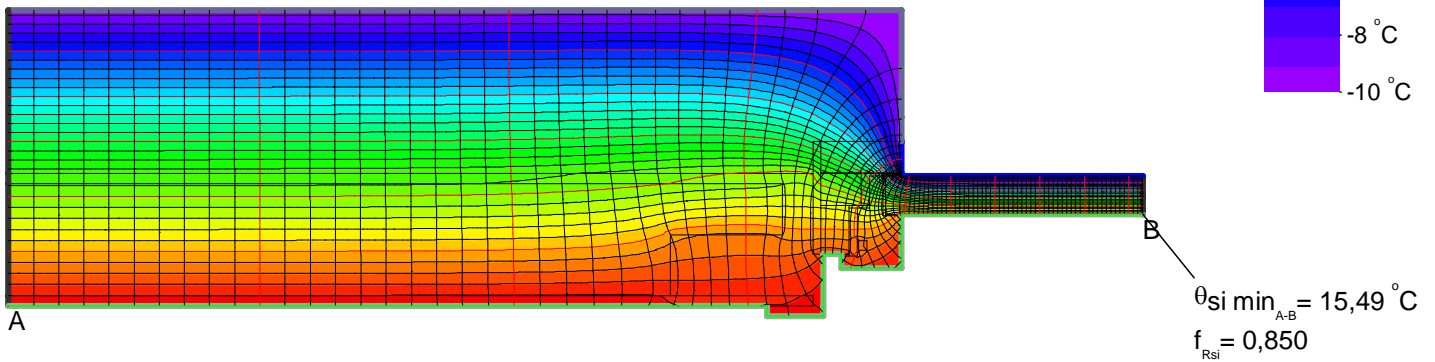


$$U_{\text{eq A-B}} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$



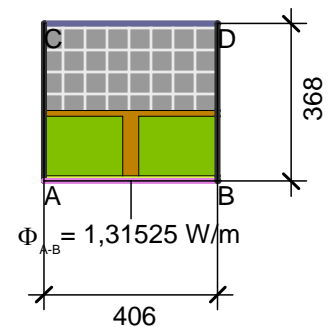
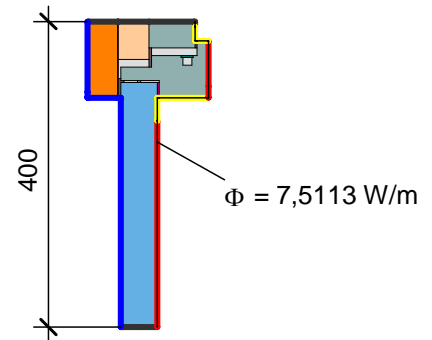


$$\Psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - \frac{\Phi_2}{\Delta T} = \frac{10,788}{30,000} - 0,108 \cdot 1,010 - \frac{7,511}{30,000} = 0,000 \text{ W}/(\text{m} \cdot \text{K})$$



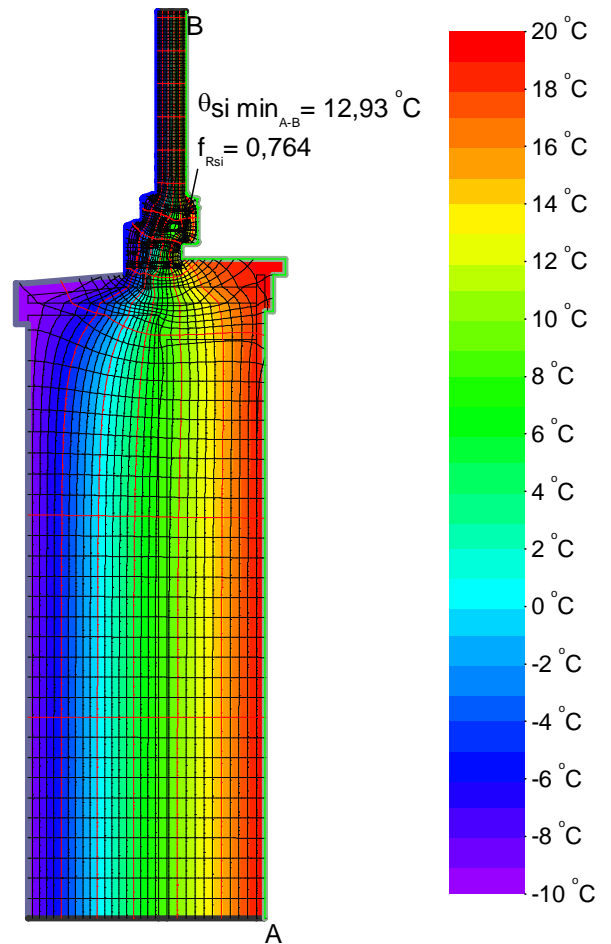
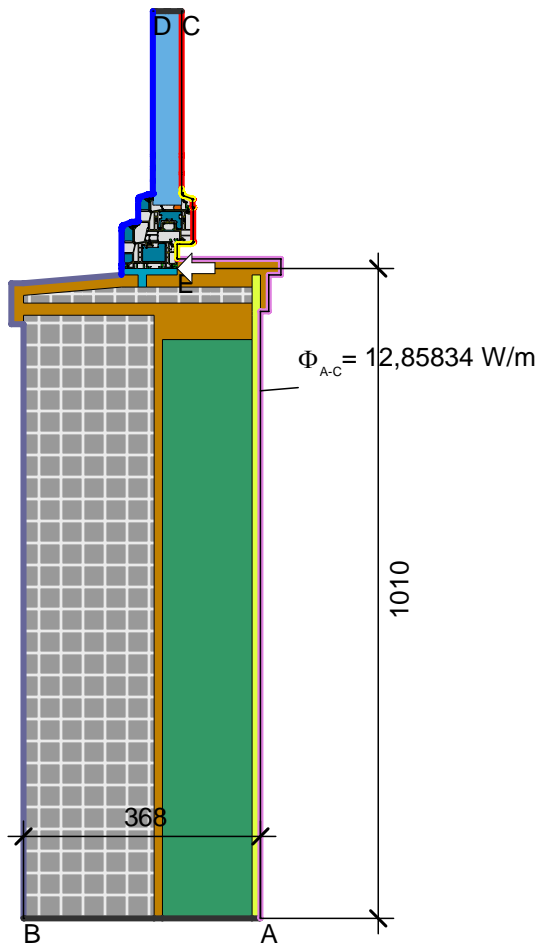
Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPDM (6)	0,250
EPS Type 2 $k=0.036$	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Insulation Wärmedämmung 040 (1)	0,040
PU Spray $k=0.024$	0,024
PVC-Schaum	0,060
Panel Maske (4)	0,035
Polyvinylchlorid (PVC)	0,170
Silicone Silikon	0,350
Softwood (500kg/m ³) $k=0.13$ [Default]	0,130
Spruce, Fir Fichte, Tanne (4)	0,110
Steel Stahl (1)	50,000
Unvent. cavity unbel. Hohlr. *	
* Vereinfachtes Verfahren	

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200



$$U_{\text{eq A-B}} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$

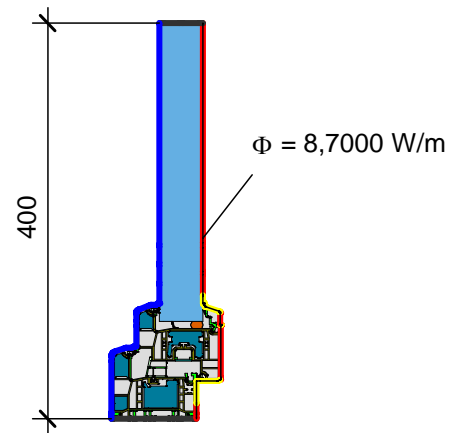




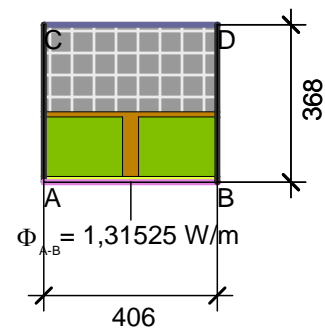
$$\psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - U_i \cdot b_1 - \frac{\Phi_2}{\Delta T} = \frac{12,858}{30,000} - 0,108 \cdot 1,010 - \frac{8,700}{30,000} = 0,030 \text{ W/(m}\cdot\text{K)}$$

Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m3 10456	0,250
Insulation I Wärmedämmung 031	0,031
Insulation I Wärmedämmung 050	0,050
PU Spray k=0.024	0,024
Panel I Maske (1)	0,035
Polyvinylchloride (PVC)	0,170
RAU-FIPRO	0,170
Soft PVC I Weich-PVC	0,140
Softwood (500kg/m3) k=0.13 [Default]	0,130
Steel I Stahl	50,000
Unvent. cavity I unbel. Hohlr. *	
slightly vent. cav. I leicht bel. Hohlr. *	

* Vereinfachtes Verfahren

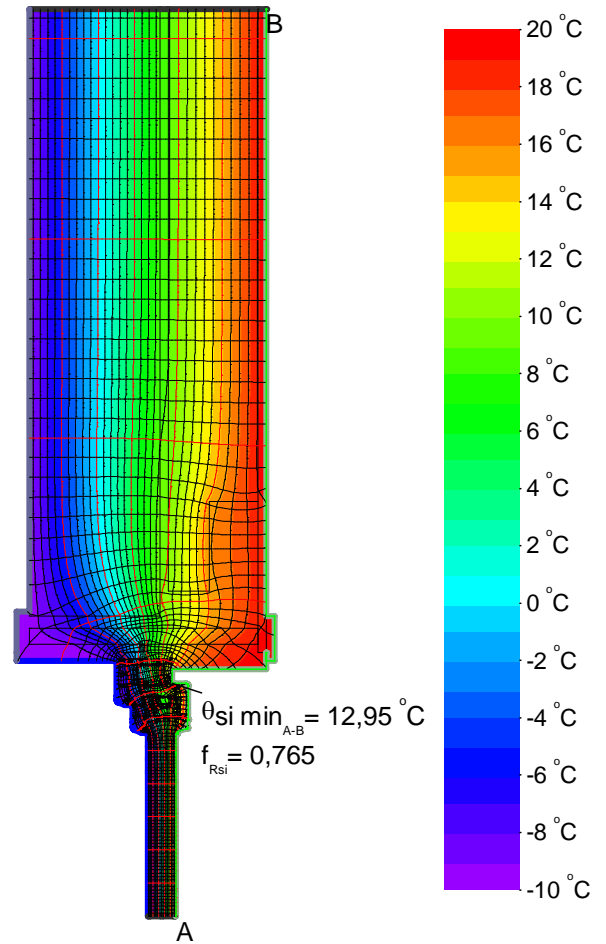
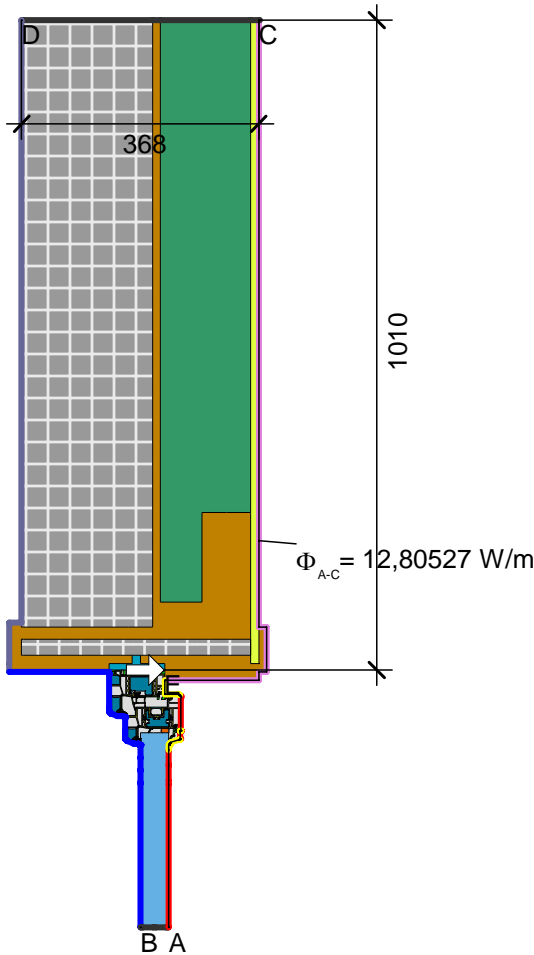


Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200



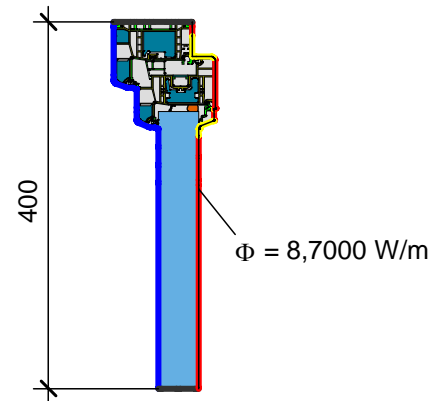
$$U_{eq A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W/(m}^2\cdot\text{K)}$$



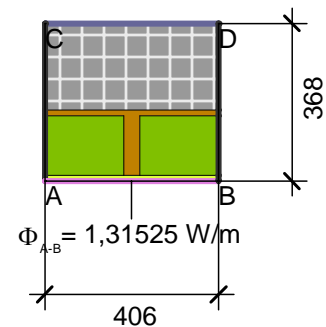


$$\Psi_{A-E-C,*} = \frac{\Phi}{\Delta T} - \frac{\Phi_1}{\Delta T} - U_2 \cdot b_2 = \frac{12,805}{30,000} - \frac{8,700}{30,000} - 0,108 \cdot 1,010 = 0,028 \text{ W}/(\text{m} \cdot \text{K})$$

Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Insulation Wärmedämmung 031	0,031
Insulation Wärmedämmung 050	0,050
PU Spray k=0.024	0,024
Panel Maske (1)	0,035
Polyvinylchloride (PVC)	0,170
RAU-FIPRO	0,170
Soft PVC Weich-PVC	0,140
Softwood (500kg/m ³) k=0.13 [Default]	0,130
Steel Stahl	50,000
Unvent. cavity unbel. Hohlr. *	
slightly vent. cav. leicht bel. Hohlr. *	
* Vereinfachtes Verfahren	

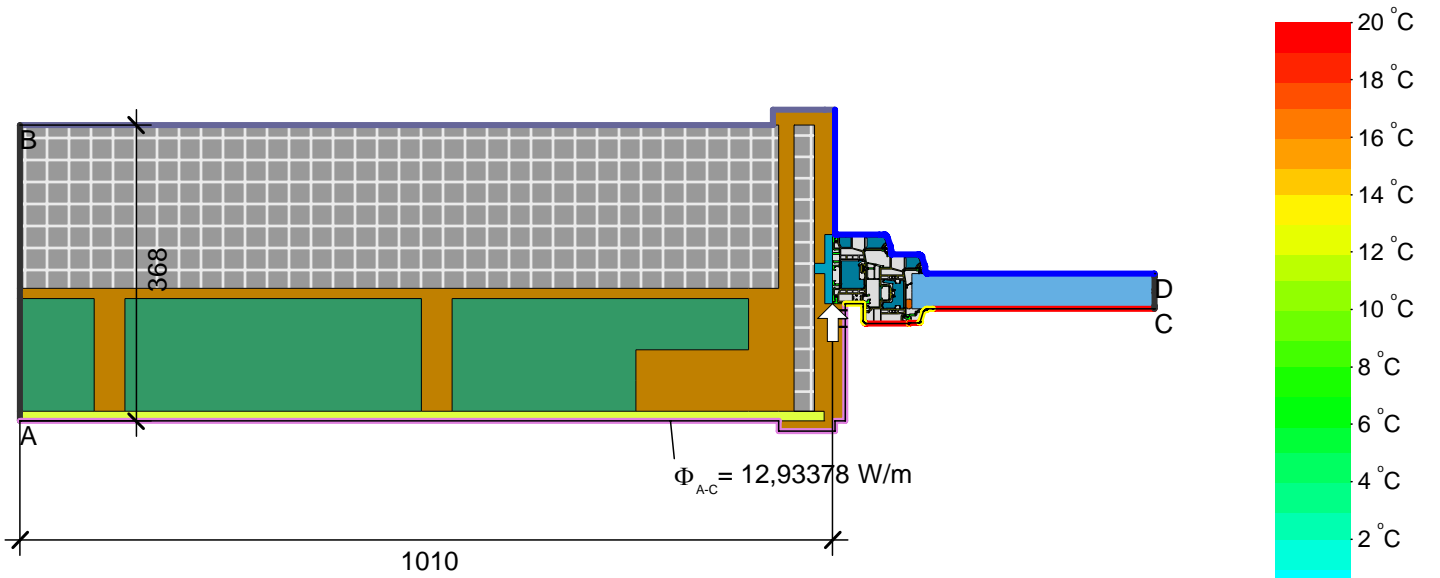


Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiatat	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200

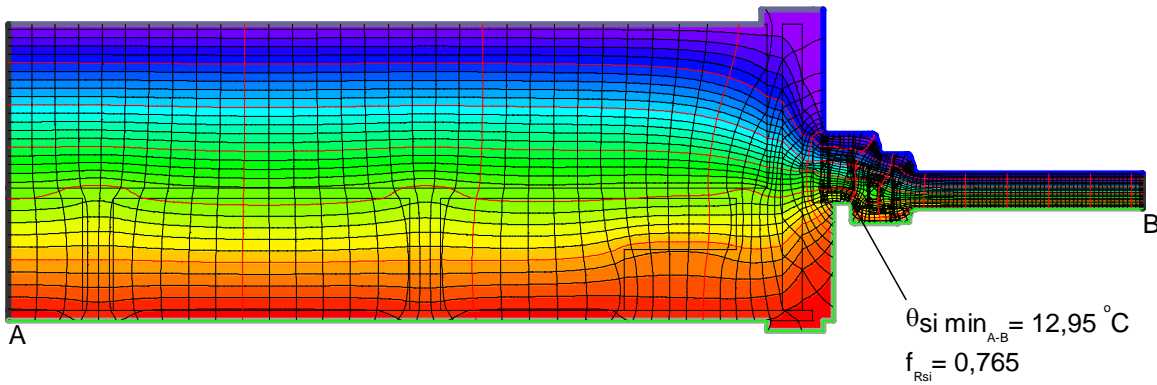


$$U_{eq\ A-B} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$





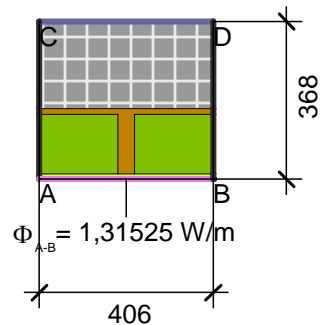
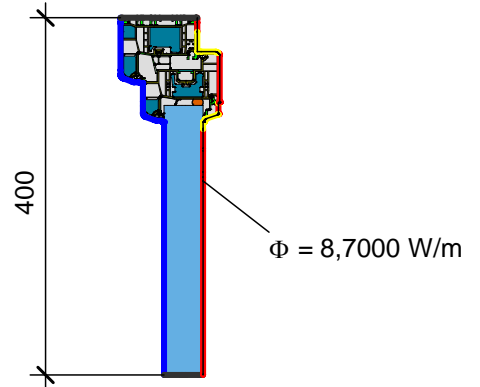
$$\psi_{A-E-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - \frac{\Phi_2}{\Delta T} = \frac{12,934}{30,000} - 0,108 \cdot 1,010 - \frac{8,700}{30,000} = 0,032 \text{ W}/(\text{m} \cdot \text{K})$$



Material	λ [W/(m·K)]
B1 Equiv. Cond.	0,044
EPS Type 2 k=0.036	0,036
Gypsum board Gipskartonplatten 900 kg/m ³ 10456	0,250
Insulation Wärmedämmung 031	0,031
Insulation Wärmedämmung 050	0,050
PU Spray k=0.024	0,024
Panel Maske (1)	0,035
Polyvinylchloride (PVC)	0,170
RAU-FIPRO	0,170
Soft PVC Weich-PVC	0,140
Softwood (500kg/m ³) k=0.13 [Default]	0,130
Steel Stahl	50,000
Unvent. cavity unbel. Hohlr. *	
slightly vent. cav. leicht bel. Hohlr. *	

* Vereinfachtes Verfahren

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]
Adiabatic Adiabatisch	0,000		
Exterior vent. Außen belüftet		-10,000	0,130
Exterior Außen		-10,000	0,040
Interior Innen		20,000	0,130
Interior, frame, normal		20,000	0,130
Interior, frame, reduced		20,000	0,200



$$U_{eq \text{ A-B}} = \frac{\Phi}{\Delta T \cdot b} = \frac{1,315}{30,000 \cdot 0,406} = 0,108 \text{ W}/(\text{m}^2 \cdot \text{K})$$





Appendix 3: Manufacturers drawings | Zeichnungen des Herstellers

Passive House Institute



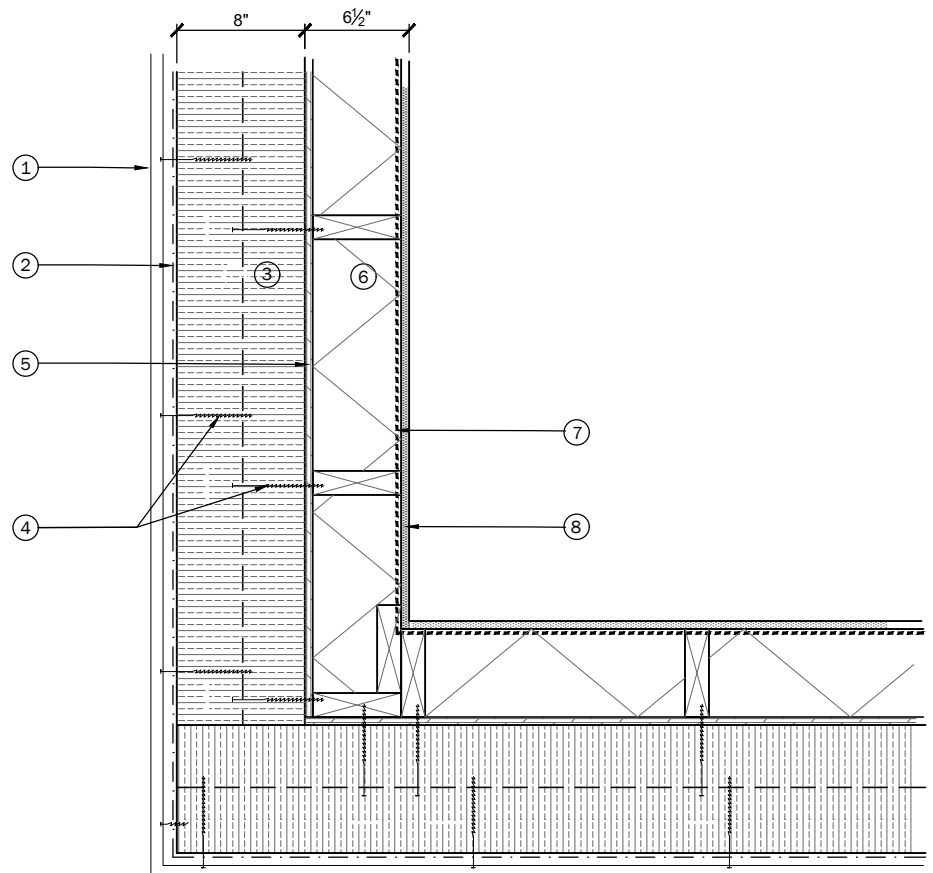
Passive House Institute

ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:
1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH



SK 38

8" THERMALWALL PH PANEL WITH
2x6 WD STUD WALL & HORIZONTAL STRAPPING
OUTSIDE CORNER DETAIL

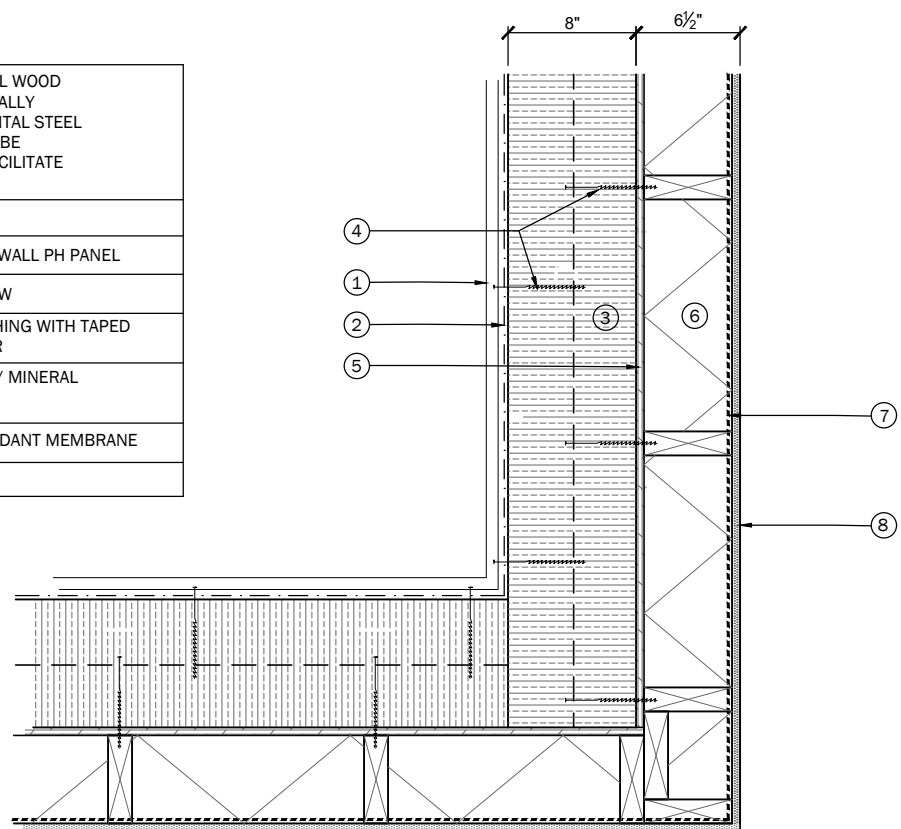
LEGALETT

ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:
1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH



SK 39

8" THERMALWALL PH PANEL WITH
2x6 WD STUD WALL & HORIZONTAL STRAPPING
INSIDE CORNER DETAIL

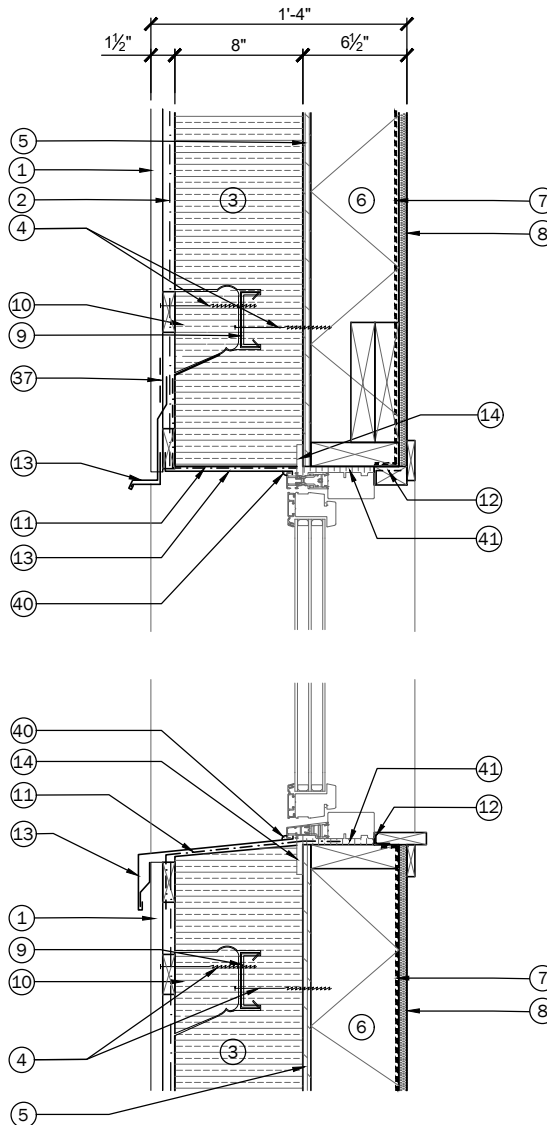
LEGALETT

ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:
1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
13	METAL FLASHING
14	NAILING FLANGE
37	TAPE
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM



SK 47

8" THERMALWALL PH PANEL
WITH 2x6 WD STUD WALL
WINDOW SILL / HEAD (NO BUCK)

LEGALETT

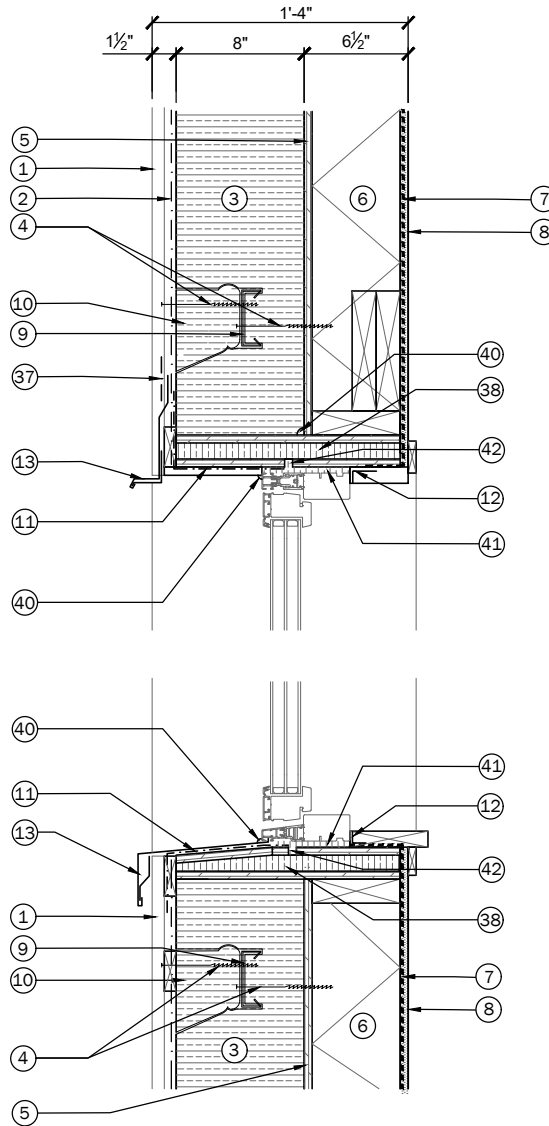
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
13	METAL FLASHING
37	TAPE
38	ENGINEERED WOOD-EPS COMPOSITE LEGALETT THERMABUCK PH
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM
42	1/2" DADO SITE-CUT IN ENGINEERED WOOD AS THERMAL BREAK



SK 48

8" THERMALWALL PH PANEL
WITH 2X6 WD STUD WALL
WINDOW SILL / HEAD WITH THERMABUCK PH

LEGALETT

ThermaWall PH Panel

JUNE 29, 2020
SCALE: 1" = 1'-0"

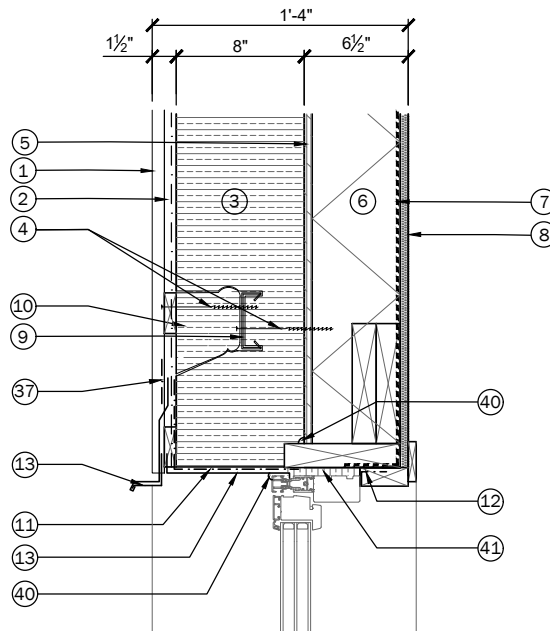
1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
13	METAL FLASHING
15	DOOR; WOOD FRAME
17	LEGALETT THERMASILL FLOOR-TO-CEILING WINDOW AND / OR DOOR SILL EDGE ELEMENT COMPOSED OF LAMINATED CEMENT-BONDED WOOD FIBER AND EPS
18	EDGE ELEMENT GLUED TO BASE EPS LAYER WITH FOAM ADHESIVE
19	CLEAR CRUSHED STONE
20	PROTECTED EPS SKIRTING AS REQUIRED
21	15 MIL STEGO VAPOUR BARRIER MEMBRANE
22	CERAMIC TILE
23	REINFORCED CONCRETE SLAB
24	UNDERSLAB EPS
37	TAPE
39	POLYMER MODIFIED HIGH STRENGTH CONCRETE TOP COAT / PATCHER
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM

ASSUMPTIONS

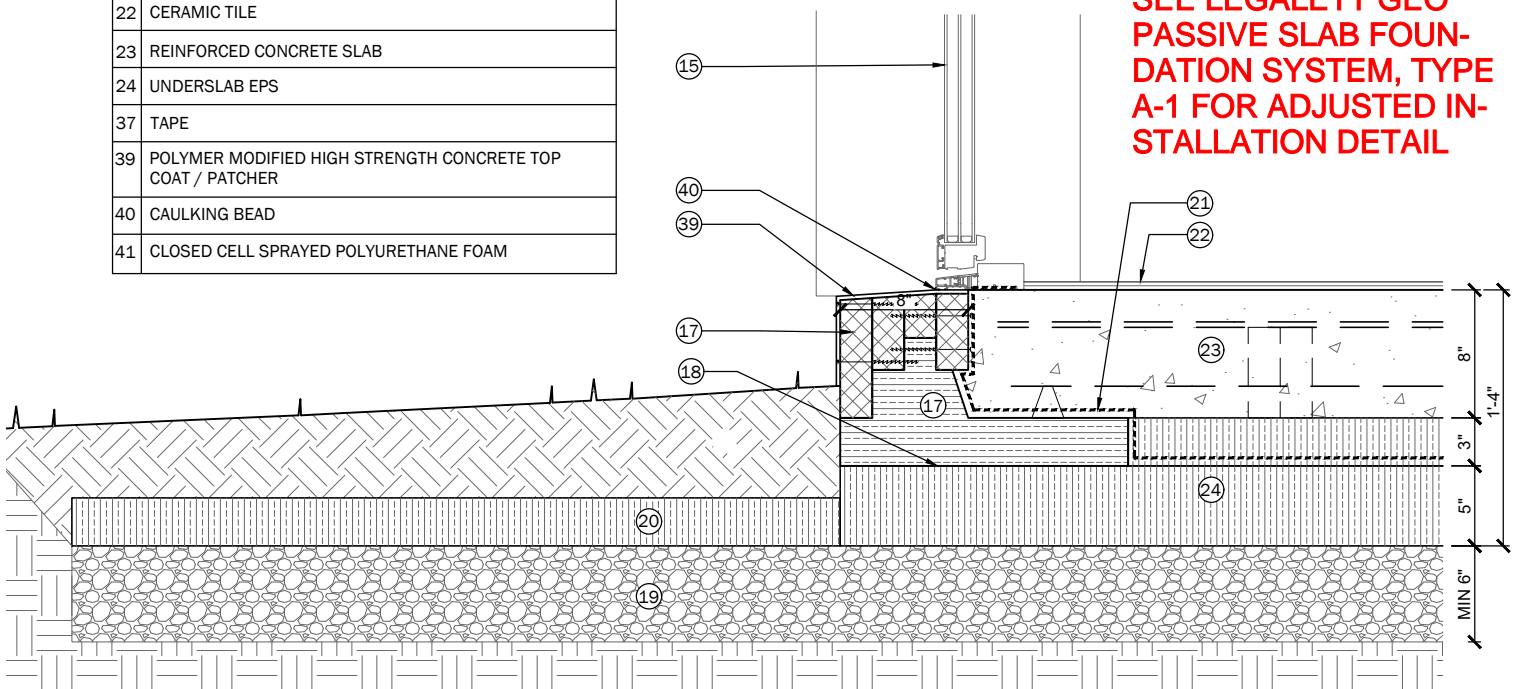
SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION



SEE LEGALETT GEO PASSIVE SLAB FOUNDATION SYSTEM, TYPE A-1 FOR ADJUSTED INSTALLATION DETAIL



SK 78

AT GRADE : 8" GEO-PASSIVE SLAB EDGE WITH 8" OF INSULATION AND 8" WIDE THERMASILL AT DOOR SILL
TYPICAL DOOR HEAD IN 2X6 WALL W/ 8" THERMALWALL

LEGALETT

ThermaWall PH Panel

JUNE 29, 2020
SCALE: 1" = 1'-0"

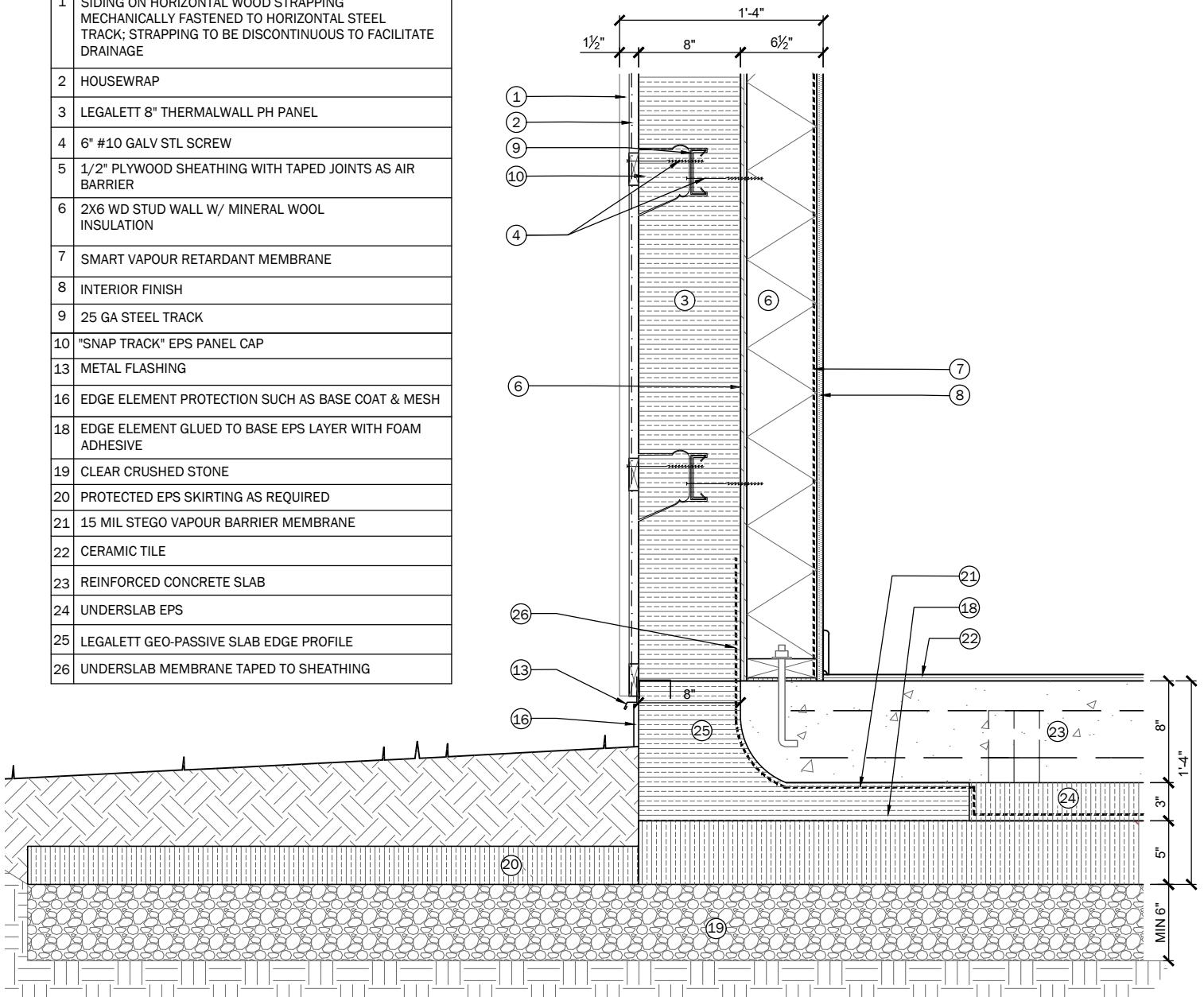
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
13	METAL FLASHING
16	EDGE ELEMENT PROTECTION SUCH AS BASE COAT & MESH
18	EDGE ELEMENT GLUED TO BASE EPS LAYER WITH FOAM ADHESIVE
19	CLEAR CRUSHED STONE
20	PROTECTED EPS SKIRTING AS REQUIRED
21	15 MIL STEGO VAPOUR BARRIER MEMBRANE
22	CERAMIC TILE
23	REINFORCED CONCRETE SLAB
24	UNDERSLAB EPS
25	LEGALETT GEO-PASSIVE SLAB EDGE PROFILE
26	UNDERSLAB MEMBRANE TAPED TO SHEATHING



SK 80

AT GRADE: 8" GEO-SLAB EDGE
WITH 8" OF INSULATION
AND 8" THERMALWALL PH PANEL
+ 2x6WD STUD WALL

LEGALETT

ThermaWall PH Panel

JUNE 29, 2020
SCALE: 1" = 1'-0"

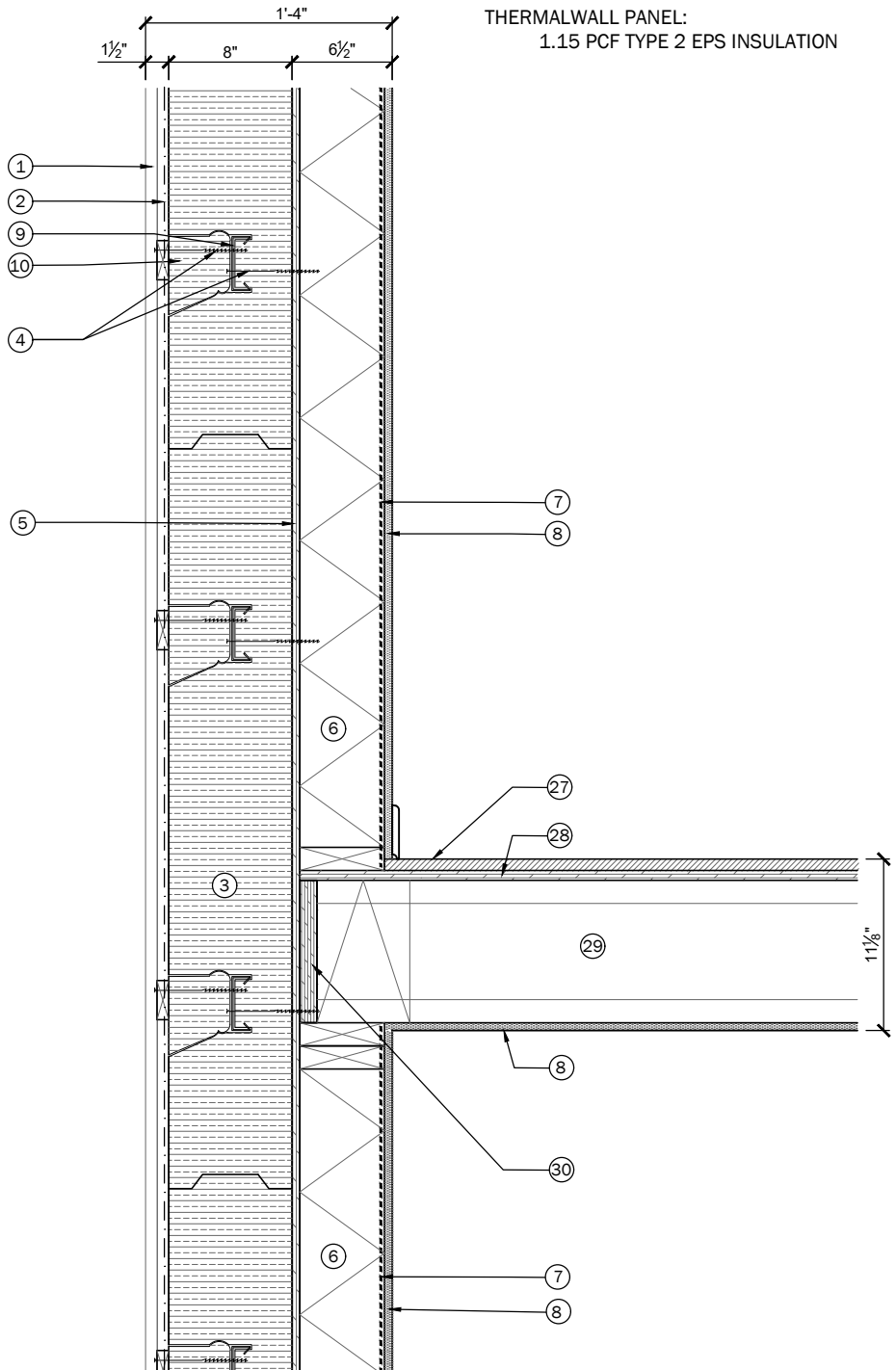
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
27	3/4" HARDWOOD FLOORING
28	5/8" T & G PLYWOOD
29	9 1/4" ENGINEERED WOOD JOIST
30	RIM JOIST INSULATED W/ MINERAL WOOL INSULATION TO R-20



SK 81

8" THERMALWALL PH PANEL
WITH 2x6 WD STUD WALL @
ENGINEERED JOIST FLOOR JUNCTION
VERTICAL SIDING

LEGALETT

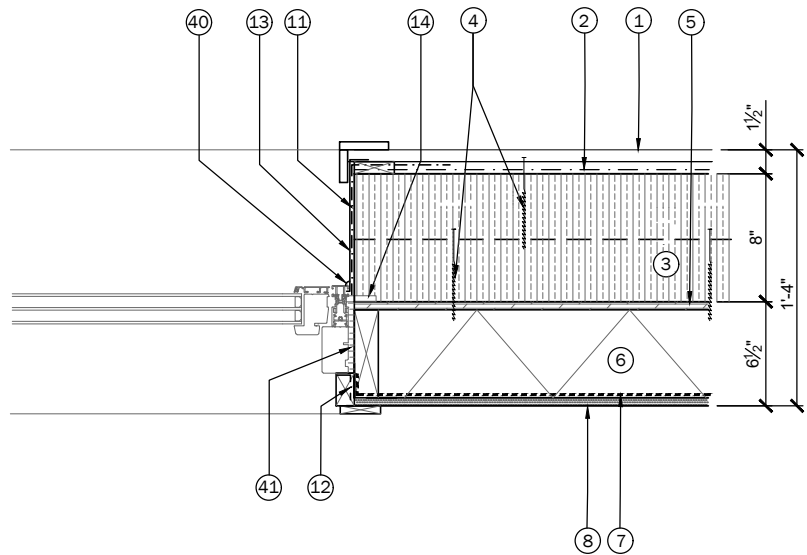
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
13	METAL FLASHING
14	NAILING FLANGE
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM



SK 82

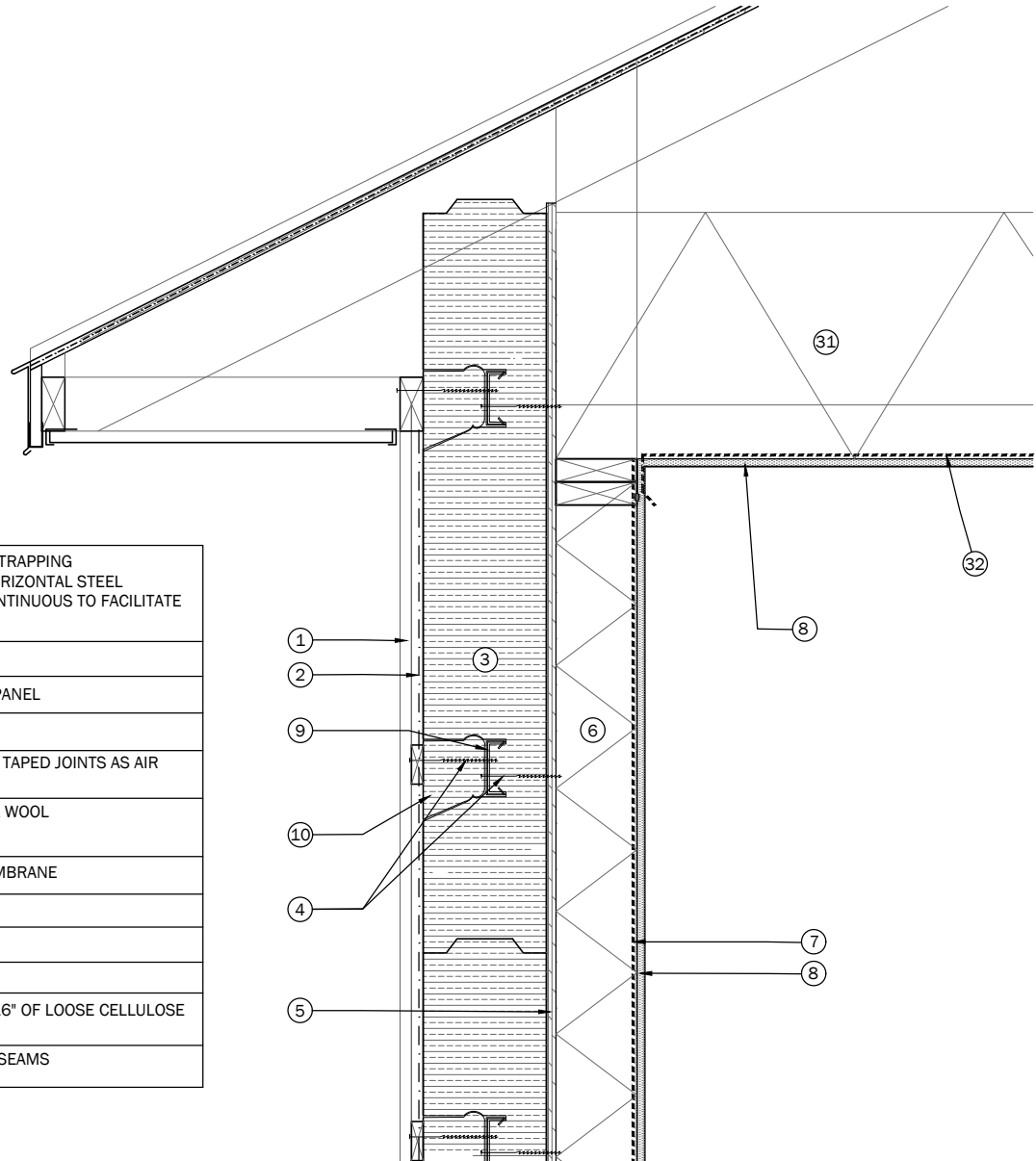
TYPICAL DOOR OR WINDOW JAMB
IN 2X6 WALL W/ 8" THERMALWALL (NO BUCK)

LEGALETT

ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:
1.15 PCF TYPE 2 EPS INSULATION



1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
31	WOOD TRUSS WITH 22" HEEL & 16" OF LOOSE CELLULOSE INSULATION
32	6 MIL POLYETHYLENE, TAPED AT SEAMS

SK 83

8" THERMALWALL PH PANEL
WITH 2x6 WD STUD WALL @ WOOD TRUSS ROOF EAVE
VERTICAL SIDING

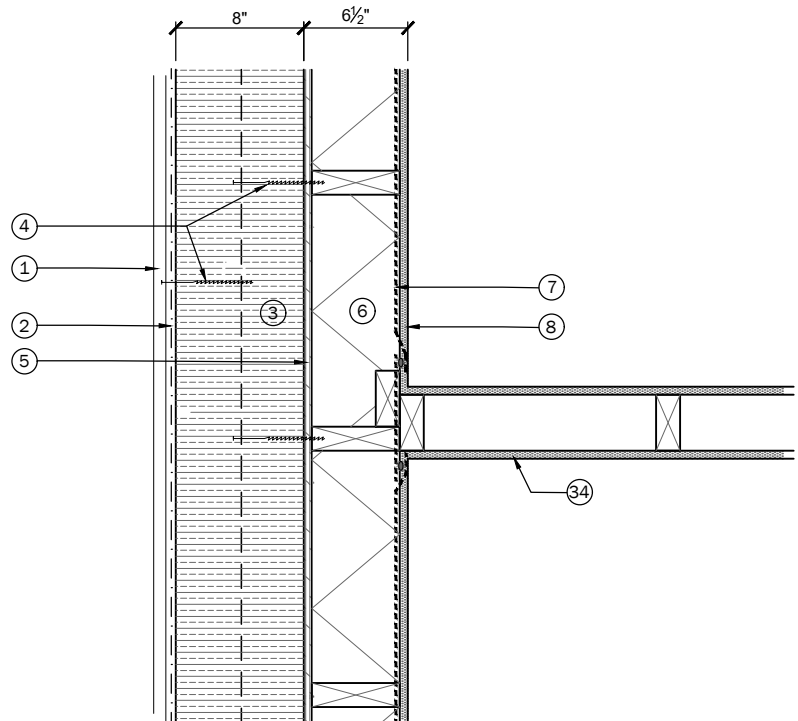
LEGALETT

ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:
1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
34	2X4 WD STUD INTERIOR PARTITION W/ 1-LAYER 1/2" DRYWALL ON EACH SIDE



SK 84

8" THERMALWALL PH PANEL
WITH 2x6 WD STUD WALL @
INTERIOR PARTITION INTERSECTION (PLAN)

LEGALETT

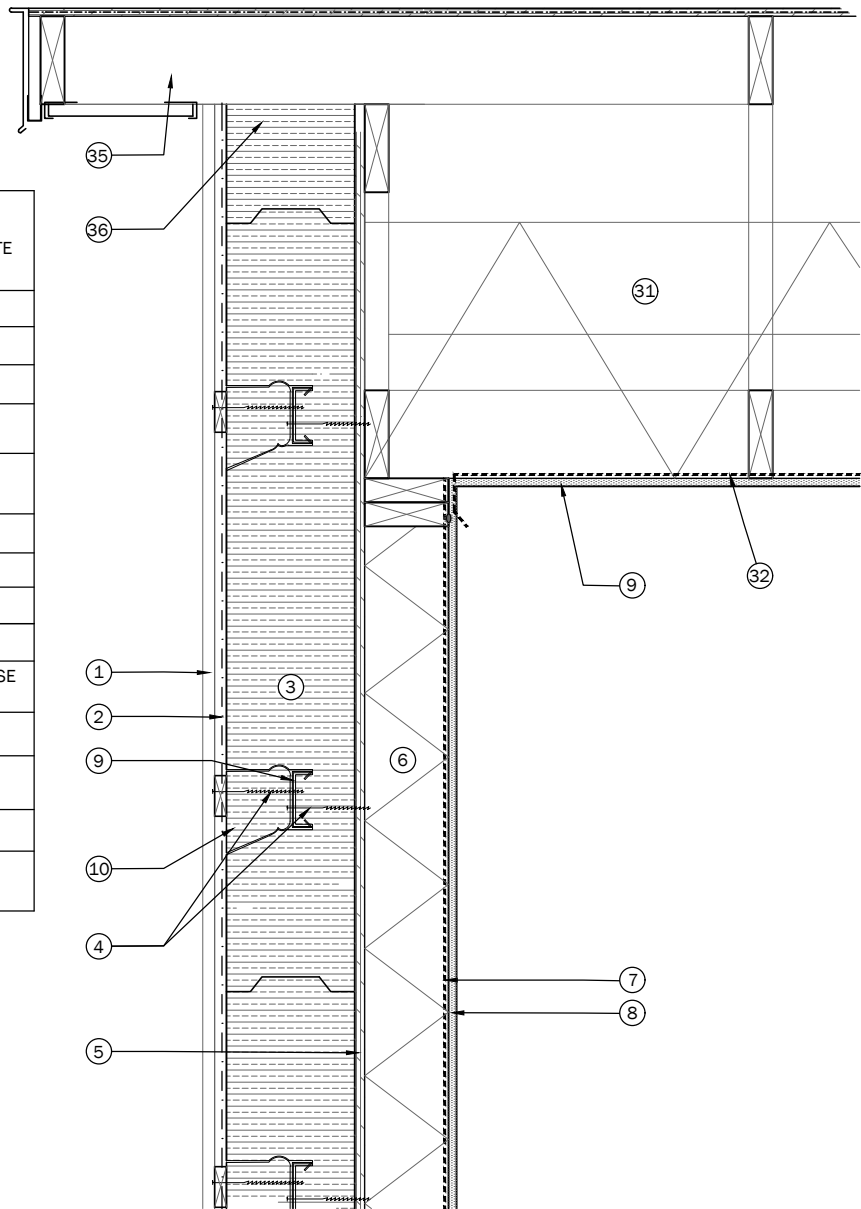
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

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2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
31	WOOD TRUSS WITH 22" HEEL & 16" OF LOOSE CELLULOSE INSULATION
32	6 MIL POLYETHYLENE, TAPED AT SEAMS
33	LEGALETT 4" THERMALWALL PH CEILING TECH PANEL (INSULATED STRAPPING)
35	VENTED SOFFIT
36	THERMALWALL PANEL CUT ON AN ANGLE TO FOLLOW PITCH OF ROOF



SK 85

8" THERMALWALL PH PANEL
WITH 2x6 WD STUD WALL @ WOOD TRUSS ROOF VERGE
VERTICAL SIDING

LEGALETT

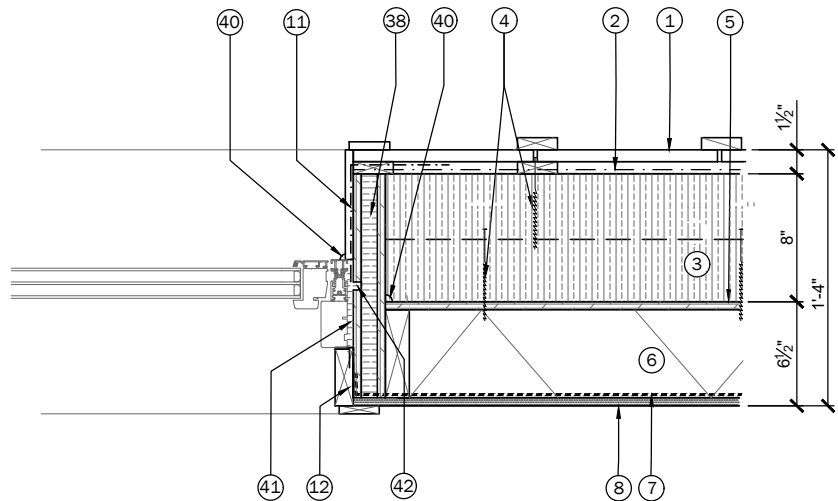
ASSUMPTIONS

SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION
FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION
FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION

1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
14	NAILING FLANGE
38	ENGINEERED WOOD-EPS COMPOSITE LEGALETT THERMABUCK PH
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM
42	1/2" DADO SITE-CUT IN ENGINEERED WOOD AS THERMAL BREAK



SK 86

TYPICAL DOOR OR WINDOW JAMB
IN 2X6 WALL W/ 8" THERMALWALL
AND LEGALETT THERMABUCK PH

LEGALETT

ThermaWall PH Panel

JUNE 29, 2020
SCALE: 1" = 1'-0"

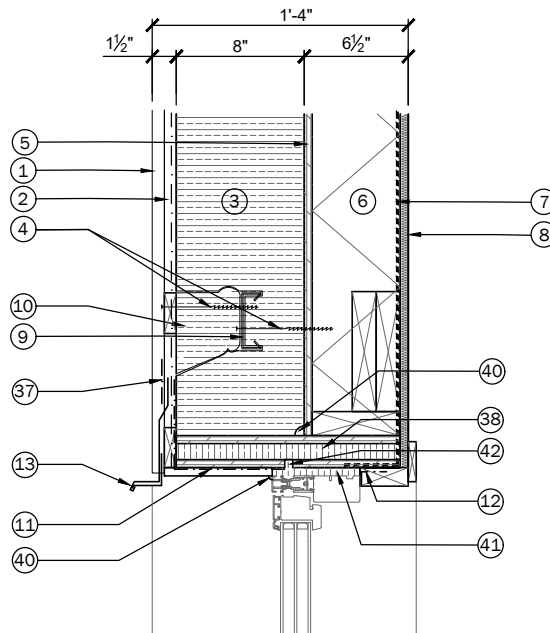
1	SIDING ON HORIZONTAL WOOD STRAPPING MECHANICALLY FASTENED TO HORIZONTAL STEEL TRACK; STRAPPING TO BE DISCONTINUOUS TO FACILITATE DRAINAGE
2	HOUSEWRAP
3	LEGALETT 8" THERMALWALL PH PANEL
4	6" #10 GALV STL SCREW
5	1/2" PLYWOOD SHEATHING WITH TAPED JOINTS AS AIR BARRIER
6	2X6 WD STUD WALL W/ MINERAL WOOL INSULATION
7	SMART VAPOUR RETARDANT MEMBRANE
8	INTERIOR FINISH
9	25 GA STEEL TRACK
10	"SNAP TRACK" EPS PANEL CAP
11	PEEL & STICK FLASHING MEMBRANE
12	AIR SEALING TAPE
13	METAL FLASHING
15	DOOR; WOOD FRAME
17	LEGALETT THERMASILL FLOOR-TO-CEILING WINDOW AND / OR DOOR SILL EDGE ELEMENT COMPOSED OF LAMINATED CEMENT-BONDED WOOD FIBER AND EPS
18	EDGE ELEMENT GLUED TO BASE EPS LAYER WITH FOAM ADHESIVE
19	CLEAR CRUSHED STONE
20	PROTECTED EPS SKIRTING AS REQUIRED
21	15 MIL STEGO VAPOUR BARRIER MEMBRANE
22	CERAMIC TILE
23	REINFORCED CONCRETE SLAB
24	UNDERSLAB EPS
37	TAPE
38	ENGINEERED WOOD-EPS COMPOSITE LEGALETT THERMABUCK PH
39	POLYMER MODIFIED HIGH STRENGTH CONCRETE TOP COAT / PATCHER
40	CAULKING BEAD
41	CLOSED CELL SPRAYED POLYURETHANE FOAM
42	1/2" DADO SITE-CUT IN ENGINEERED WOOD AS THERMAL BREAK

ASSUMPTIONS

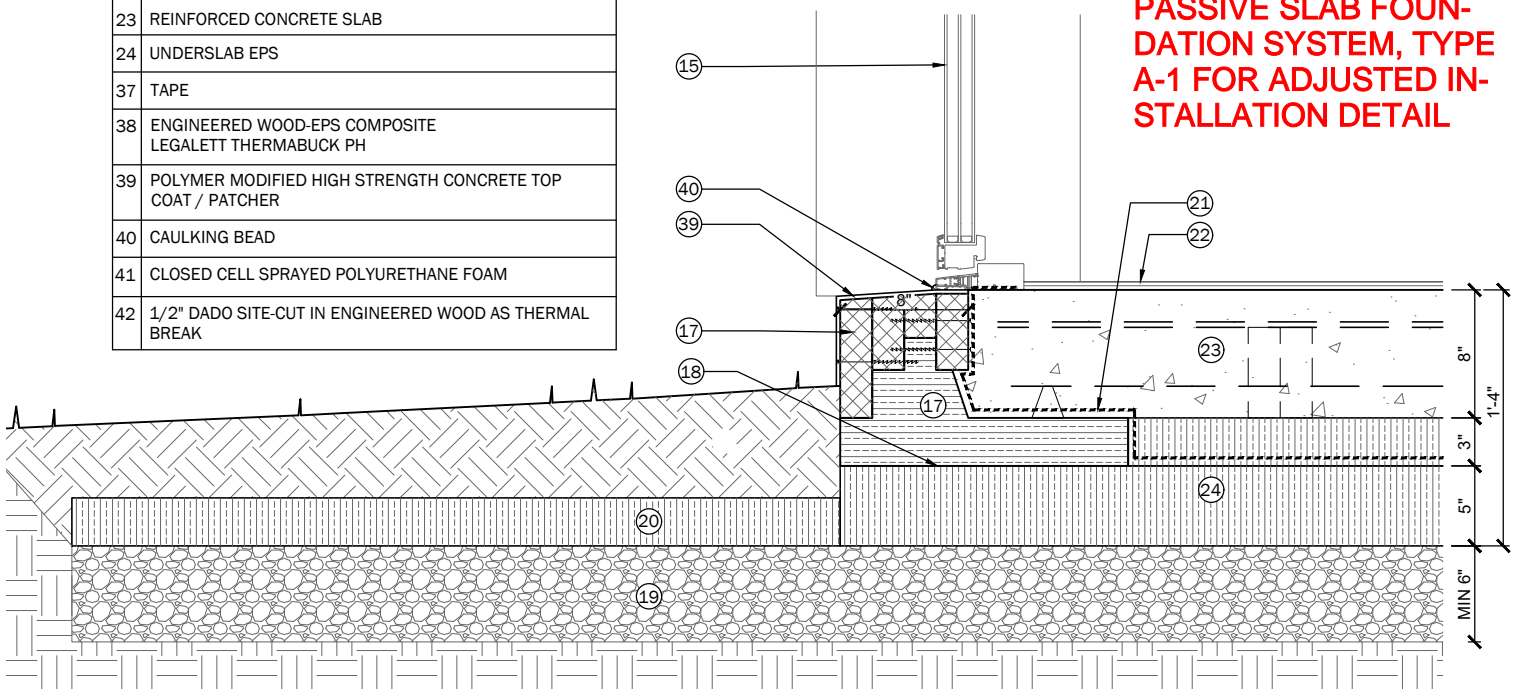
SLAB: 0.36% STEEL
1.35 PCF TYPE 2 EPS INSULATION FOR 8" SLABS
2.5 PCF TYP 3+ EPS INSULATION FOR 11"+ SLABS

THERMALWALL PANEL:

1.15 PCF TYPE 2 EPS INSULATION



SEE LEGALETT GEO PASSIVE SLAB FOUNDATION SYSTEM, TYPE A-1 FOR ADJUSTED INSTALLATION DETAIL



SK 87

AT GRADE : 8" GEO-PASSIVE SLAB EDGE W/ 8" OF INSULATION AND 8" WIDE THERMASILL AT DOOR SILL
TYPICAL DOOR HEAD IN 2X6 WALL W/ 8" THERMALWALL AND LEGALETT THERMABUCK PH

LEGALETT