

smartwin solar HPL in smartshell reno




$U_{1D}$ Wall	0,107	W/m <sup>2</sup> K
$U_{2D}$ Window	0,792	W/m <sup>2</sup> K
$U_{2D}$	0,259	W/m <sup>2</sup> K

Length S1	1,516	m
Length S2	0,400	m
Total length	1,916	m

$L_{1D}$	0,478	W/mK
$L_{2D}$	0,496	W/mK

$\Psi_e$	0,018	W/mK
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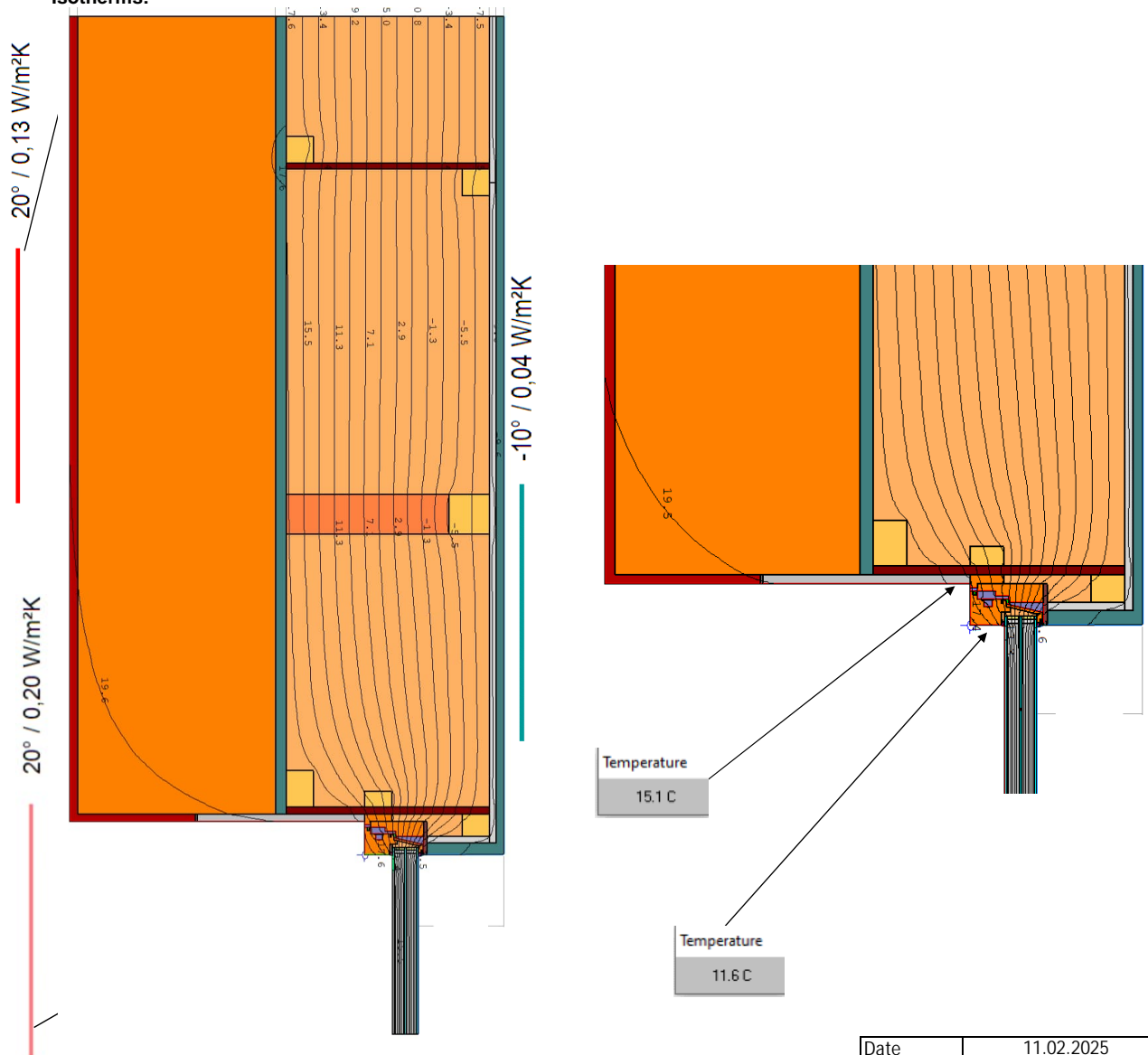
projected X  
projected X


PHI				
Boundary Conditions	$R_s$	$\theta$	$R_s$	$\theta$
	0,13	20,00	0,25	20,00
	0,13	20,00	0,20	20,00
	0,04	-10,00	0,04	-10,00
	Psi-value		$fR_{Si}$	

lowest interior temperature:  
 $f_{Rsi}$  at 20 °C / -10 °C

11,6°C
0,72 > 0,7 requirement fulfilled

Isotherms:



Date	11.02.2025
Signature	

# smartwin solar HPL in smartshell reno

Rafflamelle




$U_{1D}$ Wall	0,107	W/m <sup>2</sup> K
$U_{2D}$ Window	0,792	W/m <sup>2</sup> K
$U_{2D}$	0,260	W/m <sup>2</sup> K

Length S1	1,516	m
Length S2	0,400	m
Total length	1,916	m

$L_{1D}$	0,478	W/mK	v
$L_{2D}$	0,498	W/mK	

$\Psi_e$	0,020	W/mK
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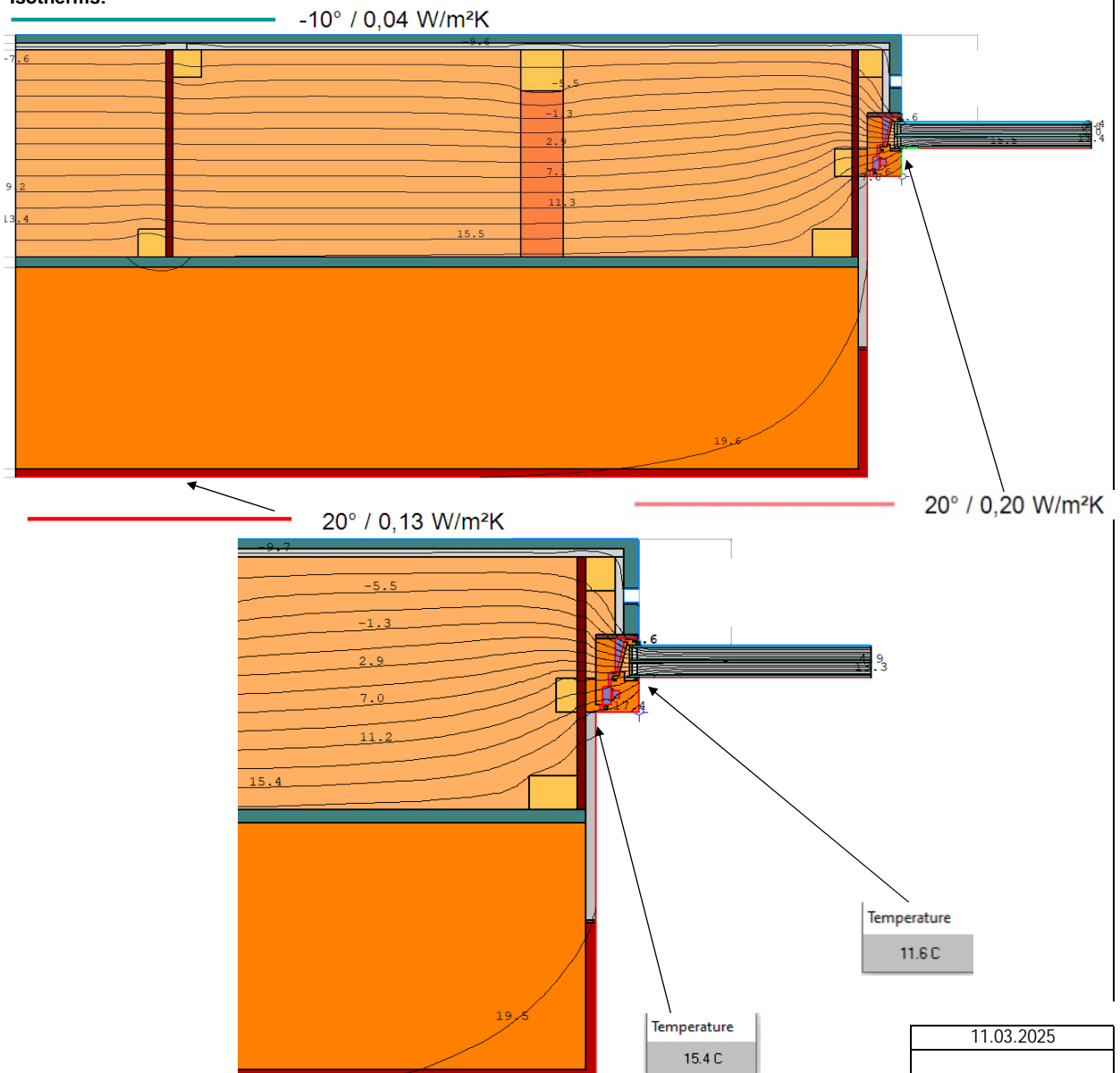
projected X  
projected X

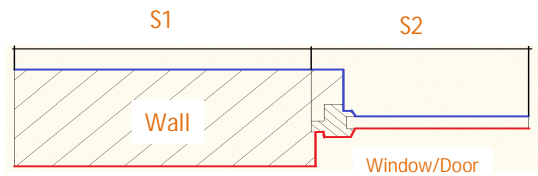
PHI				
Boundary Conditions	$R_s$	$\theta$	$R_s$	$\theta$
	0,13	20,00	0,25	20,00
	0,13	20,00	0,20	20,00
	0,04	-10,00	0,04	-10,00
Psi-value			$fR_{Si}$	

lowest interior temperature:  
 $f_{RSi}$  at 20 °C / -10 °C

11,6°C
0,72 > 0,7 requirement fulfilled

## Isotherms:





# smartwin solar in smartshell reno

Rafflamelle oben




$U_{1D}$ Wall	0,107	W/m <sup>2</sup> K
$U_{2D}$ Window	0,792	W/m <sup>2</sup> K
$U_{2D}$	0,248	W/m <sup>2</sup> K

Length S1	1,815	m
Length S2	0,400	m
Total length	2,215	m

$L_{1D}$	0,510	W/mK
$L_{2D}$	0,550	W/mK

$\Psi_e$	0,040	W/mK	PHI 0,041 W/mK
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projected X  
projected X

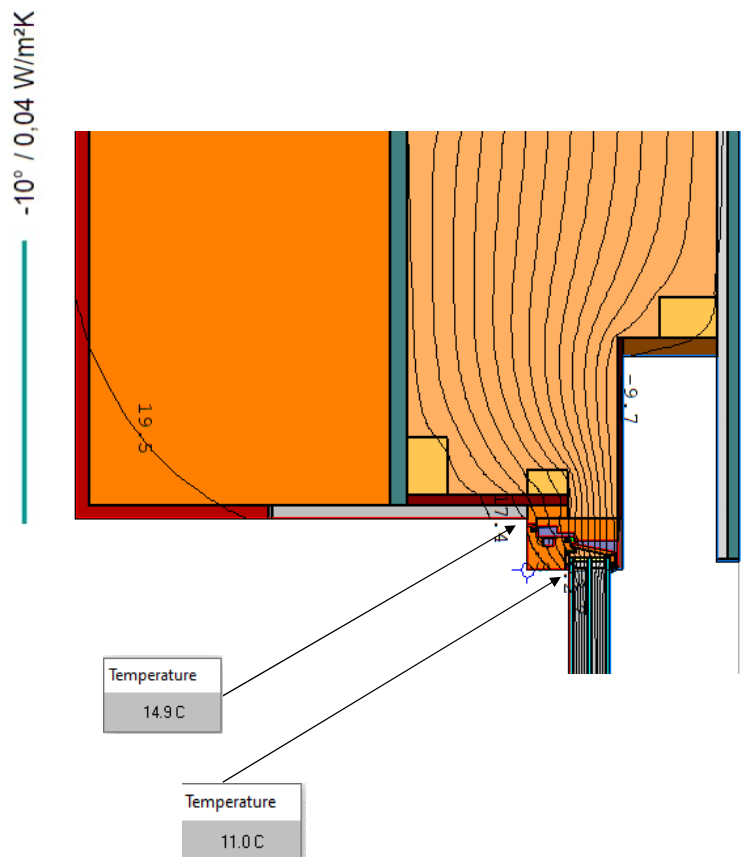
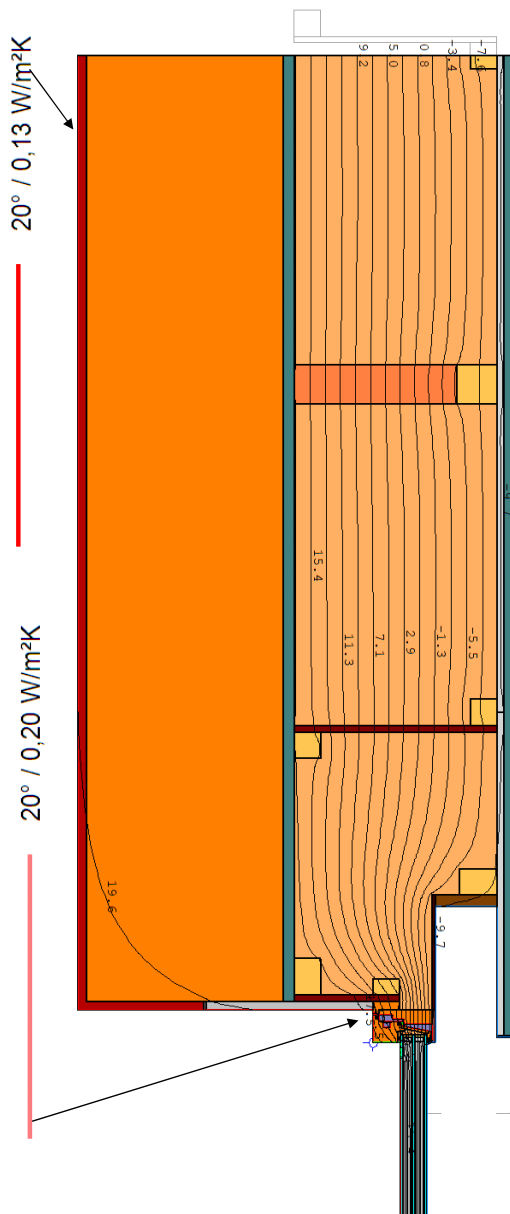
PHI				
Boundary Conditions	$R_s$	$\theta$	$R_s$	$\theta$
	0,13	20,00	0,25	20,00
	0,13	20,00	0,20	20,00
	0,04	-10,00	0,04	-10,00
Psi-value			$fR_{Si}$	


lowest interior temperature:

$f_{RSI}$  at 20 °C / -10 °C

11,0°C
0,70 > 0,7 requirement fulfilled

## Isotherms:



Date	11.02.2025
Signature	

# smartwin solar HPL in smartshell reno without "Keilleiste"

$U_{1D}$ Wall	0,107	W/m <sup>2</sup> K
$U_{2D}$ Window	0,813	W/m <sup>2</sup> K
$U_{2D}$	0,301	W/m <sup>2</sup> K

Length S1	1,227	m
Length S2	0,400	m
Total length	1,627	m

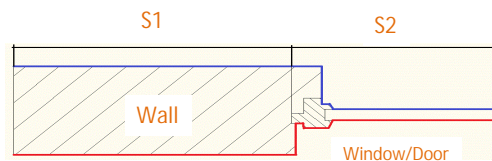
$L_{1D}$	0,456	W/mK
$L_{2D}$	0,490	W/mK

$\Psi_e$  0,034 W/mK PHI 0,025+Keilleiste

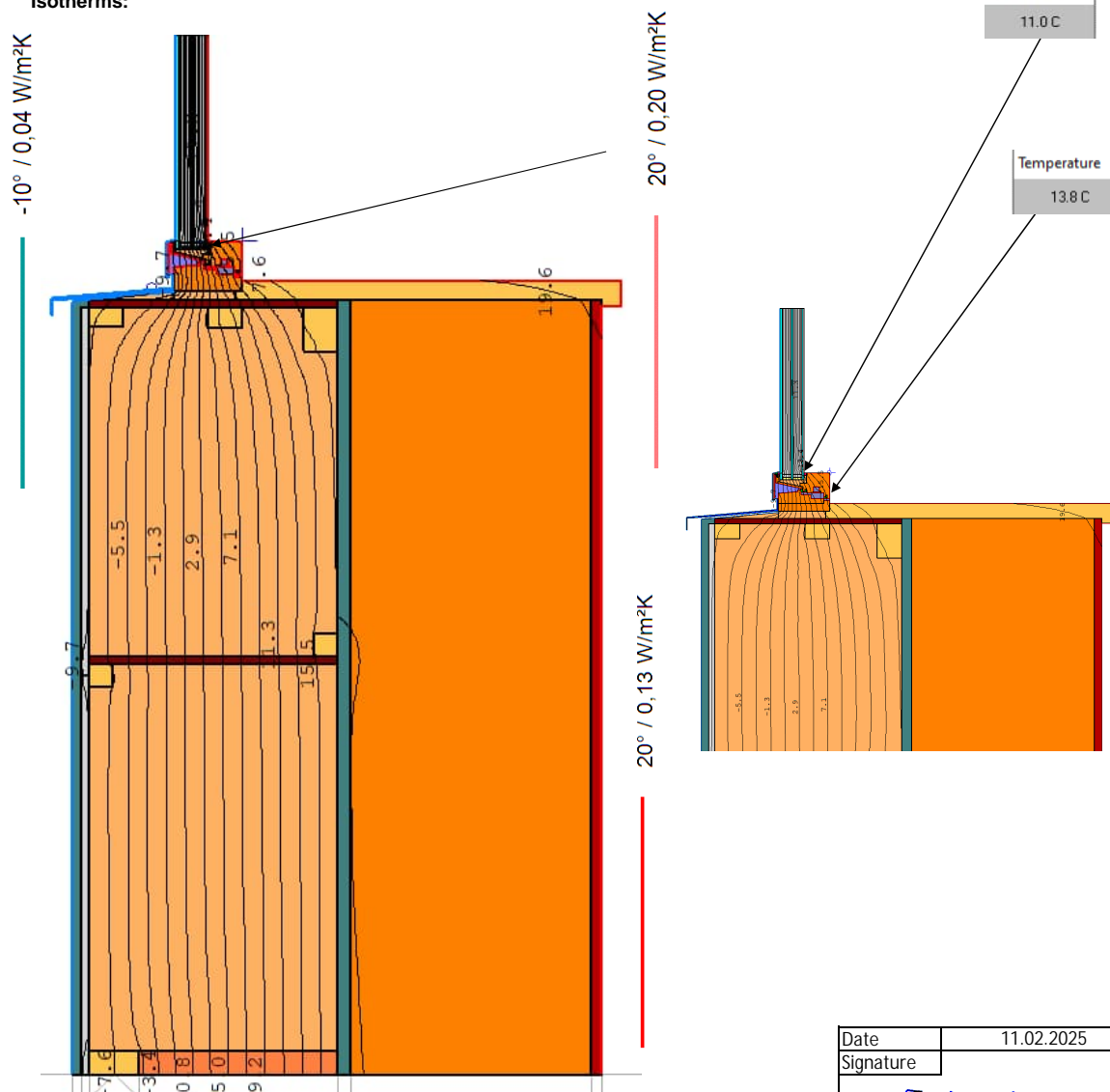
lowest interior temperature:  
 $f_{RSI\ at}$  20 °C / -10 °C

projected X  
projected X

PHI				
Boundary Conditions	$R_s$	$\theta$	$R_s$	$\theta$
—	0,13	20,00	0,25	20,00
—	0,13	20,00	0,20	20,00
—	0,04	-10,00	0,04	-10,00
Psi-value			$f_{RSI}$	



## Isotherms:



Date	11.02.2025
Signature	<i>F. Kuhn</i>



smartwin solar HPL in smartshell reno  
Balkontüre

$U_{1D}$ Wall	0,101	W/m <sup>2</sup> K
$U_{2D}$ Window	0,793	W/m <sup>2</sup> K
$U_{2D}$	0,241	W/m <sup>2</sup> K

Length S1	1,834	m
Length S2	0,400	m
Total length	2,234	m

$L_{1D}$	0,502	W/mK
$L_{2D}$	0,537	W/mK

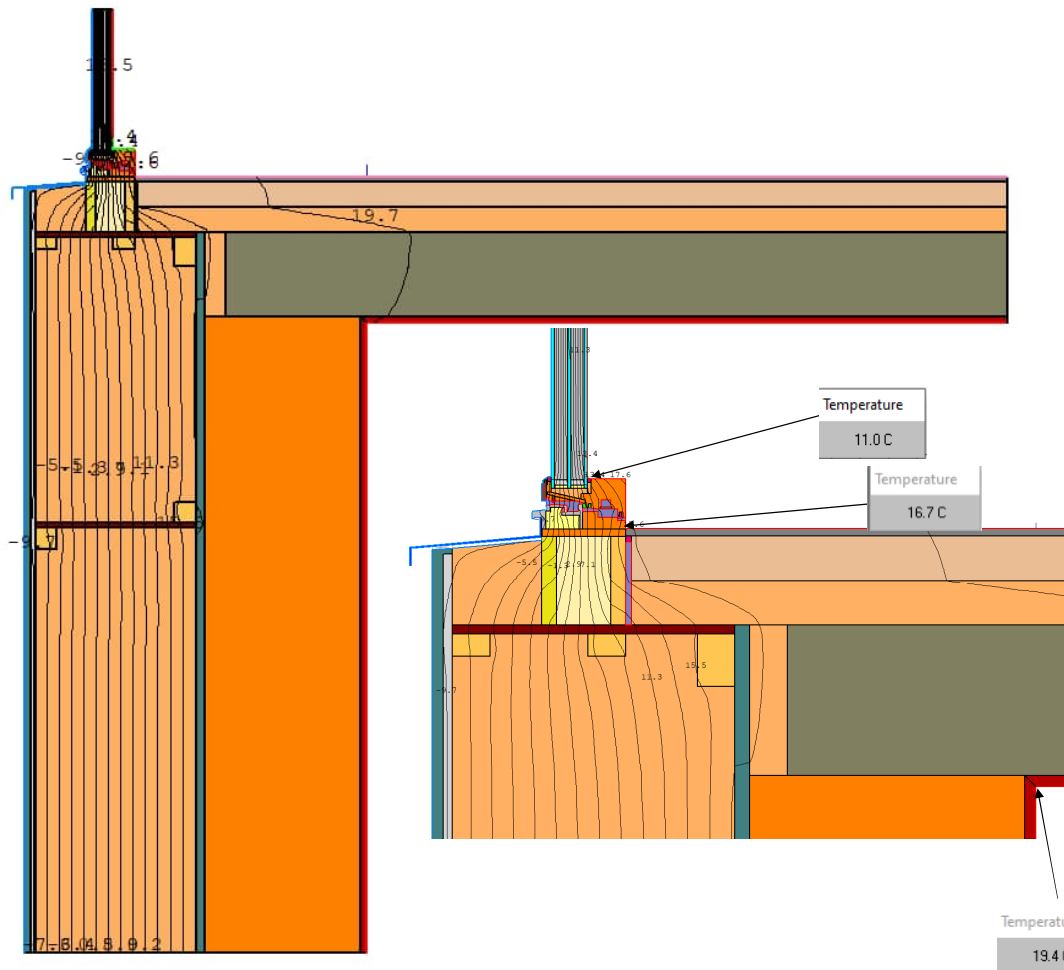
$\Psi_e$  0,036 W/mK 0,032 bei 0,04 statt 0,11

lowest interior temperature:  
 $f_{RSi}$  at 20 °C / -10 °C

11,0°C
0,70 > 0,7 requirement fulfilled

#### Isotherms:

Achtung: Für die Montage der BT und HT werden unten 10 cm Freiraum benötigt. Dieses Stück Perimeterdämmung nachträglich anbringen.



Date	11.02.2025
Signature	F. Ecker



smartwin solar HPL in smartshell reno  
Bodenplatte

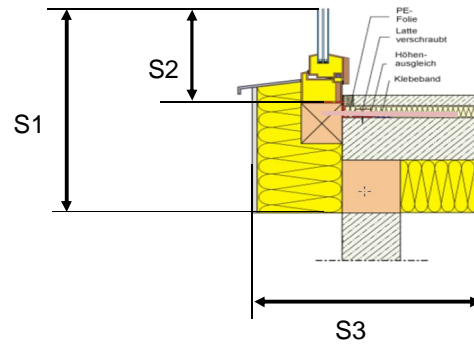
L 2D TOTAL	0,920	W/m
L 2D WINDOW	0,318	W/m
L 2Dground	0,706	W/mK
U <sub>1D</sub> Wall	0,106	W/m²K

custom length = 1000  
custom length = 1000  
custom length = 1000

Length S1	0,709	m
Length S2	0,400	m

$\Psi_e$  -0,137 W/(mK)  
PHI -0,137 W/m

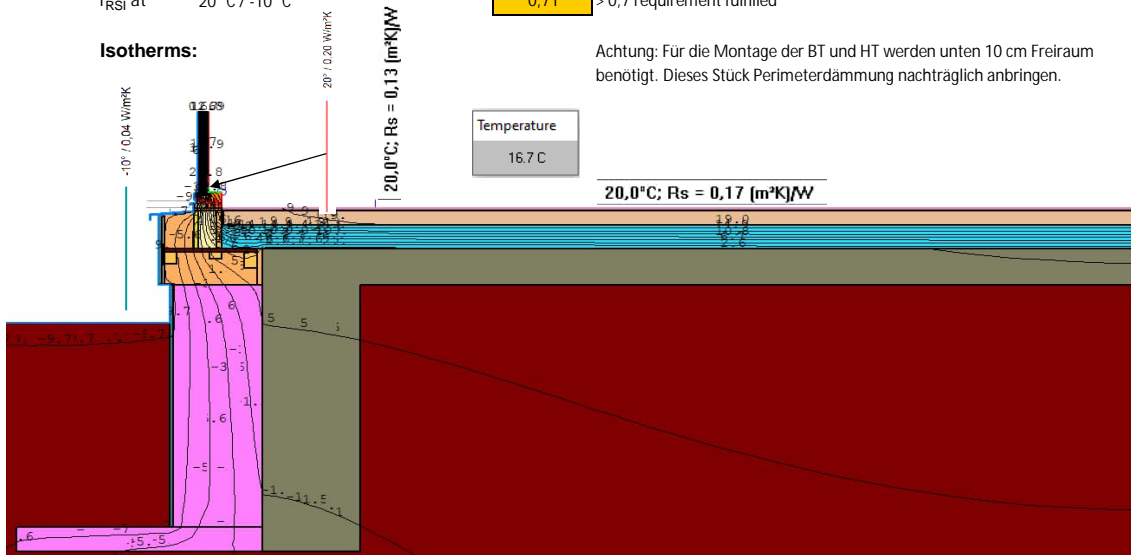
PHI				
Boundary Conditions	R <sub>s</sub>	$\theta$	R <sub>s</sub>	$\theta$
—	0,13	20,00	0,25	20,00
—	0,17	20,00	0,25	20,00
—	0,13	-10,00	0,04	-10,00
—	0,17	-5,00	0,04	-5,00
—	0,13	-5,00	0,04	-5,00
Psi-value			fR <sub>si</sub>	



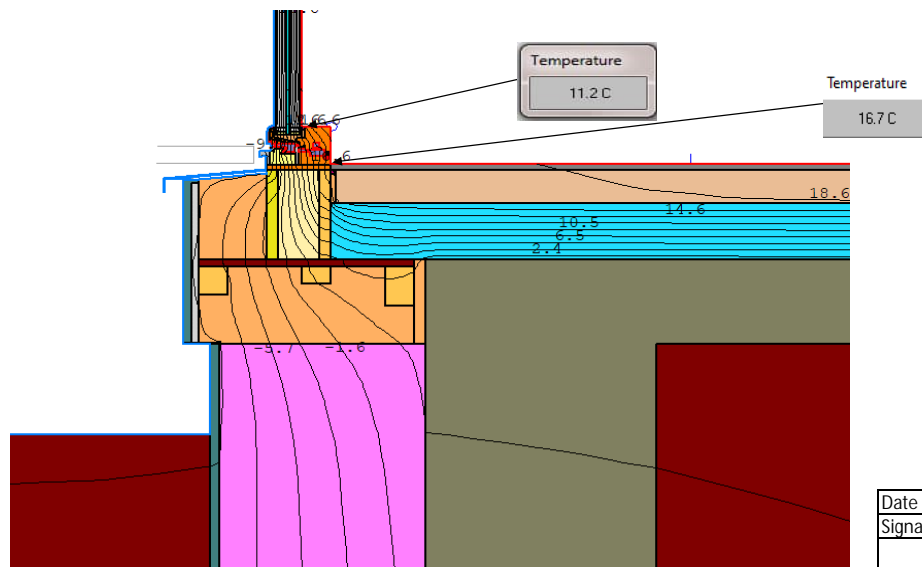
lowest interior temperature:  
fR<sub>si</sub> at 20 °C / -10 °C

11,2°C
0,71 > 0,7 requirement fulfilled

Isotherms:



Achtung: Für die Montage der BT und HT werden unten 10 cm Freiraum benötigt. Dieses Stück Perimeterdämmung nachträglich anbringen.



Date	11.02.2025
Signature	F. F. F.



smartwin solar HPL in smartshell reno V2  
Bodenplatte

L 2D TOTAL	0,920	W/m
L 2D WINDOW	0,318	W/m
L 2Dground	0,706	W/mK
U <sub>1D</sub> Wall	0,106	W/m²K

custom length = 1000  
custom length = 1000  
custom length = 1000

Length S1	0,709	m
Length S2	0,400	m

$\Psi_e$  -0,136 W/(mK)  
PHI -0,131 W/m

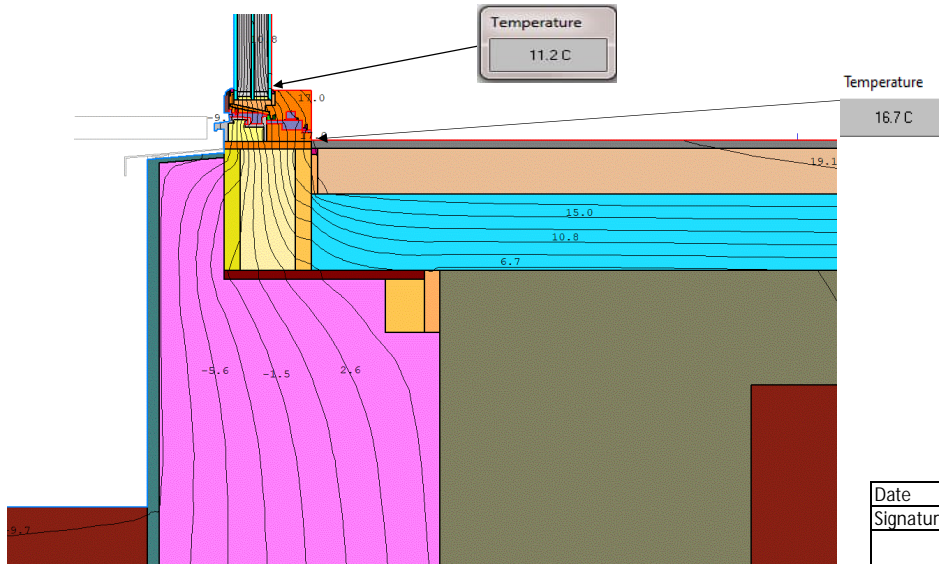
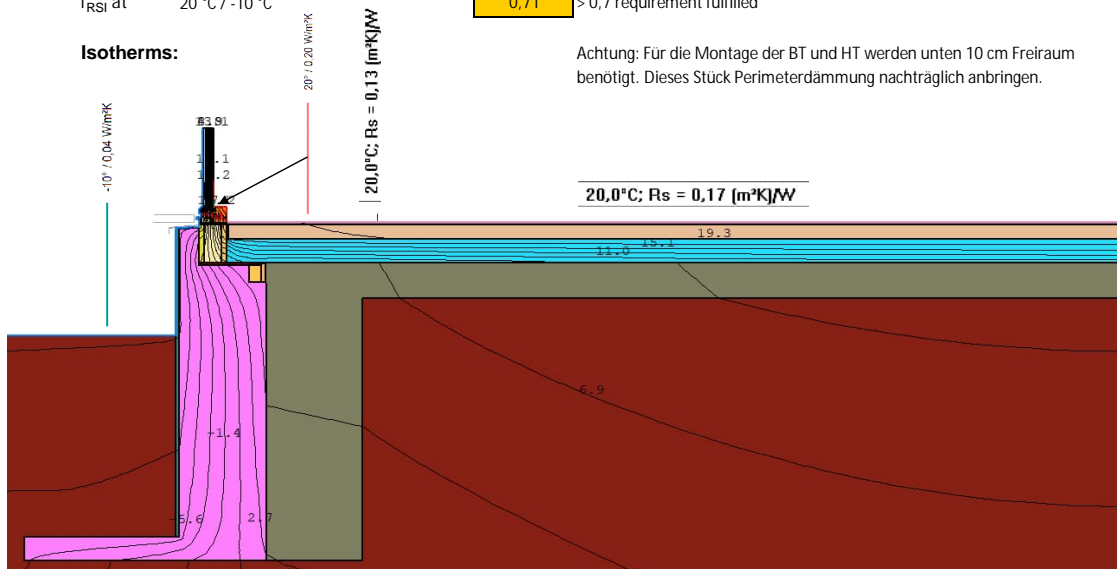
PHI				
Boundary Conditions	R <sub>s</sub>	$\theta$	R <sub>s</sub>	$\theta$
	0,13	20,00	0,25	20,00
	0,17	20,00	0,25	20,00
	0,13	-10,00	0,04	-10,00
	0,17	-5,00	0,04	-5,00
	0,13	-5,00	0,04	-5,00
Psi-value			fR <sub>si</sub>	

lowest interior temperature:  
fR<sub>si</sub> at 20 °C / -10 °C

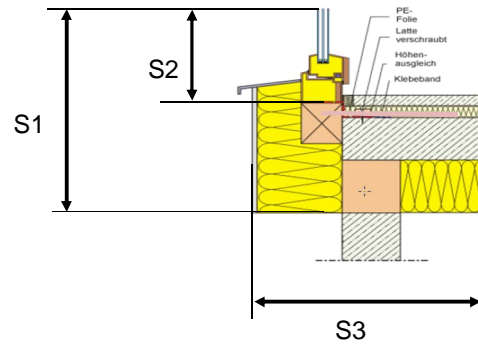
11,2°C
0,71 > 0,7 requirement fulfilled

**Isotherms:**

Achtung: Für die Montage der BT und HT werden unten 10 cm Freiraum benötigt. Dieses Stück Perimeterdämmung nachträglich anbringen.



Date	11.02.2025
Signature	





# smartwin solar HPL in smartshell reno Terrassentüre gegen unbeheizten Keller

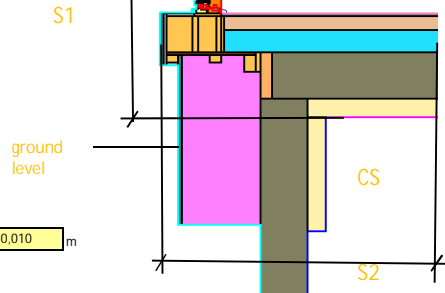
$\Phi_{\text{total}}$	21,779	W/mK	custom Length = 40 (1000/25)
$\Phi_{\text{window}}$	7,959	W/mK	custom Length = 40 (1000/25)

$U_1$ EW	0,106	W/m²K
$U_2$ CS	0,157	W/m²K
Length S1	0,839	m
Length S2	4,422	m

$\Psi_{\text{ew}}$	-0,022	W/mK
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Korrekturmass Einbau:

0,010 m



Exterior Erdr < 1 m -5 0.04	-5,000	0,040
Exterior   Außen	-5,000	0,040
Int. flux down   Innen abwärts	20,000	0,170
Interior   Innen	20,000	0,130
Unheated auf 2.5 0.17	2,500	0,170
Unheated hori 2.5 0.13	2,500	0,130
Adiabatic   Adiabat		

Bestimmung der minimalen Oberflächentemperatur und  $f_{Rsi}$

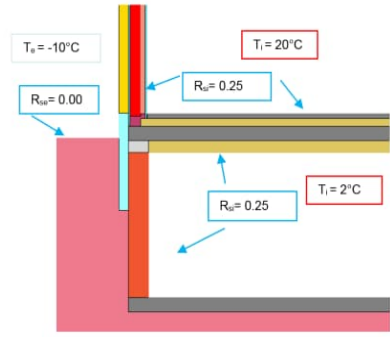
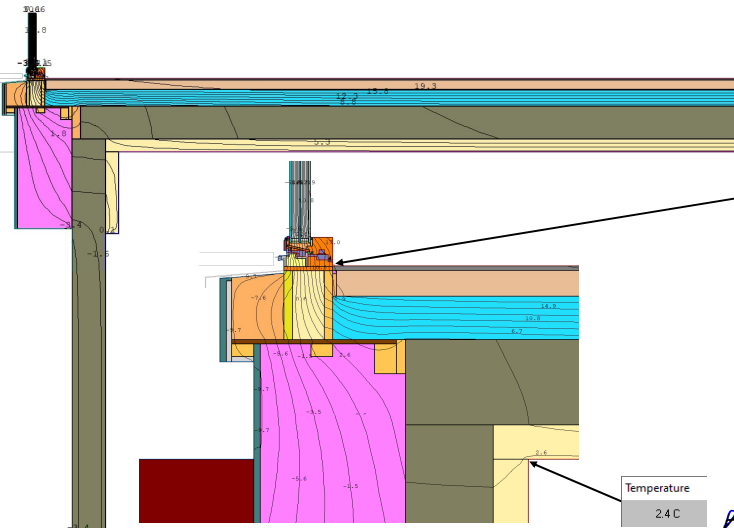
Achtung: Für die Montage der BT und HT werden unten 10 cm Freiraum benötigt. Dieses Stück Perimeterdämmung nachträglich anbringen.

lowest interior temperature:  
 $f_{Rsi}$  at 20 °C / -10 °C

16,3°C
0,85

> 0,7 requirement fulfilled

## Isotherms:



F. Eubler

Project	smartshell reno
Date	11.02.2025





# smartwin solar HPL in smartshell reno Terrassentüre gegen unbeheizten Keller Variante 2

$\Phi_{\text{total}}$	21,822	W/mK	custom Length = 40 (1000/25)
$\Phi_{\text{window}}$	7,959	W/mK	custom Length = 40 (1000/25)
$U_1$ EW	0,106	W/m²K	
$U_2$ CS	0,157	W/m²K	
Length S2	0,839	m	
Length S3	4,422	m	

$\Psi_{\text{ew}}$  -0,020 W/mK

Achtung: Für die Montage der BT und HT werden unten 10 cm Freiraum benötigt. Dieses Stück Perimeterdämmung nachträglich anbringen.

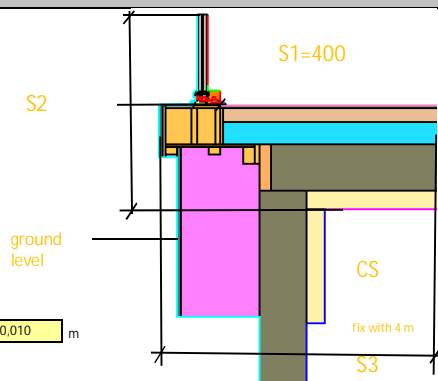
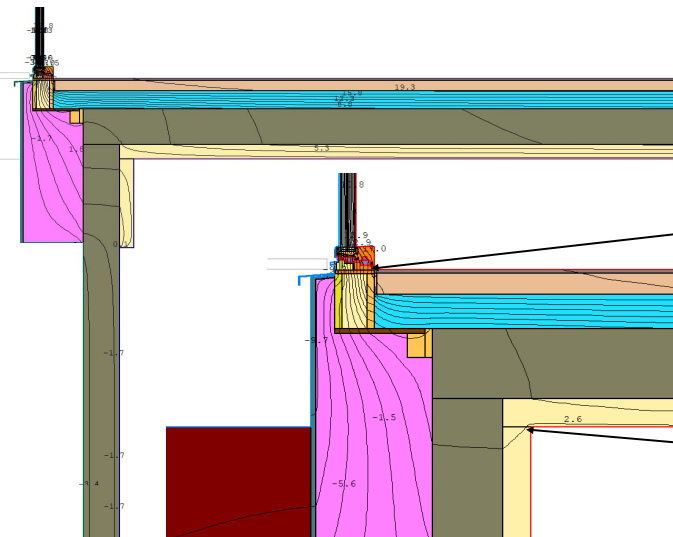
lowest interior temperature:

$f_{Rsi}$  at 20 °C / -10 °C

16,3°C
0,85

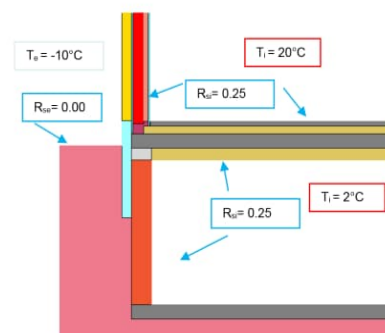
> 0,7 requirement fulfilled

## Isotherms:



Exterior Erdr < 1 m -5 0.04	-5,000	0,040
Exterior   Außen	-5,000	0,040
Int. flux down   Innen abwärts	20,000	0,170
Interior   Innen	20,000	0,130
Unheated auf 2.5 0.17	2,500	0,170
Unheated hori 2.5 0.13	2,500	0,130
Adiabatic   Adiabatic		

## Bestimmung der minimalen Oberflächentemperatur und $f_{Rsi}$



Temperature  
16.3 °C

Temperature  
2.4 °C

F. Eubank

Project	smartshell reno
Date	11.02.2025