

## Back to Earth SW Ltd

7 Tuns Lane  
Silverton, Exeter  
Devon. EX5 4HY

### Project Information

Reference

Date 14 September 2018

### Construction Type

Element : Wall - 0 Spec generator copies

Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)	Pitch (°)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.130		
Brick inner leaf	225.0	0.560	0.402		
Clay or silt	5.0	1.499	0.003		
UdiTHERM	40.0	0.039	1.000		L:0 0.000W/m <sup>2</sup> K
Multigrund	4.0	0.550	0.007		
Inside surface resistance	-	-	0.130		

**Total thickness 274.0mm**

**U-value = 0.60W/m<sup>2</sup>K**

U-value, Combined Method : 0.598W/m<sup>2</sup>K (upper/lower limit 1.672 / 1.672m<sup>2</sup>K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

### Correction factors

Mechanical fasteners :-

Fixings

Alpha : 0.00 per m lambda f : 0.0010W/mK nf : 6.000 per m<sup>2</sup> Af : 0.000mm<sup>2</sup> Recess : 0.0mm

Delta Uf for UdiTHERM : 0.0000

nf = fasteners per m<sup>2</sup> Af = fasteners cross-sectional area

Air gaps, Delta Ug = 0.000W/m<sup>2</sup>K

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	-	-	0.130	-	-
Brick inner leaf	225.0	0.560	0.402	50.00	11.25
Clay or silt	5.0	1.499	0.003	250.00	1.25
UdiTHERM	40.0	0.039	1.000	25.00	1.00
Multigrund	4.0	0.550	0.007	600.00	2.40
Inside surface resistance	-	-	0.130	-	-
<b>Total thickness</b>	<b>274.0mm</b>				

Structure element : Wall  
 Condensation calculations performed in accordance with BS5250:2011

**Condensation is occurring at the following layers interfaces:-**

Interface 1 : Clay or silt / UdiTHERM

Month	Int (C°)	Int (%RH)	Ext (C°)	Ext (%RH)	Interface 1 Gc (Kg/m <sup>2</sup> )	Ma (Kg/m <sup>2</sup> )
Jan	21.00	54.70	3.50	86.00	0.15518	0.18615
Feb	21.00	53.80	3.80	82.50	0.01942	0.20557
Mar	21.00	53.90	5.70	80.00	-0.06749	0.13808
Apr	21.00	54.40	8.00	77.00	-0.17174	0.00000
May	21.00	57.90	11.30	77.00	0.00000	0.00000
Jun	21.00	62.20	14.40	76.00	0.00000	0.00000
Jul	21.00	66.80	16.50	76.50	0.00000	0.00000
Aug	21.00	67.40	16.10	78.50	0.00000	0.00000
Sep	21.00	64.60	13.80	81.50	0.00000	0.00000
Oct	21.00	60.80	10.70	84.00	0.00000	0.00000
Nov	21.00	56.50	6.40	85.50	0.00000	0.00000
Dec	21.00	55.50	4.50	86.50	0.03097	0.03097

Gc = Monthly moisture accumulation per area at an interface  
 Ma = Accumulated moisture content per area at an interface

Peak accumulated moisture content per area at interface (Ma) = 0.20557 Kg/m<sup>2</sup>

Annual moisture accumulation = 0.00000 Kg/m<sup>2</sup>

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**Thermal Mass Details**

	Thickness assessed (actual) (mm)	Density (kg/m <sup>3</sup> )	Specific heat capacity (J/kgK)	Heat capacity (kJ/m <sup>2</sup> K)
Brick inner leaf	0.0 (225.0)	1700.0	840.0	0.0
Clay or silt	0.0 (5.0)	1500.0	2085.0	0.0
UdiTHERM	0.0 (40.0)	140.0	2100.0	0.0
Multigrund	4.0 (4.0)	1300.0	1000.0	5200000.0
Total				5200000.0
kappa value				5.2000
Limiting condition:	insulation			

Admittance : 1.07 W/m<sup>2</sup>K    Decrement : 0.14 factor    Decrement delay : -10.81 hours

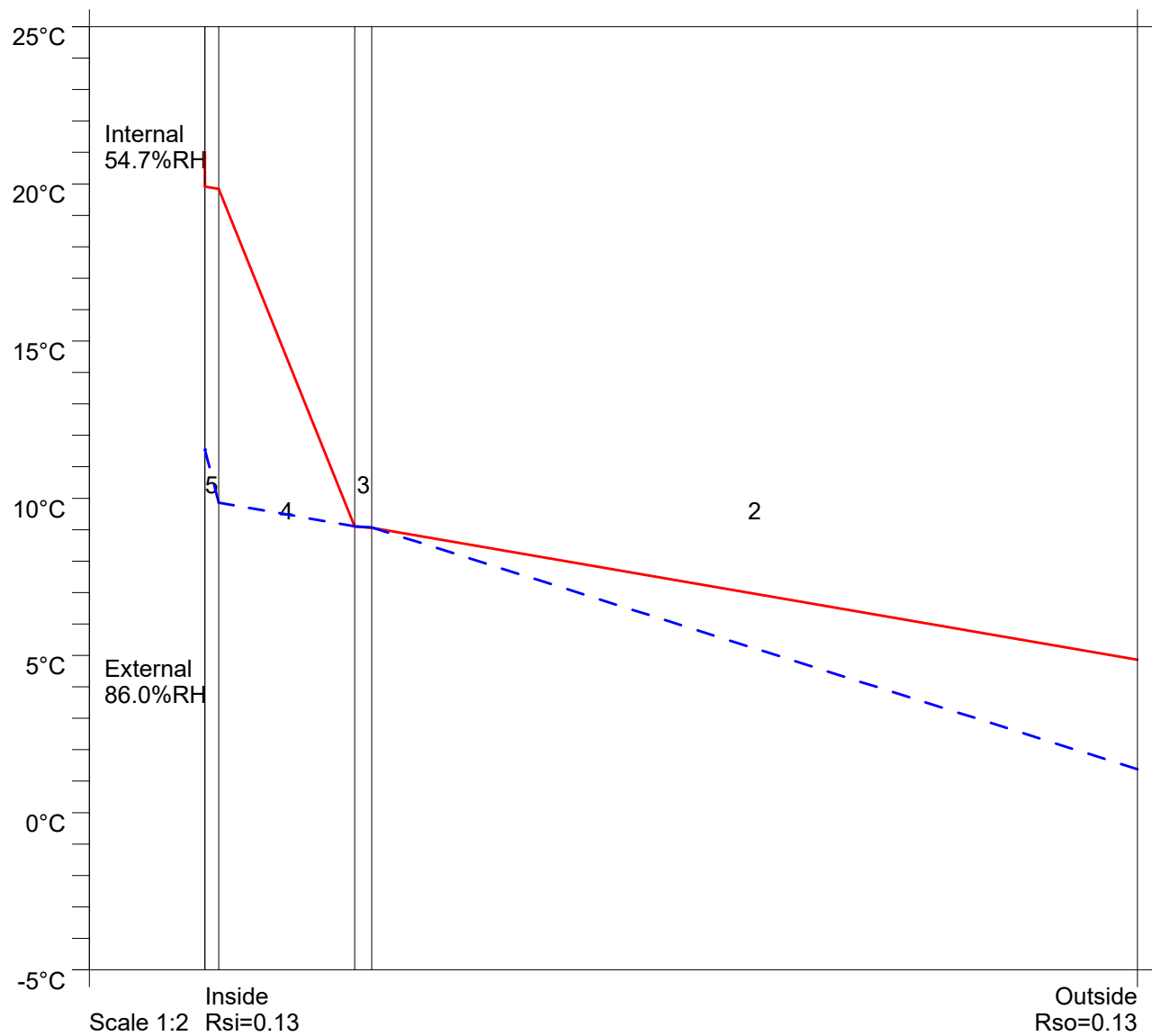
**Condensation Risk Analysis (no account taken of thermal bridges)**

**3 - Dwellings with low occupancy**

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21.0C 54.7%	21.0C 53.8%	21.0C 53.9%	21.0C 54.4%	21.0C 57.9%	21.0C 62.2%	21.0C 66.8%	21.0C 67.4%	21.0C 64.6%	21.0C 60.8%	21.0C 56.5%	21.0C 55.5%
3.5C 86.0%	3.8C 82.5%	5.7C 80.0%	8.0C 77.0%	11.3C 77.0%	14.4C 76.0%	16.5C 76.5%	16.1C 78.5%	13.8C 81.5%	10.7C 84.0%	6.4C 85.5%	4.5C 86.5%

	Interface Temp. °C	Dewpoint Temp. °C	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m <sup>2</sup> )	Peak Buildup (g/m <sup>2</sup> )	Condensation
1 Outside surface resistance							
2 Brick inner leaf	4.9	1.4	0.67	0.86			No
3 Clay or silt	9.1	9.1	1.15	1.15			No
4 UdiTHERM	9.1	9.1	1.16	1.16	155 in Jan	206 in Feb	Yes
5 Multigrund	19.8	9.9	1.22	2.31			No
6 Inside surface resistance	19.9	11.5	1.36	2.32			No

Worst case internal / external conditions for graph : 21.0°C @ 54.7%RH / 3.5°C @ 86.0%RH



**Condensation Risk Analysis (no account taken of thermal bridges)**

**3 - Dwellings with low occupancy**

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21.0C 54.7%	21.0C 53.8%	21.0C 53.9%	21.0C 54.4%	21.0C 57.9%	21.0C 62.2%	21.0C 66.8%	21.0C 67.4%	21.0C 64.6%	21.0C 60.8%	21.0C 56.5%	21.0C 55.5%
3.5C 86.0%	3.8C 82.5%	5.7C 80.0%	8.0C 77.0%	11.3C 77.0%	14.4C 76.0%	16.5C 76.5%	16.1C 78.5%	13.8C 81.5%	10.7C 84.0%	6.4C 85.5%	4.5C 86.5%

	Interface Temp. °C	Dewpoint Temp. °C	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m <sup>2</sup> )	Peak Buildup (g/m <sup>2</sup> )	Condensation
1 Outside surface resistance							
2 Brick inner leaf	16.8	12.4	1.44	1.92			No
3 Clay or silt	17.9	14.0	1.59	2.05			No
4 UdiTHERM	17.9	14.2	1.61	2.06	155 in Jan	206 in Feb	Yes
5 Multigrund	20.7	14.3	1.63	2.44			No
6 Inside surface resistance	20.7	14.6	1.66	2.44			No

Worst case internal / external conditions for graph : 21.0°C @ 66.8%RH / 16.5°C @ 76.5%RH

