Back to Earth SW Ltd
7 Tuns Lane
Silverton
Exeter
EX5 4HY

Project Information
Reference
Date 4 December 2023

Construction Type
Element : Wall - Wall-masonry-solid-external-render
Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Pitch (º)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.040		
Baumit RK70N	5.0	0.900	0.006		
Beltermo Ultra	80.0	0.042	1.900		L:0 0.000W/m²K
Baumit RK38/39	18.0	0.900	0.020		
Brick outer leaf	105.0	0.770	0.136		
Brick inner leaf	105.0	0.560	0.188		
Render, lime-sand	25.0	0.800	0.031		
Inside surface resistance	-	-	0.130		
Total thickness	**338.0mm**				

U-value = 0.41W/m²K

U-value, Combined Method : 0.408W/m²K (upper/lower limit 2.451 / 2.451m²K/W, dUf 0.0090, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

Correction factors
Mechanical fasteners :-
Insulation Fixings
Point thermal transmittance : 0.0010W/K nf : 9.000 per m²
Delta Uf for Beltermo Ultra : 0.0090
nf = fasteners per m² Af = fasteners cross-sectional area
Air gaps, Delta Ug = 0.000W/m²K

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	-	-	0.040	-	-
Baumit RK70N	5.0	0.900	0.006	50.00	0.25
Beltermo Ultra	80.0	0.042	1.900	25.00	2.00
Baumit RK38/39	18.0	0.900	0.020	50.00	0.90
Brick outer leaf	105.0	0.770	0.136	50.00	5.25
Brick inner leaf	105.0	0.560	0.188	50.00	5.25
Render, lime-sand	25.0	0.800	0.031	50.00	1.25
Inside surface resistance	-	-	0.130	-	-
Total thickness	**338.0mm**				

Structure element : Wall
Condensation calculations performed in accordance with BS5250:2021

Condensation is occuring at the following layers interfaces:-

Month	Int (C°)	Int (%RH)	Ext (C°)	Ext (%RH)
Jan	21.00	45.10	3.10	85.00
Feb	21.00	44.60	3.10	83.50
Mar	21.00	45.40	5.20	79.50
Apr	21.00	46.70	7.60	75.50
May	21.00	51.40	10.60	76.00
Jun	21.00	57.20	14.00	74.50
Jul	21.00	61.90	15.80	75.00
Aug	21.00	62.60	15.40	77.50
Sep	21.00	58.60	13.20	79.50
Oct	21.00	53.90	10.00	83.00
Nov	21.00	48.00	6.00	84.00
Dec	21.00	46.40	4.20	85.50

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) = 0.00000 Kg/m²

Annual moisture accumulation = 0.00000 Kg/m²

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Thermal Mass Details

	Thickness assessed (actual) (mm)	Density (kg/m³)	Specific heat capacity (J/kgK)	Heat capacity (kJ/m²K)
Baumit RK70N	0.0 (5.0)	1300.0	1000.0	0.0
Beltermo Ultra	0.0 (80.0)	180.0	2100.0	0.0
Baumit RK38/39	0.0 (18.0)	1300.0	1000.0	0.0
Brick outer leaf	0.0 (105.0)	1700.0	840.0	0.0
Brick inner leaf	75.0 (105.0)	1700.0	840.0	107100000.0
Render, lime-sand	25.0 (25.0)	1600.0	1000.0	40000000.0
Total				147100000.0
kappa value				147.1000
Limiting condition:	100mm in			

Admittance : 4.37 W/m²K Decrement : 0.11 factor Decrement delay : -12.85 hours

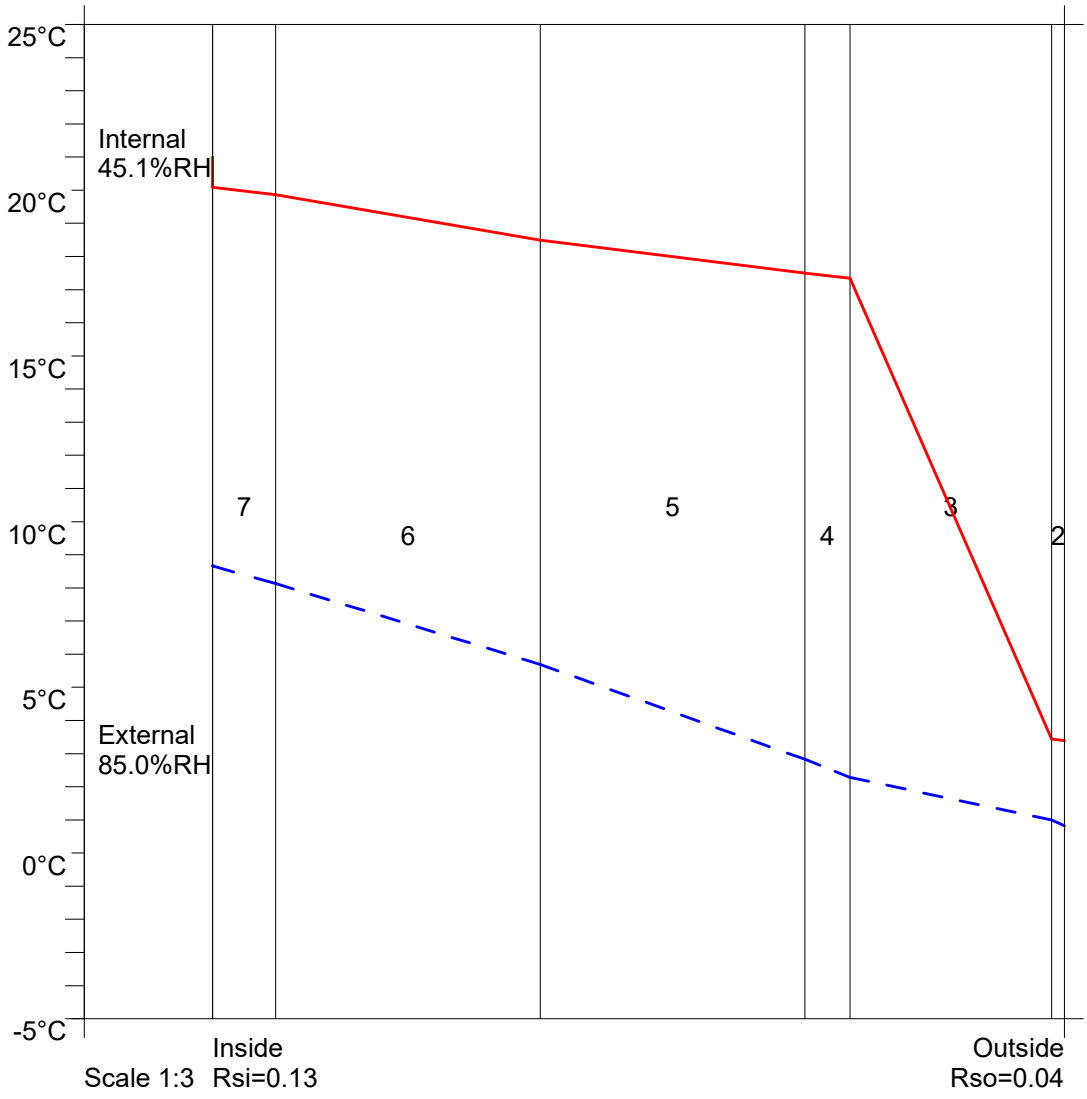
Condensation Risk Analysis (no account taken of thermal bridges)

2 - Offices, shops and dwellings with low occupancy

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21.0C 45.1%	21.0C 44.6%	21.0C 45.4%	21.0C 46.7%	21.0C 51.4%	21.0C 57.2%	21.0C 61.9%	21.0C 62.6%	21.0C 58.6%	21.0C 53.9%	21.0C 48.0%	21.0C 46.4%
3.1C 85.0%	3.1C 83.5%	5.2C 79.5%	7.6C 75.5%	10.6C 76.0%	14.0C 74.5%	15.8C 75.0%	15.4C 77.5%	13.2C 79.5%	10.0C 83.0%	6.0C 84.0%	4.2C 85.5%

	Interface Temp. ºC	Dewpoint Temp. ºC	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m²)	Peak Buildup (g/m²)	Conden-sation
1 Outside surface resistance	3.4	0.8	0.65	0.78			No
2 Baumit RK70N	3.4	1.0	0.66	0.78			No
3 Beltermo Ultra	17.3	2.3	0.72	1.98			No
4 Baumit RK38/39	17.5	2.8	0.75	2.00			No
5 Brick outer leaf	18.5	5.7	0.91	2.13			No
6 Brick inner leaf	19.9	8.1	1.08	2.32			No
7 Render, lime-sand	20.1	8.7	1.12	2.35			No
8 Inside surface resistance							

Worst case internal / external conditions for graph : 21.0°C @ 45.1%RH / 3.1°C @ 85.0%RH



Condensation Risk Analysis (no account taken of thermal bridges)

2 - Offices, shops and dwellings with low occupancy

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21.0C 45.1%	21.0C 44.6%	21.0C 45.4%	21.0C 46.7%	21.0C 51.4%	21.0C 57.2%	21.0C 61.9%	21.0C 62.6%	21.0C 58.6%	21.0C 53.9%	21.0C 48.0%	21.0C 46.4%
3.1C 85.0%	3.1C 83.5%	5.2C 79.5%	7.6C 75.5%	10.6C 76.0%	14.0C 74.5%	15.8C 75.0%	15.4C 77.5%	13.2C 79.5%	10.0C 83.0%	6.0C 84.0%	4.2C 85.5%

	Interface Temp. ºC	Dewpoint Temp. ºC	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m²)	Peak Buildup (g/m²)	Conden-sation
1 Outside surface resistance	15.9	11.4	1.35	1.80			No
2 Baumit RK70N	15.9	11.4	1.35	1.81			No
3 Beltermo Ultra	19.9	11.7	1.37	2.33			No
4 Baumit RK38/39	20.0	11.8	1.39	2.33			No
5 Brick outer leaf	20.3	12.6	1.45	2.38			No
6 Brick inner leaf	20.7	13.3	1.52	2.44			No
7 Render, lime-sand	20.7	13.4	1.54	2.45			No
8 Inside surface resistance							

Worst case internal / external conditions for graph : 21.0°C @ 61.9%RH / 15.8°C @ 75.0%RH