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 (m²K/W)	Pitch (º)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.130		
Airspace, heat flow horizontal, 50 mm thick	50.0	-	0.000		
Ampatex Aero	-	-	-		
Beltermo Ultra	100.0	0.042	2.350		L:0 0.000W/m²K
Beltermo Kombi	120.0	0.038	3.150		L:0 0.000W/m²K
Ampatex Solero	-	-	-		
Timber (500 kg/m³)	140.0	0.130	1.077		
Inside surface resistance	-	-	0.130		
Total thickness	**410.0mm**				

U-value = 0.15W/m²K

U-value, Combined Method : 0.152W/m²K (upper/lower limit 6.837 / 6.837m²K/W, dUf 0.0056, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

Correction factors
Mechanical fasteners :-
Warm pitched roof - insulation over rafters
Alpha : 0.80 per m lambda f : 17.0000W/mK nf : 9.000 per m² Af : 28.000mm² Recess : 20.0mm
Delta Uf for Beltermo Ultra : 0.0021
Warm pitched roof - insulation over rafters
Alpha : 0.80 per m lambda f : 17.0000W/mK nf : 9.000 per m² Af : 28.000mm² Recess : 20.0mm
Delta Uf for Beltermo Kombi : 0.0035
nf = fasteners per m² Af = fasteners cross-sectional area
Air gaps, Delta Ug = 0.000W/m²K

JPA Designer Version 6.04a1 031
Licensed to Back to Earth (SW) Ltd
C:\Users\chris\OneDrive\Documents\Miscellaneous calcs.JDP
© JPA Technical Literature Feb 2020
Calculations are based on manufacturers information and for default structures.

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m^2K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	-	-	0.130	-	-
Airspace, heat flow horizontal, 50 mm thick	50.0	-	0.000	-	0.00
Ampatex Aero	-	-	-	-	0.20
Beltermo Ultra	100.0	0.042	2.350	15.00	1.50
Beltermo Kombi	120.0	0.038	3.150	15.00	1.80
Ampatex Solero	-	-	-	-	25.00
Timber (500 kg/m^3)	140.0	0.130	1.077	250.00	35.00
Inside surface resistance	-	-	0.130	-	-
Total thickness	**410.0mm**				

JPA Designer Version 6.04a1 031
Licensed to Back to Earth (SW) Ltd
C:\Users\chris\OneDrive\Documents\Miscellaneous calcs.JDP

© JPA Technical Literature Feb 2020

Calculations are based on manufacturers information and for default structures.

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

Condensation is occuring at the following layers interfaces:-

Month	Int (C°)	Int (%RH)	Ext (C°)	Ext (%RH)
Jan	21.00	54.70	3.50	86.00
Feb	21.00	53.80	3.80	82.50
Mar	21.00	53.90	5.70	80.00
Apr	21.00	54.40	8.00	77.00
May	21.00	57.90	11.30	77.00
Jun	21.00	62.20	14.40	76.00
Jul	21.00	66.80	16.50	76.50
Aug	21.00	67.40	16.10	78.50
Sep	21.00	64.60	13.80	81.50
Oct	21.00	60.80	10.70	84.00
Nov	21.00	56.50	6.40	85.50
Dec	21.00	55.50	4.50	86.50

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

© JPA Technical Literature Feb 2020

Project Information
Reference
Date 14 September 2018

Thermal Mass Details

	Thickness assessed (actual) (mm)	Density (kg/m³)	Specific heat capacity (J/kgK)	Heat capacity (kJ/m²K)
Airspace, heat flow horizontal, 50 mm thick	0.0 (50.0)	1.2	1008.0	0.0
Ampatex Aero	0.0 (-)	300.0	850.0	0.0
Beltermo Ultra	0.0 (100.0)	180.0	2100.0	0.0
Beltermo Kombi	0.0 (120.0)	110.0	2100.0	0.0
Ampatex Solero	0.0 (-)	280.0	850.0	0.0
Timber (500 kg/m³)	100.0 (140.0)	500.0	1600.0	80000000.0
Total				80000000.0
kappa value				80.0000
Limiting condition:	100mm in			

Admittance : 2.16 W/m²K Decrement : 0.05 factor Decrement delay : -19.85 hours

© JPA Technical Literature Feb 2020

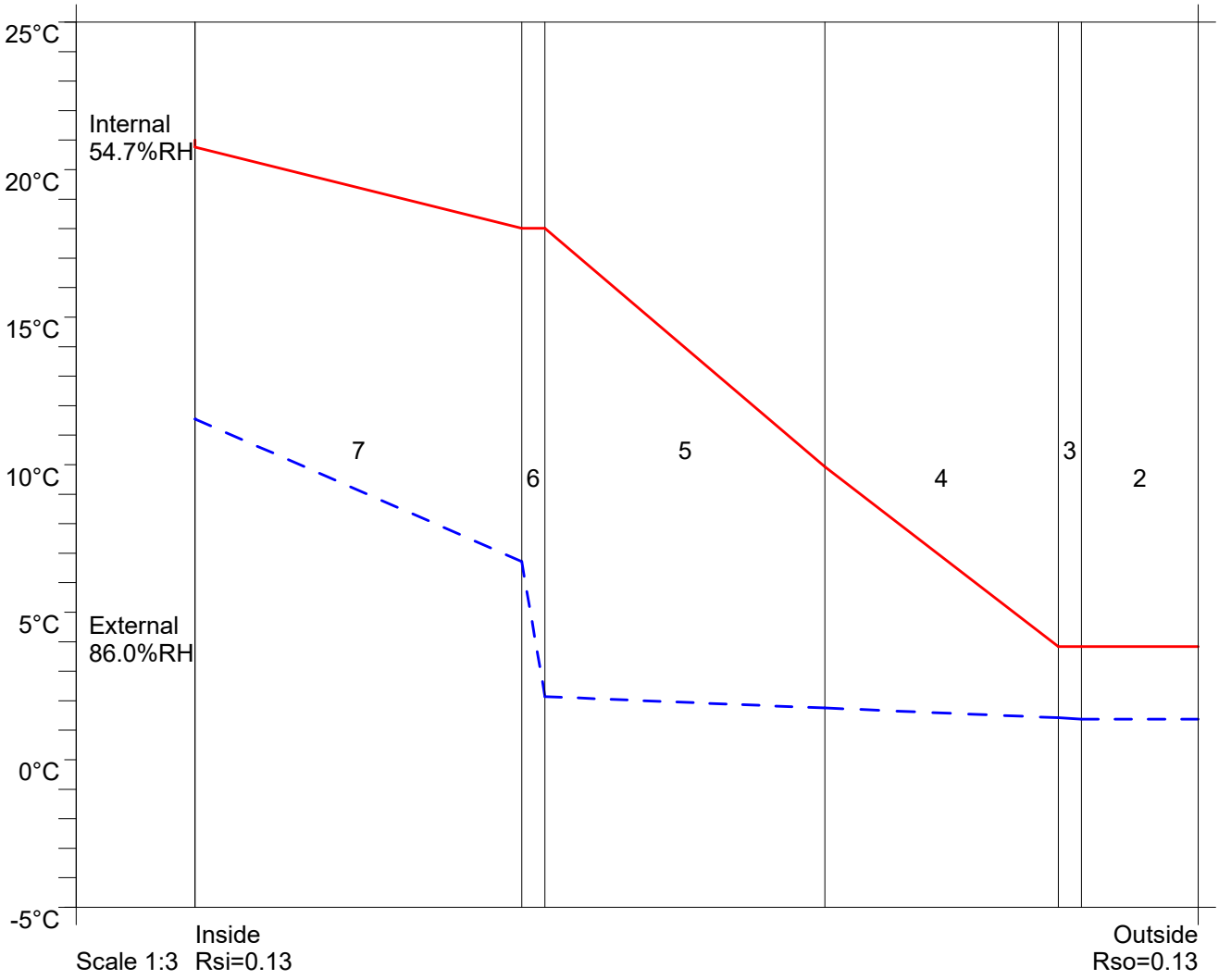
Condensation Risk Analysis (no account taken of thermal bridges)

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. 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	3.8	1.4	0.67	0.80			No
2 Airspace, heat flow horizontal, 50 mm thick	3.8	1.4	0.67	0.80			No
3 Ampatex Aero	3.8	1.4	0.68	0.80			No
4 Beltermo Ultra	9.9	1.8	0.69	1.22			No
5 Beltermo Kombi	18.0	2.1	0.71	2.06			No
6 Ampatex Solero	18.0	6.7	0.98	2.06			No
7 Timber (500 kg/m³)	20.8	11.5	1.36	2.45			No
8 Inside surface resistance							

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



JPA Designer Version 6.04a1 031
Licensed to Back to Earth (SW) Ltd
C:\Users\chris\OneDrive\Documents\Miscellaneous calcs.JDP
© JPA Technical Literature Feb 2020
Calculations are based on manufacturers information and for default structures.

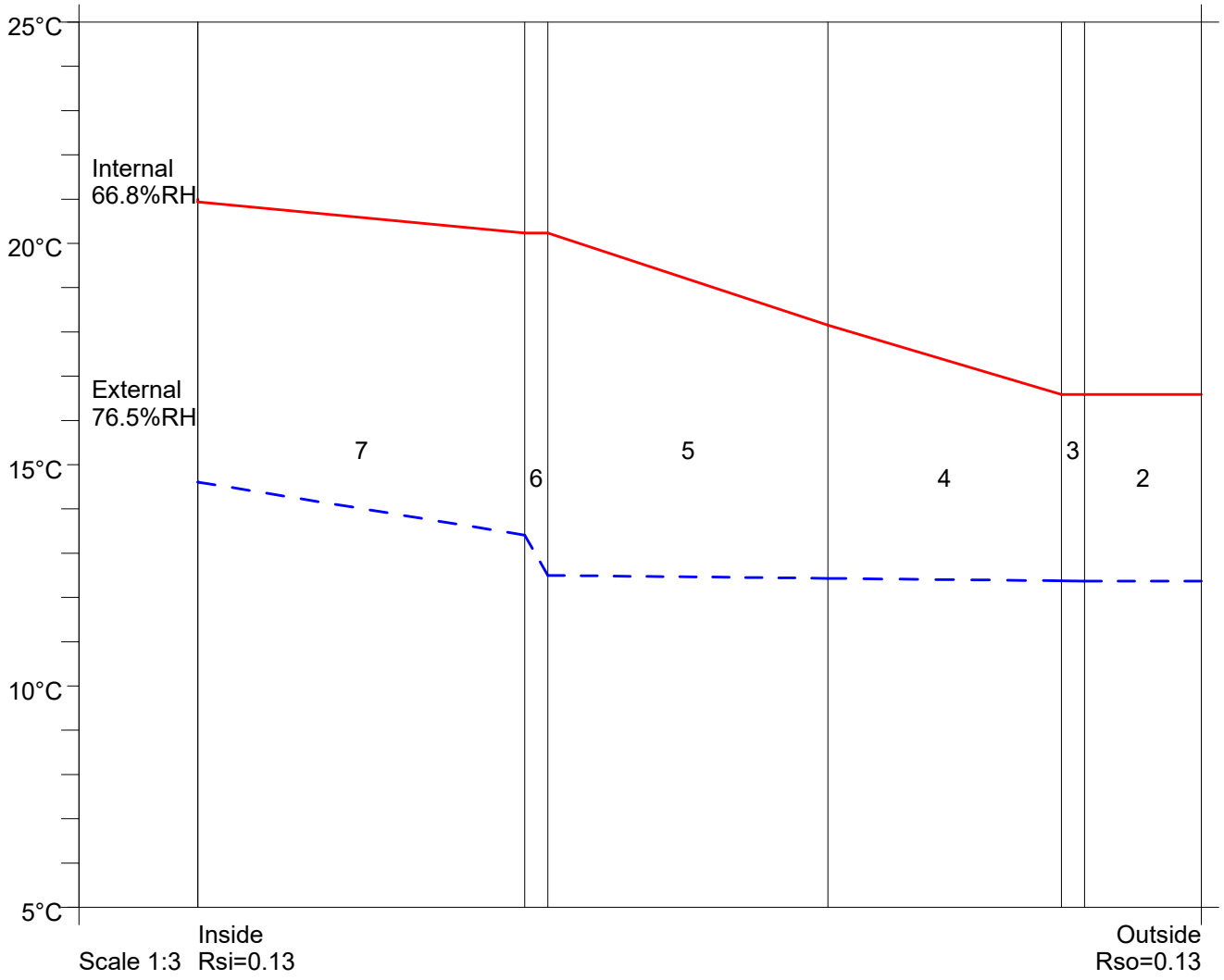
Condensation Risk Analysis (no account taken of thermal bridges)

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. 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	16.6	12.4	1.44	1.89			No
2 Airspace, heat flow horizontal, 50 mm thick	16.6	12.4	1.44	1.89			No
3 Ampatex Aero	16.6	12.4	1.44	1.89			No
4 Beltermo Ultra	18.2	12.4	1.44	2.08			No
5 Beltermo Kombi	20.2	12.5	1.45	2.37			No
6 Ampatex Solero	20.2	13.4	1.54	2.37			No
7 Timber (500 kg/m³)	20.9	14.6	1.66	2.48			No
8 Inside surface resistance							

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



JPA Designer Version 6.04a1 031
Licensed to Back to Earth (SW) Ltd
C:\Users\chris\OneDrive\Documents\Miscellaneous calcs.JDP
© JPA Technical Literature Feb 2020
Calculations are based on manufacturers information and for default structures.