

The SPAB Building Performance Survey: The Final Chapter

SPAB & STBA Conference
Online 13th October 2020



The SPAB Building Performance Survey



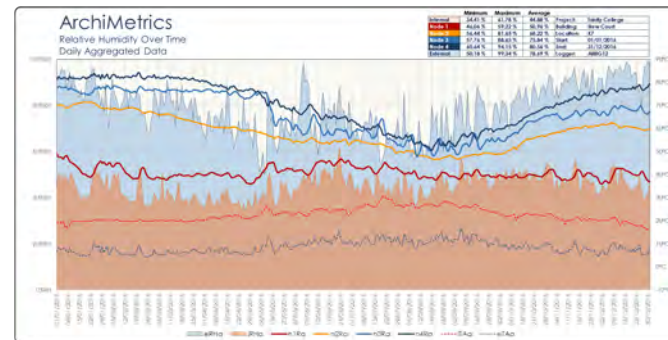
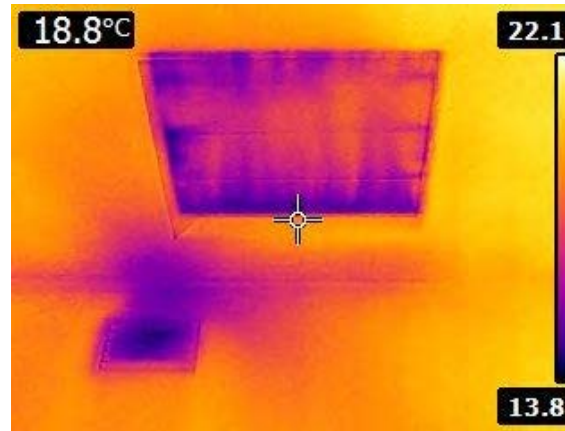
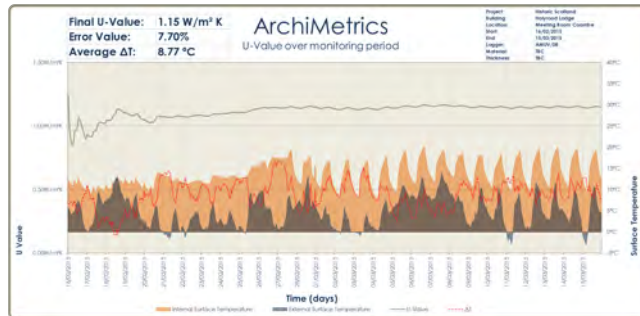
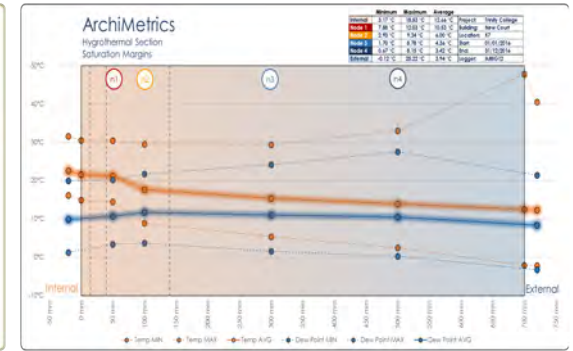
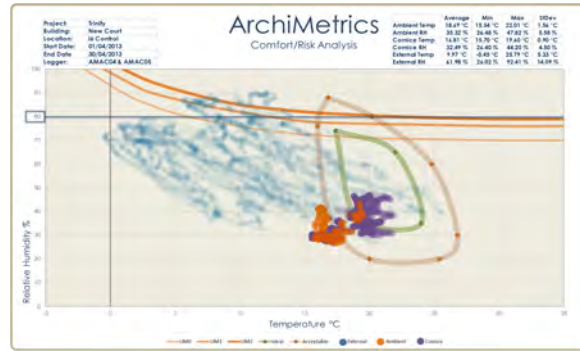
Factors affecting the performance of traditional buildings:



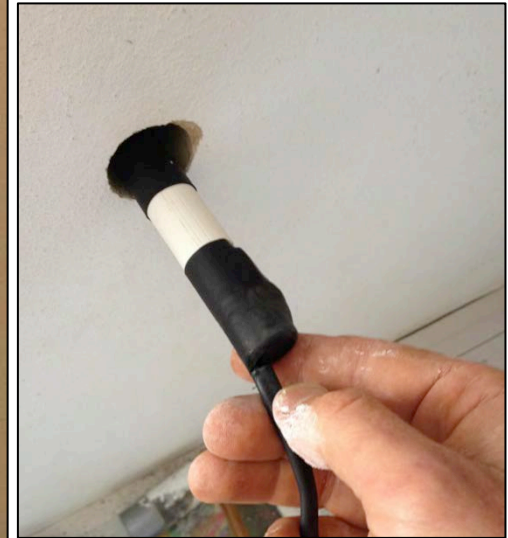
Thermal performance
Moisture behaviour
Air Leakage



The SPAB Building Performance Survey



The SPAB Building Performance Survey II

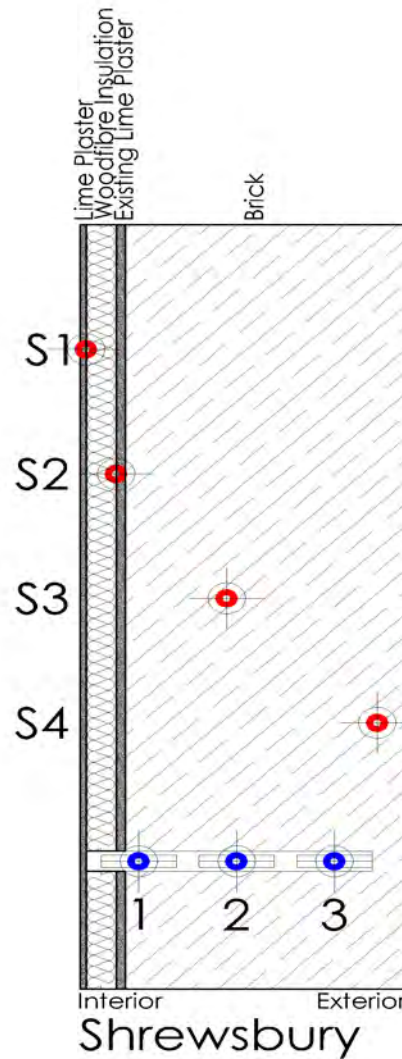


Long-term moisture responses within
insulated solid walls

Shrewsbury

IWI – South Facing – Brick wall 345 mm + 40 mm woodfibre + 8mm lime plaster
without a VCL = 68% measured heat loss reduction

Before: 1.48 W/m²K



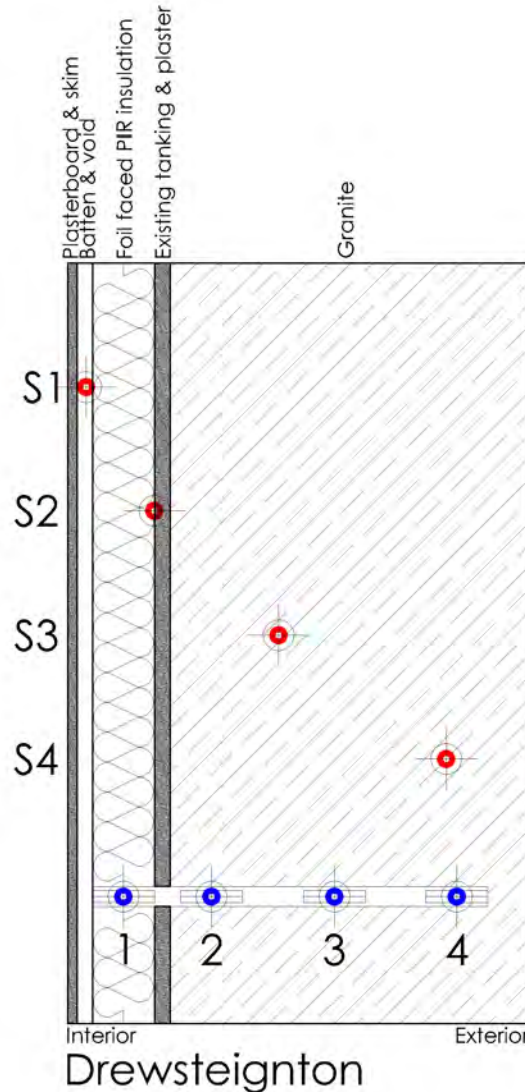
After: 0.48 W/m²K



Drewsteignton – Moisture closed

IWI – North West Facing - Granite Wall approx. 600mm + 100mm foil-faced PIR board + 25mm Air gap + 15mm Plasterboard & Gypsum Skim = 87% measured heat loss reduction

Before: 1.24 W/m²K



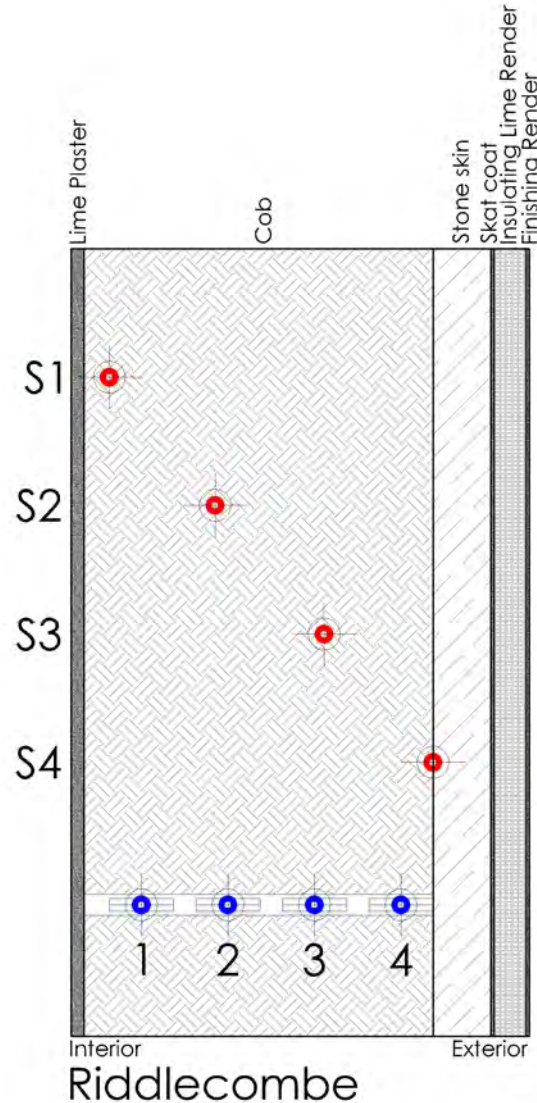
After: 0.16 W/m²K



Riddlecombe – Moisture open

EWI – South Facing - Cob wall (including masonry skin) $\approx 550 \text{ mm} + 60 \text{ mm}$ insulating lime-based render = 4% measured heat loss reduction

Before: $0.76 \text{ W/m}^2\text{K}$



After: $0.72 \text{ W/m}^2\text{K}$

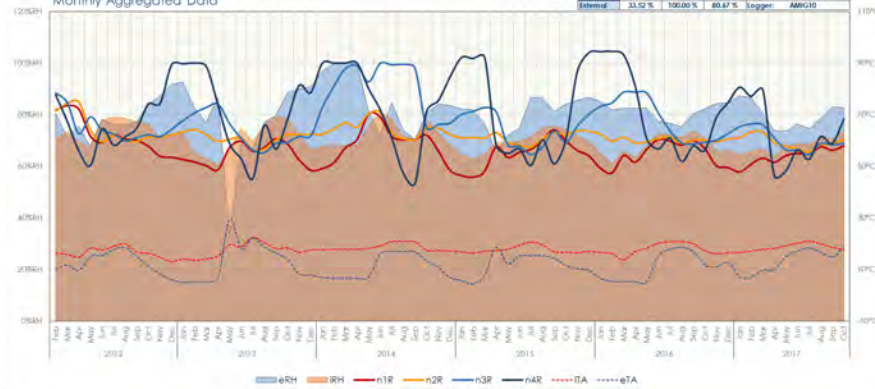


The SPAB Building Performance Survey II



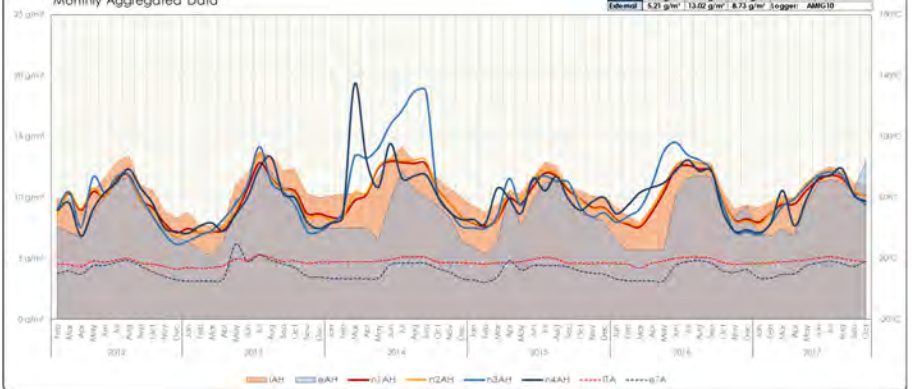
ArchiMetrics

Relative Humidity Over Time
Monthly Aggregated Data



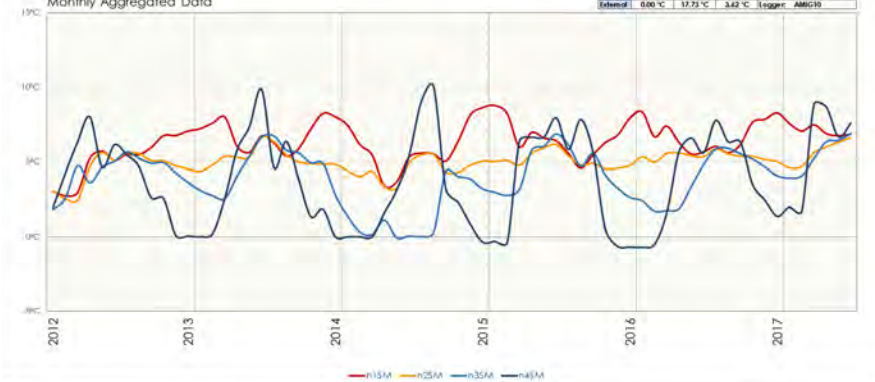
ArchiMetrics

Absolute Humidity Over Time
Monthly Aggregated Data



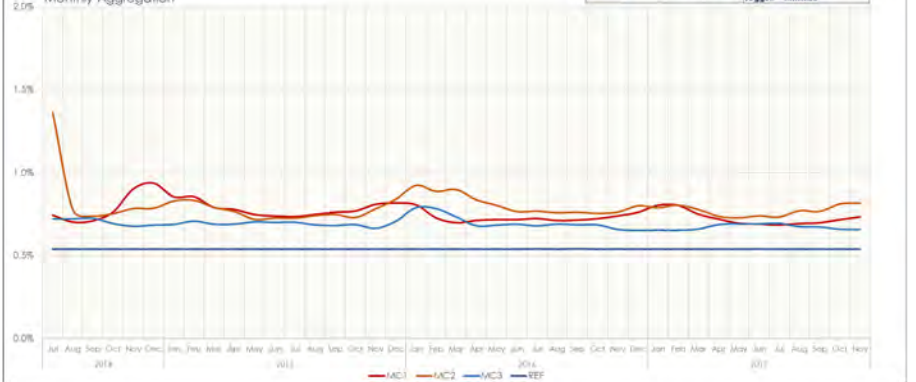
ArchiMetrics

Saturation Margin Over time
Monthly Aggregated Data



ArchiMetrics

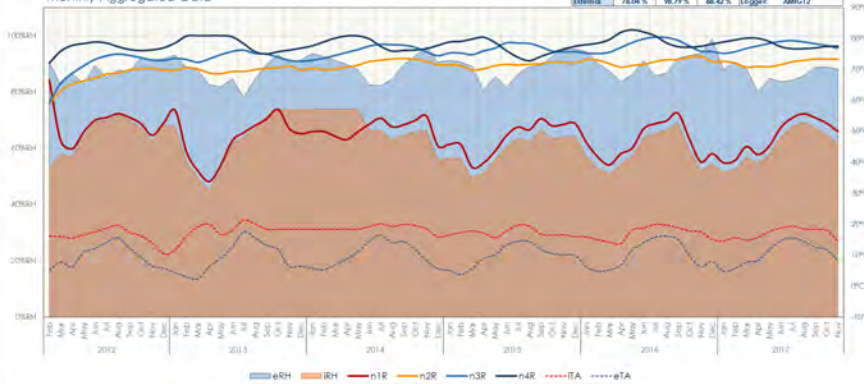
Moisture Monitoring
Monthly Aggregation



ArchiMetrics

Relative Humidity Over Time
Monthly Aggregated Data

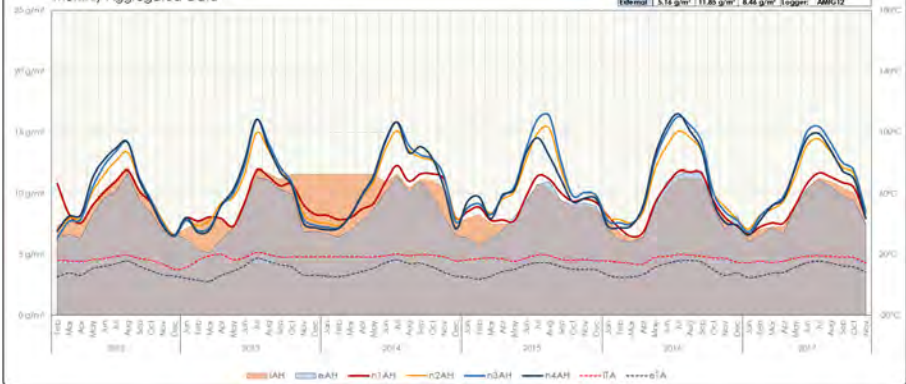
	Minimum	Maximum	Average	Project	SPAB EP20
Node 1	65.09 %	72.80 %	68.95 %	Building	MB House
Node 2	68.19 %	84.71 %	76.45 %	Location	Drenthegation
Node 3	75.06 %	79.45 %	77.26 %	Start	07/09/2012
Node 4	74.33 %	79.46 %	76.89 %	End	13/11/2017
External	70.29 %	102.00 %	86.24 %	Logger	AMM012



ArchiMetrics

Absolute Humidity Over Time
Monthly Aggregated Data

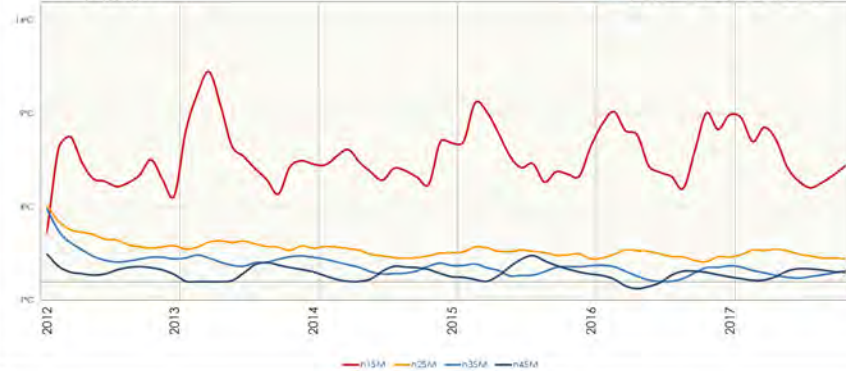
	Minimum	Maximum	Average	Project	SPAB EP20
Node 1	4.22 g/m³	12.18 g/m³	8.26 g/m³	Building	MB House
Node 2	4.47 g/m³	12.25 g/m³	8.32 g/m³	Location	Drenthegation
Node 3	4.54 g/m³	13.31 g/m³	8.92 g/m³	Start	07/09/2012
Node 4	4.57 g/m³	14.31 g/m³	9.19 g/m³	End	13/11/2017
External	4.40 g/m³	16.52 g/m³	10.55 g/m³	Logger	AMM012



ArchiMetrics

Saturation Margin Over time
Monthly Aggregated Data

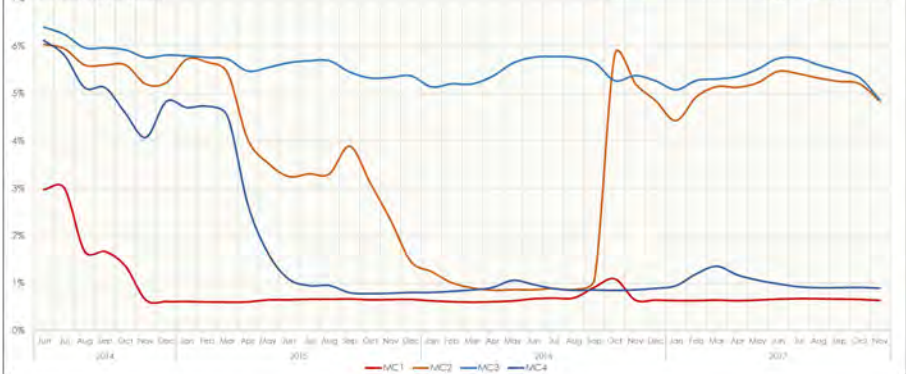
	Minimum	Maximum	Average	Project	SPAB EP20
Node 1	4.74 °C	12.35 °C	7.35 °C	Building	MB House
Node 2	2.68 °C	11.20 °C	6.93 °C	Location	Drenthegation
Node 3	1.08 °C	4.05 °C	2.57 °C	Start	07/09/2012
Node 4	0.01 °C	3.92 °C	0.88 °C	End	13/11/2017
External	0.37 °C	1.48 °C	0.92 °C	Logger	AMM012



ArchiMetrics

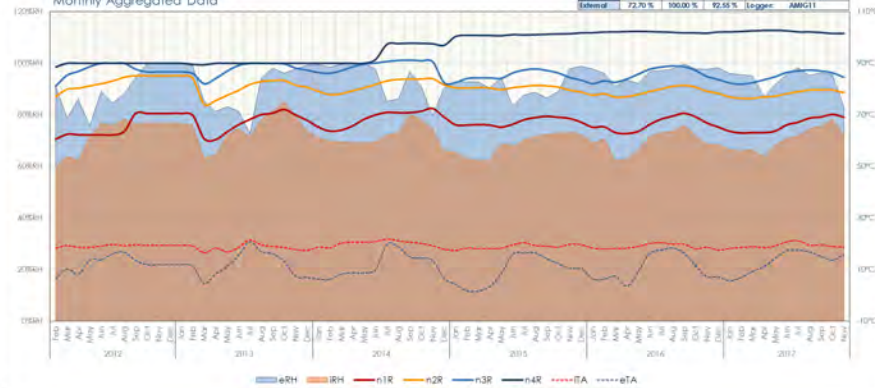
Moisture Monitoring
Monthly Aggregation

	Min	Max	Average	Project	SPAB EP20
MC1	0.40%	3.01%	0.84%	Building	MB House
MC2	0.80%	4.04%	2.42%	Location	Drenthegation
MC3	4.87%	8.40%	6.64%	Start	11/06/2014
MC4	0.78%	6.12%	1.93%	End	13/11/2017
				Logger	AMM05



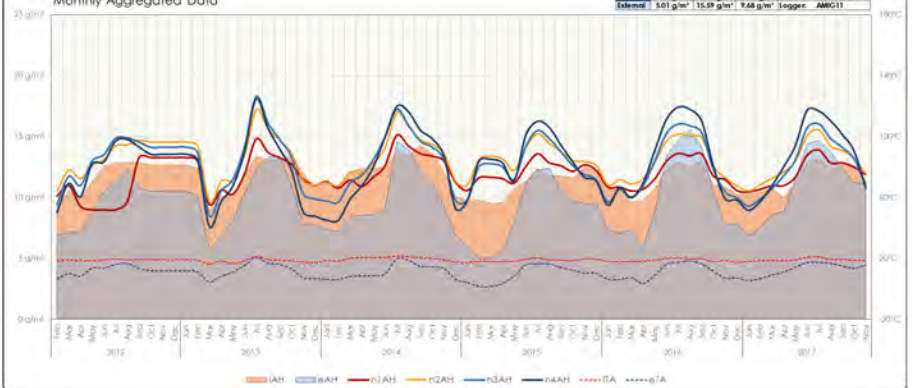
ArchiMetrics

Relative Humidity Over Time
Monthly Aggregated Data



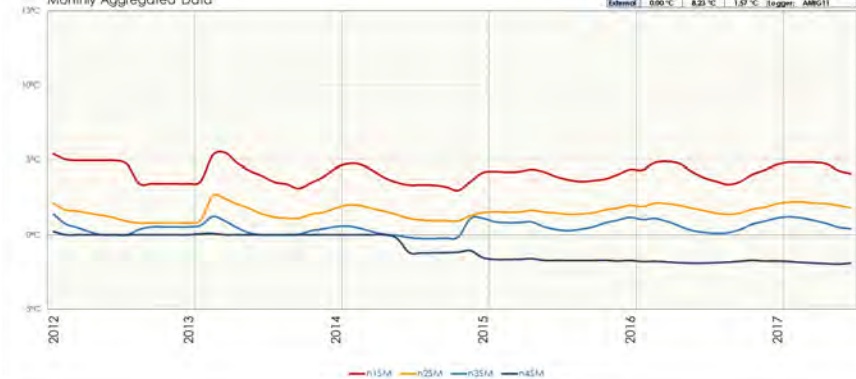
ArchiMetrics

Absolute Humidity Over Time
Monthly Aggregated Data



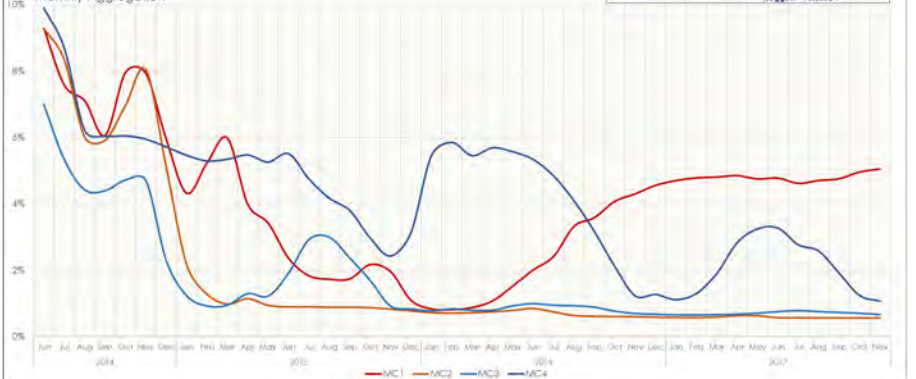
ArchiMetrics

Saturation Margin Over time
Monthly Aggregated Data



ArchiMetrics

Moisture Monitoring
Monthly Aggregation



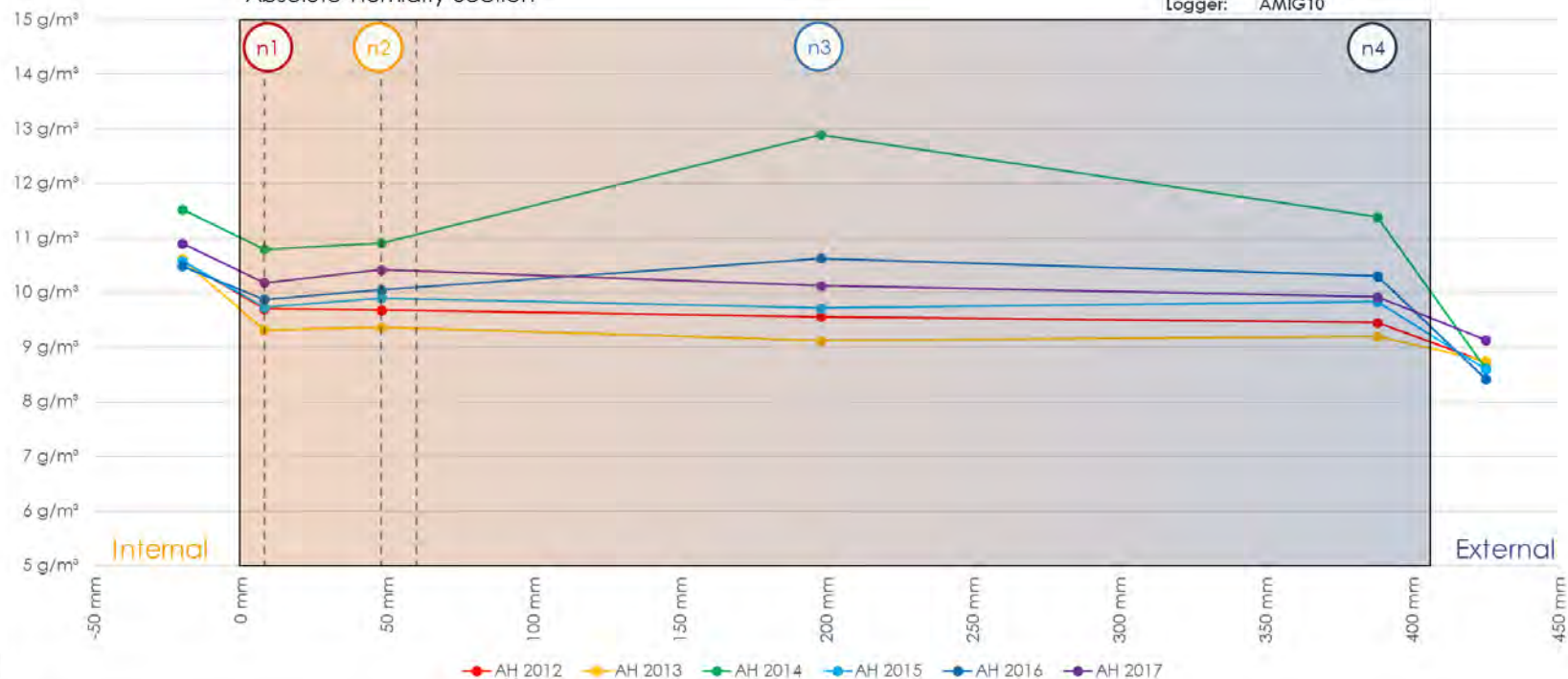
The SPAB Building Performance Survey II



ArchiMetrics

Absolute Humidity Section

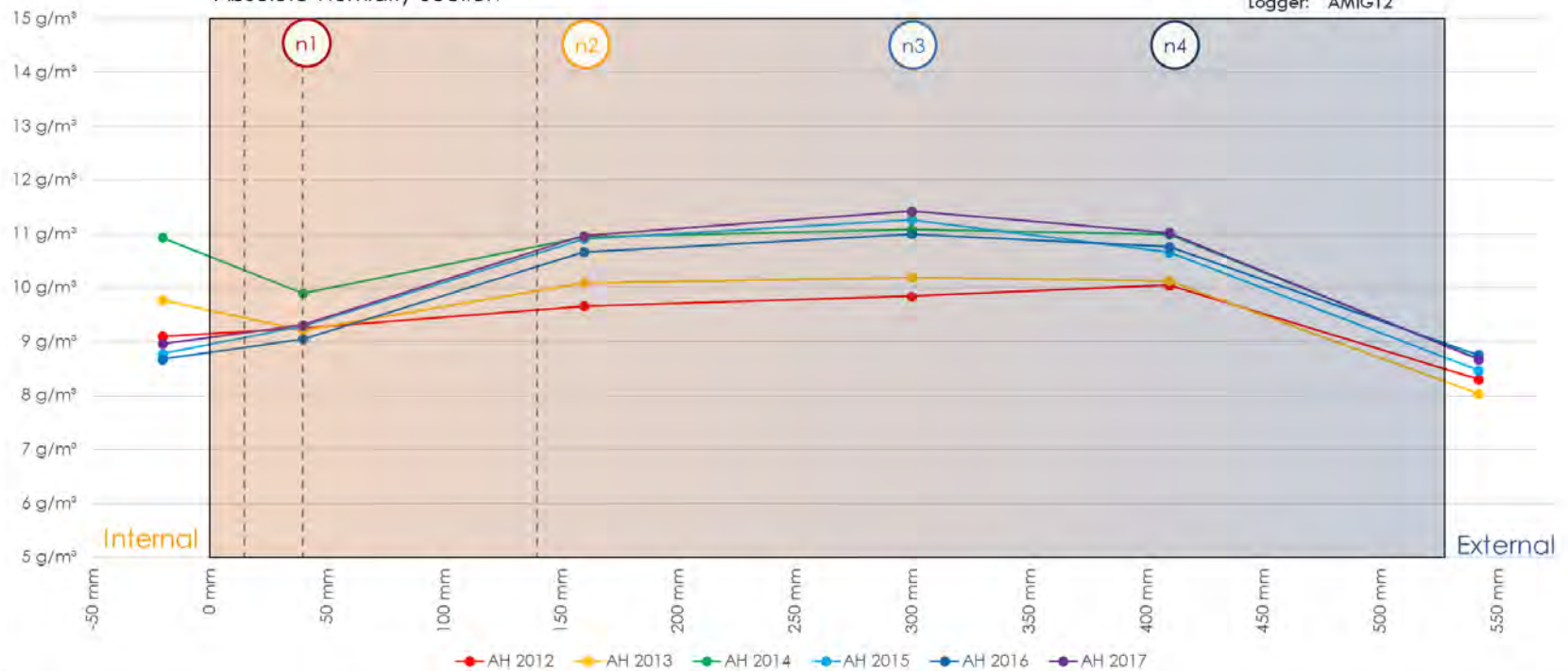
Project: SPAB BPSII
Building: Abbey Foregate
Location: Shrewsbury
Start: 19/02/2012
End: 01/10/2017
Logger: AMIG10



ArchiMetrics

Absolute Humidity Section

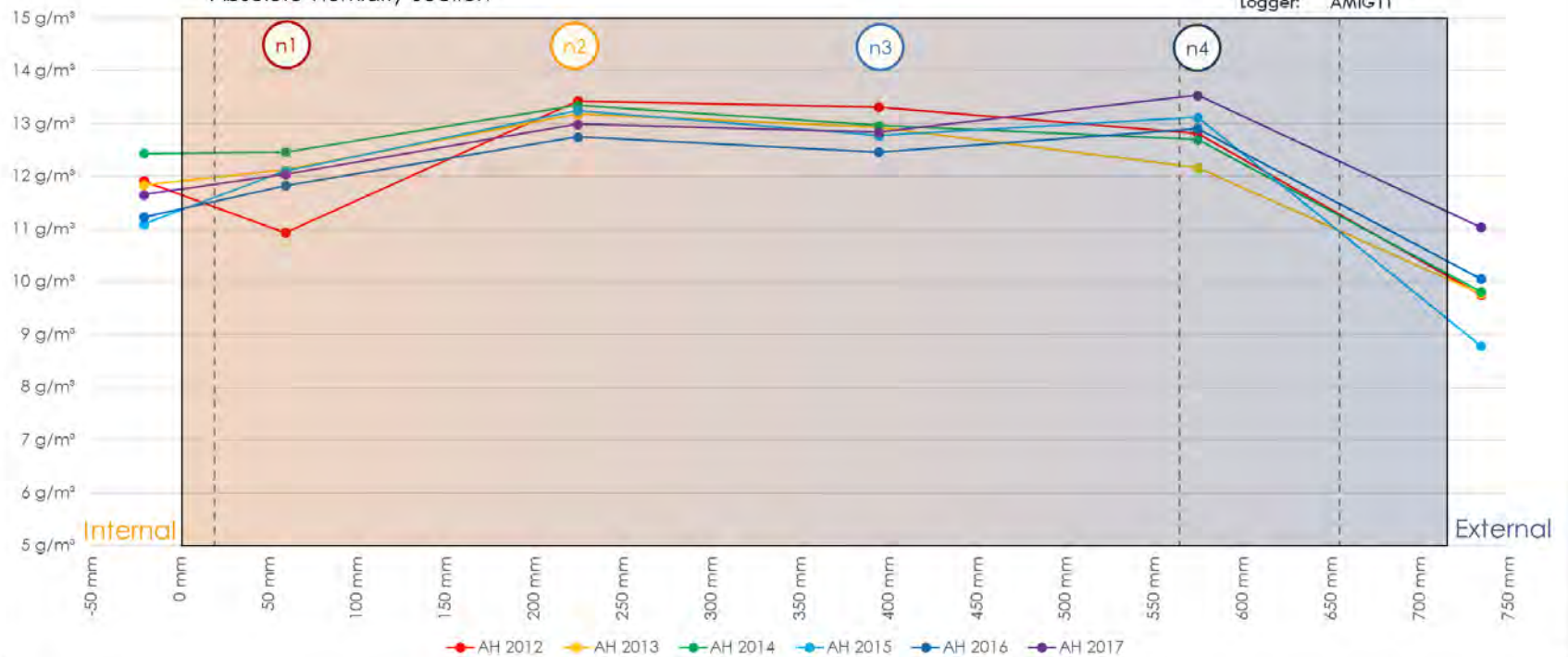
Project: SPAB BPSII
Building: Mill House
Location: Drewsteignton
Start: 07/02/2012
End: 13/11/2017
Logger: AMIG12



ArchiMetrics

Absolute Humidity Section

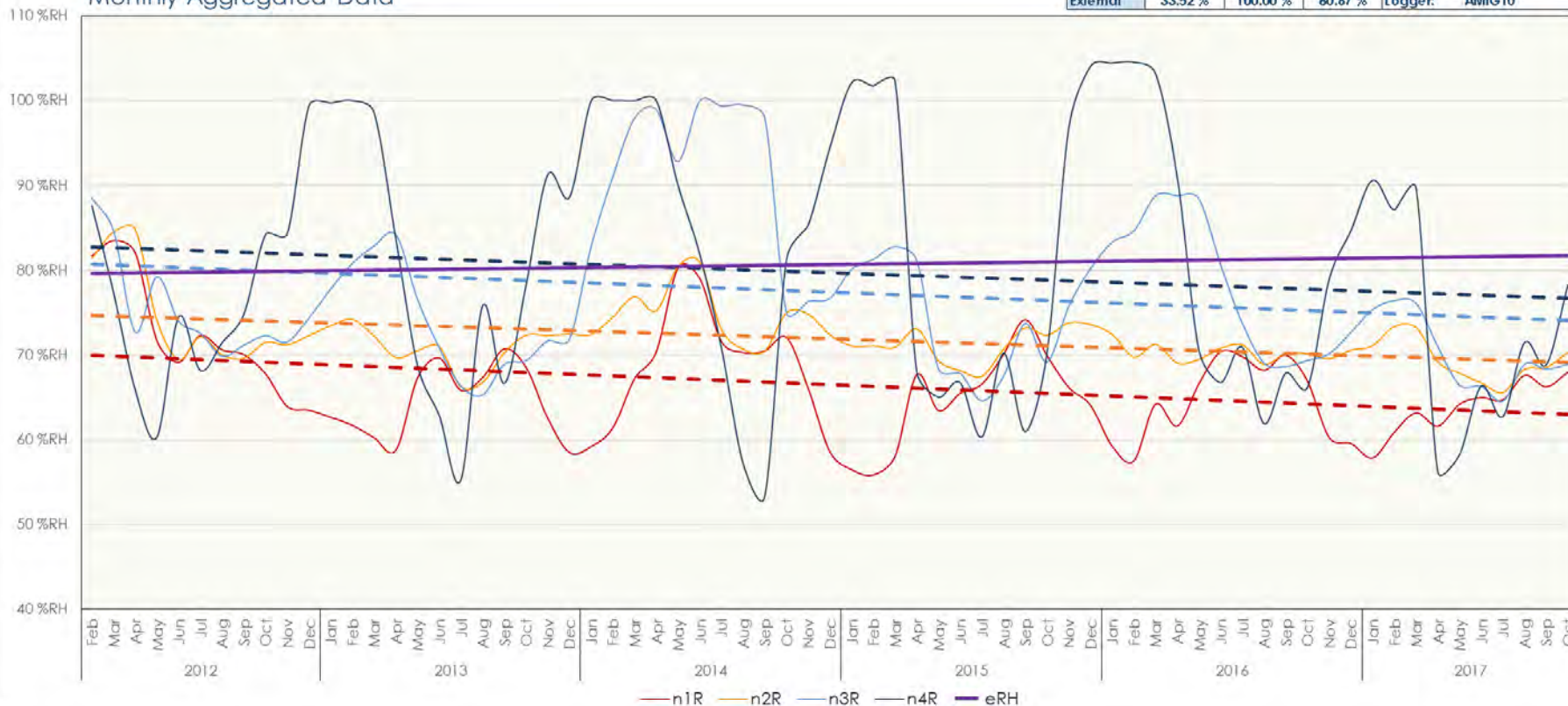
Project: SPAB BPSII
Building: The Firs
Location: Riddlecombe
Start: 08/02/2012
End: 09/11/2017
Logger: AMIG11



ArchiMetrics

Relative Humidity Trends
Monthly Aggregated Data

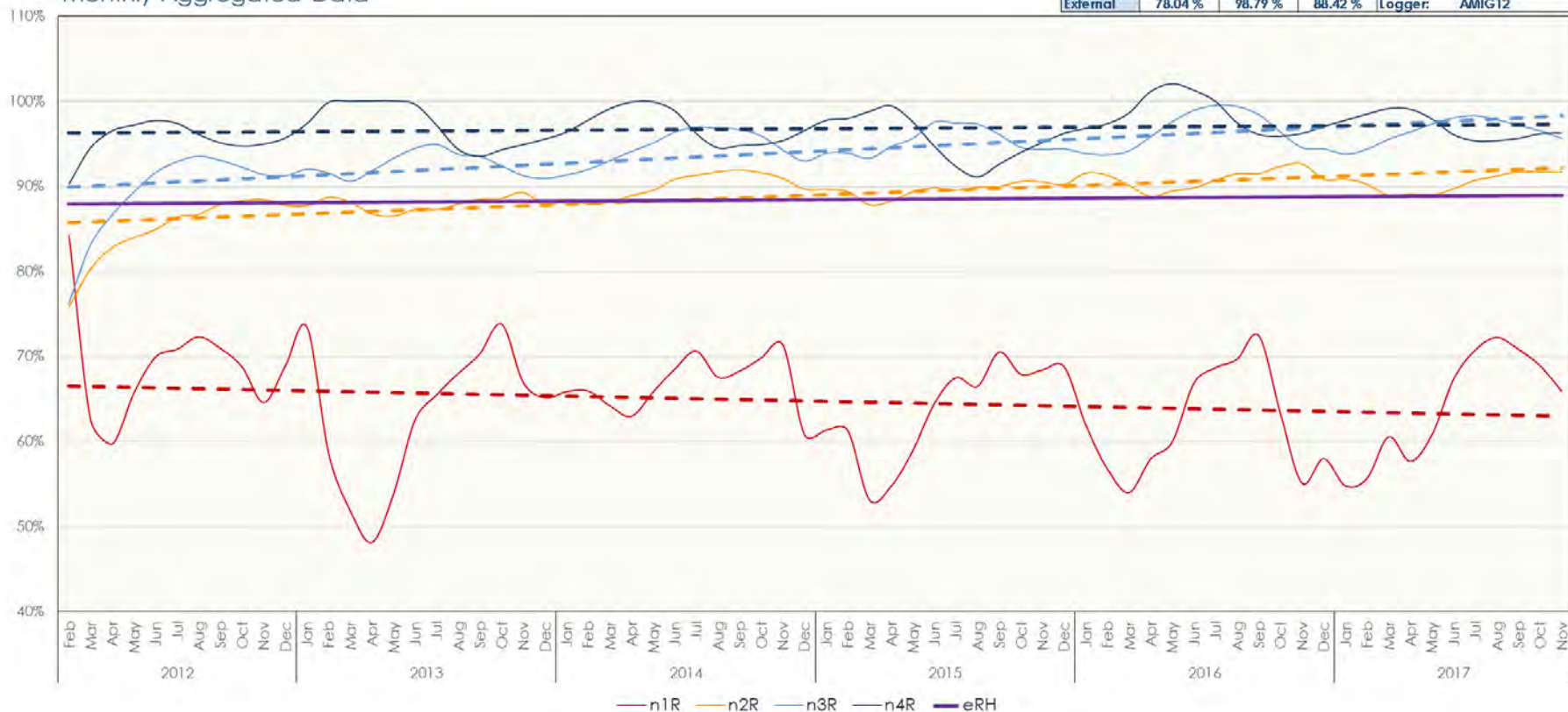
	Minimum	Maximum	Average	Project:	SPAB BPSII
Internal	60.35 %	81.20 %	70.45 %	Building:	Abbey Foregate
Node 1	55.83 %	83.51 %	66.49 %	Location:	Shrewsbury
Node 2	65.63 %	84.80 %	71.94 %	Start:	19/02/2012
Node 3	64.60 %	99.94 %	77.38 %	End:	01/10/2017
Node 4	53.39 %	104.52 %	79.72 %	Logger:	AMIG10
External	33.52 %	100.00 %	80.67 %		



ArchiMetrics

Relative Humidity Trends
Monthly Aggregated Data

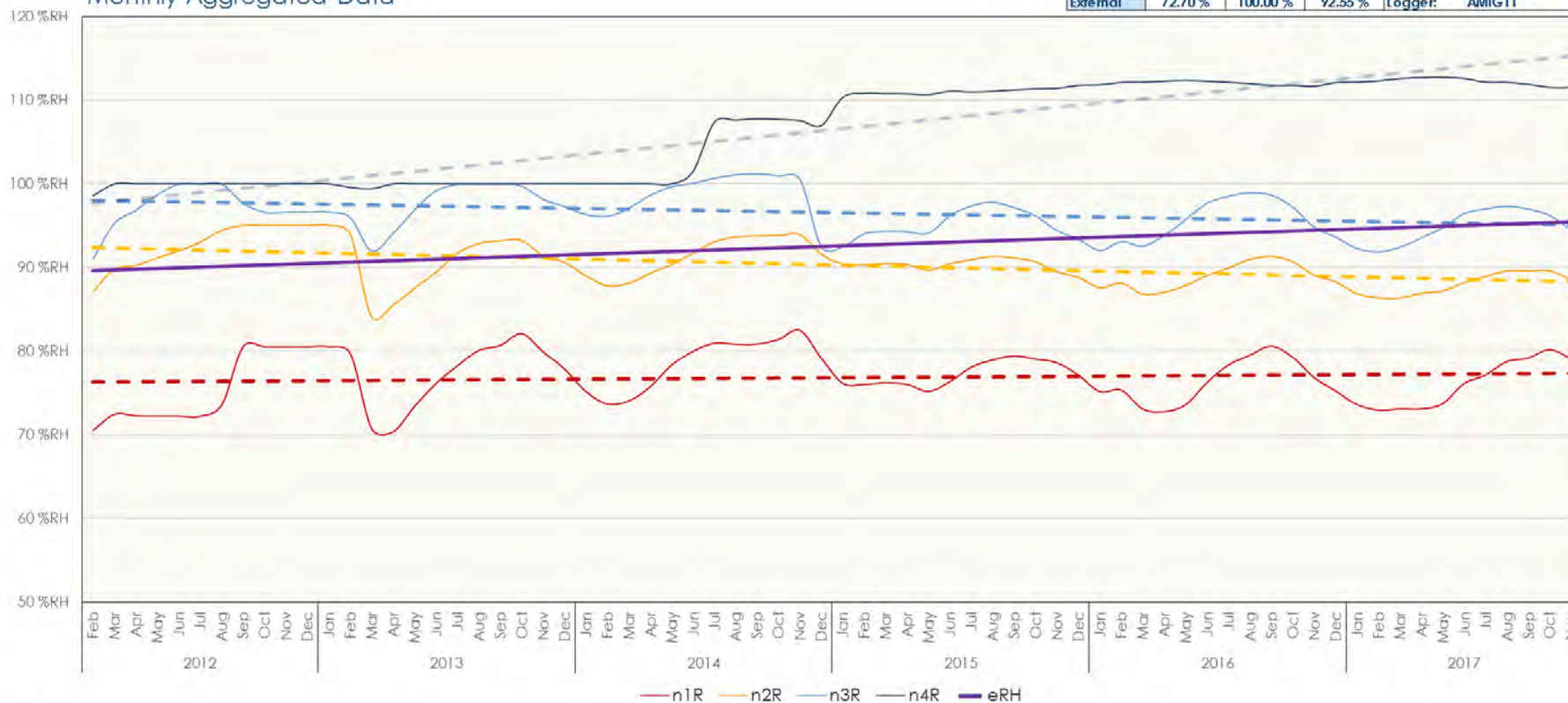
	Minimum	Maximum	Average		
Internal	45.00 %	73.80 %	62.45 %	Project:	SPAB BPSII
Node 1	48.19 %	84.21 %	64.77 %	Building:	Mill House
Node 2	75.85 %	92.65 %	88.99 %	Location:	Drewsteignton
Node 3	76.33 %	99.46 %	94.09 %	Start:	07/02/2012
Node 4	90.29 %	102.05 %	96.79 %	End:	13/11/2017
External	78.04 %	98.79 %	88.42 %	Logger:	AMIG12



ArchiMetrics

Relative Humidity Trends
Monthly Aggregated Data

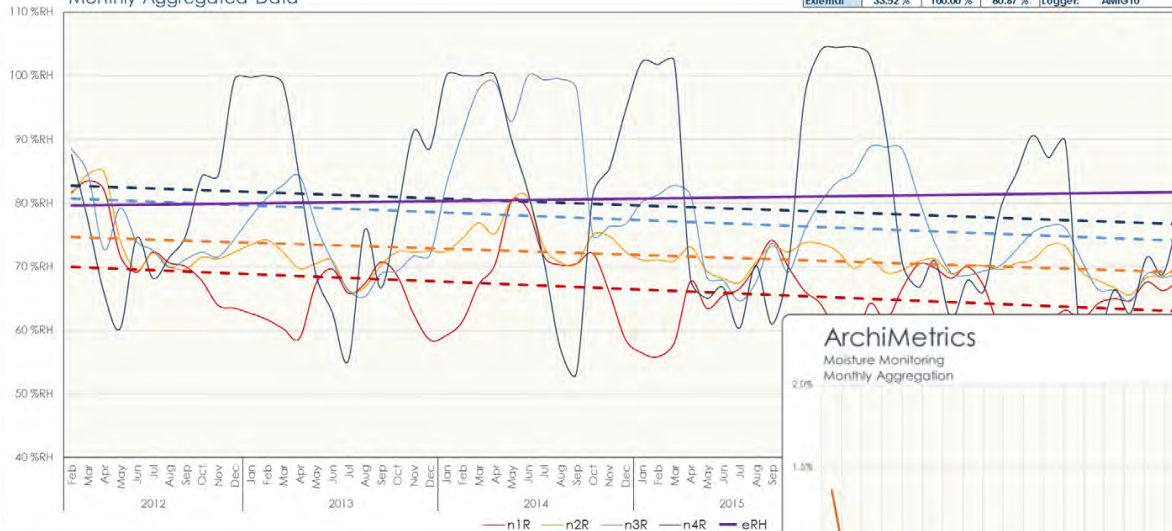
	Minimum	Maximum	Average	Project:	SPAB BPSII
Internal	59.73 %	84.95 %	70.95 %	Building:	The Firs
Node 1	70.32 %	82.48 %	76.70 %	Location:	Riddlecombe
Node 2	84.06 %	95.06 %	90.36 %	Start:	08/02/2012
Node 3	91.09 %	101.21 %	96.54 %	End:	09/11/2017
Node 4	98.56 %	112.74 %	106.18 %	Logger:	AMIG11
External	72.70 %	100.00 %	92.55 %		



ArchiMetrics

Relative Humidity Trends
Monthly Aggregated Data

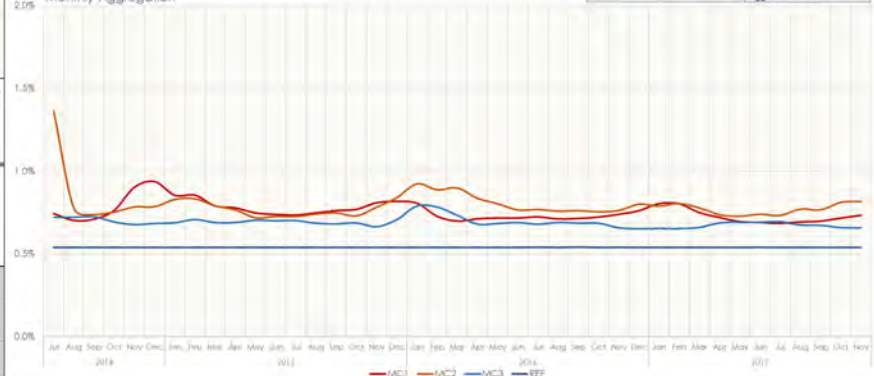
	Minimum	Maximum	Average	Project	SPAB BPSII
Internal	60.35 %	81.20 %	70.45 %	Building	Abbey Foregate
Node 1	55.83 %	83.51 %	66.49 %	Location	Shrewsbury
Node 2	65.63 %	84.80 %	71.94 %	State	19/02/2012
Node 3	64.60 %	99.94 %	77.36 %	End	01/10/2017
Node 4	53.39 %	104.52 %	79.72 %	Logger	AMM10
External	33.52 %	100.00 %	60.67 %		



ArchiMetrics

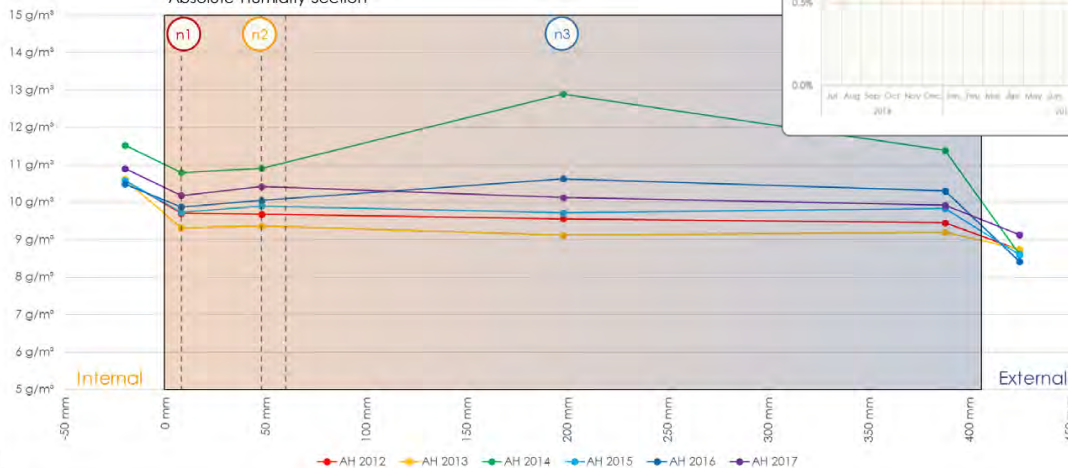
Moisture Monitoring
Monthly Aggregation

	Min	Max	Average	Project	SPAB BPSII
MC1	0.49%	0.94%	0.72%	Building	116 Abbey Foregate
MC2	0.72%	1.34%	0.80%	Location	Shrewsbury
MC3	0.48%	0.77%	0.61%	State	03/07/2014
VEF	0.64%	0.64%	0.64%	End	01/11/2017
				Logger	AMM03



ArchiMetrics

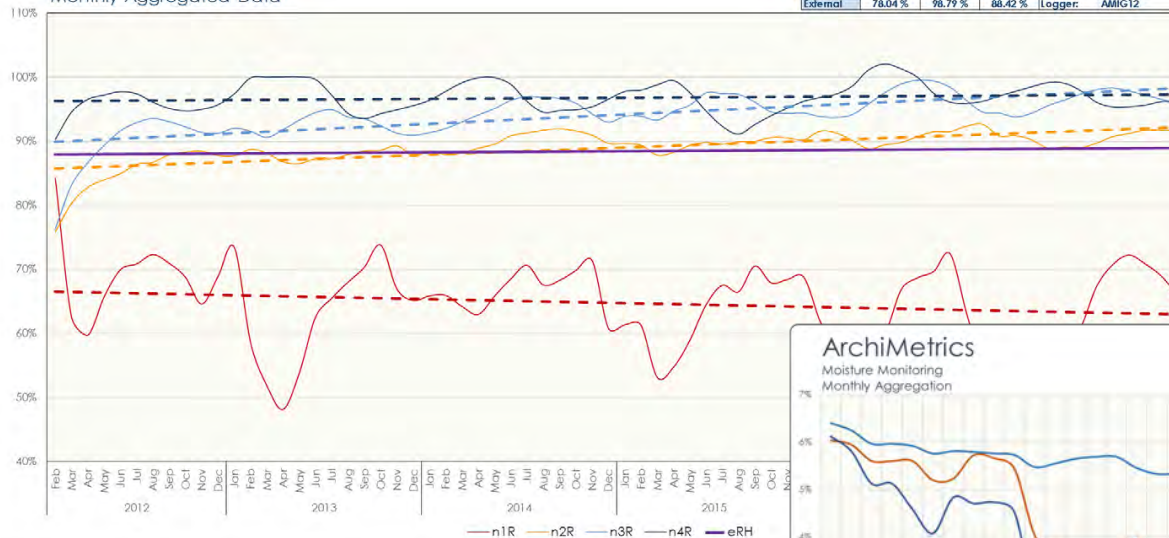
Absolute Humidity Section



ArchiMetrics

Relative Humidity Trends
Monthly Aggregated Data

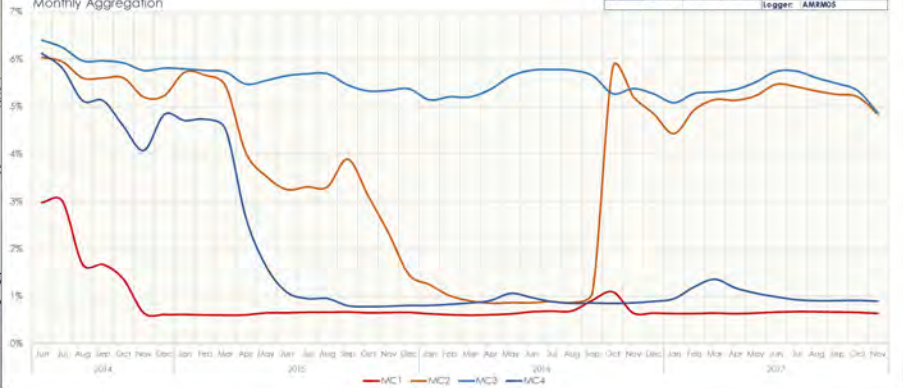
	Minimum	Maximum	Average	Project
Internal	45.00 %	73.80 %	62.45 %	SPAB BFSII
Node 1	48.19 %	84.21 %	64.77 %	Building: Mill House
Node 2	75.85 %	92.65 %	88.99 %	Location: Drewslington
Node 3	76.33 %	99.46 %	94.09 %	Start: 07/02/2012
Node 4	90.29 %	102.05 %	96.79 %	End: 13/11/2017
External	78.04 %	98.79 %	88.42 %	Logger: AMIG12



ArchiMetrics

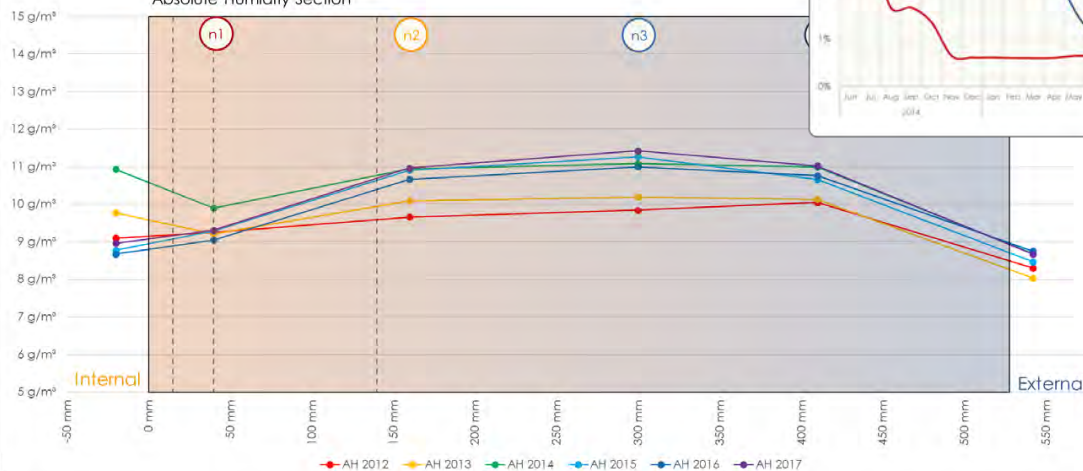
Moisture Monitoring
Monthly Aggregation

	Min	Max	Average	Project
MC1	0.40%	3.01%	0.84%	SPAB BFSII
MC2	0.86%	4.54%	1.99%	Building: Mill House
MC3	4.87%	4.40%	5.84%	Location: Drewslington
MC4	0.78%	4.12%	1.93%	Start: 11/04/2014
				End: 13/11/2017
				Logger: AMIG12



ArchiMetrics

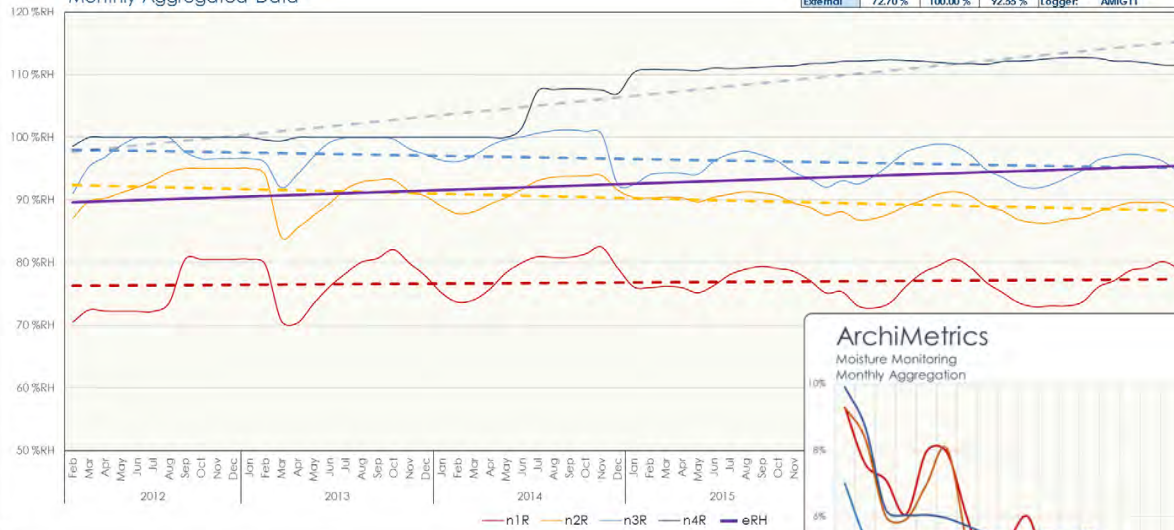
Absolute Humidity Section



ArchiMetrics

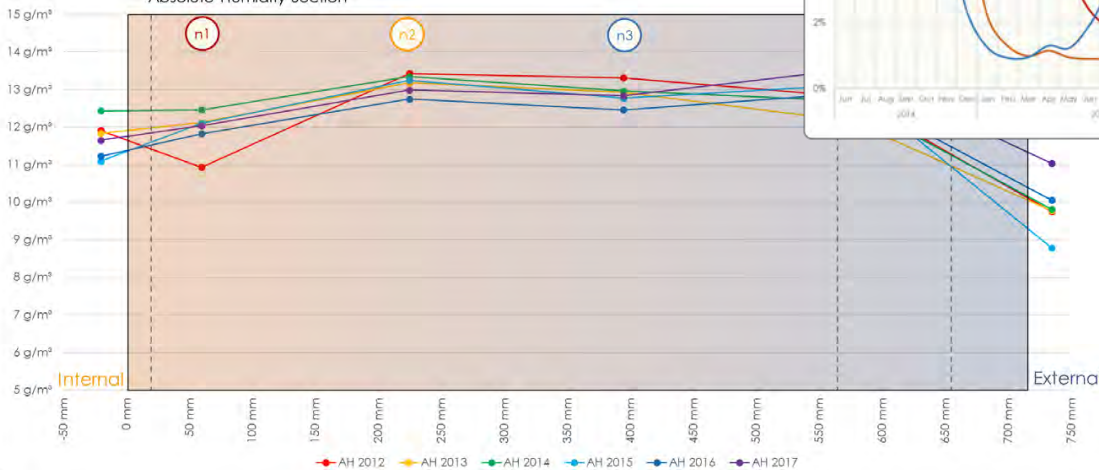
Relative Humidity Trends
Monthly Aggregated Data

	Minimum	Maximum	Average	Project	SPAB BPSII
Internal	59.73 %	84.95 %	70.95 %	Building:	The Firs
Node 1	70.32 %	82.48 %	76.70 %	Location:	Riddlecombe
Node 2	84.06 %	95.06 %	90.36 %	Start:	08/02/2012
Node 3	91.09 %	101.21 %	96.54 %	End:	09/11/2017
Node 4	98.56 %	112.74 %	106.18 %	Logger:	AMIG11
External	72.70 %	100.00 %	92.55 %		



ArchiMetrics

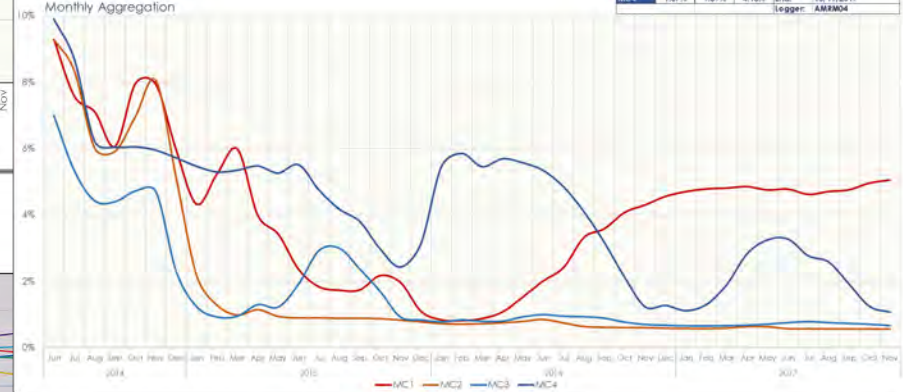
Absolute Humidity Section



ArchiMetrics

Moisture Monitoring
Monthly Aggregation

	Min	Max	Average	Project	SPAB BPSII
MC1	0.81%	9.28%	4.04%	Building:	The Firs
MC2	0.84%	9.28%	1.83%	Location:	Riddlecombe
MC3	0.44%	4.99%	1.87%	Start:	14/04/2014
MC4	1.07%	9.89%	4.18%	End:	10/11/2017
				Logger:	AMRM04



The SPAB Building Performance Survey II



‘sometimes we simply have to keep our eyes open and look carefully at individual cases - not in the hope of proving anything, but rather in the hope of learning something!’ Hans Eysenck (1976)

SPAB Research Reports

The SPAB Research Report 1: The U-value Report

The SPAB Research Report 2: The SPAB Building Performance Survey

The SPAB Research Report 3: The SPAB Hygrothermal Modelling

<https://www.spab.org.uk/advice/research/findings>

SPAB Technical Advice Line

0207 456 0916

**This research has been carried out on behalf of The SPAB
by ArchiMetrics Ltd**

