

BUILDING PERFORMANCE DIGEST

Making buildings better

Welcome to the **Building Performance Digest**. In this regular newsletter we highlight some of the issues that arise once buildings have been designed, constructed, commissioned and occupied. Many are typical of the kinds of problems addressed by the **MSc Advanced Building Performance Evaluation**.

MSc Advanced Building Performance Evaluation (ABPE)

This Masters programme covers a broad range of strategies and methods to carry out holistic assessments of building performance and identify solutions to post-occupancy issues.

The team

Course leader:

Dr Gabriela Zapata-Lancaster.

Contributors: Dr Hiral Patel, Prof Christopher Tweed, Prof Wouter Poortinga, Emmanouil Perisoglou and external guest lecturers and tutors.

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Get involved

If you want to highlight building failure problems you have encountered, let us know. We are always keen to include a range of energy and environmental related problems in the programme.

Contact us

If you are interested in studying this programme, please email architectureadmissions@cardiff.ac.uk

Website

www.cardiff.ac.uk/architecture/courses/postgraduate-taught/msc-advanced-building-performance-evaluation

LEARNING FROM COVID-19

The focus of this issue is on the Covid 19 crisis. Our team at the Welsh School of Architecture (WSA) reflects on the lessons learnt, insights gained and future research directions specifically for the field of building performance.

PERFORMANCE OF HEALTHCARE ENVIRONMENTS

Prof Chris Tweed

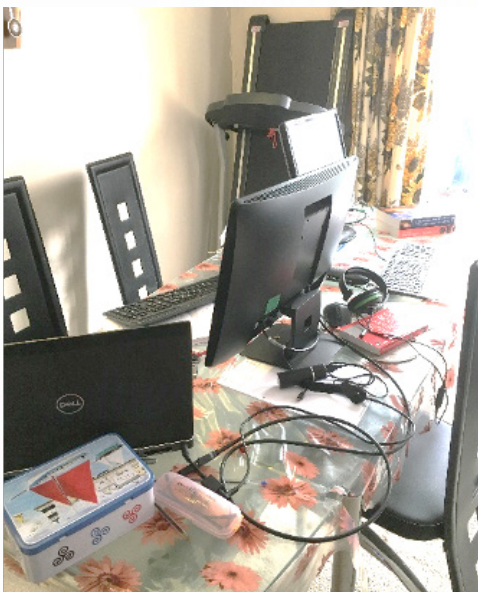
WSA previously monitored the thermal environment in the UK's first certified Passivhaus residential home. The study emphasised the problem in meeting thermal comfort needs for different groups of users. Residents were mostly elderly, spending much of their time in single-occupancy bedrooms heated by a conventional hot-water radiator system, with a reversible air-to-air heat pump system servicing all other areas. Because it was easier to monitor residents by leaving bedroom doors open, heat was spilling out into corridors and the staff, who were moving around (and so got warmer), asked for the heat pump system to be switched to cooling mode – in February – thus negating the benefits of Passivhaus design. This discovery underlines the importance of understanding the human element in achieving good thermal performance of healthcare environments, including the COVID-19 Nightingale hospitals. ([Read the article](#))



The temperatures in bedrooms are too high for the staff, but seem to be right for the residents, who can freely open windows and make use of the radiators even in the summer.



"I iron in the day rather in the night whereas perhaps [before moving to the off-grid house] I might have done it in the night watching the tele and doing the ironing... and I tend to do it more in the daytime rather than in the evening."
Interview with an off-grid home occupant.



WFH: Dining table turned into a permanent workspace.



WFH: Height adjustable ironing board used as a makeshift work table.

RECIRCULATION IS BANNED, RECOVERY IS HERE!

Emmanouil Perisoglou

Bringing fresh air into the building increases the heat demand dramatically and partial air recirculation saves some of it. However, REHVA, the Federation of European Heating, Ventilation and Air Conditioning Associations, has just called for engineers to stop recirculating air in buildings in areas with a COVID-19 outbreak. Is there any alternative? Yes! Instead of recirculating the polluted air, we can recycle its valuable heat via a heat exchanger. In WSA, we have been monitoring the impact of MVHR (Mechanical Ventilation with Heat Recovery) and found impressive energy savings, a significant reduction in moisture and CO₂, and occupants reporting respiratory health improvements. ([Read about the project](#))

ENERGY BEHAVIOURS DURING COVID-19 LOCKDOWN

Dr Simon Lannon

Our team at WSA studied an off-grid farmhouse built in 2013 to understand the energy-efficiency behaviours of the occupants and their adaptations following over a year of occupation. The study highlighted that there is a need to engage with the occupants for the energy-efficient operation of systems and controls instead of relying only on technology-based solutions to reduce energy use at home. During this Covid 19 crisis, we are all home-bound and have quickly adapted to the new way of living. This rapid change has undoubtedly affected energy-use behaviours which require further exploration. ([Read the article](#))

MAKING HOMES WORK FOR WFH

Dr Hiral Patel

The Coronavirus lockdown is an unprecedented moment when people from many professions are working from home (WFH) for all the workdays. Moreover, WFH is expected to continue as lockdown restrictions are eased and it might become a more established practice in future. The homes had to be suddenly adapted for work, while also accommodating childcare, homeschooling and caring practices. Our ongoing research explores the micro-dynamics of adapting home spaces for work as well as changes in working practices. ([Read about the project](#))

RESEARCH ON BUILDING PERFORMANCE AT THE WELSH SCHOOL OF ARCHITECTURE

Our teaching is closely linked to research in the School. Here's a sample of our research activity.

Selected publications

Jones, Phillip (2019). An appetite to lead. Touchstone , pp. 4-5.

[\(Read the article\)](#)

Rodgers, S. E. (2018) Emergency hospital admissions associated with a non-randomised housing intervention meeting national housing quality standards: a longitudinal data linkage study. Journal of Epidemiology and Community Health 72 (10), 896-903. [\(Read the article\)](#)

Poortinga, W., et al. (2017) Social and health outcomes following upgrades to a national housing standard: a multilevel analysis of a five-wave repeated cross-sectional survey. BMC Public Health (17) 927. [\(Read the article\)](#)

Turner, S., et al. (2011) Modification of the home environment for the reduction of injuries. Cochrane Database of Systematic Reviews, (2), CD003600.

[\(Read the article\)](#)

STORIES FROM THE WEB

Here are a few selected articles we found about building performance that may be of interest to you:

From SARS to COVID-19 and beyond: public health lessons for buildings

[\(Read the article\)](#)

Lessons learnt from the 2003 SARS outbreak are so relevant for future designs for air circulation in buildings.

Coronavirus: Domestic electricity use up during day as nation works from home

[\(Read the article\)](#)

As our lifestyles have changed during the lockdown, so has our energy consumption. The highest peak in power consumption is during the lunchtime.

Coronavirus: three ways the crisis may permanently change our lives

[\(Read the article\)](#)

Long term impact of COVID crisis on business travel, working remotely and industry disruption.

How ExCel's services were adapted for NHS Nightingale

[\(Read the article\)](#)

Two lead engineers at BDP and The RSP describe what was involved in creating one of the world's biggest hospitals in London, in less than two weeks, for COVID patients.

The great work-from-home experiment could have far reaching positive impacts on our office culture

[\(Read the article\)](#)

Find out how Dezeen, a largely online company is undergoing digital transition for working from homes. The experiences described in this article might resonate with many of those currently working from home in different professions.