

PRESIDENT'S AWARDS FOR RESEARCH 2016



Knowledge and  
Research in Practice

RIBA   
Architecture.com



Research is the systematic, rigorous and reflective exploration, development and sharing of knowledge.

## Foreword

The RIBA was conceived as a learned society to advance the cause of architectural knowledge. The cause of architectural research, which began explicitly in the work of Le Corbusier, has been championed by a series of key figures at the RIBA, most notably by former President Frank Duffy who first articulated and recognised its importance of knowledge to the profession. The development of an evidence base to help the profession learn from their work and demonstrate its value is key to its future resilience. This report marks an important milestone in this story and in our efforts to make research routine.

Research in practice generally takes the form of knowledge management, design development, formal research projects (sometimes funded), and practitioner PhDs. It is by practitioners in practice about practice and uses a whole range of different interdisciplinary approaches.

Research is the systematic, rigorous and reflective exploration, development and sharing of knowledge. Whether based in the sciences or the arts, it is always creative in its underlying formulation, and essential to the business of architecture.

As well as making practice more rewarding, research has important business benefits. It can enable a practice to improve and expand their products and services, develop new funding streams, manage knowledge within the practice more effectively and, importantly, evidence excellence and value to clients and others that will improve their practice brand

It was for this reason that in December 2015 RIBA Council unanimously gave its support to the vision that: *By 2020 the RIBA will be the leading architectural intelligence network, facilitating innovation, and improving practice effectiveness and outcomes through research and knowledge sharing.*

Practice based research is an important outcome of this vision, the realignment of the President's Award for Research to foster and celebrate the excellent work that is developing, often unsung, in architectural practice.

**Prof Flora Samuel**  
**Chair of the RIBA Research and Innovation Group**  
**Presidential Ambassador for Innovation**  
**Professor of Architecture in the Built Environment, University of Reading**



*Durham's Cathedral and compact city centre, surrounded by green fields.*  
© Superstock

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## Introduction

In 2016 twenty two practices based in the UK, Australia, Bulgaria and Singapore responded to the call for submissions to the President's Awards for Research: more than any year in the Awards' eleven year history. At the RIBA we view this as a reflection of both the increasing recognition of the role research can play in architectural practice and of the growing number of practitioners and practices conducting research.

The practices involved in submissions in 2016, along with Peter Clegg, 2016-2017 Chair of Judges for the President's Awards for Research, were invited to respond to a short survey providing an overview of their research interests, funding and operations within their practice. This publication is the result of those responses and is intended to elucidate how this group of architects conduct, incorporate and manage research and knowledge across their practice and in their work. The second section of each profile includes an edited edition of the 1,000 word statement of the submission under each of the five headings used in that section.

Apparent on receipt of all of the applications in 2016 was the scope and scale of the topics covered in the submissions. The work from practitioners in this publication includes research on flooding, management and conservation of heritage buildings and sites, community engagement, social impact assessment, environmental sustainability, workplaces design, contested development sites, design for ageing, food production, rural architecture, housing and new materials. This list expanded as discussions progressed to include a wider range of topics that influenced design work and practice.



The most frequent question posed by practice is how to secure funding to conduct research in practice. Often this is achieved through collaborating with a university, allowing the academic partner to apply for funding from one of the large research councils or through a knowledge transfer partnership. At the end of this document is a glossary of those funding sources mentioned in the practice profiles.

I hope that this publication encourages conversation and collaboration across the industry and with the RIBA, suggests to those less established researchers how research might work in and for their practice, and encourages further submissions to the RIBA President's Awards for Research that share, promote and support the work of practitioner researchers.

And finally, on behalf of the RIBA, thank you to all those who submitted their work for the 2016 Awards and for contributing further to this publication. We look forward to continue working with you and your colleagues in the future.

**Dr Kat Martindale**  
**RIBA Head of Research and Innovation**



*Typical density of the urban fabric in refugee camps.  
© RIWAQ photo archive*

# Practice Profiles

**Locations:** London

**Employees:** 3

**Research Leader:** Dr. Helena Rivera,  
Director and Founder of A Small Studio

**Website:** [www.asmallstudio.co.uk](http://www.asmallstudio.co.uk)

# A Small Studio

## What other organisations, practices or universities have you collaborated with on research projects?

- The University of Edinburgh
- Heriot Watt University
- Landscape Interface Studio at Kingston University
- Waterloo Community Development Group

## What funding sources have facilitated and supported your research?

- NESTA: Graduate Pioneer Programme
- Arts and Humanities Research Council with the Architecture Foundation: Collaborative Doctorate Award
- British Council: Newton Fund Institutional Links Grant
- Global Challenges Research Fund: Resilience Foundation Award
- Homes and Communities Agency: Empty Homes Programme
- Commissions from clients

## What are the main benefits to conducting research in your practice?

**Perspective.** Conducting research on themes that are much wider and larger than our architectural work grounds us. We go back to issues of politics, current affairs, social geography, planning, urbanisms and thinking about the wider issues of society. We still feel the architect has a social purpose and conducting research reminds us of the social issues underlying society today.

**Methodology.** There is a certain rigour and rigmarole required to conduct qualified research. It challenges us to constantly question assumptions, information we hear and read and build a framework for decision-making. These skills of methodology are not only applied but inform our architectural work as well.

**Diversification & Control.** By conducting research, we diversify the type of work we do and actively seek out the projects that interest us. This gives us control over the work the studio is doing.

**Challenge.** Research work takes us to unpredicted places and delivers unpredictable findings. This is exciting.

**Community.** We like working with stakeholders, communities and policy-makers. Research provides a different type of interaction with these groups that we don't usually have through our architectural work.

**Knowledge.** Traditionally, contribution to knowledge is made through research. We like to think our work is contributing to knowledge, either in the traditional sense or thorough knowledge co-creation.

**Bridge planning and architecture.** My doctoral research was on British planning, and my day to day activities as an architect require constant negotiation with planners. So, in practice these fields work together continuously. In education they have isolated themselves tremendously. I find that research provides a missing bridge/link between planning and architecture that moves away from the theoretical and into the practical.

## What are the key themes that your research focuses on?

- Cities, urbanism, planning, urban innovation
- Housing, social housing, slum dwellings, informal settlements
- Public space, wellbeing in cities and green infrastructure
- Mobility and socio-spatial integration

**How have you published and shared your research?**

Most projects have dedicated websites where I publish results and ongoing work frequently, for example: [www.medellin-urban-innovation.eca.ed.ac.uk/](http://www.medellin-urban-innovation.eca.ed.ac.uk/). In addition I am co-writing three papers to be submitted to academic journals in the field of planning, methodology, and urban studies and am looking to publish a book on British new Towns.



Three generations of New Towns  
© A Small Studio

## Pioneer perspectives: Rethinking New Towns and the building of new communities in England

Dr Helena Rivera, A Small Studio

### Context

Throughout the twentieth century, England experienced a continual housing crisis that persists to this day. In an attempt to manage it, philanthropists, policymakers and politicians have directed planning policies and legislation to build new planned communities: Howard's town/country magnet; New Labour's sustainable communities; and, the recent Conservative government's initiatives in delivering locally-led garden cities. The New Towns programme provides an important example of how goal-driven planning policy was used during the period 1946-1976 to address the housing crisis.

### Questions, aims and arguments

This research focuses on the first wave (mark 1) of New Towns built as 'balanced communities for working and living' between 1946-1955 in Southeast England, to decentralise London's population and industry.

### Resources, data and methodology

Three critical lenses are employed to understand the development of mark 1 objectives: self-containment, newness vs. sameness and governance. This research repositions the notion of balance as a continuum rather than a rupture in planning history's meta-discourse of building new communities. A principal critique here is that the historiography of New Towns has been predominantly written by experts (academic and otherwise), providing a limited interpretation of the legacy of (living in) New Towns. To empirically rectify this, Sandercock's (2003) suggestion of a narrative-led approach is employed in investigating a mark 1 case study: Harlow New Town.

### Impact, significance and outputs

This paper provides not only valuable scholarship on New Towns, but also reinforces their contemporary relevance to the continued pursuit of building new communities in England. Sir Peter Hall (1980) identified that planning served three sets of actors; politicians; bureaucracy; and community. An important contribution this paper makes is that 'pioneers' should be included as a fourth actor.



*A fancy dress party held in the streets of the New Town neighbourhood.  
© Private collection of a Harlow resident*

**Locations:** Christow, Devon and Selborne, Hampshire

**Employees:** 2

**Research Leaders:** Cameron Scott, Caroline Rye

**Website:** [www.archimetrics.co.uk](http://www.archimetrics.co.uk)

# ArchiMetrics

## **How many researchers (full-time and part-time) work for your practice?**

Two full time

## **What other organisations, practices or universities have you collaborated with on research projects?**

- Society for the Protection of Ancient Buildings
- Historic Environment Scotland
- 5th Studio, Max Fordham & Trinity College, Cambridge
- University College London Bartlett School & Energy Institute
- Saint Gobain Isover
- Sustainable Traditional Buildings Alliance

## **What funding sources have facilitated and supported your research?**

- Dartmoor Sustainable Development Fund, Dartmoor National Park
- Historic England Heritage Protect Commissions Grant for the SPAB Building Performance Survey
- DECC funding for Responsible Retrofit Report
- STBA Guidance Wheel

## **What are the main benefits to conducting research (in your practice?)**

- The effects of design decisions and construction practices are quantified in terms of genuine benefits in real world situations
- Mistakes are not repeated
- Materials and design details are scrutinised, tested and can be improved
- Risks are measured, anticipated and can be mitigated

## **What are the key themes that your research focuses on?**

Building and building fabric performance including: interstitial moisture behaviour and moisture risk, heat loss through fabric (conduction) and via convection (air leakage), indoor air quality and comfort conditions.

## **How have you published and shared your research?**

Research is published in the form of written reports including detailed graphic analysis, spoken/visual presentations at public events, conferences, CPD events etc. and occasionally via our website. Research for public bodies is normally made available via their respective websites in the form of a downloadable pdf.

## The SPAB Building Performance Survey 2015 Report

Caroline Rye and Cameron Scott, ArchiMetrics Ltd.

### Context

Over the past decade, and particularly since the passing of the UK Climate Change Act in 2008, the contribution that buildings make to greenhouse gas emissions have been a source of interest and intervention, both on an individual and governmental level. The question of older buildings, those built with solid walls mostly prior to 1919, which make up between 25 – 30% of UK building stock, has been a particular concern.

### Questions, aims and arguments

The primary issue is the matter of the long-term performance of moisture in refurbished older buildings. By deploying long term detailed measurements of interstitial conditions the research aims to identify if some insulation treatments are more suitable, i.e. present less risk for solid walls, than others with regard to moisture.

### Resources, data and methodology

Three different solid walls, with different insulation treatments, have been continually monitored since 2012, before and after refurbishment. The measurement technique, developed specifically for the project, uses highly accurate sensors to provide detailed measurements of temperature and relative humidity through and either side of wall sections. Vapour behaviour is looked at over time quantified as a percentage relative humidity, but also Absolute Humidity in terms of averaged dew point gradients, including the identification of 'saturation margins' developed as risk indices.

### Analysis and findings

By 2015 the study had accumulated sufficient comparative evidence over three years to provide confidence in the findings. This meant that short term influences, such as particular weather events, could be identified and isolated from longer term moisture trends. These trends could relate, with some certainty, to the circumstances of the individual structures and their insulation treatments. The study provides evidence of the long term impact of construction moisture for a particular wall. In addition, that a capillary active, vapour open material (wood fibre) has performed within safer margins than that of an impermeable, vapour closed treatment.

### Impact, significance and outputs

The duration and detail of the study enables a depth of understanding of the moisture responses within solid walls and provides evidence for those who wish to adopt a precautionary approach to effective and suitable refurbishment treatments for solid walls.

The findings are disseminated via an annual research report made available free of charge via the website. Details from the research are also incorporated into presentations and talks on the subject of energy efficiency and older buildings delivered to annual Energy Efficiency conferences and at other talks and events around the country.



Mill House  
© Archimetrics

**Locations:** Offices in 38 countries

**Employees:** Approx 12,000

**Research Leaders:** Global – Dr Chris Luebke & Dr Simon Roberts  
UKMEA region – Dr Kate Canning

**Website:** [www.research.arup.com](http://www.research.arup.com)

# Arup

## **How many researchers (full-time and part-time) work for your practice?**

It is difficult to estimate how many researchers work for Arup – each employee is encouraged to participate in the research programme, and there are over 1000 projects funded annually.

## **What other organisations, practices or universities have you collaborated with on research projects?**

Arup aims to collaborate externally with academia, industry and public sector. We have numerous examples of research projects delivered in collaboration with multiple stakeholders and in different regions.

- Prof Becky P.Y. Loo, University of Hong Kong
- Penny Hulse, Deputy Mayor of Auckland City
- David Sim, Creative Director at Gehl Architects

## **What funding sources have facilitated and supported your research?**

Arup operates internal investment fund dedicated to research projects. Next to this, we are actively pursuing opportunities related to external funding (i.e. Horizon 2020 or the Innovate UK).

## **What are the main benefits to conducting research in your practice?**

There are a number of benefits, but we focus on:

- Return on investment – what does this mean?
- People development
- Reputation
- Relationships development

## **What are the key themes that your research focuses on?**

We focus on several themes that are crucial to our business. Some of the most recent themes include:

- City resilience
- Circular economy
- The future of water provision
- Smart transport
- Internet of things
- Responsive master planning
- Health and well-being

## **How have you published and shared your research?**

Internally research projects are shared through forums, lunchtime presentations or articles in newsletters. Externally, some of them are featured on [arup.com](http://arup.com) or on [Arup Thoughts](#).

## Cities Alive: Towards a Walking World

Susan Claris & Demetrio Scopelliti, Arup

### Context

*Cities Alive: Towards a walking world*, investigates the role walkability plays in developing more liveable, sustainable, healthy, safe and attractive cities. Undoubtedly, the 20th century was the century of cars. The negative effects of heavy automotive use on urban everyday life are significant. Only in recent years has mobility been recognised as a fundamental factor for achieving sustainable urban development. The strive for 'liveable', 'healthy' or 'complete' streets 'for all' is dramatically increasing the centrality of walking in the urban discourse.

### Questions, aims and arguments

The report aims to challenge decision-makers to be more aware of the direct and indirect benefits of more walkable cities and provides guidance on how they might be realised.

### Recourses, data and methodology

The six month research process involved over 200 reference sources, including literature, articles and web resources and over 30 global experts focused on providing an interdisciplinary, global, shared common ground, based on the definition of 'Drivers of Change', 'Benefits', 'Actions' and 'Case studies', as a fundamental tool to frame the development of urban strategies concerning walking. The study of hundreds among global case studies investigated the definition of a range of 40 actions and policies addressing the complexity of urban issues, particularly concerning visions and strategies. The development of a list of 50 benefits of walking that should be achievable in most contexts provides a framework to guide decision makers to set visions, long-term planning, and monitor results, from a multidisciplinary and integrated perspective.

### Analysis and Findings

This report highlights several cities that have already started to take action: Hamburg, Helsinki and Madrid have contemplated going car-free; New York and Los Angeles have developed low-cost interventions for creating pedestrian-only streets;

Buenos Aires rolled out over 140km of cycle-lanes in just a few years and mayors around the world are implementing 'Vision Zero' strategies to reduce traffic fatalities in their cities. In conclusion, we all have the power to tackle the world's problems. Walkable cities are a good way to start addressing these problems.

### Impact, significance and outputs

The findings from the report have been shared widely via global marketing channels including social media platforms, press, direct mail and dissemination at conferences across five regions. The research allows us to connect with global city stakeholders and collaborators in forward thinking ways that identify opportunities and deliver solutions oriented towards promoting walkability and inclusive mobility.



Arup, *Cities Alive - Towards a walking world*.  
CCO Pixabay.com

Location: London  
Employees: 10  
Research Leader: Richard Coutts  
Website: [www.baca.uk.com/research](http://www.baca.uk.com/research)

## Baca Architects

### **How many researchers (full-time and part-time) work for your practice?**

All of the Baca Architects team have a research background and are engaged to varying degrees depending on specific architectural or master planning project requirements.

### **What other organisations, practices or universities have you collaborated with on research projects?**

- Building Research Establishment
- The Environment Agency
- Department for Environment, Food & Rural Affairs
- Department for Communities and Local Government
- Local Authority Building Control
- University of East Anglia

### **What funding sources have facilitated and supported your research?**

The Amphibious House, submitted to these Awards, was self-funded. It has been informed by the Long-term initiatives for Flood Risk Environments (LifE) project for Defra, for which we received £85,000 funding several years ago. We have also previously received funding from the Technology Strategy Board and The World Bank.

### **What are the main benefits to conducting research in your practice?**

The early policy work from the LifE for Defra project has enabled other projects, such as our Amphibious House, to come forward. This has raised the profile of our practice and the ongoing benefits includes invitations to speak high profile events around the world such as World Water Forum in Mexico and Aquaterra in Paris as well as new work in the UK and overseas.

### **What are the key themes that your research focuses on?**

Our research focuses on 'designing for water', particularly flood resilience and how we plan and design our communities to utilise water innovatively, efficiently and safely.

### **How have you published and shared your research?**

The Amphibious House has been featured in over 100 articles internationally, has appeared on TV and news reports from the UK to Japan, and we have presented this work to national and international conferences.

Our most recent book *Aquatecture: Buildings and cities designed to live and work with water* is the result of ten years of research and is aimed at architects, urban designers, planners and sustainability experts who have an interest in creating a beautiful, sustainable, intelligent and pleasurable built environment on land, in water and with water.

## UK's first amphibious house. Can-float Amphibious Building

Richard Coutts & Robert Barker, Baca Architects

### Context

Water is becoming a central concern to planning in all nations. Whether it be water shortage, redundant water space or rising flood-risk. Current methods to assess qualitative characteristics tend to focus on attributing value through predetermined criteria, such as Multi-criteria assessment, which in itself can be quite limiting. An expert judgmental form of research was used.

### Questions, aims and arguments

This paper seeks to identify how we can learn from historic civilizations to better plan with water. It examines how cities and architecture have developed around water in terms of utilizing it, harnessing it and coping with flooding. The paper examines the nature of flood-risk assessment and presents in a clear and illustrated manner. The aim was to identify commonalities of approaches that could apply to different waterbodies to transform and improve the way we plan with water.

### Resources, data and methodology

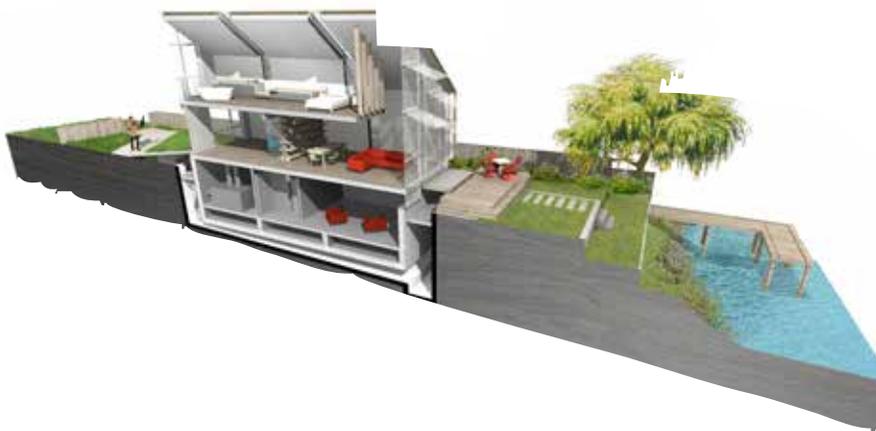
There were various strands of research that informed the work, including historical case studies, flood-risk analysis work and spatial planning. With regards to understanding flood-risk assessment this was based on research into various guidance documents and papers as well as project based research. The results are intended as a clear guide for planners as opposed to explicit recommendations. This research was used to inform approaches to planning in different water contexts as well as architectural opportunities that went onto form the basis of a separate research study.

### Analysis and findings

The research into waterfronts found repeat issues of lack of use and activity on water, as well as encroachment of the waterfront. Raised embankments and sheet piled walls that resulted from traditional flood defensive solutions, were often seen to restrict access to the water, and restrict space for water in times of flood. One of the important points of note was that the inability to adapt the infrastructure solution to the water issue became an issue in itself. The planning suggestions seek to identify parallels between water space and land spaces to encourage a more considered approach to the waterway – for instance rivers as boulevards, lakes as parkland, docks as retail or business quarters and deltas as national parks or designated wilderness.

### Impact, significance and outputs

The authors have contributed to various lectures and masterclasses on Flooding; as well as many TV and Radio appearances. After 10 years of R&D this work and other studies have been featured in *Aquatecture: Buildings and Cities designed to live and work with water* and we have written new Chapter for the Metric Handbook – which we hope will stimulate others to join this discourse.



Amphibious House in static position  
© Baca Architects

Location: York

Employees: 6

Research Leader: David Spencer

Website: [www.dsparchitects.co.uk](http://www.dsparchitects.co.uk)

## DSP Architects

### How many researchers (full-time and part-time) work for your practice?

In leading the practice, David Spencer also leads the research agenda. This has since become a joint venture between David Spencer and Ian Atkinson, who co-authored the paper submitted to the Awards.

### What other organisations, practices or universities have you collaborated with on research projects?

Not yet

### What funding sources have facilitated and supported your research?

This work has developed incrementally and so has been funded internally. We see it as an investment in our business.

### What are the main benefits to conducting research in your practice?

Integrated approach to research:

- Embedding innovation
- Design confidence
- The main benefit to the practice has been the learning process, although this has sometimes been a distraction

### What are the key themes that your research focuses on?

- Materials testing and foreign markets
- Market research - increasing profitability
- Impact on project managers and design and build

### How have you published and shared your research?

This work has led to the development and launch of the [BUY Architecture website](#)

**An analysis of Architects income with other comparative professionals and an investigation to establish if this can be improved and if so how**

**David Spencer, Ian Atkinson, Ruth Holt, DSP Architects LLP**

### **Context**

Over the last 20 years procurement has moved significantly to a preferred route via Project Managers inclined to use Design and Build procurement resulting in a reduction in fees and workload for Architects. The use of Architect services has become less valued is used more discreetly by Clients and Architects are now rarely used as Contract Administrators so have become excluded from their role of site inspection to retain design intent and build quality. The lack of reward in practice, the loss of perceived value and the high cost of qualification are conspiring to impact on the profession and its future.

### **Questions, Aims, Arguments**

The questions raised are to why these circumstances have arisen, what have been the causes, how might the difficulties be challenged and overcome and what can Architects do for themselves? The aim of the research is to identify the relatively poor position of pay and reward and the value that is put on the Architect as a professional and to promote a strategy for remedy.

### **Resources, Data and methodology**

Comparative data has been collected and reviewed for salary expectation and earnings per fee earner in respect of architectural practice, legal, accounting and doctors. This information has been derived from publicly available sources. A review of architectural practice methods of finding work and agreeing fee levels is explored alongside with initiatives currently used by the RIBA to promote, advance and improve Architects' workload.

### **Analysis and findings**

Remuneration levels for architects are low compared to those of the compared professions. In some cases the income levels are quite shocking for the education, effort and costs involved. Further examination of the comparable figures per fee earner exposes the basic issue. Architects in general do not earn enough per fee earner to give themselves commensurate remuneration. This gap is large when compared with similar professions.

### **Impact, significance and outputs**

The first project sale has gone through and web site visitors are building. A full launch will give a better awareness and work on search engine optimisation will improve web visibility. Dissemination will be through construction sector journals and papers; also by web site news to 'subscribers' and national publicity on an on-going basis. The intention is to have a world-wide capability.



Askham Bryan  
College – Animal  
Management  
Classrooms and  
Exhibition  
© DSP Architects

# Fielden Clegg Bradley Studios

**Locations:** London, Bath, Manchester & Belfast

**Employees:** 202 (177 employees, 25 partners)

**Research Leaders:** Peter Clegg, Ian Taylor, Sara Grohmann, Ken Grix, Joe Jack Williams

**Website:** [www.fcbstudios.com](http://www.fcbstudios.com)

## How many researchers (full-time and part-time) work for your practice?

For specific research projects we have one full time, one part-time and an additional ten working part time on research project per year, with around 40 working as researchers part time as part of project work.

## What other organisations, practices or universities have you collaborated with on research projects?

- University College London
- Queen Mary University of London
- University of East London
- University of Bath
- University of Oxford
- Tsinghua University China
- Max Fordham
- Usable Building Trust
- Bioregional
- Aedas/AHR
- Aecom
- XCO2
- Kier
- Inklings
- Building Research Establishment
- Autodesk
- RIBA
- CIBSE
- UK Green Building Council
- BSRIA
- Good Homes Alliance

## What funding sources have facilitated and supported your research?

- EPSRC
- AHRC
- InnovateUK – TSB
- Winston Churchill Memorial Trust
- Higher Education Design Quality Forum

## What are the main benefits to conducting research in your practice?

We feel there are three main benefits. It creates a virtuous circle of improvement, leverages the creative talent within FCBS and facilitates the exploration of new technologies to apply to our projects.

## What are the key themes that your research focuses on?

- Schools and higher education
- Housing
- Museums
- Operational energy/carbon and embodied energy/carbon
- Air quality

## How have you published and shared your research?

We deliver talks and presentations, we continue to publish books, and other articles on our website.

### Schools Research

FCBS have a long history of designing schools, from the technology colleges of the early 1990s to the current Priority School Building Programme. With the shifting building programmes, it's the ideal time to reflect on the largest school building programme: Building Schools for Future (BSF). In collaboration with UCL, FCBS sponsored a full-time Engineering Doctorate (EngD) student to examine the influence of the built environment on the students within secondary schools.

The research had two sections: a high-level analysis of all secondary schools in England, and a low-level case-study analysis of four schools. Within the high-level analysis, schools that received new school buildings were shown to improve attainment before the new building as well as after, but this temporary boost typically only lasted for 3-4 years after the move to the new building, before returning to the original attainment performance.



Plymouth School of Creative Arts  
© FCB Studios

Examining the link between the students and their building in detail necessitated using a broad spectrum of methods: data loggers, space syntax, questionnaires, passive samples, and a bespoke online feedback tool. These showed that the students were strongly influenced the look and feel of the school, focusing on the aesthetics, space, and layout. Also important was the internal temperature of the building.

### Museums Research

Museums face an uncertain time, with reductions in public funding, increasing competition from other forms of leisure and the continuing prevalence of digital technology in our lives. The traditional role of the museum has been eroded and new and different experiences are being demanded of them. Recognising the challenges that museums and exhibition designers now face, FCBS carried out a short programme of research into the key issues under its internal R&I bursary programme.

This led to a successful Winston Churchill Travelling Fellowship which funded our partner Clare Hughes to explore the current state of exhibition design around the world. She sought out the most innovative museums, from the USA, to the Netherlands, France and Germany. There she explored a whole range of exhibition styles and story-telling techniques in order to understand what it is that helps to truly connect with what we see.



Museums Collage  
© FCB Studios

That might be the built form that houses the exhibits, the power of storytelling and the spoken word or the ingenuity of technology. Her findings have recently been published in a user-friendly and haptic book: *Made You Look. Made You Stare: inspiration from a museum road trip.*

**Locations:** London, New York, Madrid, Hong Kong, Beijing, Shanghai, Abu Dhabi, Dubai, Buenos Aires, Sao Paulo, Silicon Valley, Singapore

**Employees:** 1465

**Research Leaders:** Irene Gallou, Head of Specialist Modelling Group

**Website:** [www.fosterandpartners.com](http://www.fosterandpartners.com)

## Foster + Partners

### **How many researchers (full-time and part-time) work for your practice?**

We have 35 'Researchers' employed in the Specialist Modelling and Applied Research and Design groups. We also have 7 employees within the Materials Research Centre team.

General design research happens across all levels within the practice. However, specific research problems are typically tackled by the various support groups such as Urban Design, Environmental and Structural Engineering, Applied Research and Development, and the Specialist Modelling Group.

### **What other organisations, practices or universities have you collaborated with on research projects?**

We have three main modes of conducting formal research projects:

- Internal funding
- Funding and supervising PhD students with universities. We are currently hosting four PhD students: one at the Royal Veterinary College, and three more as part of a large EU-funded group, involving the Bartlett, IAAC Barcelona, and ITKE Stuttgart.
- Research consortiums working on specific projects. Across these we work at different levels of formality, time and scope with various partners. We are currently working with:
  - Loughborough University, Skanska and ABB on a continuing Innovate UK Knowledge Transfer Partnership to develop large scale 3d concrete printing; and
  - Cranfield University, BAE Systems, Vestas, and Autodesk on an EU-funded project on metal printing.

### **What are the main benefits to conducting research in your practice?**

In the short term it is gaining knowledge and expertise and developing interesting partnerships in other fields of expertise.

### **What funding sources have facilitated and supported your research?**

Funded research projects have been mainly handled through the Specialist Modelling Group. Besides working with universities to access their own internal funding routes, we have successfully applied for:

- Innovate UK
- EPSRC
- EU Horizon2020

### **What are the key themes that your research focuses on?**

Within the Specialist Modelling Group, there is currently a broad interest in robotic construction, 3d printing, post-occupancy evaluation, and autonomous drone surveys.

### **How have you published and shared your research?**

When possible we publish in relevant journals and present at conferences such as Fabricate, IAS, ACADIA, Smartgeometry, IASS, AAG, etc. We also publish our most prominent research on the Foster+Partners website.

## Cathedral Cities in Peril

Spencer de Grey, Bruno Moser, Theo Malzieu, Foster + Partners  
Terence O'Rourke, Terence O'Rourke Ltd

### Context

Historic towns and cities in England need to find ways to preserve their unique heritage while dealing with considerable national population growth. Divided between the desire to protect and the need to expand, they should combine the objective demand for new homes with the conservation of their historic environment. Previous research has highlighted ways to preserve heritage in the face of urban growth, but we believe that new insights can be gained by considering how historic cities can achieve better growth because of their intrinsic heritage value.

### Questions, aims and arguments

The primary focus is on how historic towns and cities in the UK can reconcile the need to preserve and enhance their heritage, given the pressures for urban development and growth, and what they might learn from other European cities that have dealt with this tension in an exemplary way.

### Resources, data and methodology

We studied Delft, Lund, Tübingen and Bayonne as examples of European cities where the reconciliation of historical heritage and urban growth has been achieved in an exemplary way. We looked at cities such as, Durham, Ely, Chichester, Lichfield and King's Lynn that are currently experiencing forces of change, or will do so in the next few years. Where possible, places that are World Heritage sites and listed buildings were considered. To assess tensions with heritage preservation, the actual plans and mechanisms being applied in each city were analysed. This framework was used as an indicator of important and ancient historical heritage.

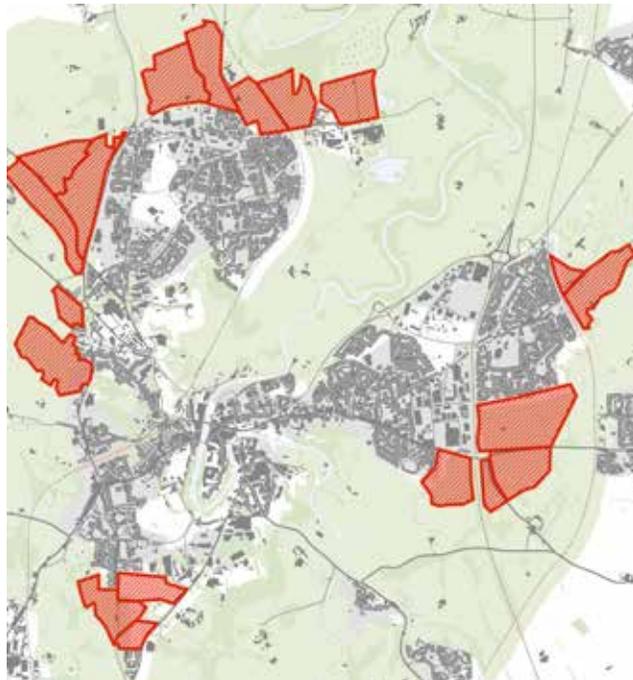
### Analysis and Findings

We found that the need to build more and better housing in England is inescapable and growth pressures affect small historic cities in different ways.

Current legislation and practices trigger a set of risks for the reconciliation of urban development and heritage preservation – excessive and poorly located urban expansion, failure to provide sufficient housing, little control of urban regeneration and lack of spatial and social quality of expansion areas. We have identified these challenges and shown how we can learn from good practices in historic cities that are managing to accommodate extensive growth and create better cities in the process.

### Impact, significance and outputs

This study sets out policy recommendations for government to restrict greenfield expansion, improve the liveability of historic centres and urban extensions, bring new developments back into the urban fabric, and integrate whole townscapes into a consistent, desirable and well-connected urban environment. We will continue to liaise with relevant stakeholders across a variety of platforms to develop and implement our proposals.



*Durham's planned urban growth: this map corresponds to the Durham Local Plan, now declared unsound by the Planning Inspectorate's interim report.*  
© Foster + Partners

Locations: London

Employees: 6

Research Leaders: Dr Nasser Golzari and  
Dr Yara Sharif

Website: [www.ngarchitects.co.uk/](http://www.ngarchitects.co.uk/)

## Golzari-NG Architects

### How many researchers (full-time and part-time) work for your practice?

Everyone working in our practice is contracted to allocate 20-25% of their time to research.

### What other organisations, practices or universities have you collaborated with on research projects?

- Qalandiya International
- University of Westminster
- University College London
- Oxford Brookes University
- New York City College
- RIWAQ
- ARUP
- UNESCO
- UNHabitat
- Terreform

### What funding sources have facilitated and supported your research?

- Arts Council England
- A3 Times
- UNHabitat
- RIWAQ
- Oxford Brookes University
- University of Westminster
- Direct project commissions

### What are the main benefits to conducting research in your practice?

The ongoing research in our office enables us to explore different possibilities and test ideas, being more speculative and creative. Research enables our designs to be more embedded in specific contexts as well as being more evidence based.

### What are the key themes that your research focuses on?

- Empowering excluded communities
- Affordable and inclusive architecture
- Socio-economic sustainability.

### How have you published and shared your research?

We have been involved in a number of lectures, seminars and workshops both locally and internationally both as practices and academic researchers. Most recently curating Qalandiya International in which over 20 contributors participated in exhibitions, film screenings, live performances and symposiums in London. Our work has been published in several books and articles, recently *Reclaiming space: 50 village project in rural Palestine*. We also have our website with our current and past research as well as current event and projects taking places.

## Palestine Regeneration Team (PART)

Dr Nasser Golzari, Golzari-NG Architects, PART, University of Westminster

Dr Yara Sharif, Golzari NG Architects, PART

Prof Murray Fraser, Bartlett School of Architecture UCL, PART

### Context

This submission describes the design research of a team seeking constructive ways of using architecture and urban design to mend the fragmented landscape in Palestine/Israel through the principles of 'stitching' and 'empowering'. The work presented here builds upon previous involvement in an ongoing programme to regenerate 50 historic towns/villages that together contain half of Palestine's surviving built heritage, two projects for which won prestigious international architectural awards in 2013 and 2014.

### Questions, aims and arguments

The main aims of the team are to examine the spatial fractures caused by many years of Israeli occupation, and to seek architectural/urban means to 'stitch' together the fragments and 'empower' Palestinian community groups.

Hence vital to all of the team's design research are these questions:

- How can architecture heal, stitch and empower within the Middle Eastern context?
- How can critical design research/practice enact change within a conflict zone?
- How might low-energy sustainable design take on a more political approach?
- How might everyday life and silent forms of resistance be incorporated into architectural/urban design?

### Resources, data and methodology

The team uses 'social mapping' with local community groups to explore the invisible networks, socio-economic activities and emotional responses of a site. Urban design proposals are modelled/tested as part of developing the final suggestions, working with local NGOs and community groups. Environmental testing is used to reconfigure typical existing dwellings to save energy and improve internal thermal comfort through simple modifications and/or extensions, drawing on traditional cultural practices. This is based on intensive in situ climate monitoring and is aided by acknowledged experts in low-energy design.

### Analysis and Findings

The environmental strategy includes using 'greening' as means to create 'urban pockets' that can stitch together the Palestinian built fabric. The strategy was initially devised for the Gaza Strip, and later adapted for towns in the West Bank, where it is presently developing a unique technology using local labour and recycled materials to provide the first-ever 'green roofs' there.

Team members are also involved in designing speculative and experimental projects, especially for the marginal zones and lost territories created along boundaries such as the Israeli 'Separation Wall'. This aspect has been developed yet further by team members through their teaching work.

### Impact, significance and outputs

The research team has collaborated with other cultural producers such as artists, filmmakers and photographers from several countries including Palestine. The team has, between them, given over 50 presentations in Britain and around the world about their work in Palestine, and have assembled a number of exhibitions, published a range of journal essays and book chapters, and held workshops in many countries. Future exhibitions and books are also planned.



*Derelict historical centre of Beit Iksa prior to Riwaq & PART scheme.  
© RIWAQ photo archive*

**Locations:** Melbourne, Sydney, Brisbane, Perth, Adelaide, Singapore, Shanghai, Beijing, Hong Kong, London, and Cardiff

**Employees:** 750

**Research Leader:** Head of Knowledge and Sustainability: Brett Pollard

**Website:** [www.hassellstudio.com](http://www.hassellstudio.com)

## HASSELL

### **How many researchers (full-time and part-time) work for your practice?**

The Knowledge and Sustainability team conducts and facilitates research across the practice with our design and sector leaders and sit outside the time and budgetary constraints of design projects. The team comprises Principal Brett Pollard, researcher Michaela Sheahan and Dr Agustin Chevez, Senior Researcher and Adjunct Research Fellow at the Centre for Design Innovation at Swinburne University

### **What other organisations, practices or universities have you collaborated with on research projects?**

We undertake research with various organisations, including:

- Cooperative Research Centre (CRC) for Low Carbon Living
- University of Melbourne School of Population and Global Health – *Design Matters for Nurses: Hospital design for staff attraction and retention*
- Hong Kong Polytechnic University School of Hotel and Tourism Management – *How to Get a Good Night's Sleep in a Hotel*
- Empirica Research – *Does Workplace Design Affect Staff Attraction?*
- ARUP – *Cracking the Capacity Code: Rethinking building occupancy in a new era of work*
- Optimice – *Interactions by Design: A social network analysis of workplaces*

### **What funding sources have facilitated and supported your research?**

The majority of research projects are funded internally but we have previously obtained a Research Connections grant from the Australian government Department of Industry. We also work with our clients to incorporate research into specific projects.

### **What are the main benefits to conducting research in your practice?**

Our research supports knowledge leadership, innovation and sustainability that is directly relevant to our clients and our designers. This investment in evidence based design means we offer a significant body of international best practice knowledge, which directly informs our design thinking and delivers design outcomes.

### **What are the key themes that your research focuses on?**

Our research is based in four key sectors: Education and Science; Health; Commercial; and Workplace. We have a particular focus on the following, which allows our practice to understand the complexities of design:

- Benefits of proximity and density in workplaces for interaction and collaborative working.
- Social network analysis
- Pre and Post Occupancy Evaluation by both quantitative and qualitative methods
- Design trend analysis

### **How have you published and shared your research?**

We publish our research on our website in video and print formats. We also conduct Creative Futures Forums with our clients to disseminate and discuss our research periodically, and present to industry forums and conferences wherever possible.

## Design Matters for Nurses - Hospital design for nurse attraction and retention

Dr. Lucio Naccarella and Michaela Sheahan, Hassell  
Prof. James Buchan, Queen Margaret University Edinburgh

### Context

Nurses are the cornerstone of hospital care delivery, yet stress, burnout and staff turnover are common issues that undermine the ability of hospitals to provide a committed and sustainable nurse workforce. Previous research has identified a number of individual and organisational factors that affect the job satisfaction and productivity of nurses, including pay, responsibility, career advancement and workplace culture. While the role of the physical hospital environment in job satisfaction is under-researched, studies have uncovered links between hospital workplace design and efficiency, patient and staff safety, and staff morale.

### Questions, aims and arguments

The aim of the research is to identify how hospital design influences nursing staff attraction and retention, in order to better inform future hospital design projects. The key objectives of the project were to identify:

- Characteristics of hospital workplace design that can improve attraction and retention
- Contextual factors that may influence the interplay between workplace design and attraction and retention
- Enablers and barriers to achieving workplace design that can positively influence attraction and retention

### Resources, data and methodology

A literature review was conducted, which identified four influential design elements: external hospital environment, ward layout, staff amenities, and ward indoor environment quality. Twelve focus groups were then conducted with 74 nurse managers and clinical ward nurses in Melbourne, Edinburgh and Glasgow.

The focus groups were facilitated by two chief investigators using a common framework developed from the design elements identified in the literature review to ensure a consistent approach to data collection, analysis and interpretation. Transcripts were coded and analysed using constant comparative thematic analysis.

### Analysis and findings

While the research findings confirmed existing evidence further analysis uncovered three specific design elements that directly influence nursing staff work experiences, and indirectly influence staff attraction and retention: adequate space for working, storage, learning and rest; proximity to storage, patients and other staff; and indoor environment quality. The factors relating to attraction of staff varied from those that retain staff. Aesthetic and maintenance issues (indoor environment quality) were more important in attraction of staff, whereas design for space and proximity in the workplace were more relevant to retention of staff.

### Impact, significance and outputs

The research findings were presented at a media launch on 12th May, International Nurses Day, the translation by the architectural studio into engagement tools for healthcare providers (radio and print media, client forums and conference presentations). This has prompted the funding partners to grant additional funds to explore innovative design solutions for emergency care settings.



Western Australia  
Cancer Centre.  
© HASSELL Studio

Locations: London

Employees: 250

Research Leader: Darryl Chen

Website: [www.hawkinsbrown.com/  
research](http://www.hawkinsbrown.com/research)

## Hawkins\Brown

### How many researchers (full-time and part-time) work for your practice?

Michael Riebel is full time, Tom Fox and Mikel Azcona are part-time and Yair Schwartz is part-time on a PhD placement.

### What other organisations, practices or universities have you collaborated with on research projects?

- Centre for London
- RIBA
- University of Lancaster
- University of Cardiff
- University College London
- Pointr
- Buro Happold

### What funding sources have facilitated and supported your research?

Our work is either funded internally, direct through commissions or incorporated as part of larger projects.

### What are the main benefits to conducting research in your practice?

There are four main benefits to research for our practice:

- to enhance design practice through knowledge dissemination;
- to enter new markets/subsectors;
- to provide an evidence base for design decisions, principally at RIBA Stages 1-3; and
- to open new services at RIBA Stage 0.

### What are the key themes that your research focuses on?

- Drivers and shapes of new architectural typologies in the fields of creative workspace and industrial parks
- Innovation districts
- Client briefing
- Post-Occupancy Evaluation

### How have you published and shared your research?

Selected short reports and excerpts are available online through our website which are offered with discretion to clients, and through industry publications.

## Creative Ecologies

Michael Riebel, Hawkins\Brown

### Context

Our Practice is involved in a range of projects for the knowledge economy, including the design of co-working spaces, innovation centres and science parks. These projects – ranging for the urban dimension to workplace design – seem to be different at first glance. They nevertheless share the ambition to set out a spatial configuration that fosters communication and provides a fertile environment for innovative thinking.

### Questions, aims, arguments

The research project addresses two tasks. First, to provide the design teams with knowledge for well-informed design decisions. Second, to extend our knowledge and improve understanding of mechanisms of communication at knowledge related work places.

We set out the case studies, research interests and project related questions which we collected and related in a loose way. In single cases, like the workplace tracking field study we took a closer look at a subject and developed a more systematic research methodology which generated primary data to enable scientifically backed insights.

### Resources, data and methodology

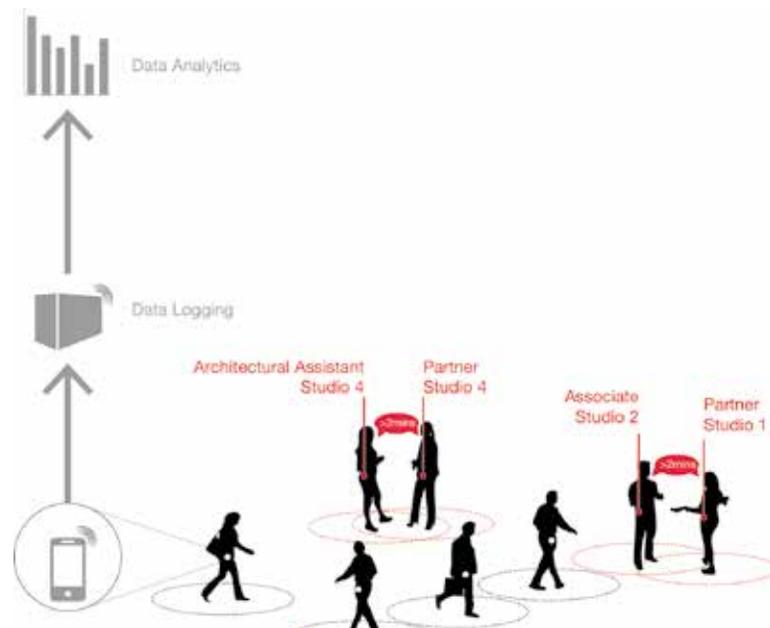
We decided to test Bluetooth beacons and WIFI devices and to analyse its own work environment. We collaborated with Pointr, a tech start up from level 39 that develops indoor navigation systems using a grid of Bluetooth beacons in combination with mobile phones, and the Smart Move department of Buro Happold that helped us dealing with the massive amount of data produced within one week of tracking 180 employees.

### Analysis and findings

The study helped us to understand the spatial user profiles of different seniorities and various levels of occupancy. The key message of this study is that an intelligently arranged inefficiency or “positive disruption” as we labelled it can be successful design tool for the design of innovative workplace design.

### Impact, significance and outputs

It is our intention to refine this approach together with Pointr and Buro Happold and apply the spatial affordance of disruption to concrete projects. We are working on two projects for the knowledge industry /higher education sector that potentially will use the tracking technology for POE.



Beacons  
© Hawkins\Brown

**Locations:** London, Sheffield, Cardiff, Plymouth, Manchester, Glasgow, Belfast, Abu Dhabi, Dubai, Johannesburg

**Employees:** 230

**Research Leaders:** Board Director Caroline Buckingham. Ambassadors – Matt Ward, Jeannine Gavaghan, and Lucy Plumridge

**Website:** [www.hlmarchitects.com](http://www.hlmarchitects.com)

## HLM Architects

### **How many researchers (full-time and part-time) work for your practice?**

Research can be carried out by any employees.

### **What other organisations, practices or universities have you collaborated with on research projects?**

- University of Strathclyde
- University of Sheffield
- Sheffield Hallam University

### **What funding sources have facilitated and supported your research?**

- Funding from within the business, allocated budget
- Clients contributing towards research projects

### **What are the main benefits to conducting research in your practice?**

- Increasing our knowledge and skills in specialist areas
- Continual Professional Development in areas of interest
- Moving into new sector markets based on evidence outcomes of research

### **What are the key themes that your research focuses on?**

- Low rise High Density Housing – MATT housing
- Component driven and modular school design
- Group culture and ethos in architectural practice
- Blended and collaborative learning spaces
- The use of integrated design and dynamic simulation modelling in creating a new Regulatory Strategy for High Rise residential projects

### **How have you published and shared your research?**

- Submission to RIBA, President's Awards for Research, 2016
- Competition entries

## The Use of Integrated Design and Dynamic Simulation Modelling In Creating a New Regulatory Strategy for High Density Residential Projects

Raffaele De Angelis, HLM

### Context

The targets applied to reduce carbon emissions within the building industry are based on standard benchmarking procedures that provide a robust/shared framework for comparing buildings performance. Residential benchmarking procedures have been defined upon simplified calculation methods. Although the Standard Assessment Procedure (SAP) has been instrumental to the substantial performance increase in the residential sector during the past 15 years, this simplified method is increasingly limited.

### Questions, aims and arguments

The main question of this study is how to use advanced calculation methods to measure and assess complex interactions in design that are not accountable within a steady state calculation, and then implement relevant results within the SAP compliance framework. The study explores the use of Dynamic Simulation Modelling (DSM) and SAP for: assessing the overall performance; integrating the passive solutions with active systems; and comparing of levels of fabric specification against actual performance.

### Resources, data and methodology

An exercise for aligning assumptions for the different modelling was undertaken and implemented adopting BRE based assumptions. A detailed performance mapping allowed for the investigation of potential weakness in design elements and parts; a platform on which to progress further optimisation, and the delivery of a higher level of efficiency including a substantial reduction in the capital cost by a more accurate allocation of resources.

### Analysis and Findings

This paper demonstrates how a more appropriate CO<sub>2</sub> reduction hierarchy is implemented through DSM. The lack of required information, caused by ever-increasing performance targets is leading to the adoption of LZC or Renewable solutions instead of an effective design optimisation process.

A comparison of SAP and DSM analysis applied to a same apartment with specifications corresponding to progressive baseline requirements in the past 18 years, shows how the effectiveness of SAP is progressively reduced as the overall design efficiency is improved.

### Impact, significance and outputs

Designers may benefit from this research using its findings to promote integrated and innovative design solutions with the support of detailed analysis. DSM procedures are the way forward for addressing the strategies for smart communities.



Sutton Estate, Chelsea.  
© HLM

**Locations:** London, Edinburgh, Manchester, Bristol

**Employees:** 165

**Research Leaders:** Rory Bergin, Partner, Sustainable Futures. Dr Riette Oosthuizen, Partner, Planning. Ben Derbyshire, Chair

**Website:** [www.hta.co.uk](http://www.hta.co.uk)

## HTA Design LLP

### **How many researchers (full-time and part-time) work for your practice?**

Besides the research leaders Phoebe Eustance is full time and Michael Stock is part time and other members of staff work on research between projects, including Anna Sullivan.

### **What other organisations, practices or universities have you collaborated with on research projects?**

- 4 Housing Architects (PTE, PRP, Levitt Bernstein and HTA Design LLP)
- The Housing Forum
- Imperial College London
- Apex Airspace
- Savills Research
- Centre for London
- Sticky World
- SliderStudio
- Kingspan Potton
- Igloo
- BLP
- Peabody Trust
- Wates
- Steel Construction Institute

### **What funding sources have facilitated and supported your research?**

HTA Design LLP has a resource and innovations budget of 60,000 for innovations and an additional £70,000 commissions from clients.

### **What are the main benefits to conducting research in your practice?**

We are keen on developing new ways of thinking that could challenge policy thinking and stimulating debate and growing collaboration with likeminded people.

### **What are the key themes that your research focuses on?**

- Suburban intensification
- Custom build digitisation
- New models of housing for the future

### **How have you published and shared your research?**

We have published articles in Planning in London, discussed our research with key officers at the Greater London Architecture, talked at a variety of conferences and seminars, such as Ecobuild, the NLA, Urban Design Group National Conference, and the All Party Political Group on suburban intensification at the House of Commons.

## Chelsea Court Heritage Study

Anna Sullivan, HTA Design LLP

### Context

Research into the history of a place consistently proves valuable, even for buildings of relatively recent construction, and contextualises the merits of its design and presents its history to stakeholders during consultation. Demonstrating understanding also implies care is being taken in the work being done, which is particularly important when it affects someone's home. Making the narrative of the building's history engaging and accessible to readers outside the profession, who are likely to read the Heritage Study, is an important aim of that section of the report

### Questions, aims and arguments

Primarily concerned with why the building is the way it is, the aims were to understand who designed it and when, the physical and historical context of the building at the time of construction, subsequent alterations and a comparison with others of its type to generate a Statement of Significance.

### Resources, data and methodology

An initial search of British History Online was followed by a wider internet search into the subject including histories, biographies and maps. Search terms were refined as increasingly relevant information emerged. Catalogue searches of the Historic Environment Record local to the building and relevant national collections followed using information from the internet searches and the Local Studies section of the borough library and at the RIBA. A photographic record of the building and its curtilage was made during inspection was collected with measured survey drawings, photographs of the conservation area in which it was built and the history of the building.

### Analysis and Findings

Maps overlaid with the various boundaries illustrate the phases of the development of Chelsea Embankment and enable readers to relate the familiar building and setting to the area over time. This is brought up to date with the profusely illustrated assessment of the conservation area. Noticing outlines of flat numbers in the varnish of the best doors in the building during inspection indicated the early layout of the block. Richard Norman Shaw is not celebrated today despite his success in the late 19th Century which raised questions about how many really good Architects of that time are now largely forgotten, how many really good buildings are taken for granted.

### Impact, significance and outputs

The history of the area around the building is of great historical interest seemingly overshadowing those other buildings that are important for being part of the lived experience of so many people for so long, and that deserve to be championed if we value our built environment. The Heritage Study is an opportunity to add to the understanding of a place. Circulated to the project team during design development the completed Heritage Study will also form part of the documentation for the planning application through which it will become available to the public through the planning portal website. It is also hoped that drawing attention to the forgotten Architect of the building in a small way may encourage further study of his work, his life and perhaps his wider social circle, which was not relevant to the Heritage Study but could yield an interesting history



*Swan House, 17 Chelsea Embankment, designed by Richard Norman Shaw  
© HTA Design LLP*

## Home Performance Labelling

Ben Derbyshire, Rory Bergin, Lucy Smith, Kim Vernau, Shelagh Grant, HTA Design LLP

### Context

It is now widely accepted that the housing market would be greatly improved by the availability of accredited information on the quality and performance of homes. Now consumers have access to instantly available information in just about every other walk of life on their smart phones.

### Questions, aims and arguments

The question is how best to introduce information to the marketplace, what information would be best made available, and how to overcome the various obstacles involved?

### Resources, data and methodology

Members of The Housing Forum and their collaborators were invited to submit designs for single dwellings; houses or apartments, of any size, using Building Information Modelling (BIM) software. These were compared against the same metrics and then benchmarked and the data presented in the format of a comparison website with a traffic light system revealing performance in relation to benchmark standards with 'hover over' explainers to convey the means of calculation and parameters of compliance. The pilot project carried out the assessment of 15 BIM based dwelling designs for the following performance parameters. An explanatory panel and iPad, presenting the website, were displayed at New London Architecture for six months.

### Analysis and Findings

BLP's Butterfly software, developed to measure life cycle performance and operational and embodied energy performance, analysed the output schedules for each project using spatial information extracted from the BIM files. It then generated results on the planned maintenance and component replacement cost of the dwellings for a life cycle period of 60 years. The operational cost was calculated using the output from the Standard Assessment Procedure calculation. Water consumption was measured based on an average usage per household-person and fuel tariffs and standing charges were based on a typical currently available offer. Daylight availability was modelled based on a consistent surrounding context using the IES FlucsDL tool.

### Impact, significance and outputs

The success of this pilot has encouraged us to develop the tool further. We have been pleased by the support we have already received from respected companies as well as the positive response so far from Brandon Lewis, HBF, GLA and RICS. The tool will be developed by forming a consortium of a small group of members who would work with us to develop the idea further and bring it to market and so far includes Barratt Developments Plc, L&Q, Climate Energy Homes, Wates Living Space and Pocket Living have agreed to support the initiative.

Comparison Results (15)		Floor Area	Operational Costs	Maintenance Costs	Storage Area	Volume	Daylight	Broadband
	<b>Pievna Street House</b> £1,500,000 4 Bedrooms £10,870/m <sup>2</sup>	138.00m <sup>2</sup> Floor Area	£2316 pa Operational Costs	£2091 pa Maintenance / Replacement	4.90m <sup>2</sup> Storage Area	379m <sup>3</sup> Volume	4.58% Daylight	12.2Mb Broadband
<b>Performance Benchmarks</b>		123m <sup>2</sup>	£2361 pa	£2778/m <sup>2</sup> pa	4m <sup>2</sup>	358.8m <sup>3</sup>	2.0%	14.7Mb
	<b>Stewart Street Flat</b> £700,000 3 Bedrooms £7,527/m <sup>2</sup>	93.00m <sup>2</sup> Floor Area	£1798 pa Operational Costs	£2638 pa Maintenance / Replacement	1.00m <sup>2</sup> Storage Area	251m <sup>3</sup> Volume	2.01% Daylight	12.2Mb Broadband

Comparison of Performance criteria. © HTA Design LLP

## Louise House Forest Hill Heritage Study

Anna Sullivan, HTA Design LLP

### Context

Even for buildings of relatively recent construction, research into the history of a place consistently proves valuable and contextualises the merits of its design and presents its history to stakeholders during consultation. The Heritage Study produced informed the project team and the stakeholders about the history of the building and its conservation area setting before proposals were developed for a new landscape design and alterations to a curtilage building included in the listing for a community focused arts organisation.

### Questions, aims and arguments

The aims were to understand how the institution providing a Girls' Industrial Home came to build one, the people involved, the physical and historical context at the time of construction, subsequent alterations and an assessment to frame strategies for future alterations. Social and cultural connections to the community were considered important here. Opportunities to connect the building and site with events in the history of its surrounding community were sought to provide context, enrich the narrative and assist engagement.

### Resources, data and methodology

An initial search of British History Online was followed by a wider internet search into the subject including histories, biographies and maps. Search terms were refined as increasingly relevant information emerged. Catalogue searches of the Historic Environment Record local to the building and relevant national collections followed using information from the internet searches and the Local Studies section of the borough library and at the RIBA. A photographic record of the building and its curtilage was made during inspection was collected with measured survey drawings, photographs of the conservation area in which it was built and the history of the building.

### Analysis and Findings

Those involved in the Girls' Home were closely connected to their community, its Honorary Architect also responsible several adjacent and nearby buildings. Introducing aspects of the 19th Century debate around education for girls gave context to the distinctiveness of the institution that was expressed in its architecture.

### Impact, significance and outputs

There are many buildings that are important for being part of the lived experience of so many people for so long that do not have connections to prominent people or events but deserve to be championed if we value our built environment. The Heritage Study is an opportunity to add to the understanding of a place.



*Louise House Heritage Study, Seen across Dartmouth Road.  
© HTA Design LLP.*

**Locations:** London, New York, Beijing

**Employees:** Approx. 180

**Research Leaders:** Research Director:  
Lars Hesselgren. Environmental & Timber:  
Kevin P. Flanagan & Ron Bakker.

**Transport & Geometry:** Lars Hesselgren  
& Kevin P. Flanagan

**Website:** [www.plparchitecture.com](http://www.plparchitecture.com)

## PLP Architects

### **How many researchers (full-time and part-time) work for your practice?**

As designers we are all often involved in research to some degree. We often involve ourselves in new technology, in optimising performance and improving the live and work environment of people in our cities. Lars, Kevin and Ron are, at the moment, principally involved in research collaborations, but the list is far broader, in the development of collaborative ideas.

### **What other organisations, practices or universities have you collaborated with on research projects?**

- University of Cambridge
- Tyrens Engineering, Sweden
- Bouygues, UK – Logistics
- University of Bath – Materials
- Government Ministry of Trade and Industry, Sweden – Looking to establish a dedicated research facility

### **What funding sources have facilitated and supported your research?**

Our work is funded by our collaborative partners.

### **What are the main benefits to conducting research in your practice?**

Challenges provide a greater focus for the firm, and promote innovative thinking. The aspiration is that ultimately the research will benefit positively our design process, our buildings once realised, our clients through greater value, to the livelihoods of the denizens of the city, and country. Each design is a laboratory that encapsulates an aspiration.

### **What are the key themes that your research focuses on?**

Urbanity, with disciplines including:

- Architecture and interior design
- Urban planning and landscaping
- Transport including materials, engineering of mechanical systems and structure, geometry and generative components.

### **How have you published and shared your research?**

The research is disseminated through lectures or publications and, as it is often collaborative, the results are often promoted and published through our partners.

## Supertall Timber: Design research for the next generation of natural structure

Michael H. Ramage, University of Cambridge

### Context

This research is underpinned by a vision for a sustainable future in which natural materials play a greater role in the construction of the built environment. This research furthers the architectural and structural engineering knowledge necessary to make tall timber buildings a reality. The research will enable the use of natural materials in taller and larger buildings as a substitute for steel and concrete, and to reduce the carbon emissions associated with them. There has been significant recent interest in tall timber, although “tall” in contemporary timber buildings is up to 14 stories; this height is barely midrise in steel or concrete.

### Questions, aims and arguments

The research considers the integrated architectural and structural requirements of a tall building and the specific requirements of key connections and details within a building. The project considers the innovation possible with available engineered timber materials, including glued-laminated timber (glulam), cross laminated timber (CLT), laminated veneer lumber (LVL), and structural bamboo. The research also investigates particular construction challenges of high-rise buildings and the opportunities that arise through the prefabrication that is frequently found with contemporary timber construction.

### Resources, data and methodology

The research explores how and why high-rise timber building designs work and how they might fail. “Premortems” of conceptual failures are carried out – a forensic analysis of sorts – to determine weaknesses in design strategies and the properties needed in new timber-based materials. This interrogation of the architectural and structural design allows experimental testing to be planned and precisely targeted at the key areas limiting design.

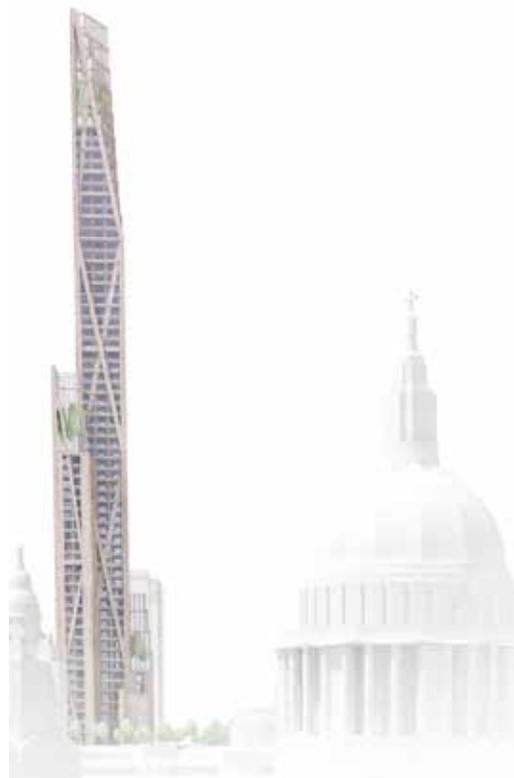
The research addresses a range of material forms including solid engineered timber, timber composites, and hybrid timber/metal elements. The physical testing is supplemented by structural modelling, comparing performance with relevant design codes and informing requirements for future structural testing. The research includes a thorough review of constructed timber buildings, identifying common approaches, building-specific innovations, and instances where creativity plays a part in wider adoption, acceptance, and better design of tall timber buildings.

### Analysis and findings

The structural loads that timber needs to carry in order to achieve a height of 300 m are shown to be within the limits of the material, although typically design must focus on stiffness limitations rather than strength limitations. The lateral wind loads which dominate high rise design, coupled with the natural lightness of timber structures, requires a careful approach to carrying structural loads to the perimeter of the building.

### Impact, significance and outputs

This research is having a significant impact, both in the UK and internationally, because it has both academic research “push” and practical industry “pull” into the market. This project aims to create significant change in research and in architecture and engineering practice.



*The notional site of  
Oakwood Tower -  
London's Barbican.  
© PLP Architecture*

**Locations:** 16 UK offices including London, international offices in Melbourne, Sydney, Delhi & Hong Kong

**Employees:** 286 UK & 304 Globally

**Research Leaders:** Heather Jermy, Michael Morrison, Hattie Mulhearn, Jon Wright, Brian Anderson.

**Website:** [www.purcelluk.com](http://www.purcelluk.com)

# Purcell

## **How many researchers (full-time and part-time) work for your practice?**

Most of our employees are researchers. We consider what we do to be bespoke and research driven. It is an integral part of the process. In every project our core approach is to understand and be informed about all relevant aspects, for example the history and significance of the site, and how it was constructed and of what. These research-based questions are posed and assessed by a range of individuals and teams within the practice.

## **What other organisations, practices or universities have you collaborated with on research projects?**

- Historic England, Church Buildings Council (Church of England), Heritage Lottery Fund, Greater Churches Network and Doncaster Minster – Major Parish Churches national research project
- Getty Foundation – Liverpool Cathedral
- Commonwealth War Graves Commission and Jerusalem University – Conservation Management Plans for: Taukkyan War Cemetery, Myanmar, Jerusalem War Cemetery, Israel, Menin Gate Memorial, Belgium, Tyne Cot Cemetery, Belgium, Cassino War Cemetery, Italy, and Naval Memorials, UK
- British Museum
- Andrew Handley Microsoft – BIM research

## **What funding sources have facilitated and supported your research?**

- Historic England
- Heritage Lottery Fund
- Getty Foundation
- CBA work from David Hills
- South Georgia work

## **What are the main benefits to conducting research in your practice?**

We see three key benefits to our practice and work:

- Understanding underpins everything we do. We often work on buildings with no existing published so establishing the best possible understanding is necessary for maintaining and enhancing heritage value.
- Opening new avenues for potential work
- Influencing national policy. Our work on Major Parish Churches will inform the Government's Cathedrals and Churches Sustainability Review.

## **What are the key themes that your research focuses on?**

- Places of worship
- Significant architectural buildings
- Historic landscapes
- Materials (specifically stained glass, stonework, lime and leadwork)
- Construction methods
- Architectural history
- Understanding significance
- Buildings Archaeology – how places have developed and changed

## **How have you published and shared your research?**

Most of our research is published in conservation reports, heritage reports (HIAs, Heritage Statements, CMPs) which are shared amongst stakeholder groups and sometimes the client will publish reports online or on shared websites such as the Government's Planning Portal. We publish articles in journals, such as *Context Magazine*, Tom Brigden is writing a book to be published by RIBA publishing and members of our practice deliver lectures, and speak at seminars and conferences.

## Commonwealth War Graves Commission Conservation Management Plans

Heather Jermy, Purcell

### Context

The Commonwealth War Graves Commission (CWGC) ensures the continued commemoration of the Commonwealth dead. Previously, understanding of CWGC sites has been largely centred on commemoration. However, the completion of Conservation Management Plans (CMPs) for Ypres (Menin Gate) Memorial in Belgium, Jerusalem War Cemetery in Israel and Taukkyan War Cemetery in Myanmar, has brought attention to the architecture of these places and the substantial role this has within the development and global dissemination of British design in the 20th century.

### Questions, aims and arguments

The aim of the CMPs was to provide the CWGC with working documents to guide conservation management strategy, thus enabling them to take a long-term approach to the care of the sites, ensuring they meet their Royal Charter obligation of maintaining them in perpetuity. Underlying the research and its contribution to the CMPs are important considerations including:

- The importance of these sites within a global consideration of British and Commonwealth architecture
- The significance of the architects and their designs within the context of the CWGC
- The importance of these sites with regards to local and regional architectural development
- The impact of these sites on their local and regional setting
- Collaboration between various architects and designers

### Resources, data and methodology

The main source of information were the CWGC archives which contain considerable information about the establishment, design and early works to the site, although material became less prolific as digital resources have been employed. Comparative analysis was used in understanding other memorials and their progressive design, as well as the CWGC contributing understanding of their own sites, leading to a considered approach to assessing architectural significance.

Whilst the output of the Commission's principal architects has been researched previously, most notably Sir Reginald Blomfield, Sir Herbert Baker and Sir Edwin Lutyens, our approach was to look past the structures simply as commemorative and elucidate more clearly and objectively whether or not they constituted successful architecture and design.

### Analysis and Findings

There are three key findings from the research, namely the significance of:

- the architects and architecture of these sites within the context of the UK architectural history;
- the sites and their design within a regional context; and
- the sites in physical, material terms rather than concentration on intangible considerations.

Generally, the geographical distance from the UK has left these sites outside of the story of UK architectural history. This is all the more surprising considering the architects, artists and sculptors involved worked together at a time when British architecture and sculpture was of a particularly high standard.

### Impact, significance and outputs

The CMPs will help ensure the conservation of the sites and raise awareness within the CWGC and with relevant local and regional stakeholders of the importance of the sites. The baseline research sets the stage for exploring in greater detail how CWGC sites represent British architecture around the world, often adapting design styles to suit local landscape and climate.



Jerusalem Memorial.  
Jerusalem War  
Cemetery  
© CWGC Digital  
Archive

**Locations:** Singapore, Shanghai, London

**Employees:** 48

**Research Leaders:** Stephen Pimbley, Lim Wenhui, Wai Wing Yun

**Website:** [www.sparkarchitects.com](http://www.sparkarchitects.com)

## Spark Architects

**How many researchers (full-time and part-time) work for your practice?**

Three – Stephen Pimbley, Lim Wenhui and Wai Wing Yun.

**What other organisations, practices or universities have you collaborated with on research projects?**

None yet.

**What funding sources have facilitated and supported your research?**

Currently all of our research is internally funded.

**What are the main benefits to conducting research in your practice?**

There are three clear benefits for our practice of conducting research:

- Developing thought leadership
- Establishing conversations with other business sectors
- Providing continuing education for staff members

**What are the key themes that your research focuses on?**

Presently we have three topics that we see as supporting our work with the intention of improving social space and social sustainability:

- Aged care
- Community
- Urban interventions

**How have you published and shared your research?**

We have produced our own books. Downloads of our research projects are available on our website including the project we submitted for the 2016 President's Awards for Research – 'Home Farm'.



*Daily life of senior citizens in Home Farm: a mix of agriculture and green living*  
© Spark Architects

## Home Farm

Stephen Pimbley & Narelle Yabuka, Spark Architects

### Context

The proposal for Home Farm emerges from the dual challenges of an ageing population and the multi-pronged problem of food insecurity. To address these issues a hybrid of senior housing and urban farming creates a range of economic, food security, social, health, environmental and urban landscape potentials. At Home Farm, efficient agro-technology closes the gap between producers and consumers of food. By 2030, 18.7% of Singapore will be aged 65 years and over – up from 11.2% today.

### Questions, aims and arguments

With the shift in age demographics and food sources in mind, the questions that arise are:

- How can we increase yield of food production in Singapore itself, taking into consideration our burgeoning building density?
- Can we improve the lives of our seniors?
- How can we alleviate their financial burdens?

The aim of Home Farm is to empower and treat the senior sector of the population with dignity through the provision of a community-focused working and living environment that seeks to develop a sense of self-esteem, social connection, physical activity and financial security for residents.

### Resources, data and methodology

Research, interviews and site visits to existing urban farms in Singapore helped inform our design strategy. We highlighted the current demographic shift towards an ageing population using reports from Singapore's Department of Statistics. In developing appropriate unit typologies we used a sample household survey conducted by Singapore's Housing Development Board in 2008, which revealed some major shifts on the seniors' current and preferred living arrangements.

### Analysis and Findings

Home Farm is a concept for the next generation of retirement living in Singapore. Apartments are contained in an elevated green strata-like band that snakes across a cluster of pod-like facilities buildings at ground level. On the stepped, inward-facing facade of the band, aquaponic farming tubes and soil-based strip gardens create an active, living facade that will change throughout the year with the growing and harvesting cycle of leafy green vegetables and herbs.

### Impact, significance and outputs

The concept offers multi-dimensional benefits to the residents and its wider community. We think that this innovative product could be built in any place which looks to improve lives of its residents through active inclusion.



*Aerial view of Home Farm, looking to the Tiong Bahru area.  
© Spark Architects*

**Location:** London

**Employees:** 19

**Research Leaders:** Richard Partington, Marielle Assue, Suzanne Davenport, Simon Bradbury (external)

**Website:** [www.studiopartington.co.uk](http://www.studiopartington.co.uk)

## Studio Partington

### How many researchers (full-time and part-time) work for your practice?

Three part time, practice based researchers who are all also full time employees engaged in project work. One external collaborator, part-time.

### What other organisations, practices or universities have you collaborated with on research projects?

- AECOM
- Building Research Establishment
- Joseph Rowntree Foundation / Joseph Rowntree Housing Trust
- Leeds Metropolitan University
- Modern Masonry Alliance
- NHBC Foundation
- The NBS
- University College London
- Zero Carbon Hub

### What funding sources have facilitated and supported your research?

- NHBC Foundation
- Innovate UK
- DCLG

### What are the main benefits to conducting research in your practice?

- Research raises the profile of the practice. It has led to competition successes, particularly for organisations that also wish to publish their work.
- Research informs our practice's project work, such as enabling us to incorporate new building practices and processes; new building fabrics / manufacturing techniques etc
- We are able to advise clients on best practice and building performance and in this way can offer a different service with the added benefits of our research.

### What are the key themes that your research focuses on?

- Building fabric
- Building performance
- Energy efficiency in new housing
- Reducing carbon emissions
- Understanding overheating and ventilation
- Comparative analysis of design versus as built – the performance gap

### How have you published and shared your research?

We have contributed to five books including the forthcoming *Better Buildings: learning from buildings in use*, 11 NHBC Foundation guides, four Zero Carbon Hub guides (published by NBS) on concrete frame, insulating concrete formwork, masonry and timber frames, two reports published by Joseph Rowntree Foundation on energy efficient new and refurbished homes, and articles in various industry journals.

## Derwenthorpe

**Richard Partington, Partington Studio**  
**Simon Bradbury, Plymouth University**

### Context

Over the last 15 years in the UK there has been an ambition by successive governments and clients to deliver different models of sustainable housing in response to climate change and growing housing need. Derwenthorpe aimed to provide “a potential blue print for a family living in a truly sustainable community fit for the 21st Century” and is an outcome of a long-term vision, conceived and sustained by an exceptional housing provider, the Joseph Rowntree Housing Trust.

### Questions, aims and arguments

The aim is to create a vibrant and supportive mixed-income, mixed-tenure sustainable community with high quality, energy-efficient, well managed and maintained homes which could be an exemplar that could be replicated. One of the key objectives at Derwenthorpe was to reduce fuel poverty by reducing heating demand and by closing the ‘performance gap’.

### Resources, data and methodology

Two prototype homes were built using different modern methods of construction and tested prior to the start of development. The design details used were provided to the developer partner David Wilson Homes for review by their supply chain. They were assisted in the early construction stages with weekly walk-arounds, post-construction testing, inspections and tool-box talks.

### Analysis and Findings

There was a rigorous process of post occupancy evaluation and building performance evaluation that included a 3 year research project looking at both the social and environmental interventions and their effectiveness. This involved in-depth longitudinal research with residents, tracking of resident’s carbon footprints and evaluation of individual interventions.

The quality of construction is demonstrated by the consistency of the measured air permeability for the first 64 homes, with a performance gap well below industry standards. The study of scheme occupants showed household energy use to be significantly lower than average residents in nearby York. There were problems with the operation of Mechanical Ventilation with Heat Recovery systems which has been the subject of a further research project looking at ventilation and indoor air quality undertaken by BRE that has influenced design decisions for future phases.

### Impact, significance and outputs

Learning from the Derwenthorpe project has been widely disseminated by Joseph Rowntree Housing Trust, Zero Carbon Homes and the Good Homes Alliance. The project has won a number of awards and been published in both academic and industry literature.



*View of Derwenthorpe  
 Phase 1 across Jubilee  
 Pond by Studio  
 Partington  
 © Tim Crocker*

**Location:** Sofia, Bulgaria

**Employees:** 5 architects

**Research Leaders:** Rossitza Bratkova and  
Andrey Hodkevich

**Website:** [www.aedesstudio.com](http://www.aedesstudio.com)

## TTHR Aedes Studio

### **How many researchers (full-time and part-time) work for your practice?**

There is no such definite separation of the work in our practice. It is our understanding that each member of the team should do everything on a project. If the project also includes the necessity for some research it is also carried out by the project architect. In case a team member starts a more profound research, he/she usually performs it personally outside of the office.

### **What other organisations, practices or universities have you collaborated with on research projects?**

In 2009 together with Victor Mani from the Muenster School of Architecture we led a workshop about the panel block complexes in Sofia in collaboration with University of Architecture, Civil Engineering and Geodesy (UACEG), Bulgaria.

### **What funding sources have facilitated and supported your research?**

The research was part of Rossitza Bratkova's self-funded master's thesis in Architecture Theory and Criticism at UACEG.

### **What are the main benefits to conducting research in your practice?**

As the architectural practice is really wide scoped any research is beneficial in the long term. It gives a better understanding of the profession with its main tasks and challenges. A practicing architect should sense the pulse of the time and this is only possible if he/she has a broad and profound view of the world – in the time being and in the past as well.

### **What are the key themes that your research focuses on?**

We are interested in spatial boundaries, in multitudes and their arrangement in certain systems, revealing both order and chaos; the connection between architecture and theoretical physics. The context is another issue that we are focused on – on the small scale of each specific site on the one hand, and on the large scale of the Bulgarian context between its post-communist past and its part-of-Europe again today, on the other. An important part of that context are the Modern Socialistic panel block complexes which still accommodate a vast majority of the Bulgarian population today and have not been renovated in any way except for some occasional insulation.

### **How have you published and shared your research?**

The program Architecture Theory and Criticism at UACEG published all the abstracts and three of the master theses including Rossitza Bratkova's which forms the basis of this project submitted to the 2016, RIBA President's Awards for Research.

## Primitives in Vernacular Bulgarian Barns as Reference Source for New Bulgarian Architecture

Rossitza Bratkova, TTHR Aedes Studio

### Context

During its socialist 50 years period Bulgaria's strong rural tradition has been abruptly transformed into rapid industrialization and urbanization. Though traditional Bulgarian architecture of the houses and churches has been extensively studied, there is no research so far on vernacular barns. Despite the parallels that could be found in similar studies in other parts of the world, there are local specificities comprised of the complex factors of geography, history and religion which need to be studied and analysed.

### Questions, aims and arguments

The research aims to define the beauty of barns in the light of the contemporary understanding of beauty in architecture. In order to achieve that a definition is sought and it is proposed that beauty in architecture today is conceived as a logical complexity, a balance of opposing dualities and as an open-ended structure in analogy with natural patterns. The research aims to find instruments for both a more analytical and a more sensitive design approach in architecture.

### Resources, data and methodology

The research includes two groups of villages in different regions in Bulgaria featuring different climatic and economic conditions. Additionally some single examples are proposed from other parts of the country that present some local specificity, influencing building design, for instance a particular building material or an area prone to frequent flooding and such.

### Analysis and findings

The study leads to the suggestion that the poetic strength of the exposed unplastered structure of barn walls. Additionally, it is the richness of the blurred boundary, their intermediate state between close and open, inside and outside, and in a more general context between culture and nature. Finally, barns reveal a strong expression of balance between the opposing dualities of the whole and the part, the common and the individual, the rule and the exception, etc.

### Impact, significance and outputs

In conclusion, the features in the aesthetics of barns are reviewed through five architectural designs, four of them from the author's own architectural practice. Four designs of various scale are presented, all of them to some degree interpreting the principles of vernacular barns. The long term ambition of this research is to raise the interest in the vernacular Bulgarian barns on the one hand, and learning from them, to improve the quality of new architectural design on the other.



*Oberrealta Chapel,  
Christian Kerez  
© TTHR Aedes Studio*

# Funding Sources

# Funding Sources

Client and project commissions aside, the practices included in this book have cited many of their funding sources. Below is a glossary of those funding sources with outlines, where available, on topic areas and funding options available. This is intended to provide an insight into the sources some architecture practices have successfully secured funding from to support their research. Some of these funding bodies are supported by EU funding and open only to members of the EU. Following the UK's vote to leave the EU access to these funds for UK based researchers, organisations and practices is likely to be affected.

## Arts Council England

[www.artscouncil.org.uk](http://www.artscouncil.org.uk)

The Arts Council seeks to “champion, develop and invest in artistic and cultural experiences that enrich...culture experiences for everyone, everywhere”. Having recently identified three main funding streams - the National Portfolio, Grants for Arts and Culture, and strategic funds - has outlined a budget of £622 million per year from 2018-2022 to achieve this goal. The website provides funding guidance, advice on finding funding including their Funding Finder, and application portal.

## Australian Department of Industry (Innovation and Science)

[www.industry.gov.au/Pages/default.aspx](http://www.industry.gov.au/Pages/default.aspx)

Part of the Federal Government, the Department has four key objectives: supporting science and commercialisation, growing business investment and improving business capability, streamlining regulation and building a high performance organisation. In order to deliver this the Department oversees four portfolio agencies including Commonwealth Scientific and Industrial Research Organisation (CSIRO). CSIRO is the country's national science agency and conducts research with industry partners on a range of fields relating to industry, society and the environment.

[www.csiro.au](http://www.csiro.au)

## British Council: Newton Fund Institutional Links Grant

[www.britishcouncil.org/education/science/newton](http://www.britishcouncil.org/education/science/newton)

Launched in 2014, the Newton Fund is managed by UK's Department of Business, Energy and Industrial Strategy. The Fund currently consists of £75 million a year and will increase to £150 million by 2021 and was established to promote economic development and welfare in partnering countries, through science and innovation partnerships, unlocking further funding to support poverty alleviation. The funding covers activities in three broad categories:

- People: increasing capacity for science and innovation in partner countries.
- Research: research collaborations on development topics.
- Translation: creating collaborative solutions to development challenges and strengthening innovation systems.

## Centre for London

[www.centreforlondon.org](http://www.centreforlondon.org)

Centre for London is a politically independent think tank dedicated to the capital. To deliver its research on economic, environmental and social issues, the Centre focuses on five key themes:

- society
- governance & public services
- London's economy
- housing & infrastructure
- London & beyond

### **ARUP**

[www.arup.com/news/events\\_and\\_exhibitions/global\\_research\\_challenge\\_2016](http://www.arup.com/news/events_and_exhibitions/global_research_challenge_2016)

The Global Research Challenge is an annual competition that aims to “build a deeper understanding of subjects and issues that challenge the world”. The competition is open to all current Arup employees and external partners, with participants conducting collaborative research with ARUP colleagues across regions, as well as peers from other companies or academic institutions. The fund sponsors 5-8 projects each year with budgets of £30k to £50k.

### **Cooperative Research Centre (CRC) for Low Carbon Living**

[www.lowcarbonlivingcrc.com.au](http://www.lowcarbonlivingcrc.com.au)

The CRC brings together over 40 research institutions, government agencies and industry organisations to develop new social, technical and policy tools for reducing greenhouse gas emissions

### **Department for Communities and Local Government (DCLG)**

[www.gov.uk/government/organisations/department-for-communities-and-local-government/about/procurement](http://www.gov.uk/government/organisations/department-for-communities-and-local-government/about/procurement)

This UK Government department is tasked with ‘creating great places to live and work’. The website provides links for funding through procurement with links to where to find contracts, free online procurement course and aiming to award 25% of spending with third-party suppliers.

### **Global Challenges Research Fund (GCRF): Resilience Foundation Award**

[www.rcuk.ac.uk/funding/gcrf](http://www.rcuk.ac.uk/funding/gcrf)

The Global Challenges Research Fund is a £1.5 billion fund is administered through delivery partners including the Research Councils and national academies. It is intended to support cutting-edge research that addresses the challenges faced by developing countries through:

- Challenge-led disciplinary and interdisciplinary research
- Strengthening capacity for research and innovation within both the UK and developing countries
- Providing an agile response to emergencies where there is an urgent research need.

### **Higher Education Design Quality Forum (HEDQF)**

[www.hedqf.org](http://www.hedqf.org)

The HEDQF is a registered charity aimed at championing “high-quality design in university campuses, buildings and facilities, in the knowledge that the quality of the estate enhances the student experience of teaching and learning, the effective pursuit of research and the process of public engagement”. Besides visits to exemplary institutions, an annual conference and hosting workshops and debates, the Forum also undertakes and publishes research focused on innovation and lessons learned.

### **Homes & Communities Agency (HCA): Empty Homes Programme**

[www.gov.uk/government/organisations/homes-and-communities-agency](http://www.gov.uk/government/organisations/homes-and-communities-agency)

HCA is an executive non-departmental public body, sponsored by the Department for Communities and Local Government which regulates social housing providers and aims to help create successful communities by “making more homes and business premises available to the residents and businesses who need them”. As with other UK government departments and agencies, contracts worth over £10,000 can be located through the Contracts Finder. <https://www.gov.uk/contracts-finder>

### **Horizon**

[www.ec.europa.eu/programmes/horizon2020](http://www.ec.europa.eu/programmes/horizon2020)

With nearly €80 billion of funding available over 7 years to 2020, Horizon 2020 is the biggest EU Research and Innovation programme and focuses on science, industrial leadership and tackling societal challenges. The scheme is open to all and has worked to removed barriers making it easier for public and private sectors to collaborate. There are 22 research areas including Environment and Climate Action, Society and Transport.

**Innovate UK**

[www.gov.uk/government/organisations/innovate-uk](http://www.gov.uk/government/organisations/innovate-uk)

Innovate UK runs funding competitions which can help you develop your idea and make it successful. These competitions are open for projects led by any UK based companies. Innovate UK awards funding to the winners of these competitions.

**National Endowment for Science, Technology and the Arts (NESTA)**

[www.nesta.org.uk](http://www.nesta.org.uk)

NESTA was established in 1997 with funding from the National Lottery and the aim of promoting creativity, talent and innovation across a wide spectrum of areas and interests. Working with partners NESTA works in nine key areas:

- Citizen engagement in public services
- Digital arts and media
- Future thinking
- Government innovation
- Health and ageing
- Impact investment
- Innovation policy
- New models for inclusive economic growth
- Opportunities for young people

**National House Building Council (NHBC) Foundation**

[www.nhbcfoundation.org/research](http://www.nhbcfoundation.org/research)

Over the last decade the NHBC has published research reports and guidance on sustainable homes, risk management and consumer issues. The Foundation supports research proposals on planning, design, construction, occupation or performance of homes, there may be suitable collaborative research project opportunities but research relating to the supply of new homes and work that aims to deliver improved technical guidance for designers and house builders is of high priority.

**Royal Institute of British Architects (RIBA)**

[www.architecture.com/RIBA/Becomeanarchitect/Fundingyoureducation/Researchfunding/RIBAResearchTrustAwards.aspx](http://www.architecture.com/RIBA/Becomeanarchitect/Fundingyoureducation/Researchfunding/RIBAResearchTrustAwards.aspx)

The RIBA offers Research Trust Awards every year for a closely defined piece of architectural research. Awards are given only to named individuals, not organisations. The maximum grant applicants may apply for is £10,000.

**Technology Strategy Board (TSB)**

The Technology Strategy Board supported the development of innovative technologies and products. TSB has been rebranded as InnovateUK.

**UNHabitat**

[www.unhabitat.org](http://www.unhabitat.org)

UN-Habitat is the United Nations programme “working towards a better urban future..by promoting socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all.” There are 16 urban themes including Planning & Design, Energy, Housing, Reconstruction, Resilience and Climate Change. The organisation accepts expressions of interest for procurement, which are listed on the ‘Join Us’ page. General information on UN procurement is available from [www.un.org/depts/ptd](http://www.un.org/depts/ptd)

**Winston Churchill Memorial Trust**

[www.wcmt.org.uk](http://www.wcmt.org.uk)

Established in 1965 after the death of Sir Winston Churchill and supported by individual donations, to support British citizens to travel overseas in pursuit of new and better ways of tackling a wide range of the current

challenges facing the UK in fifteen categories including Environment, Nature and Sustainable Living, Migration and New Approaches to Housing. A reciprocal organisation based in Australia supports research by Australian citizens.

### **The World Bank**

[www.worldbank.org](http://www.worldbank.org)

The Washington DC based organisation is comprised of The International Bank for Reconstruction and Development and The International Development Association. Established with the aim of alleviating extreme poverty and supporting economic development, the World Bank publishes some of the most highly regarded policy papers and reports on economic development, global development finance and poverty. Procurement is through a separate section of the website

### **Research Councils UK (RCUK)**

[www.rcuk.ac.uk](http://www.rcuk.ac.uk)

The RCUK is a strategic partnership comprising seven research councils including the Arts and Humanities Research Council and Engineering and Physical Sciences Research Council cited by practices in this document. Collectively RCUK councils invest around £3 billion annually in research covering the full spectrum of academic disciplines from the medical and biological sciences to astronomy, physics, chemistry and engineering, social sciences, economics, environmental sciences and the arts and humanities.

As eligibility is restricted to universities and Independent Research Organisations, practices should seek to partner with academics and universities to apply for funding through Knowledge Transfer Partnerships (KTPs).

### **Arts and Humanities Research Council (AHRC)**

[www.ahrc.ac.uk](http://www.ahrc.ac.uk)

The AHRC is one of the seven research councils and, as the name suggests, focuses on supporting research in the arts and humanities. In 2009 the organisation identified four key themes which are:

- Care for the future: Thinking forward through the past
- Digital transformations in the arts and humanities
- Science in Culture
- Translating Cultures

The website contains full details of policies, application procedures and open calls.

### **Engineering and Physical Sciences Research Council (EPSRC)**

[www.epsrc.ac.uk](http://www.epsrc.ac.uk)

EPSRC is the RCUK council for funding research and training in engineering and the physical sciences, from mathematics to materials science, and from information technology to structural engineering, with an annual investment of over £800million. The current research themes are:

- Digital economy
- Energy
- Engineering
- Global Uncertainties
- Healthcare Technologies
- Information and Communication Technologies
- Living With Environment Change
- Manufacturing the future
- Mathematical sciences
- Physical sciences
- Quantum technologies

