



## Annual Report 2017/18

### Purpose

The aim of the Foundation is: 'the advancement of education of the public directed towards the promotion, furtherance and dissemination of knowledge of matters associated with the built environment'. We pursue these, where possible, with an emphasis on 'the multi-disciplinary nature of design in engineering and architecture'.

### Chairman's Statement

The year 2017-18 has been very busy with extensions granted to existing projects, some new smaller projects and the launch of a very significant project. Inevitably not all the work developing projects is successful, but when it is it can be the result of many months and sometimes years of work.

This year saw the launch of The Digital Cities for Change project with the largest investment that The Ove Arup Foundation has made for one project. The project with Cambridge University is initially research leading to a series of multi-disciplinary teaching modules at post-graduate level. This is an example of a project which has required several years of development.

Our financial position is strong, in spite of the continuing economic pressures, and we enter the next year with confidence by continuing the pattern of supporting both short and long-term projects.

This year we continued to implement the Actions Arising from the Strategic Discussion workshop: The Next 25 Years of The Ove Arup Foundation held in 2015, we achieved this by providing grants for specific projects.

There has been one addition to the Trustees in 2017; we welcomed Tim Chapman as the new Trustee. Also, there was one change to the Advisors to the Foundation in the past year; we would like to thank Sarah Buck for her seven years of service and commitment to the Foundation. We welcomed Tim Ibell as the new Advisor representing the Institution of Structural Engineers. The Trustees are supported by the Advisors who represent the professional bodies. Our Advisors are invaluable in helping to develop our thinking and supporting the work of the Foundation.

Once again, we are grateful for the continuing support of Arup Group which, when combined with our own endowed funds, enables us to seek wider outcomes, and to take a long-term view over the scope of our activities.

Terry Hill

Chairman of The Ove Arup Foundation



## Activities during 2017/18

### University of Edinburgh – Sociology and Fire Safety ITSAFE Total Grant £200,000 In Year Grant £43,243 Dates: 2013 - 2018

Dr Graham Spinardi is carrying out research into the sociological nature of fire safety. The Masters Course which has developed as a result of his research has attracted 32 UK and International students including engineers, architects, fire scientists, social scientists and is now in its second year.

Dr Spinardi is preparing a number of research publications with two published and four in draft. One important aspect of his research is to look at post-construction fire safety regulation and how it is applied in practice.

One London Borough has been assessing the lessons of the Grenfell Fire on the housing stock in their own borough and has asked for advice from Dr Spinardi and because of this they have appointed a Director of Regulations. There is a common belief that people in local government do not understand the regulations and neither do the general public. Dr Spinardi would like to introduce a PhD student to the London Borough to study what Fire Safety Policy is like in practice.

Another area for research is to look at informal settlements in South Africa, studying aerial photographs, interviewing the fire service and testing the existing designs of the informal settlement shack accommodation.

Two related research grants from EPSRC and ESRC have been awarded:

- Improving the Resilience of Informal Settlements to Fire
- Tackling Fire in Informal Urban Settlements: An Interdisciplinary Approach

The output from the research should lead to safer shacks and it might be possible to apply the lessons learnt to other parts of the world.

TOAF are also funding an MSc Student at Stellenbosch University studying shanty towns. This work has attracted additional funding from four SA Cape universities.

We are focussing on a particularly challenging problem – that of fires in informal settlements in which residents live in shacks that they construct themselves with little or no formal regulation of building standards, and little or no infrastructure in terms of water, electricity, and paved roads.

### DC<sup>2</sup> – Digital Cities for Change

Total Grant £477,355 In Year Grant £233,000 Dates: 2017 - 2021

The University of Cambridge will carry out a four-year research programme leading to educational modules in Digital Cities for Change at graduate and executive level.

The research will address the disciplinary gulf between city managers, engineers and urban designers working towards an educational modular programme that trains built-environment professionals in a broader range of disciplines and tools, bridging infrastructure and city management solutions in order to develop the opportunities presented by the digital economy.

The research programme will address the gaps and identify the digital tools required to deliver a smart city which benefits the citizens it serves.

This programme will be delivered by a team of experts from the Centre for Smart Infrastructure and Construction (CSIC) at the University of Cambridge. Led by Dr Jennifer Schooling (CSIC, Department of Engineering), the programme will bring together academics from the disciplines of civil engineering, land economy, architecture, geography, manufacturing engineering and computer science to develop capacity and capability within UK industry to design, deliver and sustain smart cities and infrastructure solutions. The research will not be confined to the UK but will also develop international case studies.

### **TOAF/ Anglo Danish Society Scholarship**

**Total Grant £5,000    In Year Grant £5,000    Annual Award**

The recipient of the 2018 award for the Ove Arup Foundation Scholarship awarded by the Anglo Danish Society was awarded to Archie Cantwell to study at Royal Danish Academy of Fine Arts, School of Architecture, Urbanism and Societal Change.

Funding from this scholarship will support Archie Cantwell to contribute to the discussion of the changing role of the architect as strategic designer. Whilst the city used to be the exclusive field of the architect, it is now shared between a diverse range of urban practitioners: from corporate agendas keen to take a stake in the exploding urban market, to a smorgasbord of 'urban thinkers'. Within this crowded field, the responsibility of architecture to express public values is becoming increasingly diluted. He considers the profession of architecture is at an impasse, either it becomes pivotal in steering cities, or it fades into obsolescence. Historically, the architect and craftsman have been tightly correlated professions.

### **Sheffield Engineering Leadership Academy**

**Total Award £ 5,000    In Year Grant £5,000    Date 2018-2019**

The Ove Arup Foundation has agreed to provide a grant to the Sheffield Engineering Leadership Academy (SELA). SELA is a leadership development programme for undergraduate students which addresses the UK skills gap in engineering by supplementing the outstanding technical knowledge of Sheffield engineering graduates with the skills, confidence and aptitude to take the lead and make a positive impact.

The outcome is intended to provide:

For the members

- Improved leaderships skills
- Improved communications and public engagement skills
- Access to high quality work experience and research opportunities
- Increased awareness of enterprise and entrepreneurialism
- Building networks
- Improved employability

For the University

- Positive impact on recruitment of engineering undergraduates
- Partnerships with businesses and companies
- Increased alumni engagement through mentoring, talks, workshops and visits

For society

- Help to address the skills gap in engineering
- Support the development of engineers who can become the leaders of the future
- Work towards solving some of the challenges we face today.

The grant will meet the cost of the student projects and associated activities.

### **Hong Kong Polytechnic University**

**Total Grant £ 189,200    In Year Grant £0    Dates: 2015 - 2018**

A four-year multi-disciplinary programme has been arranged with Professor JG Teng of the Hong Kong Polytechnic University and is now in its third year of the Distinguished Lecture series and International Symposia.

The Sustainable Urban Development Advanced Summer School and Distinguished Lecture series is designed to attract students invited from all-over South-East Asia including Hong Kong, Mainland China and the region.

## International Symposium

17 speakers were invited to give presentations at the plenary sessions and 3 workshops. Despite hurricane Hato on the day before the symposium, 118 and 173 participants attended on days 1 and 2. On day 1 six presentations were delivered by distinguished research leaders in areas related to sustainable urban development including:

- Leader Dr Andrew KC Chan
- Prof Xiao-li Ding
- Prof Jin-guang Teng

Workshops addressing three frontier topics of importance were held on day 2:

- Urban Simulation
- Industrialisation of Construction
- Very large floating structures

Prominent researchers from Hong Kong gave presentations at the workshops.

Students from National Taiwan University, National Taiwan University of Science and Technology, Tongji University and Tsinghua University attended the summer symposium.

## Generation Place

**Total Grant £ 12,000    In Year Grant £12,000    Dates: 2018 - 2019**

Past TOAF grants allowed the three core groups MADE, The Architecture Centre and 22sheds to develop their work to coordinate national initiatives enabling young people to participate in multidisciplinary academies to gain some experience of a career in the Built Environment profession. In 2016-17 the three groups teamed up with Place Alliance at The Bartlett to launch Generation Place at a National Event "Urban Rooms: Engaging Communities in Place". There were 120 delegates present and it was well received.

The Generation Place website is an initiative to nurture the next generation of creative place-makers. The website offers:

- Learning programmes
- Case studies highlighting best practice
- Delivers Impact in key areas
- Provides advocacy and marketing

A further extension to the Generation Place programme was agreed for the core groups to develop and pilot an Evaluation framework and Impact materials and these will be delivered during 2018. They are also delivering a pilot programme aimed at Primary Schools.

The Ove Arup Foundation has provided funding for three architecture centres to work toward a new platform to inspire the next generation of creative place-makers.

## Meghalaya Living Root Bridges, India

**Total Grant £ 1,632    In Year Grant £1,632    Dates: 2018 - 2019**

The Living Root Bridges of Meghalaya are a unique phenomenon in the natural world. Woven from the aerial roots of the Indian Rubber Tree (*Ficus elastica*), spans of remarkable strength grow over the course of years. The bridges withstand floods, earthquakes, and are used as public highways. Very little is known about the bridges. In 2015, over 80 specimens of Living Root Architecture across the Khasi and Jaintia Hills in Meghalaya were documented although few had been known to the outside world.

Wilfred Middleton visited Meghalaya in 2017 to study the bridges, talking to builders, users, owners, and maintainers about the design process and their understanding of the growth mechanisms of *Ficus elastica*.

He made measurements of the bridges and the canyons they span, which will provide the basis for engineering research and a report into the strength mechanisms of trees, growth for resilience, and engineering for extreme loading. The work will bring together engineers, architects, botanists, biochemists (cuticular chemistry) local builders, environmentalists, and explorers.

### **TOAF / Edinburgh University Fire Engineering Prize**

**Total Grant £ 1,000    In Year Grant £1,000    Annual Award**

The 2017 Ove Arup Foundation Prize in Fire Safety Engineering at the University of Edinburgh has been awarded to Mr Joshua Hutchison by the Head of School, Professor Hugh McCann. He has been a standout student throughout his time at Edinburgh, demonstrating a particular depth of understanding particularly in areas related to fire safety science and engineering.

The award is made to the top student graduating on the Structural and Fire Safety Engineering degree course at Edinburgh University.

### **Institution of Civil Engineers (ICE) – Academic in Residence**

**Total Grant £ 30,000    In Year Grant £15,000    Dates: 2017 - 2018**

TOAF has part funded the post of Academic in Residence at the ICE to help inform decision-making for global solutions and innovation.

The ICE appointed Professor Guymer as the Academic in Residence and since starting his work he has moved from Warwick University to Sheffield University. Sheffield University will continue to support him in all his activities for the ICE.

He was in his third of residence and this was the final year of TOAF support. TOAF has been represented on the Steering Group

### **Expedition Workshed**

**Total Grant £ 80,000    In Year Grant £5,000    Dates: 2014 - 2018**

Expedition Workshed has completed its project developing multimedia teaching aids which present complex topics in an easily understandable way. Our commitment has encouraged other funders to support other aspects of their programme.

Projects which have been completed with TOAF funding include:

- Make a Scape for the iPad  
Just launched and has already had 1000 downloads, a Hackathon has taken place to promote it
- Bare Essentials of Engineering, Geotechnics including interviews with John Burland has received 70,000 hits, it also includes Reinforced Concrete and Pre-stressed Concrete.
- Engineering Mastermind has received 900 hits. Includes sponsorship and competitions for schools and universities.
- Report on the future of Constructionarium.

### **The Edge – Commission of Enquiry**

**Total Grant £ 20,000    In Year Grant £6,134    Dates: 2014 - 2016**

The Edge commission carried out an enquiry with the built environment Institutes to collectively discuss the role of professionals working in the built environment: how is professionalism relevant to today's world and what needs to be done to ensure that it remains pertinent?

## Trustees

Andrew Chan  
Tim Chapman  
Caroline Cole  
Richard Haryott  
Terry Hill  
Gregory Hodkinson  
Joanna Kennedy

## Special Advisor

Mahadev Raman

## Advisors

John Burland representing the Institution of Civil Engineers  
Tim Ibell representing the Institution of Structural Engineers  
Jim Croll representing the Royal Academy of Engineering  
Christine Hawley representing the Royal Institute of British Architects  
Doug King representing the Chartered Institution of Building Services Engineers  
Ian Ritchie representing the Royal Academy of Arts

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