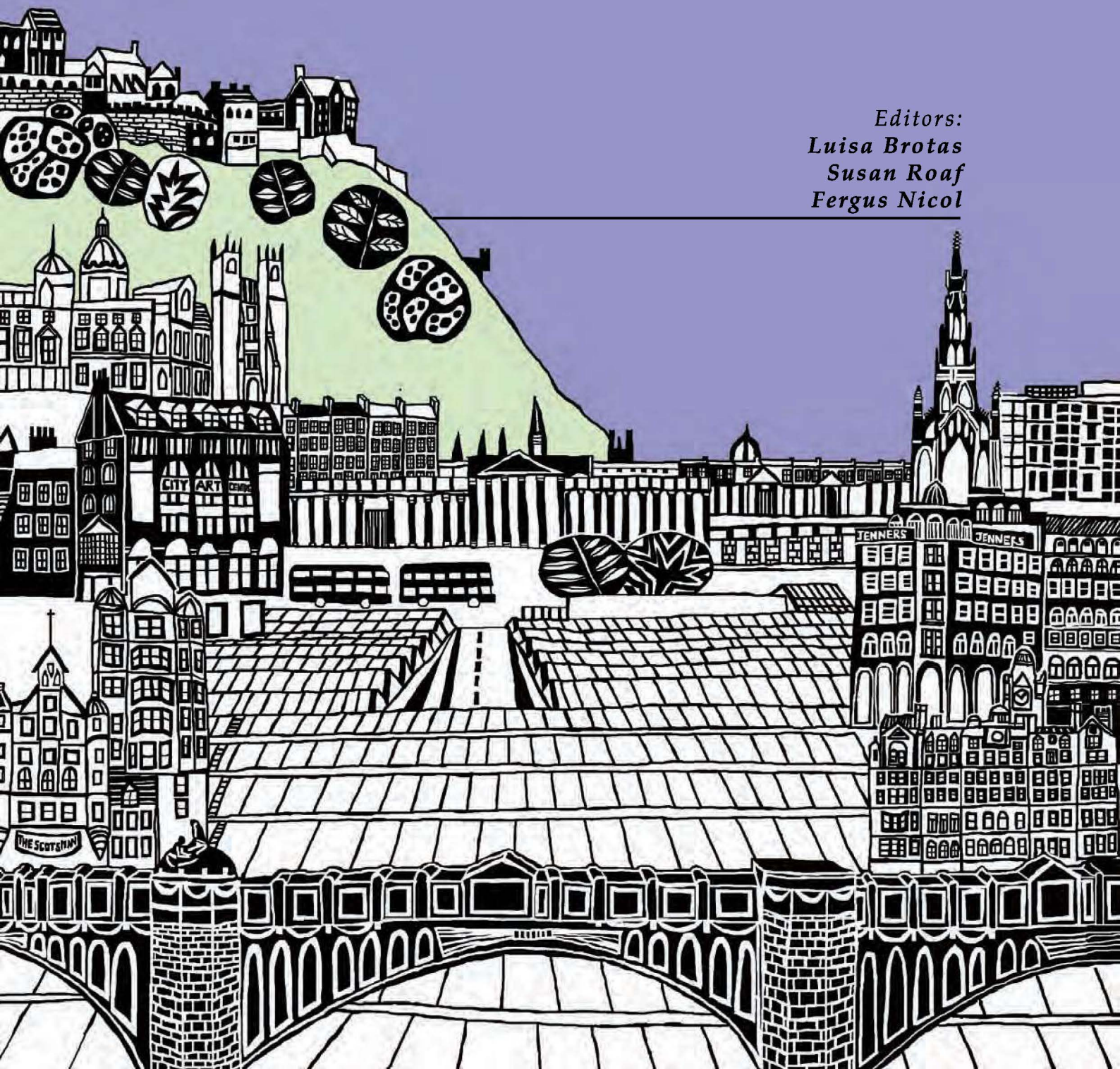


DESIGN TO THRIVE

Proceedings Volume III

PLEA 2017 Conference

*Editors:
Luisa Brotas
Susan Roaf
Fergus Nicol*



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All contributions to the 2017 PLEA Conference included herein were independently peer reviewed as a full paper, prior to publication.

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Introduction to the Proceedings of PLEA 2017

The question we all too often forget to ask is Why? Why, for instance did we in Edinburgh set out on the PLEA 2017 journey to give ourselves all the very hard work of creating a huge conference in which people from all over the world were invited to discuss and develop ideas of Passive and Low Energy Buildings (PLEA)? Well the answer is that we believe the issue of good building design, embraced for thirty five years by the PLEA movement is simply one of the most important there is in the evolution of a safer world in which people will be able to live comfortable and affordable lives in a rapidly changing world.

The PLEA organisation started in 1982 as a small group of international friends dedicated to the ideal of sharing knowledge on how to design and operate minimal and renewable energy buildings. The development of solar buildings lay at the core of its ethos in those early days and still does. PLEA now has a membership of several thousand professionals, academics and students from over forty countries (www.plea-arch.org). Having expected three to five hundred abstracts for the 2017 PLEA conference we were overwhelmed by more than fourteen hundred.

It is obvious that the time for PLEA thinking has come.

Where better to share these important ideas than in Edinburgh, the 18th Century capital of the European 'Age of Enlightenment'? It is here we set about creating our Team Scotland to organise the conference, held on the 2nd – 5th July 2017 and including 665 papers published in these Proceedings. The impressive list of people who helped us included: the Scottish schools of architecture and engineering, the City of Edinburgh, the Scottish Government, Historic Environment Scotland, the Royal Incorporation of Architects in Scotland, the Chartered Institution of Building Services Engineers and a host of related professional companies and organisations.

Reflecting the diverse interests of the team involved, the subject matter of the conference is separated in the following proceedings into papers sorted according to the thirty-one Forums in which they were presented at the conference. Readers should first review the contents lists to see which subject areas are of particular interest to them and then browse through the varied papers by selected Forums. Separation of the papers into these various fields enabled authors to present their ideas at the conference to smaller groups with whom they could expertly explore and discuss their own results while learning from other related studies that might lend light to their own thinking.

Introduction to the Proceedings of PLEA 2017

In discussions at one of our Forum Leader meetings we decided that in reality many of the the larger challenges we face could be distilled down into five different themes:

- **Building Better, Safer Places for All (inclusion and resilience)**

- **Designing to Thrive in a Changing world
(affordability and well-being in good buildings)**

- **Learning from, and building on, the Lessons of the Past
(evidence based design evolution)**

- **Powering our Lives with Sustainable Energy
(clear, durable and affordable futures)**

- **Empowering Current Generations (Education for change)**

These themes run through in the pages of these proceedings, and were accompanied at the conference itself by a fascinating exchange of ideas, interpretations and assumptions and their attendant design solutions.

The conference was also accompanied by a simple Enlightenment message, presented in four flanking banners in the Ballroom of the Assembly Rooms where generations have deliberated since it was first opened at the height of the original Age of Enlightenment two hundred and thirty ago:

Sun – Light – Wind – Natural Energy Buildings

*The Editors:
Luisa Brotas
Sue Roaf
Fergus Nicol*

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PLEA 2017 Conference

Volume I includes the following forums:

- Adapting to Climate Change
- Aesthetics and Design
- Bridging the Performance Gap
- Building Performance Evaluation
- Carbon Accounting
- Comfort and Delight
- Community Energy
- Construction

Volume II includes the following forums:

- Cool Cities and Urban Heat Islands
- Culture and Society
- Digital Design
- Education and Training
- Energy Efficiency
- Future City Visions
- Green Infrastructure
- Health and Air Quality
- Historic Buildings and Refurbishment
- Light

Volume III includes the following forums:

- Low Carbon Design
 - Materials
 - Overheating
 - Passive Climatic Design
 - Place Making and Well-being
 - Renewables Solar and Hydrogen Buildings
 - Resilience Aging and Adapting to Change
 - Sound
 - Transition Communities
 - Transport
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