

Preface

In 2012, the School of Architecture and Society of Politecnico di Milano organized the first edition of the lightweight landscape architectural workshop (LLaw). Its aim was to take part in the wider initiative “Campus Sostenibile” and to design new temporary architectures and ephemeral environments for renovations of the area of Leonardo Campus as well as enjoying its open-air living. Special attention was given both to the design of green areas and to the construction of some light canopies. That was the first didactic activity at Politecnico to be focused on our understanding of lightness in the field of architecture and landscaping.

Beginning in 2012 and flourishing today, interest in lightweight structures has been constantly increasing inside and outside academia. We are confident that this distillation of the essays we wrote at that time can go on serving its purpose for students and researchers for years to come.

This book is meant to stimulate readers to apply “lightweight thinking” both in design and construction phases, which means focusing on the minimal quantity of materials to be used in the most efficient way and facing construction – either architecture or landscape – as a temporary instead of immanent presence on the soil.

The book also aims to reproduce the intensive mutual effort made between the different disciplines of the authors and the invited lecturers who inspired that first workshop – architecture designers, structural engineers, urban landscape designers, and LCA experts. We felt able to share this quite innovative designing approach and tried to demonstrate how lightweight thinking in buildings at different scales can be seen as a fruitful effort toward a more energy-saving and sustainable built environment.

The following words by Frei Otto, pioneer designer of membrane structures, sounded as inspiration for our work presented here: “Buildings are an exercise of power, by changing the existing environment and using materials and energies, even if we do not intend it, because we cannot do otherwise. The contrast between architecture and nature is getting bigger and bigger. [...] Our times demand lighter, more energy-saving, more mobile and more adaptable, in short more natural, buildings, without disregarding the demand for safety and security. This logically

leads to further development of light constructions. The way to minimal mass building, to minimal energy building, that is one with the landscape and at the same time architecture, is yet to be found.” (Otto 2004).

Consequently, the most important angle of the book is the understanding of a virtuous overlap between the concept of lightness both in architecture and in landscape design. We cannot actually distinguish on one hand the lightness in architecture and, on the other hand, the lightness in landscape; working on lightness in a built environment means that the two levels of understanding tend to overlap. More often, the lightness in architecture is related to the landscape in which it is placed, and the lightness in landscape is given by its architectures. We believe that the fruitful ground where we should start this hopeful development of a new kind of light construction is actually close to those “non-architecture” creations we have found in between architectural and landscaping design. They look like constructions able to create an architectural identity without architecture, due to a relevant dialog with the urban context or even through an appropriate use of materials and techniques. They are often the results of an experimental design and construction process; they are sometimes ephemeral, sometimes temporary, rarely permanent buildings; they always are the results of a time-based design approach. They refer to a lightweight design concept and a streamlined manufacturing process, not only to a simplistic reduction of weight during the material selection. Eventually, they refer to an ultralight and flexible kind of materials with specific deformation properties such as polymeric composites and technical textiles.

The theme of a lightweight designing approach will deepen from a microscale (minimal mass architecture, lightweight techniques) to a macroscale (urban context and landscape), presenting several case studies, instructive praxis, and design strategies.

The first part of the book – focused on the theme of lightweight technology and advanced textiles materials – previews some concepts and results of European research studies, with the aim to renew the use of membranes in the specific climatic context and particularly to increase the qualified building of temporary spaces and the practiced application of lightweight materials. The second part of the book – focused on the theme of landscape – presents case studies and innovative approaches for seeking a visual lightness that is so critical for improving the quality of landscapes, especially urban spaces.

Within the authors’ essays, further essays of the following experts are foreseen: Alessandro Villari, Mediterranea University, Reggio Calabria; Jan Cremers, Hochschule für Technik Stuttgart; Arantza Ozaeta Cortázar, Álvaro Martín Fidalgo, TallerDE2, Spain; Bernd Stimpfle, form TL, Germany; Paolo Beccarelli, University of Nottingham, UK.

Furthermore, a selection of students’ works exploited by the 2-week intensive design workshop follows this introduction, with the aim to underline the connection between the two different scales of thinking the students were asked to consider – the landscape level and the building technology level – looking for a new kind of minimal mass architecture, easy to install and to remove if necessary.

Architects, engineers, landscape designers, and LCA experts can find in this book the instructive ideas and examples of how to plan–design–build something “with lightness,” where lightness has a triple meaning:

1. that it is possible to be discreet in dealing with the context in which one is working, seeking a visual lightness and a closer pertinence with the cultural and material surroundings;
2. that it is possible to be discreet in relation to future generations, designing constructions that are not eternal, but that last as long as needed and can be taken down or reused or adapted if future generations have different needs from ours; and
3. that it is possible to act in a manner compatible with a global context, focusing on environmental sustainability, minimizing the quantities of materials used in buildings and using these as efficiently and smartly as possible, and considering how they can be reused or recycled at the end of their service life.

These meanings of lightness in buildings turn architectural projects into processes of seeking their identity in urban contexts, adaptivity in architectures, and a wider sustainability of the whole built environment.

This book does not pretend to exhaust the subject but strives to emphasize an attitude of lightness in the field of architecture that is worth paying attention to more and more in the near future, where a renovated set of production tools is transforming the traditional architectural design process, bringing buildings fabrication closer to other industrial artifacts. We know well how much an airplane, a ship, or even a car weighs and that their efficiency and cost are related to matters involved in those artifacts. It is now time to count and weigh also the architecture components, then use – and reuse – them as intelligently as possible.

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Reference

Otto F (2004) Introduction: on the way to an architecture of the minimal. In: Forster B, Mollaert M (eds) European design guide for tensile surface structures. Tensinet Edition, Brussel, pp 3–6

Logo of “Lightweight
Landscape architectural
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Lightweight Landscape

Enhancing Design through Minimal Mass Structures

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