

# THE TYPOLOGY OF ADAPTABILITY IN BUILDING CONSTRUCTION

NATALIE PLAGARO COWEE, PETER SCHWEHR







## Credits

First published in German as  
*Die Typologie der Flexibilität im Hochbau*  
by the Lucerne University of Applied Sciences  
and Arts – School of Engineering & Architecture  
Competence Centre for Typology & Planning  
in Architecture (CCTP)  
Lucerne, Switzerland

### AUTHORS

Natalie Plagaro Cowee  
Peter Schwehr

### GRAPHIC DESIGN BY

Fabienne Koller

### GERMAN EDITION EDITED BY

Frank Westbomke  
Stefan Mennel  
Amelie-Therese Mayer

### TRANSLATED BY

Christine Vetter-Taylor / English in Best Form,  
Turgi, Switzerland

### ENGLISH EDITION COPY EDITED BY

David Koralek / ArchiTrans, Berlin, Germany

### DISTRIBUTED BY

vdf Hochschulverlag AG an der ETH Zürich

### PUBLICATION SUPPORTED BY

Lucerne University of Applied Sciences  
and Arts, Switzerland  
Knauf AG, Reinach, Switzerland

### BIBLIOGRAPHIC INFORMATION PUBLISHED BY THE DEUTSCHE NATIONALBIBLIOTHEK

The Deutsche Nationalbibliothek lists  
this publication in the Internet at  
<http://dnb.d-nb.de>



© 2012, vdf Hochschulverlag AG  
an der ETH Zürich  
[www.vdf.ethz.ch](http://www.vdf.ethz.ch), [verlag@vdf.ethz.ch](mailto:verlag@vdf.ethz.ch)

All rights reserved. Nothing from this publica-  
tion may be reproduced, stored in comput-  
erised systems or published in any form or in  
any manner, including electronic, mechanical,  
reprographic or photographic, without prior  
written permission from the publisher.



ISBN 978-3-7281-3515-5 (Print)  
ISBN 978-3-7281-3516-2 (eBook)  
Doi-Nr. 10.3218/3516-2

# THE TYPOLOGY OF ADAPTABILITY IN BUILDING CONSTRUCTION

NATALIE PLAGARO COWEE, PETER SCHWEHR



*«Change is the  
only constant»*

HERACLITUS OF EPHESUS (535 BC – 475 BC)



CONTENTS



## E Exploration 13

- E.1 Adaptability & Specialisation 16
- E.2 Adaptability & Structure 17
- E.3 Adaptability & Harmonisation 19
- E.4 Adaptability & Metropolis 20
- E.5 Adaptability & Sustainability 22
- E.6 Adaptability & Discipline 25

## 1 Typology of Adaptability 31

- 1.1 Extension Adaptability 34
- 1.2 Internal Adaptability 44
- 1.3 Use Adaptability 56
- 1.4 Planning Adaptability and Prospective Adaptability 62

## 2 Consequences and Measures 65

- 2.1 Load-Bearing Structure 66
- 2.2 Façade 72
- 2.3 Mechanical Engineering 77
- 2.4 Fire Protection 81

## 3 Determining Factors for Adaptability 85

## 4 Case Study 91

## A Appendix 101

- A.1 Authors & Contributors 102
- A.2 Illustrations 104
- A.3 Bibliography 106

## CHAMELEON

*Class: Reptilia; Order: Squamata; Suborder: Iguania; Family: Chamaeleonidae; Genus: Chamaeleo Laurenti; Species: Yemen Chameleon (Chamaeleo calyptratus)*

*'I observed that two chameleons assumed a milky white colour during mating and also that they turned almost completely black when aggravated. . . In general, the healthier and more excited the animal, the more vivid its colouration and. . . when agitated or alarmed, the animal turns blackish-grey with many yellow spots, and before death, it fades to light yellow or greyish white. . . The conclusion drawn from this is that colour change is dependent on how the nerves are influenced and occurs only when they are stimulated.'* [1]

[1] Brehm, 1913



Change is a reliable constant. Constant change calls for appropriate strategies and a high level of adaptability. Architecture must also rise to this challenge. The architect Richard Buckminster Fuller claimed, 'a room should not be fixed, should not create a static mood, but should lend itself to change so that its occupants may play upon it as they would play upon a piano.' [2]

In architecture, this liberal interpretation defines the ability of a building to react to changing requirements. If it fails to do so, or succeeds only with considerable structural and financial effort, the building is threatened with demolition.

In addition to the entire planning process, other architecturally relevant issues such as design, construction, technical equipment, economy, operation and maintenance must be questioned for adaptability. We believe that the resulting value retention, which will help to achieve users' identification with their building, is an important contribution to sustainability.

This publication is part of the ongoing research project 'The Typology of Adaptability in Building Construction'. It provides an overview on adaptability in building construction and aims to raise awareness to the topic and initiate discussion.

Following an exploration, the publication focuses on different types of adaptability, grouped together in a series of typologies. This is the basis for formulating consequences and measures for each discipline. The subsequent chapter shows how adaptability is determined by effort, cost and time, and how a building's degree of adaptability can be ascertained.

[2] Krause & Lichtenstein, 2001