

# Contents

<b>EN</b>	Abstract	13
<b>DE</b>	Zusammenfassung	15
<b>NL</b>	Samenvatting	17
	List of Figures	19
<b>Part I</b>	<b>Introduction - Methodology - Theory</b>	<b>27</b>
<b>1</b>	<b>Introduction: From Creating to Knowing in Architectural Design</b>	<b>29</b>
1.1	Background and Motivation	30
1.2	Research Hypothesis	32
1.3	Research Questions Arising from the Hypothesis	34
1.4	Methodology and Structure	35
1.5	Methodological Note on the Designer as Researcher	38
1.6	Definitional Remarks on Scope and Focus Areas	39
1.7	Positioning and Relevance	41
<b>2</b>	<b>Design Theory: Epistemic Potentials of Visual Representation in Architectural Design Processes</b>	<b>45</b>
2.1	Scope and Main Themes	46
2.1.1	A Discipline in Development	51
2.1.2	Lack of a Coherent Conceptual Framework	52

2.1.3	Approach and Argumentation	55
2.2	<b>Structural Characterisation of Design Problems</b>	60
2.2.1	Core Premises	61
2.2.2	The Problem as Problem Space	61
2.2.3	Wicked Problems: A Detailed Analysis	68
2.2.4	From Wicked to Superwicked Problems	73
2.2.5	Planning and Spatial Problems	74
2.2.6	Contemporary Complexity: Anarchic Nets and Controlled Ignorance	78
2.2.7	Definition of Task Space	82
2.2.8	Constraints Structuring Task Space	88
2.3	<b>Transformative Strategies as Knowledge Practices in Architectural Design</b>	89
2.3.1	Core Premises	90
2.3.2	The Process View and the Operational View	91
2.4	<b>Problem-Solving: Six Decisional Strategies</b>	92
2.4.1	Systematic Design Processes and the "Primary Generator"	92
2.4.2	Conjecturing as Explorative Strategy in Architectural Design	100
2.4.3	Strategies of Stepwise Approximation	108
2.4.4	Problem Decomposition and its Limits	118
2.4.5	Projective Modes of Thinking	126
2.4.6	Strong Concepts as Generative Building Blocks	128

2.5	<b>Reflexive Practice: Six Cognitive Strategies</b>	132
2.5.1	Theoretical Foundations for Reflexive Understanding	134
2.5.2	Reflection-in-Action and Thinking in Implications	145
2.5.3	Epistemic Dissonance and Constructive Memory	149
2.5.4	Reflexive Practice and Objectual Practice	155
2.6	<b>Application: an Excursus of Six Design Techniques</b>	159
2.6.1	Framing and Structuring-Solving	161
2.6.2	Epistemic Enactment and Inner Dialogue	167
2.6.3	Generating Imaginary Worlds	176
2.6.4	Expansive Interpretation	179
2.7	<b>Operative Modes of Knowledge: Six Accounts</b>	183
2.7.1	Core premises	184
2.7.2	Selected Attempts at Describing Modes of Knowledge	184
2.7.3	Cross: Designerly Ways of Knowing	186
2.7.4	Reuter: Instrumentality and Imperative	190
2.7.5	Dreyfus/Lawson: Formality and Complexity	192
2.7.6	Jonas: Attitudinal Dispositions	196
2.7.7	Polanyi: The Tacit Domain	198
2.7.8	Rheinberger: Differential Repetition	205
2.8	<b>Outlook: From Epistemic Potentials to Experimentation</b>	212

<b>3</b>	<b>Case Study Approach: Methodology, Cases, Definitions</b>	<b>217</b>
3.1	Methodology	218
3.2	Cases	222
3.3	Definition of Urban Sustainability	226
3.4	Urbanisation: Core Data and Overview	228
3.5	Design Directives	232
<b>Part II</b>	<b>Analysis – Design Experiments – Reflection</b>	<b>239</b>
<b>4</b>	<b>Cases: Context and Analysis</b>	<b>241</b>
4.1	Berlin: Hellersdorf-Süd	243
4.2	Situational Analysis of Hellersdorf-Süd	267
4.2.1	Explanation of the Situational Approach	269
4.3	Rotterdam: Pendrecht/Zuidwijk	295
4.4	Situational Analysis of Pendrecht/Zuidwijk	317
<b>5</b>	<b>Design Experiments: Experiments in Methodical Knowledge Generation Through Architectural Design</b>	<b>343</b>
5.1	Experiments and Rationale	345

5.2	Design Experiment 1 <b>Generic Components – Specific Solutions</b>	349
5.2.1	Rationale of the Experiment	351
<b>REFLECTION I</b>	<b>EPISTEMIC EFFECTS OF ARCHITECTURAL CATALOGUES</b>	404
5.3	Design Experiment 2 <b>Modernism+</b>	415
5.3.1	Rationale of the Experiment	417
	Urban transformation Hellersdorf-Süd phase 1: Restructure and densify	420
	Detail 1: Optimizing energy production	423
	Detail 2: Flexible buildings- densification	435
	Detail 3: Designing for integrated solutions	443
	Urban transformation Hellersdorf-Süd phase 2: Adapt and consolidate	456
	Detail 4: Concepts for a new microclimate	459
<b>REFLECTION II</b>	<b>OBJECTUALITY AND INTEGRATIVE THINKING</b>	466

5.4	Design Experiment 3 <b>Interpolation</b>	475
5.4.1	Rationale of the Experiment	477
	Urban transformation Pendrecht/Zuidwijk phase 1: Green zoning, public spaces	480
	Detail 1: Residential renewal and redesigned public space	483
	Urban transformation Pendrecht/Zuidwijk phase 2: Central public spaces and connections	492
	Detail 2: Renewing the urban corridor	495
<b>REFLECTION III</b>	<b>FORM ELEMENTS, PROGRAMME ELEMENTS AND INNER COHERENCE</b>	506
	Urban transformation Pendrecht/Zuidwijk phase 3: Station area and functional diversification	516
	Detail 3: Redesigning the station area	519
<b>REFLECTION IV</b>	<b>RETAINING A KERNEL IDEA: "PERFORMATIVE SURFACE"</b>	538

<b>6</b>	<b>Conclusions and Outlook: Creation as Knowledge Generator - Reflections for Architectural Design</b>	<b>547</b>
6.1	Conclusions	548
6.2	Creation as Knowledge Production	551
6.3	On Experimental Results	552
6.4	Outlook and Recommendations	553
	Bibliography	557
	Curriculum vitae	587
<b>Appendix</b>	<b>Papers and Publications 2016-2019</b>	<b>589</b>