Contents

Introduction	7
You cannot resist an idea whose time has come	8
Informed Design Systems	12
Introducing the BE-AM platform	20
If additive manufacturing is the answer, what is the question?	
A philosophical perspective	22
History	29
The development of additive manufacturing in construction	30
The Urschel wall building machine	52
Subdivided columns	56
3D-printed formwork	59
Advanced FDM multi-axis-printing	62
A 3D-printed global habitat for sustainable living	65
3D-printable paper	69
Lunar habitation	76
Engineering	81
Structural design for Additive Manufacturing	82
Additive Manufacturing of glass	92
3D-concrete-printed masonry	96
Lightweight design in Additive Manufacturing	100
3D-printed façade node for complex joints	103
3D-printed steel nodes	106
Welding and milling	110
Life-cycle analysis as design tool	115
Design to Print	123
Linking ideation to materialization	125
Bespoke concrete building components	142
3D-printed façade	145
New Delft Blue	149
The Sandwaves	152
Bio hybrids	155
From plastic waste to furniture with robotic 3D-printing	158
Democratization and access in large-scale additive manufacturing	162



Technology interaction	167
Additive Manufacturing as part of the digital process chain in construction	169
Adaptive detailing	187
Re-printing architectural heritage	194
Interactive fabrication with Augmented Reality	200
Scan, print, assemble	202
Robotically inducing jamming into granular materials	206
Building Performance	213
Integrating function through additive manufacturing	214
3D-printed concrete bridges	221
3D-printed apartment building	222
Ceramic vault shading system	225
Additive Manufacturing of multifunctional discrete ceramic columns	228
Tectonics and aesthetics of 3D-printed clay bricks	231
A new digital craft	235
Fibre composite structures	239
DoubleFace 2.0	243
Acoustic design and additive manufacturing	246
List of Authors	250
Editors	252
Imprint	254