Contents

	Introduction	
	Preface	10
	How to use this book	11
	Solid and filigree construction	13
MATERIAL C. MODULES	Modulos	
MATERIALS - MODULES	Modules The importance of the material	40
Introduction	The importance of the material	19
Properties of materials	The perception of architectural space	20 21
Fu con a ta	The longevity of materials Plastic	22
Example	riasuc	42
	Masonry	
Introduction	The pathos of masonry	23
Properties of materials	The materials	32
	Swiss clay bricks and blocks	33
Systems	Masonry terminology	35
	Design and construction	36
	Masonry bonds	38
	Tying and reinforcing double-leaf masonry walls	42
Systems in architecture	The skill of masonry construction	43
	Types of construction	49
	Prefabrication	52
	Concrete	
Introduction	On the metaphysics of exposed concrete	56
Properties of materials	The materials	60
, reported of materials	The concreting process	63
	10 rules for the production of concrete	66
	Exposed concrete surfaces	67
Systems	Floor supports, exposed concrete with internal insulation	69
•	The fixing of heavy external cladding (concrete)	70
	The fixing of heavy external cladding (stone)	71
	Chart for establishing preliminary size of reinforced concrete slabs	72
Systems in architecture	Linear structural members	73
	Systems with linear members	74
	Planar structural members	75
	Systems with planar structural members	76
	Timber	
Introduction	Wood: indifferent, synthetic, abstract – plastic	77
	The materials	82
Properties of materials	Wood-based products – Overview	84
	Wood-based products – Civerview Wood-based products – Layered products	85
	Wood-based products – Layered products Wood-based products – Particleboards	87
	Wood-based products – Fibreboards	88
	Important panel and prefabricated systems – Overview	89
	Panel construction – Current developments	94
Printoma	Timber construction systems – Overview	9 4 96
Systems	Platform frame construction – Construction principle	99
	Chart for establishing preliminary size of timber beams	103
Examples	Conversion of a trunk in traditional Japanese timber building culture	103
Examples	The threads of the net	104
	THE SHOULD OF THE FIELD	100



	Steel	
Introduction	Why steel?	113
Properties of materials	Sections – forms and applications	120
	Fire protection	122
	Potential applications for structural steelwork	123
Systems	Connections – A selection	124
	Structures – frame with cantilevering beams	126
	Structures – frame with continuous columns	128
	Structures – two-way frame	130
	Chart for establishing preliminary size of steel beams	132
Systems in architecture	Folding and bending	130
	Frames	134
	Girder, lattice beam and facade	135
	Space frames	136
	Diamonds and diagonals	137
	Canopy structures	138
	Insulation	
Introduction	The "invisible" building material	139
Properties of materials	Transparent thermal insulation	143
	Thermal insulation materials and their applications	144
Systems	Thermal insulation systems – Overview	146
•	Glass	
Introduction	Glass – crystalline, amorphous	147
midudotton	Glass or Johanne, arrior priodo	
ELEMENTS	Foundation – Plinth	
Introduction	Building underground	153
Processes	Site preparation – Surveying work	161
	Site preparation – Earthworks	162
	Foundations	163
Systems	Foundation schemes - Loadbearing layer inside	164
	Foundation schemes – Loadbearing layer outside	165
Systems in architecture	The basis for plinths	166
Building performance issues	External wall below ground - Influences on the building envelope	169
	Wall	
Introduction	The wall	170
	<u>Opening</u>	
Introduction	For and against the long window –	
	The Perret – Le Corbusier controversy	175
Systems	The window – opening package	184
	Position of window, opening rebate forms	185
	The window as a component – frame sections	186
	The window as a component – glass	187
	Window - horizontal section, 1:1	188
Cuntoma in auchia-da	Window – vertical section, 1:1	190
Systems in architecture	The opening as a horizontal strip	192 193
	The opening as a horizontal strip The opening as a joint	193
	The opening as a transparent wall	195
	The opening as a nanoparent wall	130

Introduction	About the door	196
Systems	Doors – types of opening	197
	Doors – types of door stop	198
	Doors – hardware	199
Building performance issues	Wall – opening – Influences on the building envelope	200
	Cutting out sunlight and glare	201
	Floor	
Introduction	The doubling of the sky	205
introduction	The doubling of the sky	203
	Roof	
Introduction	The roof	211
Systems	Pitched roof – Functions of layers	213
	Flat roof – Functions of layers	214
	Flat roof – Warm deck – conventional systems	215
	Flat roof – Warm deck – special systems	216
	Flat roof — Upside-down roof	217
	Flat roof – Cold deck	218
Systems in architecture	Pitched roof	219
	Flat roof	220
	The roof as a folded plate	221
	Barrel-vault roof and shell roof	222
Building performance issues	Criteria and relationships	223
	Flat roof – Pitched roof – Repercussions for the building envelope	224
	Stairs, lifts	
Introduction	Flights of fancy	225
Systems	Excerpt from the Bauentwurfslehre by Ernst Neufert	230
	The geometry of stair transitions	232
	Balustrades and spandrel panels – Extract from SIA 358	233
	Lifts	234
Systems in architecture	The staircase as an assembly of simply-supported beams	236
	The staircase as a monolithic, organic form	237
	The staircase as a space frame	238
	The staircase as a solid timber construction	239
STRUCTURES	Forms of construction	
Introduction	An attempt to classify horizontal and	
muduenon	vertical space development	243
Concepts	Vertical loadbearing structures in solid construction –	
	Cross-section concepts	251
	Vertical loadbearing structures in solid construction – Plan concepts	252
	Vaulted loadbearing structures in solid construction –	
	Compression structures	253
Examples	Of heavy mass and apparent heaviness	255
	Ksar Ferich - A fortified storehouse in southern Tunisia	258
	Sculpted architecture – The Scottish tower house	263
Processes	Provision of services during planning work	271
	The sequence of building operations	272
Systems	Compartmentation	273
	Box frame construction	274
	Frame construction	275
	Column-and-slab systems	276
	Single-storey shed forms	277
Systems in architecture	Prefabrication – System building	278

Introduction Concepts Example	Building performance, energy Sustainability – Fundamentals of architecture The problem of heat flow and vapour diffusion Insulation concepts – Diagram of layers Insulation concepts – Complementary systems, loadb. layer inside Insulation concepts – Complementary systems, loadb. layer outside Seven rules for the design of a low-energy house Low-tech – high tectonics	282 286 287 288 289 290 291
BUILDINGS	Selected projects	
Introduction	Structural issues – The relationship between interior structure,	
Examples	loadbearing structure, and infrastructure Apartment blocks, Martinsbergstr., Baden: Burkard Meyer + Partner Gallery for Contemporary Art, Marktoberdorf: Bearth + Deplazes Detached family home, Grabs: Peter Märkli Paspels School: Valerio Olgiati Volta School: Miller + Maranta Sihlhof School, Zürich: Giuliani + Hönger "Im Birch" School, Zürich: Peter Märkli Chur Teacher Training College, science wing: Bearth + Deplazes Swiss School of Engineering for the Wood Industry, Biel: Meili + Peter Private house, Sevgein: Bearth + Deplazes	295 303 313 322 332 341 350 361 374 383 394
COMPONENTS	Drawings Preparation of drawings for buildings Extract from Swiss standard SIA 400:2000 Presentation on drawings – Example: timber platform frame construction Symbols – Legend for the catalogue of components	401 407 409
	Foundation – Plinth	
	Single-leaf masonry	410
	Double-leaf masonry, rendered	411
	Facing masonry	412
	Fair-face concrete with internal insulation External insulation, rendered	413 414
	External cladding, lightweight	414
	External cladding, heavyweight	416
	Timber platform frame construction	417
	Plinth – Roof: solid timber panel construction	418
	Wall – Floor	
	Single-leaf masonry, rendered	420
	Double-leaf masonry, rendered	421
	Facing masonry	422
	Fair-face concrete with internal insulation	423
	External insulation, rendered	424
	External cladding, lightweight	425
	External cladding, heavyweight	426
	Non-loadbearing external wall	427
	Timber platform frame construction Solid timber panel construction	428 429
	Cona umbor parior contenuous	723

500

508

	Opening	
Windows	Single-leaf masonry	430
	Double-leaf masonry, rendered	432
	Facing masonry	434
	Fair-face concrete with internal insulation	436
	External cladding, lightweight	438
	External cladding, heavyweight	440
	External insulation, rendered	442
	Non-loadbearing external wall	444
	Timber platform frame construction	446
	Solid timber panel construction	448
Doors	Hinged door, external – wood	450
	Hinged door, external wood/glass	451
	Sliding door, external metal/glass	452
	Hinged door, internal – wood	453
	Sliding door, internal – wood	454
	Floor	
	Hollow clay block floor	455
	Hourdis-type hollow clay block floor	456
	Solid concrete slab	457
	Ribbed concrete slab	458
	Concrete waffle slab	459
	Hollow-core concrete slab	460
	Composite slab, profiled metal sheeting–concrete	461
	Solid timber floor	462
	Timber joist floor	463
	Timber box element floor	464
	Steel floor	465
	Roof - Parapet	
	Pitched roof – warm deck –	
	Fibre-cement, external cladding, lightweight	466
	Pitched roof – warm deck, monopitch roof –	
	Fibre-cement – facing masonry	467
	Pitched roof – cold deck – Roof tiles, masonry in brickwork bond	468
	Pitched roof – cold deck – Sheet metal, single-leaf masonry	469
	Flat roof ~ warm deck — Bitumen, double-leaf masonry, rendered Flat roof ~ warm deck —	470
	Bitumen, fair-face concrete with internal insulation	471
	Flat roof – warm deck – Plastics, external cladding, heavyweight	472
	Flat roof – warm deck – Bitumen, non-loadbearing external wall	473
	Flat roof – upside-down roof – Bitumen, external insulation, rendered	474
	Flat roof - cold deck, uncoated roof -	
	Bitumen, timber platform frame construction	475
	Flat roof – warm deck, suitable/unsuitable for foot traffic	476
	Flat roof cold deck	478
	Flat roof ~ upside-down roof, with rooftop planting	480
APPENDIX		
	Further reading	485
	Picture credits	486

Index Thanks