

Contents

Introduction 8

SECTION 1

Stylistic Periods and Geographical Adaptations

Architecture Adapted to Climate	12
Primitive Architecture	14
Mesopotamian and Iranian Architecture	21
Egyptian Architecture	23
Pre-Columbian Architecture	24
Ancient Greek Architecture	26
Roman Architecture	28
Early Christian and Byzantine Architecture	30
Romanesque Architecture	32
Gothic Architecture	34
Renaissance Architecture	35
Baroque Architecture	37
Rococo Architecture	38
Neo-Classical Architecture	39
Romantic Architecture	40
Islamic Architecture	41
Japanese Architecture	43
Chinese Architecture	44
Indian Architecture	45
Modern Isms	46

SECTION 2

Built Forms and Building Types

LANDSCAPES	
Private Gardens and Parks	56
Urban Open Space	59
Specialized Landscapes	62
TRANSPORTATION	
Bridges	64
Railroad Stations	68
Airports	70
RESIDENTIAL	
Houses	76
Apartments	86
Palaces	88
Hotels	91
INDUSTRIAL	
Factories	94
Warehouses	100
COMMERCIAL AND ADMINISTRATIVE	
Offices	106
Skyscrapers	109
Shops, Stores, and Shopping Centers	111
Banks	114
Exhibition Buildings	116
GOVERNMENT	
Civic Buildings	120
EDUCATIONAL AND RESEARCH	
Schools	124
Universities	126
Museums	129
Laboratories	132
ENTERTAINMENT AND RECREATION	
Theaters	136
Movie Theaters	138
Sports Buildings	141
INSTITUTIONAL	
Hospitals	146
Prisons	150
DEFENSE, EMERGENCY, AND PORTABLE BUILDINGS	
Fortifications	154
Emergency Buildings	161

SECTION 3

Structures – Ideas, Elements, Structural Systems, and the Processes of Erecting Buildings

STRUCTURAL DESIGN AND ITS BASES	
Structural Theory	166
Statics and Dynamics	166
Deformation and Strength	167
Design Criteria	168
Structural Design	169
STRUCTURAL ELEMENTS	
Arches	171
Beams and Slabs	172
Columns, Piers, and Walls	173
Domes and Related Elements	174
Floor Systems	175
Foundations	176
Rigid Frames	177
Shells	177
Trusses and Space Frames	178
Suspension Elements, Tensile Membranes, and Cable Nets	180
Vaults	180
STRUCTURAL SYSTEMS	
Early Forms	182
Later Wide-Span Buildings: Timber-, Concrete-, and Masonry-Roofed Systems	184
Iron-, Steel-, and Reinforced-Concrete-Roofed Systems	186
Later Multistorey Buildings: Bearing-Wall Systems	188
Hybrid Systems with Partial Timber or Iron Framing	189
Fully Framed Systems of Iron, Steel, and Reinforced Concrete	190
Recent Hybrid Systems for Tall Buildings	191
Protection Against Fire, Earthquake, and Other Hazards	192
MEANS OF BUILDING AND CONSTRUCTION PROCESSES	
Construction Plant	193
Measuring Equipment	194
Scaffolding, Centering, and Formwork	194
Construction Processes: Problems Associated with the Incompleteness of the Structure during Construction	196
Prestressing	197
From Prefabrication to Industrialization and Systems Building	197

SECTION 4**Services, Mechanical and Environmental Systems**

BEFORE THE INDUSTRIAL REVOLUTION	
(Minimal Servicing — The Age of Wood and Water)	200
THE 19th CENTURY	202
(The Age of Steam and Gas)	
Assembly Buildings	202
Hospitals	204
Offices	206
Schools	208
Domestic Buildings	209
THE 20th CENTURY	212
(The Electric Age)	
Assembly Buildings	213
Hospitals	215
Offices	217
Schools	220
Domestic Buildings	222
THE RESPONSIBLE AGE	224

SECTION 5**Building Materials**

Timber	228
Plywood and other	
Wood-Based Sheet Material	234
Stone	236
Earth in various forms (cob, pisé, adobe, wattle and daub)	241
Brickwork	143
Terra-cotta	246
Roofing Materials and Tiles	247
Plaster	251
Mortar and Cement	252
Concrete	253
Asbestos	263
Iron	263
Steel	272
Copper	277
Brass	278
Zinc	279
Bronze	279
Lead	280
Aluminum	281
Glass	282
Paint	285
Bitumen and Asphalt	286
Plastics	236

SECTION 6**Tools, Techniques, and Fixings**

TOOLS	290
Carpentry	290
The Hammer	291
Axes and Adzes	291
The Plane	292
The Saw	293
The Drill	293
Masonry	294
Glazing and Sealing	295
Finishing and Ancillary Trades	295
Plastering	295
Painting	295
The Blacksmith	296
Powered Tools	296
Surveying Instruments	297
TECHNIQUES	298
Casting and Molding	299
Extrusion	300
Carving	301
Cutting	301
Drilling	302
Grinding	302
Milling	303
Turning	303
Rolling	304
Forging	305
Bending	305
Stamping	305
JOINTS AND FIXINGS	306
Lashings	306
Homogeneous Joints for Wood	306
Masonry Joints	307
Nails	308
Screws and Bolts	309
Riveting and Welding	309
Adhesives and Sealing Compounds	312
Miscellaneous Fixings and Fastenings	313
Index	314