1 A BIOCLIMATIC VIEW OF ARCHITECTURE

Climate and nature

Climate and culture

Bioclimatic design

Sustainable and regenerative design

Framework for analysis

2 DOUBLE-SKIN FAÇADE CONCEPTS AND STRATEGIES

An integrative strategy

A bioclimatic kit of parts

Bioclimatic design concepts and strategies

3 DOUBLE-SKIN FAÇADE CLASSIFICATIONS

Cavity partitioning

Ventilation type and mode

Structural classification

Alternative nomenclatures

4 DOUBLE-SKIN FAÇADE HISTORY, PART I: ORIGINS

Buffer zones in vernacular architecture

Mid-19th Century: Glass for light and heat

20th Century: Glass for health, thermal comfort, and (sometimes) ventilation

Mid-20th century: Ventilation and acoustics in early DSF architecture

1970s: Energy focus feeds DSF development

1980s: Experimentation

5 DOUBLE-SKIN FAÇADE HISTORY, PART II: ADAPTATIONS

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21st century: Global expansion

Supertall

6 DOUBLE-SKIN FAÇADES: MOTIVATIONS AND ALTERNATIVES

Motivations

Benefits, cautions, and costs

Alternatives

7 DOUBLE-SKIN FAÇADE PERFORMANCE IN PRACTICE

Façade performance

Façade design process

1 Predesign: Concepts and criteria

2 Schematic design: Models and iteration

3 Design development: Simulation of performance

4 Construction documentation: Collaboration with fabricators

5 Bidding / final buyout: Final fabrication drawings

6 Construction and closeout: Mockups, installation, and quality assurance

7 Post-occupancy: Evaluation and feedback loops

8 DOUBLE-SKIN FAÇADE CASE STUDIES

8.1 Marseille Library | *BMVR de Marseille* (Marseille, France, 1997-2004)

8.2 Grenoble Courthouse | *Palais de Justice de Grenoble* (Grenoble, France, 1994-2002)

8.3 Cambridge Public Library (Cambridge, Massachusetts, USA, 2002-09)

8.4 Manitoba Hydro Place (Winnipeg, Canada, 2004-09)

8.5 Pearl River Tower | 珠江城大厦 (Guangzhou, China, 2005-13)

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