



Façade Design

Institut Teknologi Bandung

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Meinhardt Façade Technology
22 November 2019

MEINHARDT

OUR CORPORATE BACKGROUND

MEINHARDT FAÇADE TECHNOLOGY (MFT)

MORE THAN 60 YEARS
OF TRACK RECORD

**START-TO-END SERVICES ACROSS
ENTIRE PROJECT DELIVERY CYCLE**

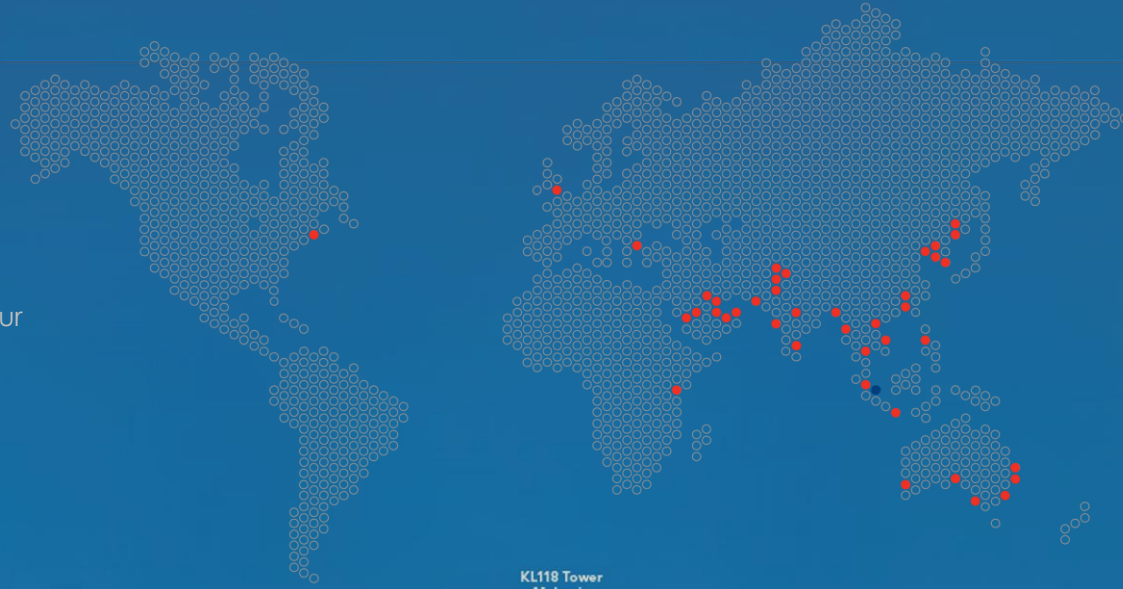
**45 OFFICES &
4,500+ PROFESSIONAL STAFF
WORLDWIDE**

**ENR 2011: LARGEST INDEPENDENT
ENGINEERING CONSULTING FIRM IN ASIA**



PART OF A GLOBAL NETWORK

Meinhardt group, a global multi-disciplinary engineering consultancy with over 4,500 staff in 45 offices worldwide. Our global presence and international experience allow us to best service our projects across regions. Unique to MFT is our ability to offer a fully integrated and seamless design in close coordination with engineering teams, project management and planning departments or be contracted independently.



EUROPE

London

MIDDLE EAST & NORTH AFRICA (MENA)

- Doha
- Dubai
- Kuwait City
- Manama
- Muscat
- Riyadh

AUSTRALIA

- Adelaide
- Brisbane
- Melbourne
- Sydney

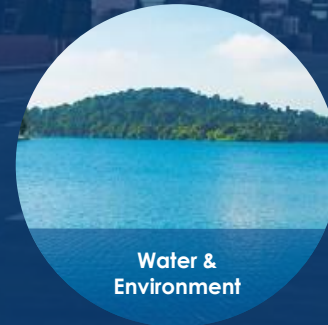
ASIA

- Bangkok
- Beijing
- Chennai
- Danang
- Gurgaon
- Hanoi
- Ho Chi Minh City
- Hong Kong
- Jakarta
- Karachi
- Kuala Lumpur
- Lahore
- Macau
- Manila
- Noida
- Seoul
- Shanghai
- Shenzhen
- Singapore
- Tianjin



MEINHARDT GROUP & SERVICES

CAPABILITIES



FAÇADE ENGINEERING

CAPABILITIES

Specialized in Façade design and engineering, materials specification and testing, façade construction and maintenance, and remedial façade consulting.



**OVER 25 YEARS
OF EXPERIENCE**



**DESIGNED OVER
30,000,000M² OF
BUILT-UP FAÇADE
DESIGN**



**OVER 1,500
PROJECTS
WORLDWIDE**



**OVER 200 FAÇADE
SPECIALISTS IN OUR
TEAM WORLDWIDE**



**VAST KNOWLEDGE BASE
AND EXPERTISE AVAILABLE
FOR TEAM WORLDWIDE**



200 STAFF

14 OFFICES

ONE MEINHARDT FACADE

Meinhardt Façade Technology



Meinhardt Façade Technology



Contents

- Façade Introduction
- Basic Function
- Key Considerations
- Innovative Façade





FAÇADE INTRODUCTION

Facia (Latin)

DEFINITION

- the front of a building
- any face of a building given special architectural treatment
- first layer of the building

Front of a building which is treated aesthetically to give impression to the building itself.

FAÇADE INTRODUCTION



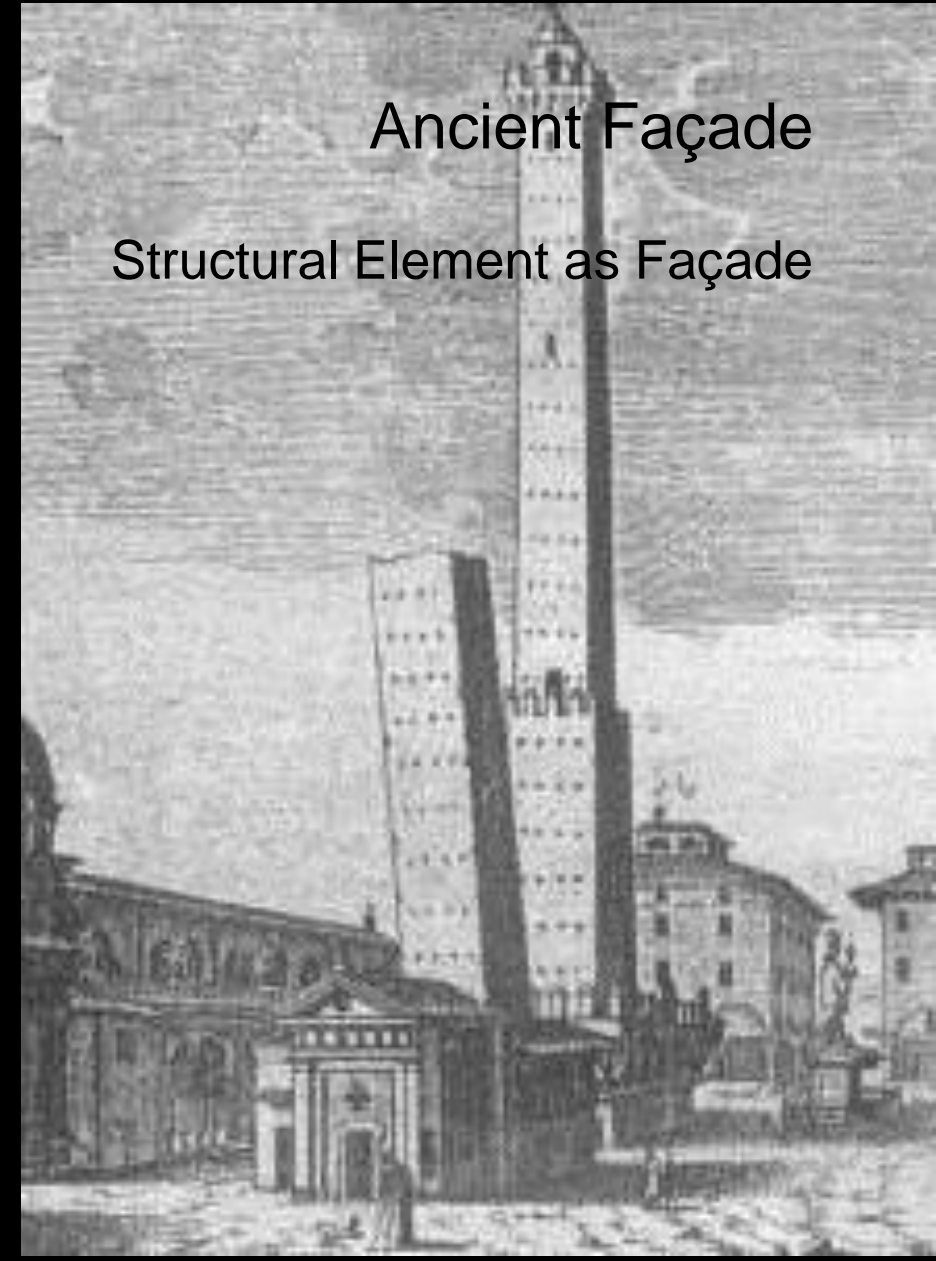
FAÇADE INTRODUCTION



Garisenda
(48 m)

Asinelli
(97 m)

Two Towers Bologna
Bologna, Italia



Ancient Façade

Structural Element as Façade

FAÇADE INTRODUCTION

Ancient Façade

Structural Element as Façade



Parthenon
Athens, Greece
Iktinos, Kalikrates



FAÇADE INTRODUCTION

19th Century Facade

- Structural Elements as Part of Façade
 - Steel structure for high-rise building
- Window Wall or Curtain Wall Construction

Home Insurance Building
Chicago, USA
William Le Baron Jenney

FAÇADE INTRODUCTION



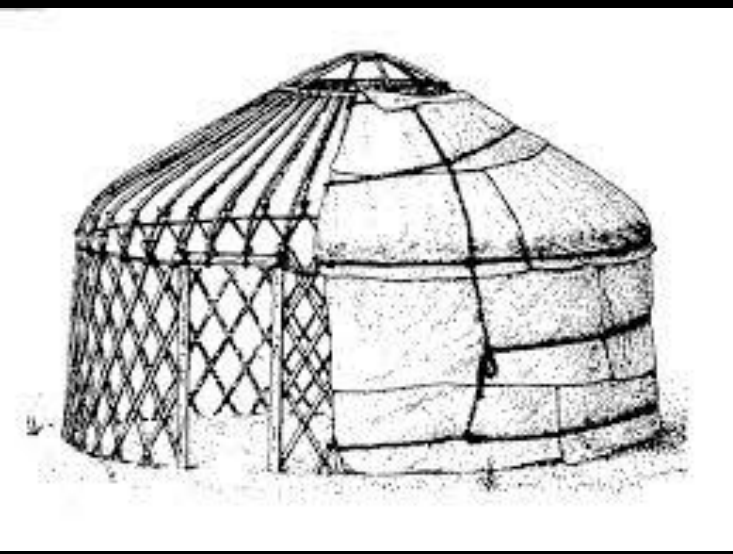
American Surety Building
New York, USA
Bruce Price

19th Century Facade



Separation from Primary Structures

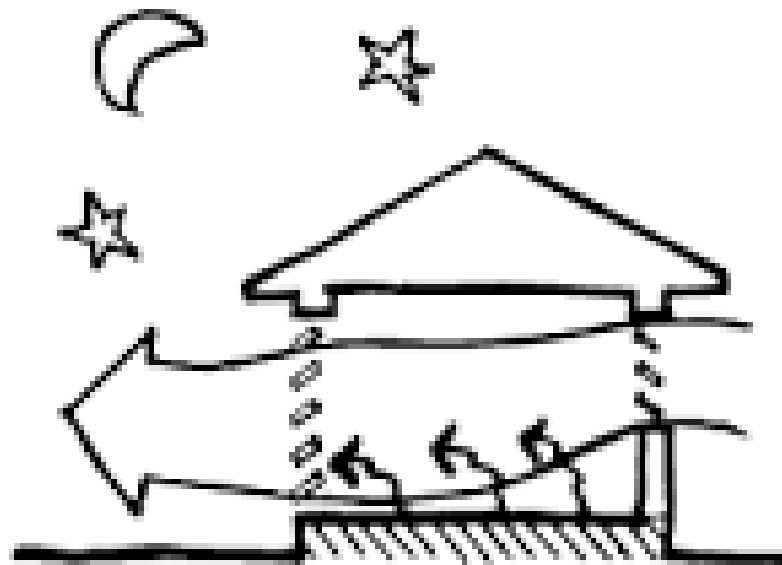
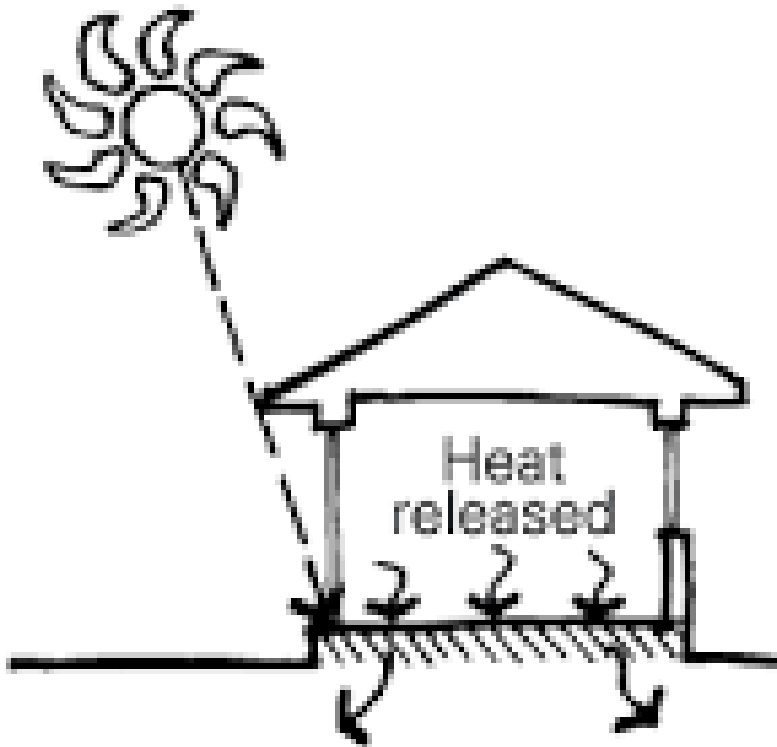




BASIC FUNCTION

CONTROL NATURAL ELEMENTS

- Water
- Temperature
- Sound
- Air

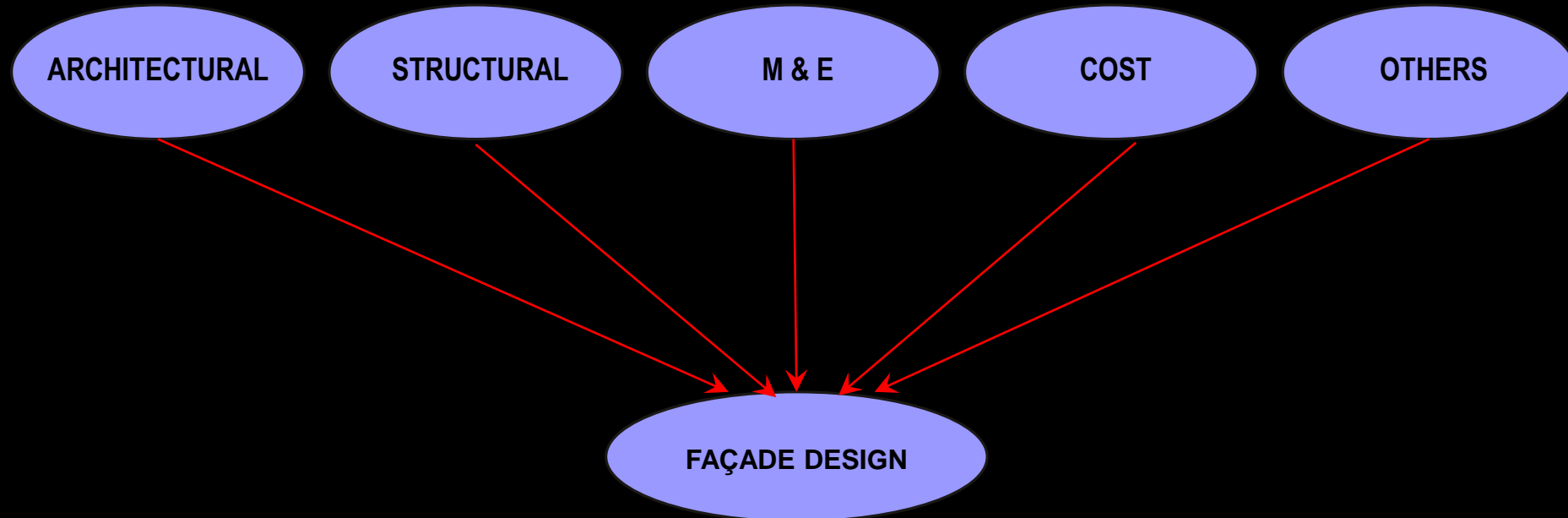


Occupant Comfort

- ❑ Thermal
- ❑ Visual
- ❑ Acoustical
- ❑ Air Quality



KEY CONSIDERATION



- Façade System
- Material
- Requirements

KEY CONSIDERATION

ARCHITECTURAL

- Architectural Concept and Geometry
- Materials
- Colours
- Transparency
- Etc



International Commerce Centre
Hongkong
KPF

ARCHITECTURAL

- Architectural Concept and Geometry
 - Shape of facade
 - Square
 - Twisted façade
 - Diamond shape
 - etc



ARCHITECTURAL

- Material
 - Glass



**Amsterdam
Building**

GLASS



UN House, NY, USA

1948 - 1952

Architect: Harrison & Ambramovich

Lever House, NY, USA

1950 - 1952

Architect: SOM



**Mode Gakuen Spiral Tower,
Nagoya, Japan**

2005 - 2008

Architect: Nikken Sekkei

GLASS

**One Blackfriars,
London, England**

2013 – 2018

Architect: SimpsonHaugh and Partners





GLASS



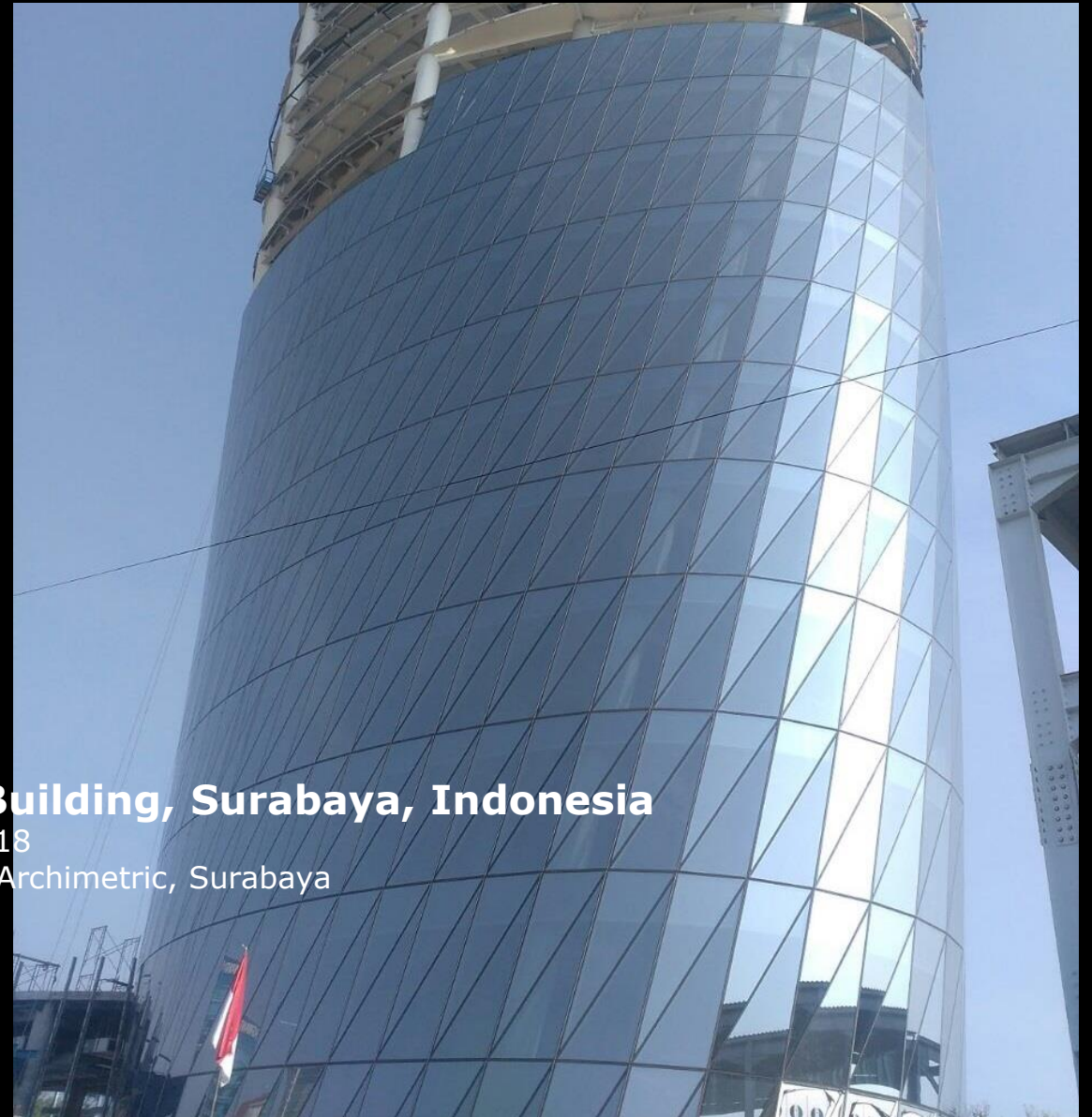
GLASS



Avian Building, Surabaya, Indonesia

2015 - 2018

Architect: Archimetric, Surabaya



GLASS



ARCHITECTURAL

- Material
 - Aluminium Panel



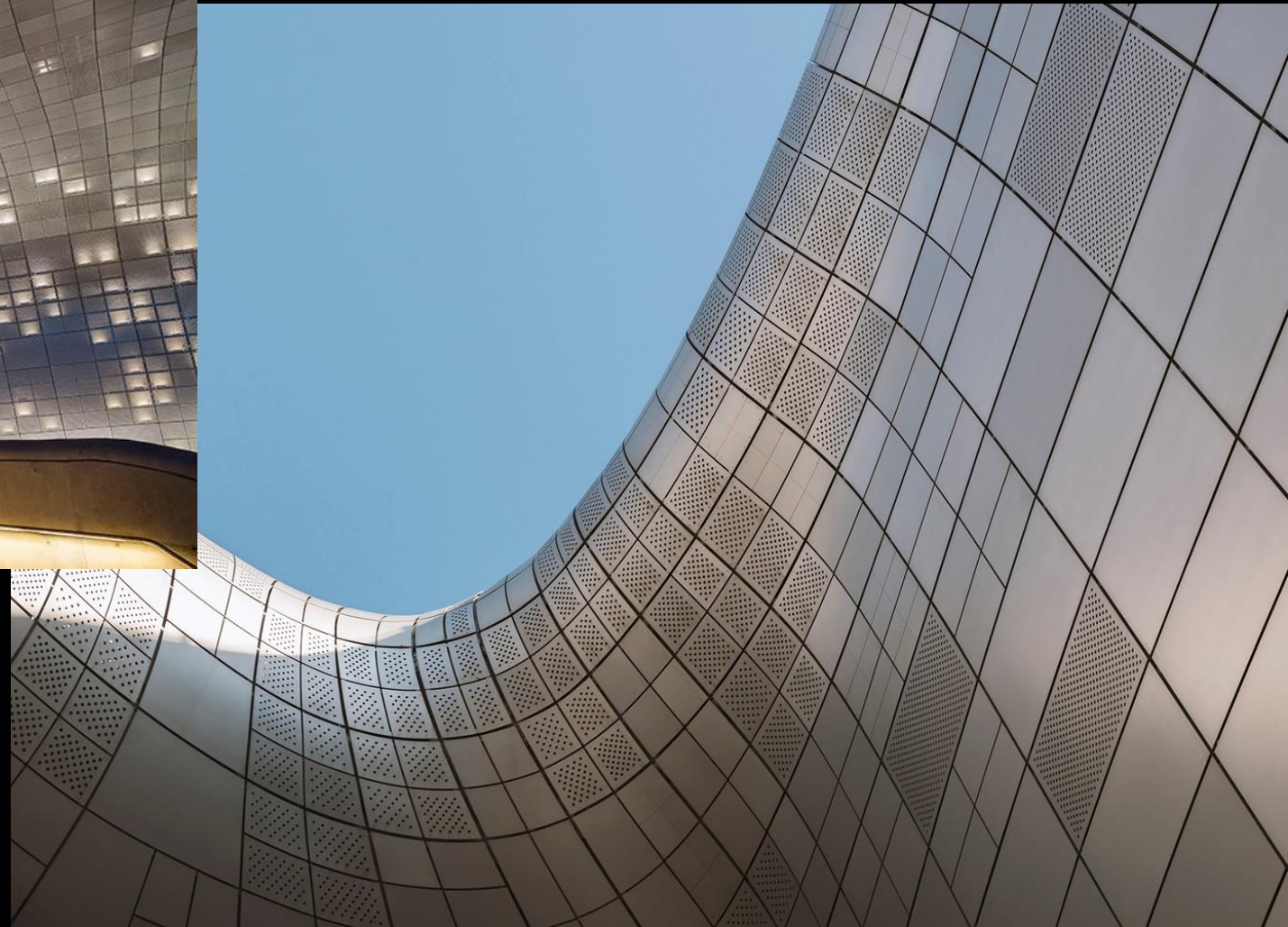
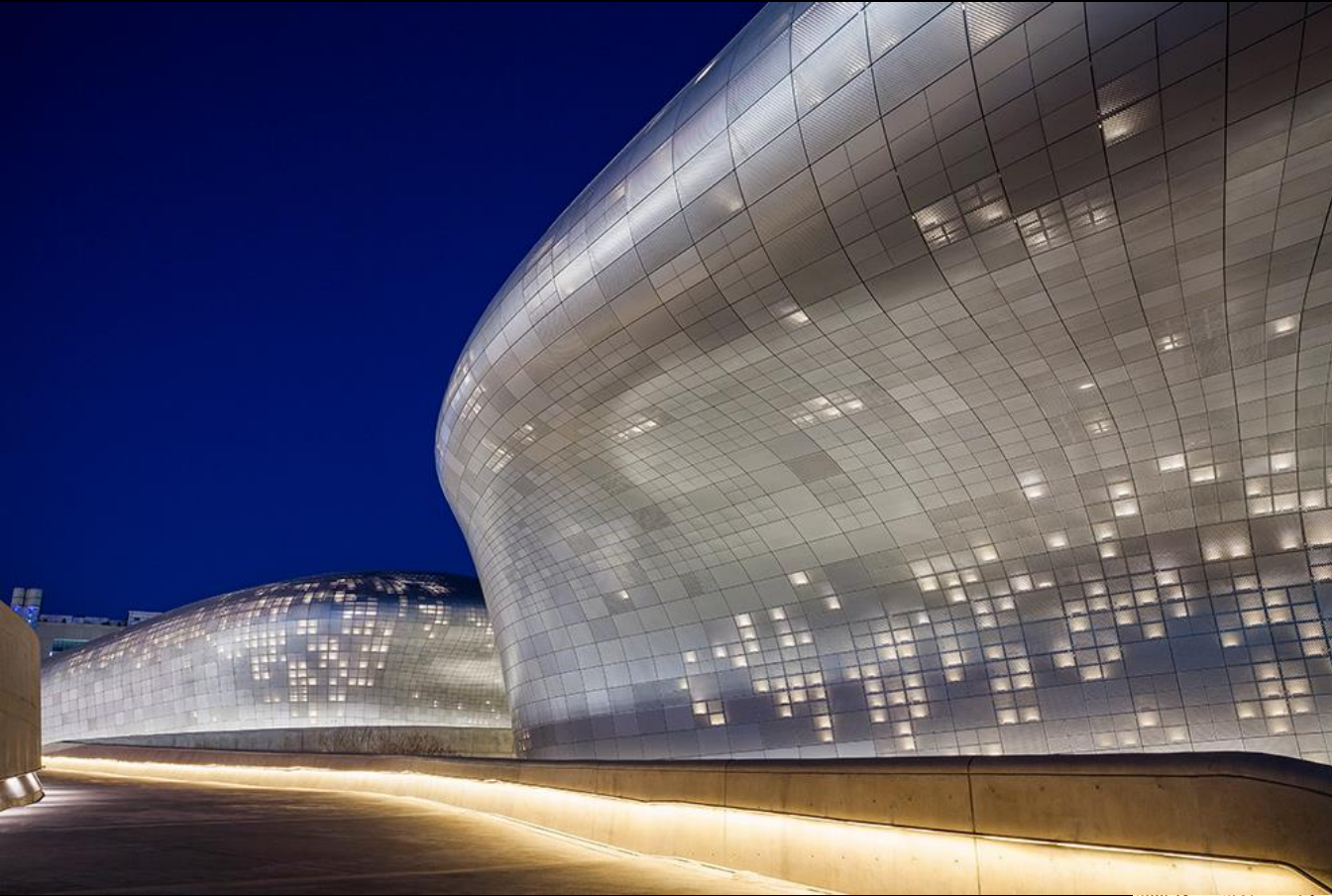
ALUMINIUM PANEL



ALUMINIUM PANEL



ALUMINIUM PANEL



ALUMINIUM PANEL



ARCHITECTURAL

- Material
 - Stone Cladding



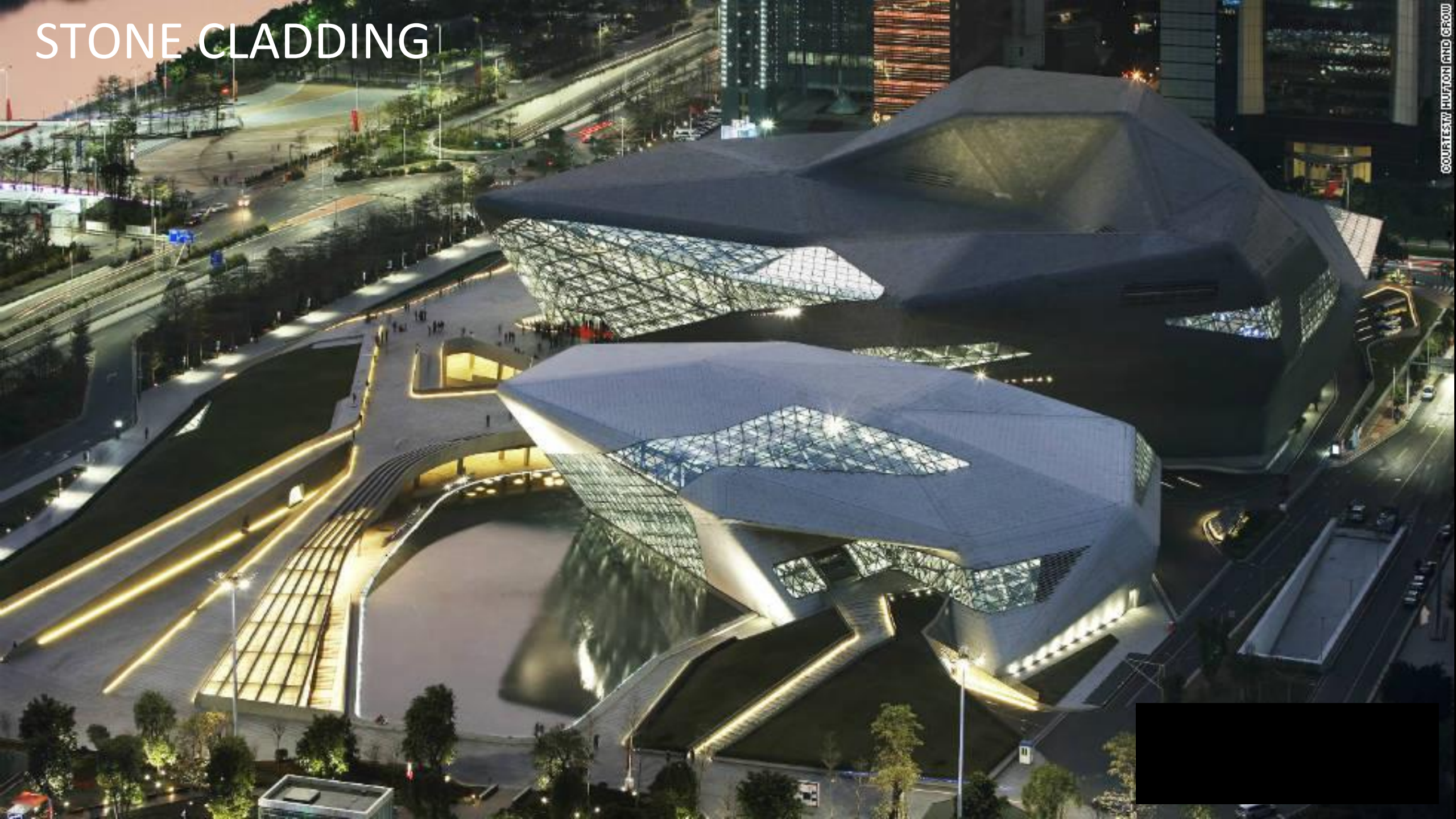
STONE CLADDING



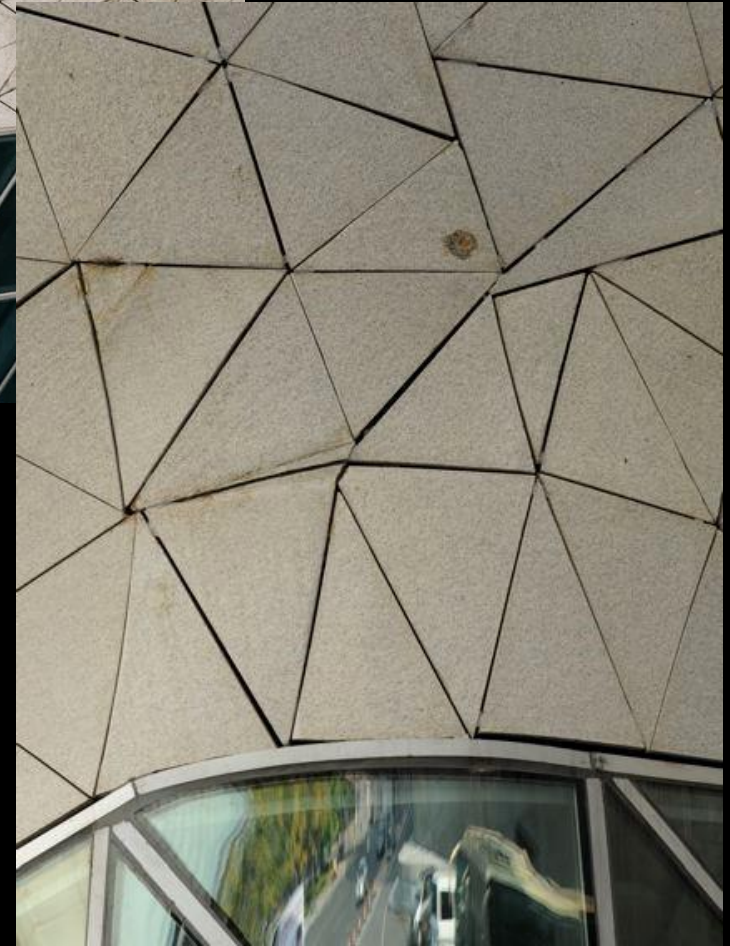
STONE CLADDING



STONE CLADDING



STONE CLADDING



ARCHITECTURAL

- Material
 - Terracotta



TERRACOTTA

USEGLI
WEINWELT

TERRACOTTA



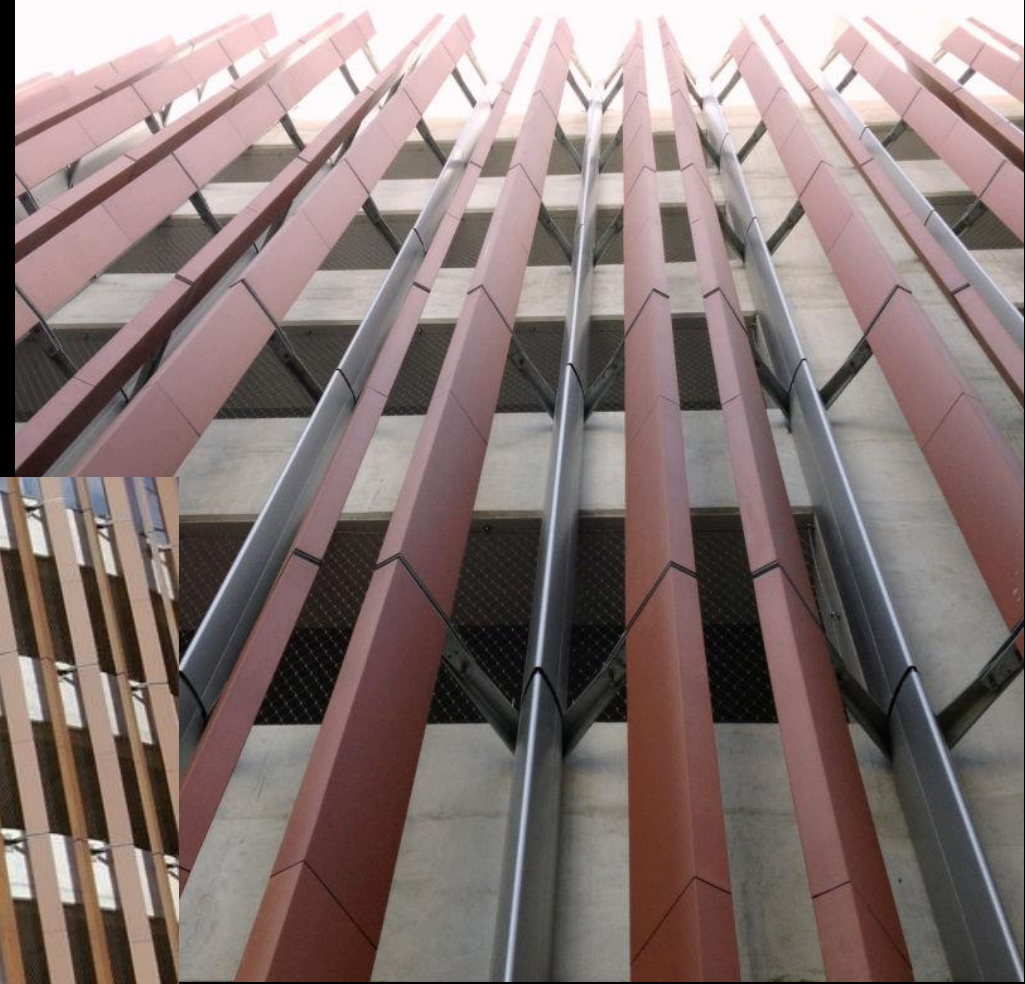
TERRACOTTA



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ARCHITECTURAL

- Material
 - Glass Reinforced Polyester



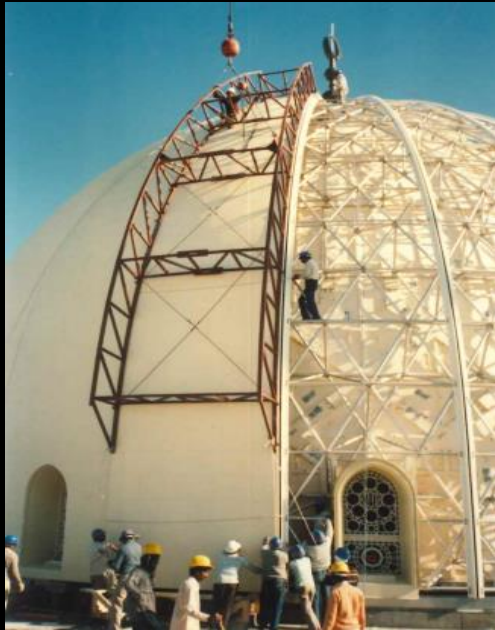
GLASS REINFORCED POLYESTER



GLASS REINFORCED POLYESTER



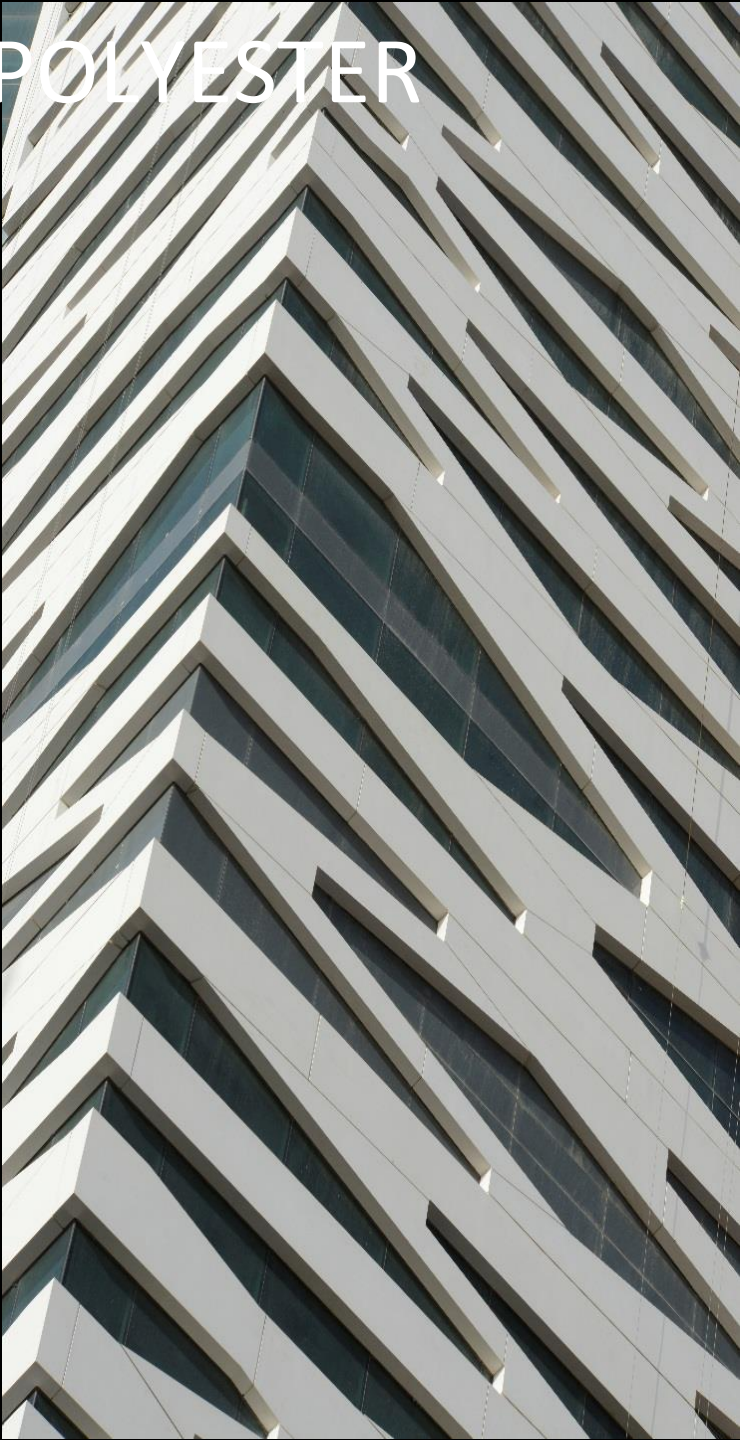
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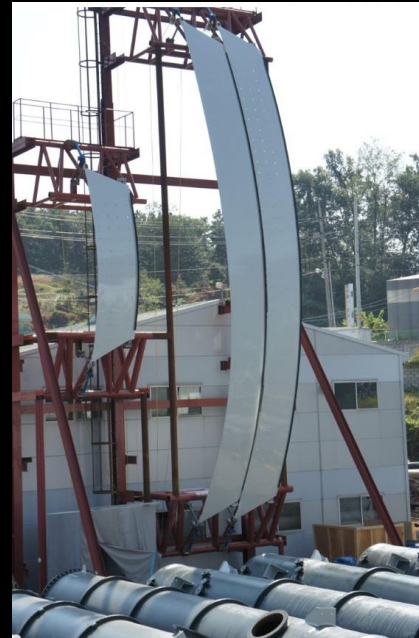
GLASS REINFORCED POLYESTER



GLASS REINFORCED POLYESTER



GLASS REINFORCED POLYESTER



ARCHITECTURAL

- Material
 - Ceramic Tiles
(Large Size Ceramic Tiles)



CERAMIC TILES



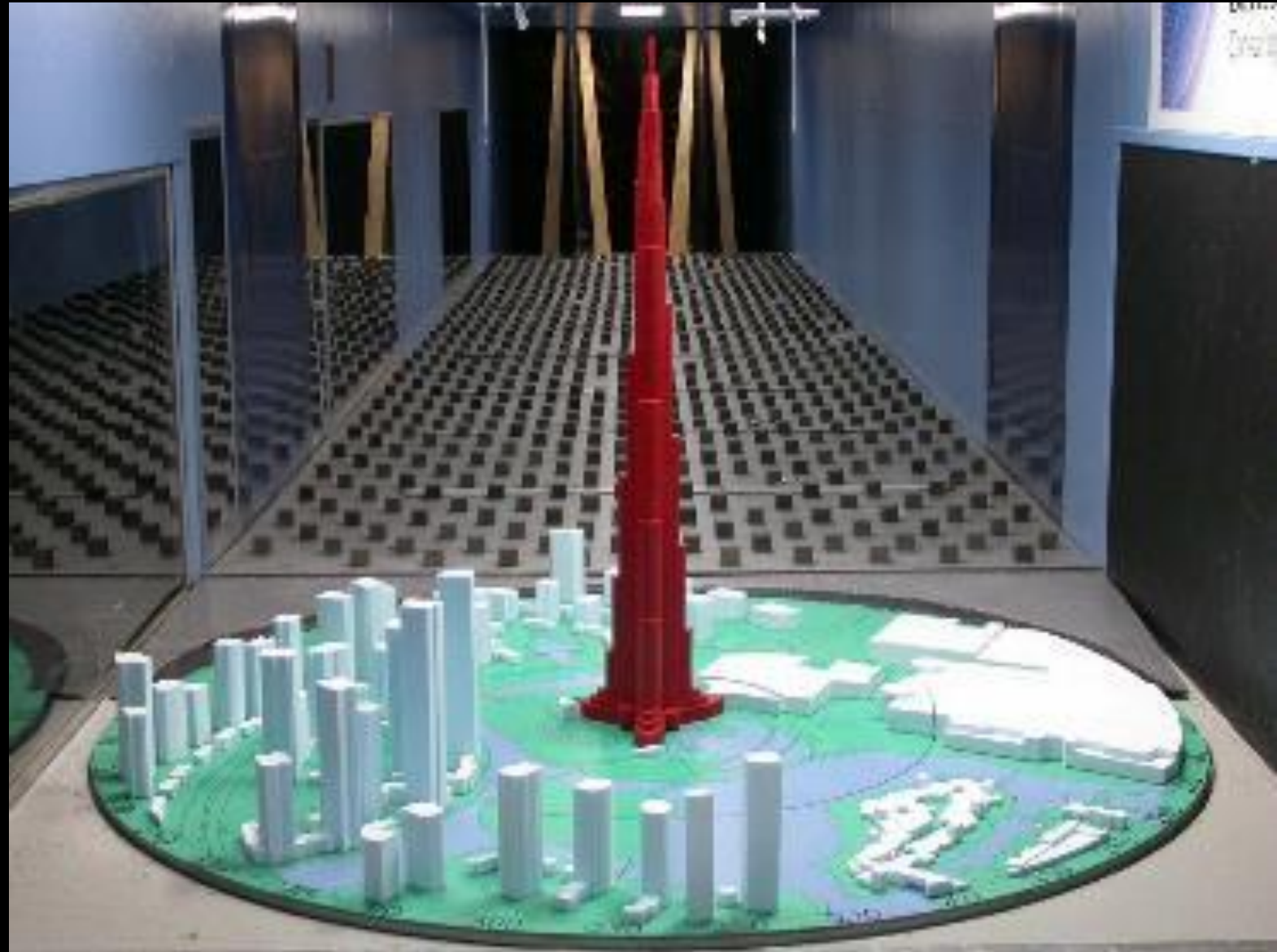
CERAMIC TILES



KEY CONSIDERATION

STRUCTURAL

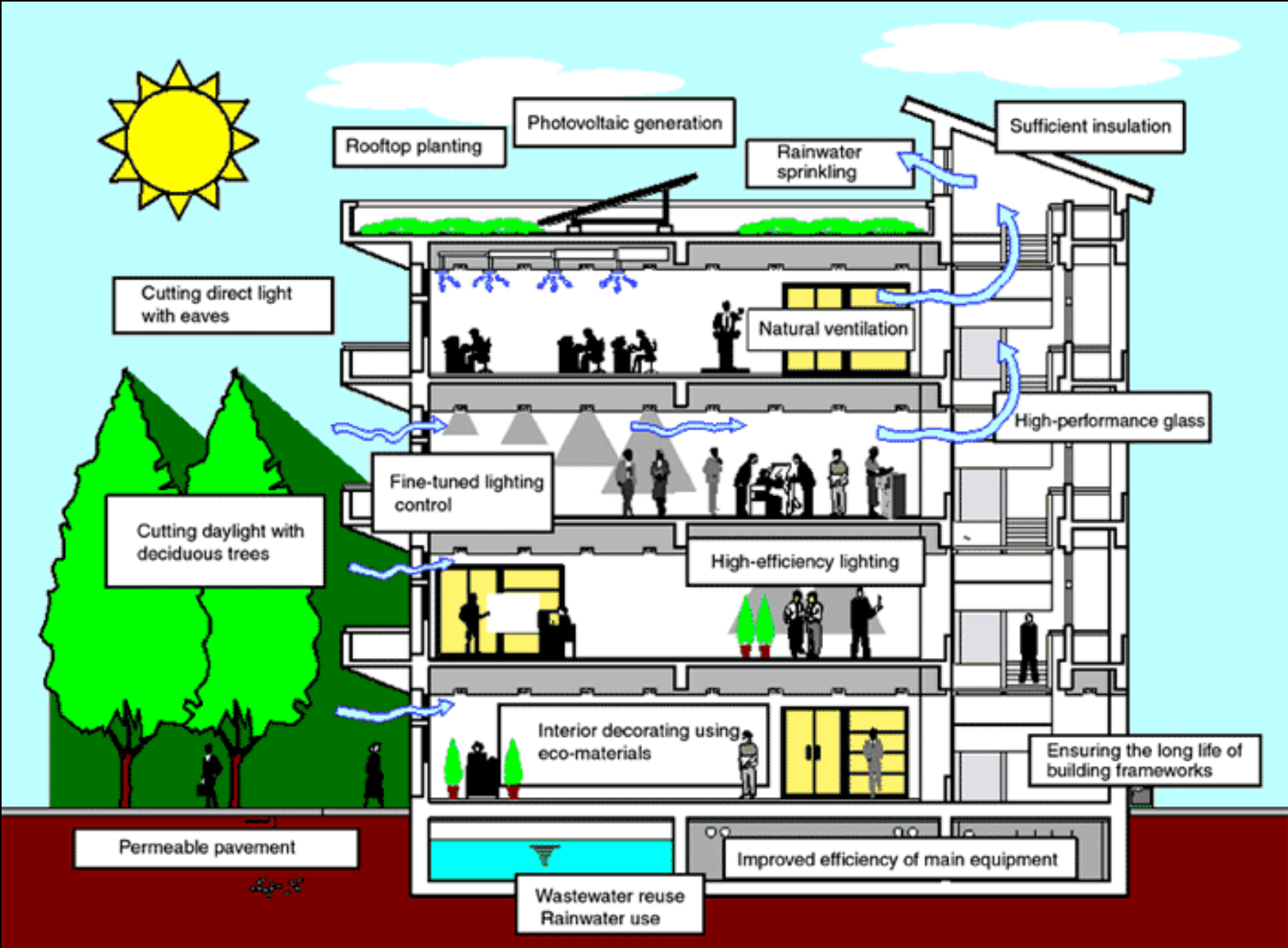
- Wind Load
- Structural System
- Building Sway
- Live Differential Deflection
- Thermal Expansion
- Structural Behaviour
- etc



KEY CONSIDERATION

ME

- Heat Transfer
- Lighting (Natural & Artificial)



KEY CONSIDERATION

COST

- Budget
- Building Grade
- Owner's or User's requirement
- Feasibility Study
- Etc



KEY CONSIDERATION

OTHERS

- Authorities Requirements
- Fire Resistance Requirements
- Safety





THE ADDRESS DOWNTOWN HOTEL, DUBAI, UAE

Building type: 63-storey hotel (5-star)

Fire Event: 31st December 2015

Fire Duration: 4 hours

Fire Caused: Electric Short Circuit at level 14 to 15

Fire Damage:

- 14 people suffered minor injuries
- 1 people suffered moderate injuries
- Hotel closed for renovation.
- 320 US\$ claim to insurance

Criticism was levelled towards the high amount of cladding implemented into the building's design; it was reported that this cladding may have contributed to the fire's spread.

The TORCH TOWER, DUBAI MARINA

1st Fire Incident, 21st February 2015

2nd Fire Incident, 4th August 2017





THE TORCH TOWER, DUBAI MARINA, UAE

1st fire incident

Building type: 84-storey residential

Fire Event: 21st February 2015

Fire Duration: N/A

Fire Caused: Grilled at Balconies at level 50

Fire Damage:

- 7 people suffered due to smoke inhalation.
- External cladding were burned from lv. 50 to roof.
- 101 of 757 units apartment is inhabitable and have to be renovated.

The Telegraph News:

The **external cladding on the building** was blamed for the rapid spread of the 2015 fire



THE TORCH TOWER, DUBAI MARINA, UAE 2nd fire incident

Building type: 84-storey residential

Fire Event: 4th August 2017

Fire Duration: N/A

Fire Caused: N/A

Fire Damage:

- No injuries
- More than 40 floor are burned

OTHERS

KEY CONSIDERATION

➤ Bomb Blast Requirements (Security)



KEY CONSIDERATION

OTHERS

➤ Acoustics Requirement



OTHERS

➤ Comfort Requirements

Occupant Comfort

- Thermal
- Visual
- Acoustical
- Air Quality



INNOVATIVE FACADE





INNOVATIVE FACADE

- Media Wall Facade

Green Piz Zero Energy Media Wall
Beijing, China

INNOVATIVE FACADE

- Green Wall Facade



Inhabitat
France
Patrick Blanc

INNOVATIVE FACADE

- Green Wall Facade



L'Oasis D Aboukir (Oasis of Aboukir)
Paris, France
Patrick Blanc



INNOVATIVE FACADE



INNOVATIVE FACADE

- Double Skin Facade

Shanghai Tower
Shanghai, China
Gensler, London



INNOVATIVE FACADE





INNOVATIVE FACADE

- BIPV Facade



INNOVATIVE FACADE

- BIPV Facade





Thank You

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