Ar Rahmah Mosque

Jalan Cempaka Putih Tengah no I/1
Jakarta, **Indonesia**

|	
Architects	Joseph Wardi Argasetya Java, Indonesia
Clients	H. Mohamad Natsir Bakrie Jakarta, Indonesia
Commission	2007
Design	2007
Construction	2005 - 2007
Occupancy	2007
Site	800 m²
Ground floor	520 m²
Total floor	1,320 m²
Costs	n.a.
Programme	The design development process of the dome for this mosque prompted the architect to produce a standardised dome design system. The intention was to facilitate middle and lower income communities to build and renovate their own mosques without the need for highly skilled labour. Using computer modelling techniques, a 'web-dome' structural frame and diamond-shaped cladding panel form evolved. Careful detailing and galvanising enables metal to be used for both elements, with a soft internal ceiling to mitigate echoes. A funnel-shaped apex draws hot air through a hole that is sheltered from rain by an ornamental crown. This also allows fresh air to be drawn into the dome.

DEVELOPMENT OF THE 'DOME'

AR-RAHMAH MOSQUE DOME
Islamic Hospital, Jakarta, Indonesia - 2007

Exterior
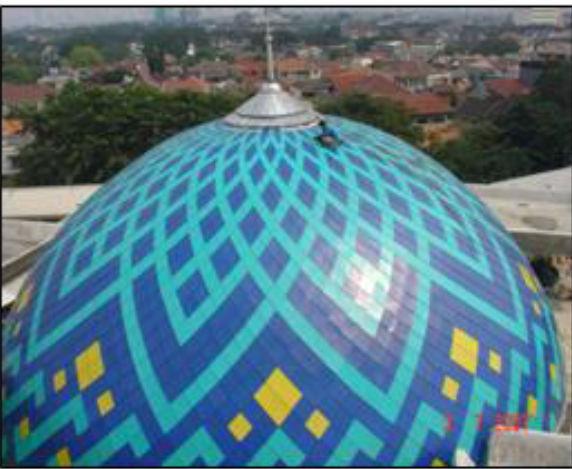
Interior

AR-BARKAH MOSQUE DOME
Bekasi, West Java, Indonesia - 2006

Exterior

Interior
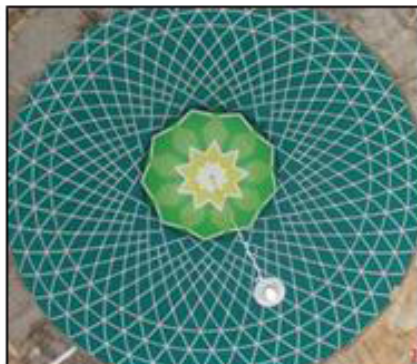

OTHER DOMES

1. Wakasihu, Ambon, Indonesia

Before   After Renovation

2. Bekasi, West Java, Indonesia
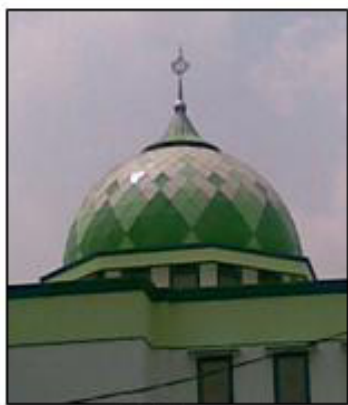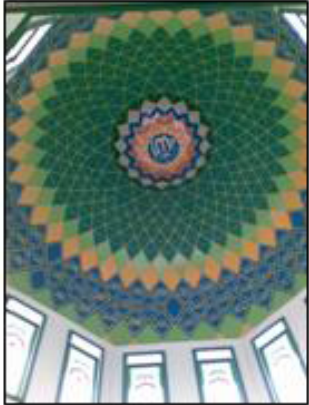

Exterior   Interior

3. Rawamangun, Center Jakarta, Indonesia

Exterior   Interior

4. Jati Asih, Bekasi, West Java, Indonesia

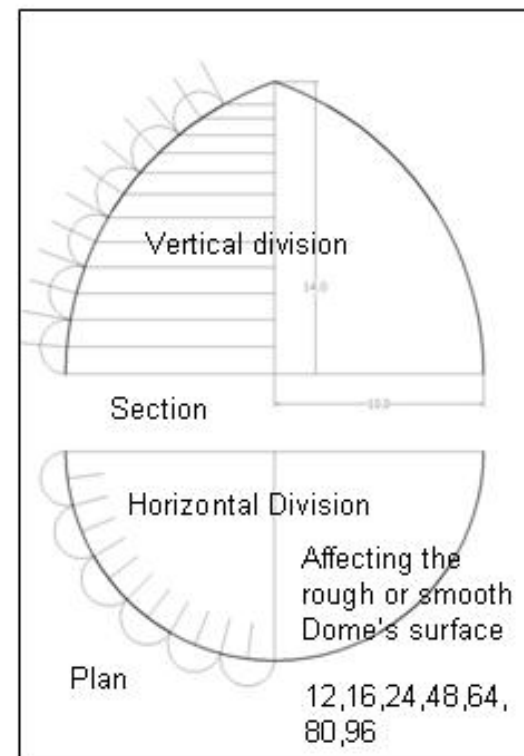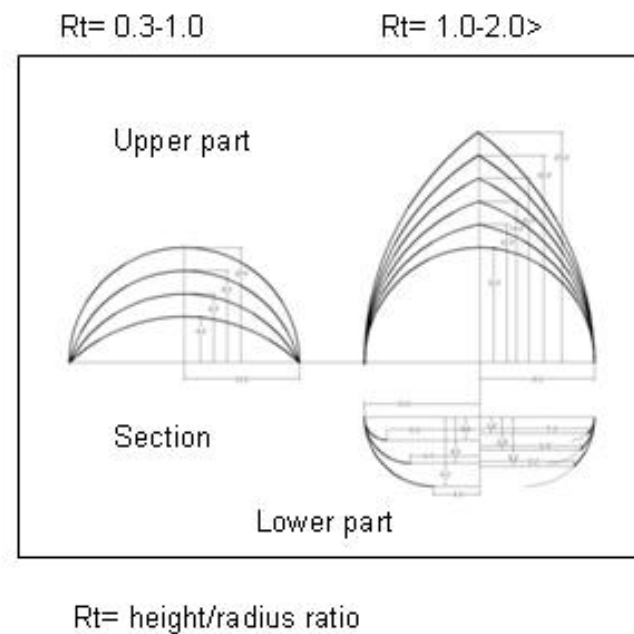5. Umang Island, Banten West Java, Indonesia

Various types of domes have been designed and installed, mainly as the basic feature for Mosque buildings in Indonesia.
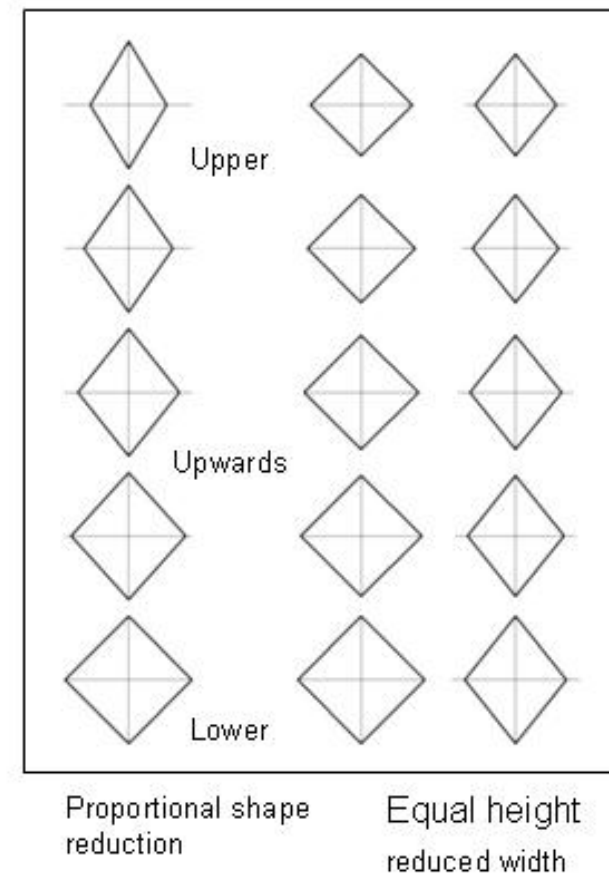
Being involved in the Ar – Rahmah Mosque at the Islamic Hospital compound, have instigated that much more has to be worked-out to achieve a better system where speed of work, effective costing, durable & reliable design-product can be obtained while at the same time still allowing the variability and creativity of its designer and owner as well.
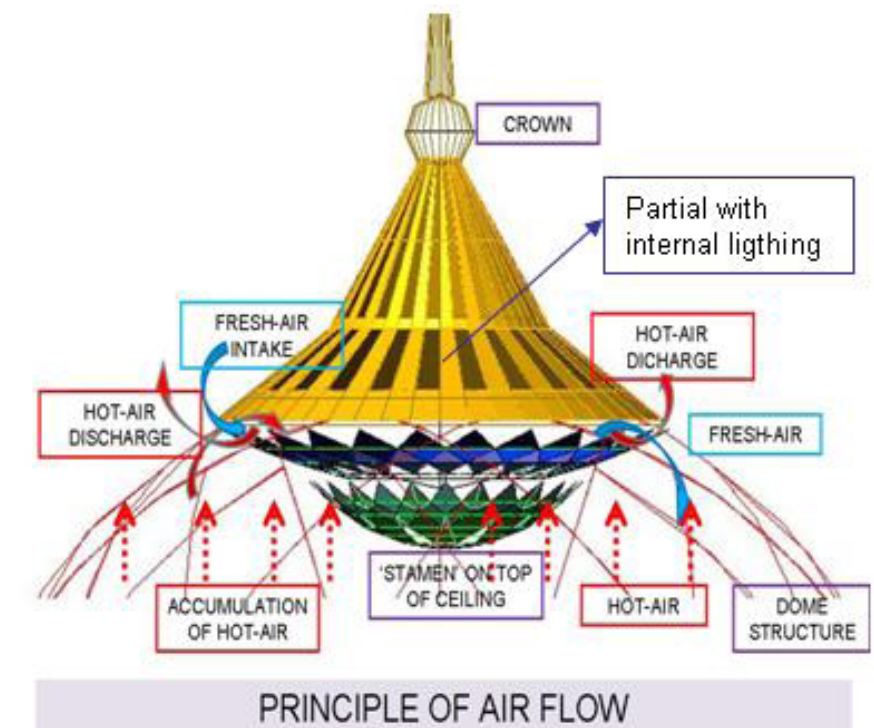
DESIGN ANALYSIS

SINGLE – ARC FORM

Rt= 0.3-1.0   Rt= 1.0-2.0>

Upper part

Section

Lower part

Rt= height/radius ratio

Vertical division

Section

Horizontal Division

Affecting the rough or smooth Dome's surface

Plan

12,16,24,48,64, 80,96

PANEL MODEL

Upper

Upwards

Lower

Proportional shape reduction

Equal height

reduced width

PRINCIPLE DETAIL

CROWN

Partial with internal ligthing

FRESH-AIR INTAKE

HOT-AIR DICHARGE

HOT-AIR DISCHARGE

FRESH-AIR

'STAMEN' ON TOP OF CEILING

ACCUMULATION OF HOT-AIR

HOT-AIR

DOME STRUCTURE

PRINCIPLE OF AIR FLOW

INDONESIA in Statistic

	Administrative Area	Qty	Population in millions		Area in km2	
A	Province	33	0.6-38.9	220.953	740-309,900	1,860,360
			range	Total	range	Total
B	Regencies	349				
C	Major towns	91				
D	Districts	5,263				
E	Major Villages	7,113				
F	Villages	62,806				

Essential notes:

+ 90% of the population are Moslem

+ Every Administrative Area have or will built at least one Mosque

+ The majority of a Mosque building is still resembled by a 'Dome'

+ 10% are under preparation or being renovated

+ A huge demand is searching for better solution

THE CHALLENGE

• To fulfill the vast demand for the medium and lower economic scale.

• Develop the right detailing and solution : water tight, leakage-free, natural ventilation, sound and echo control, heat insulation, strength, lightweight and durability in consideration.

• Innovate systems to optimize and reduce cost and enhance its appearance and reliability at the same time.

• Applicable for home industry, an array of labor force can be involved.

• Keep the never ending research and development in creating the dynamic essence in the design.

• Spread the system and attitude to enable other designer develop and enrich further

• Guidance along the historic Islamic Architecture

COST COMPARISON
of a 10 m diameter example

300.00
250.00
200.00
150.00
100.00
50.00
-

ANCIENT   PREVIOUS   PRESENT

☐ Acc
■ Dcv
☐ Str

Note

Acc : Accessories

Dcv : Dome cover
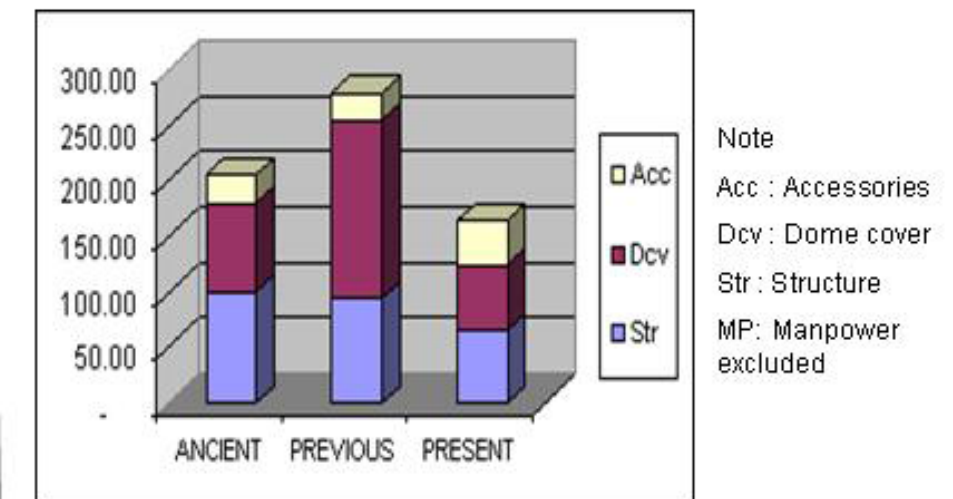
Str : Structure

MP: Manpower excluded

Chart-1

More emphasize is given to item 'Acc' hence its appearance may become brighter, richer. The structure cost-reduction using the 'web-dome' system with zinc-alumunium panel roofing plays a drastic reduction in the total cost.
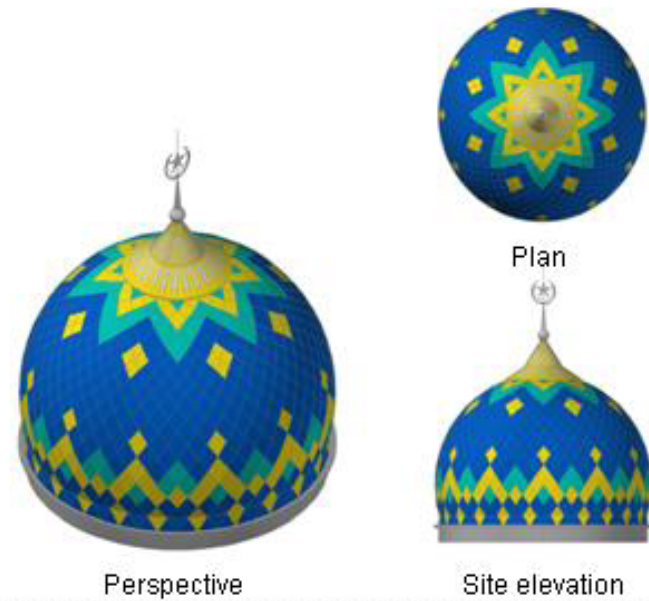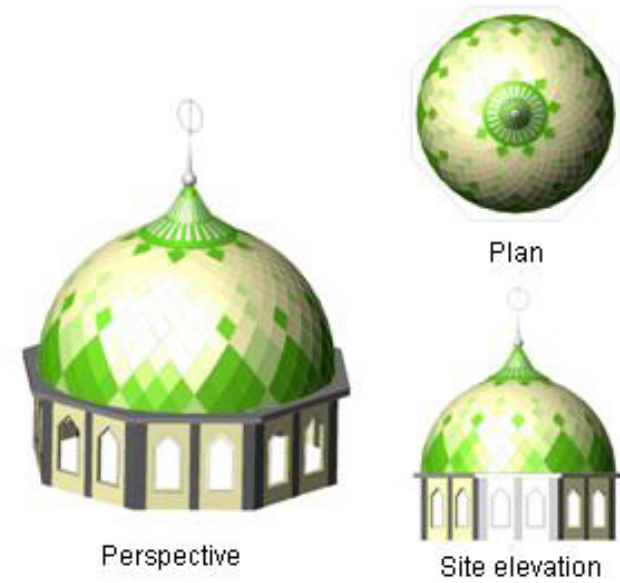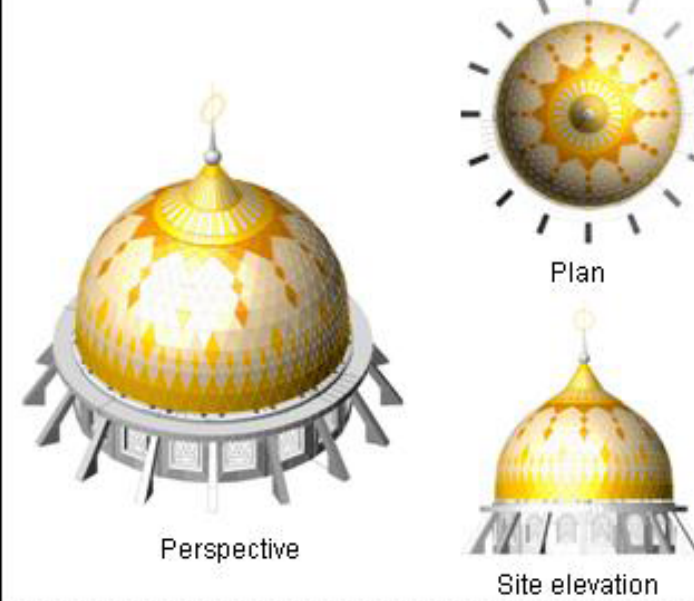
DESIGN STAGE

DOME

Ijtihadul Muslimin Mosque
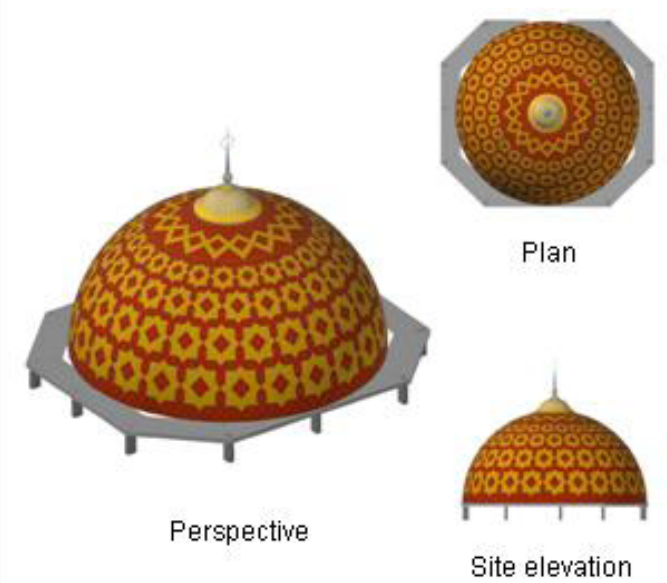Pekanbaru, Riau, Indonesia

Plan

Perspective

Site elevation

Baitul Mukminin Mosque
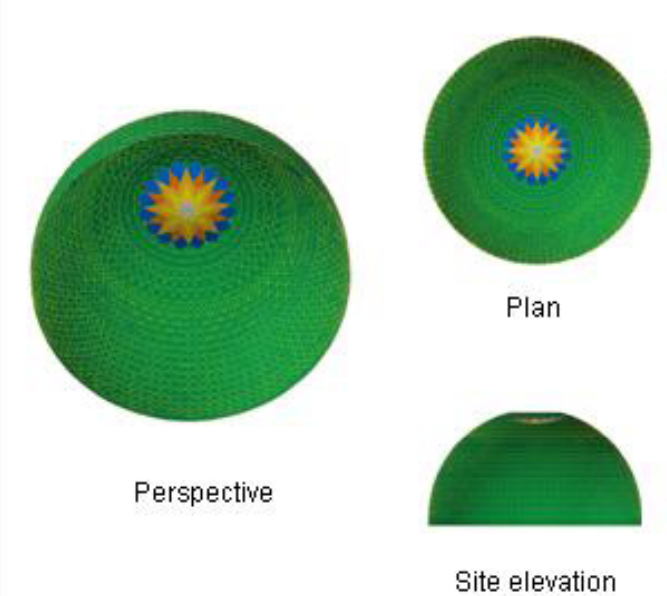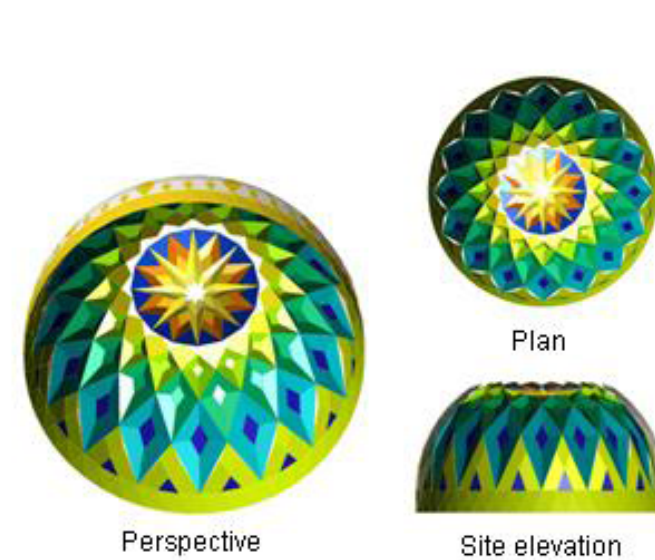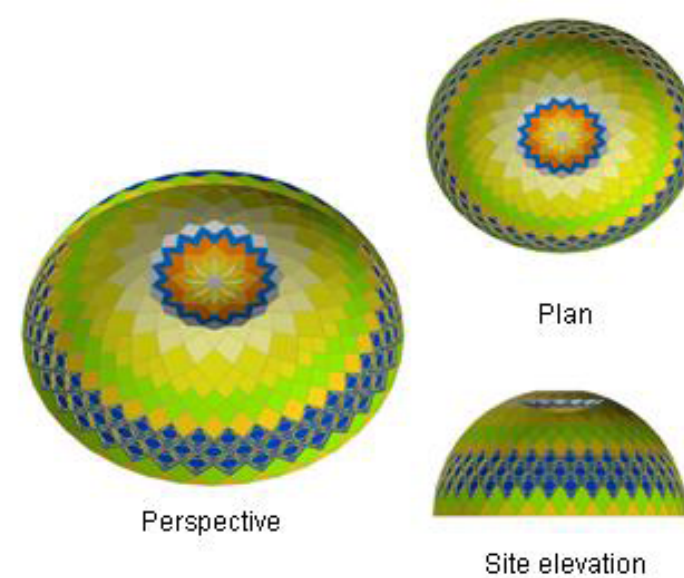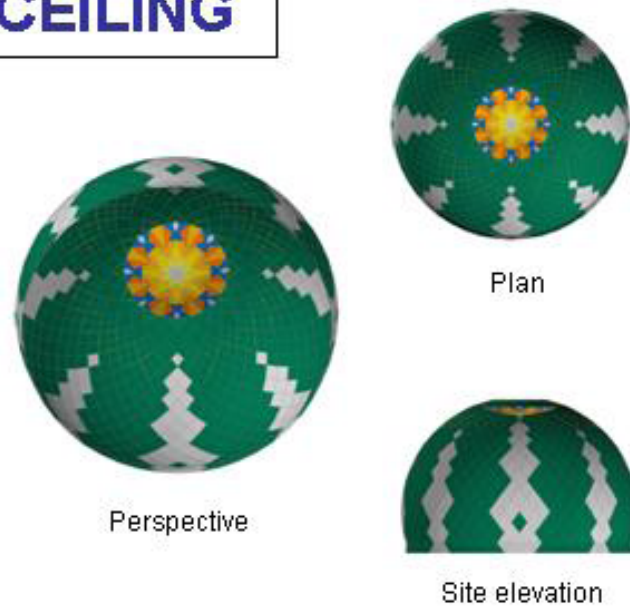Rawamangun, Center Jakarta, Indonesia

Plan

Perspective

Site elevation

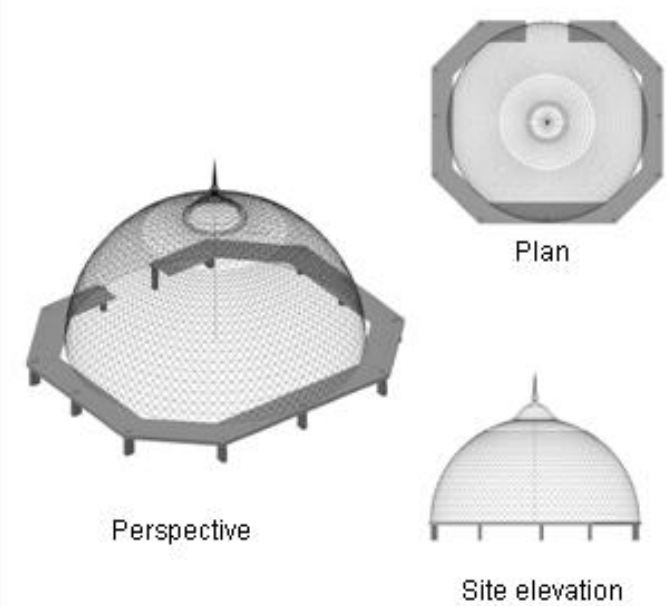**Cakmarussalam Mosque**
Wakasihu, Ambon, Indonesia

Plan

Perspective

Site elevation

Al Furqon Mosque
Bekasi, West Java, Indonesia

Plan

Perspective

Site elevation

CEILING

Plan

Perspective

Site elevation

Plan

Perspective

Site elevation

Plan

Perspective

Site elevation

Plan

Perspective

Site elevation

STRUCTURE

Plan

Perspective

Site elevation

Plan

Perspective

Site elevation
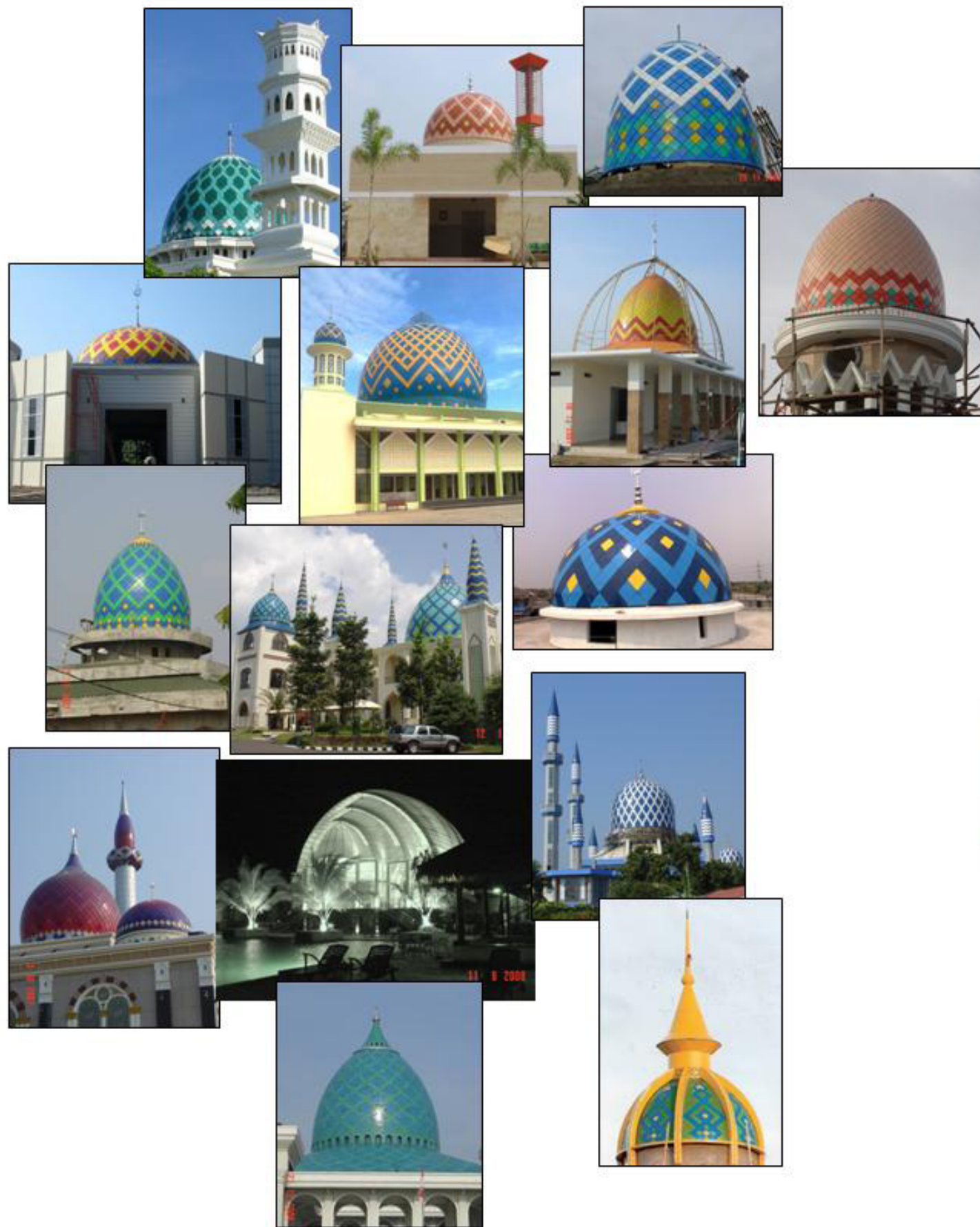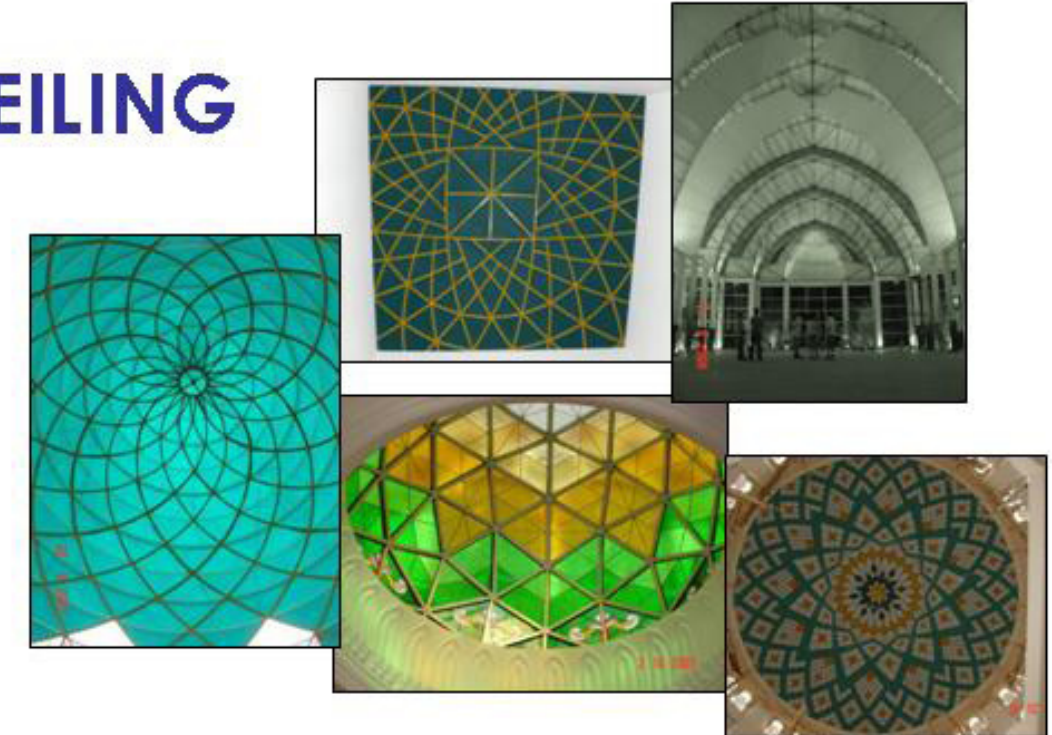
Plan

Perspective

Site elevation

Plan

Perspective

Site elevation

MOZAIC OF COMPLETED JOBS

DOME

CEILING

STRUCTURE