1 Iconography

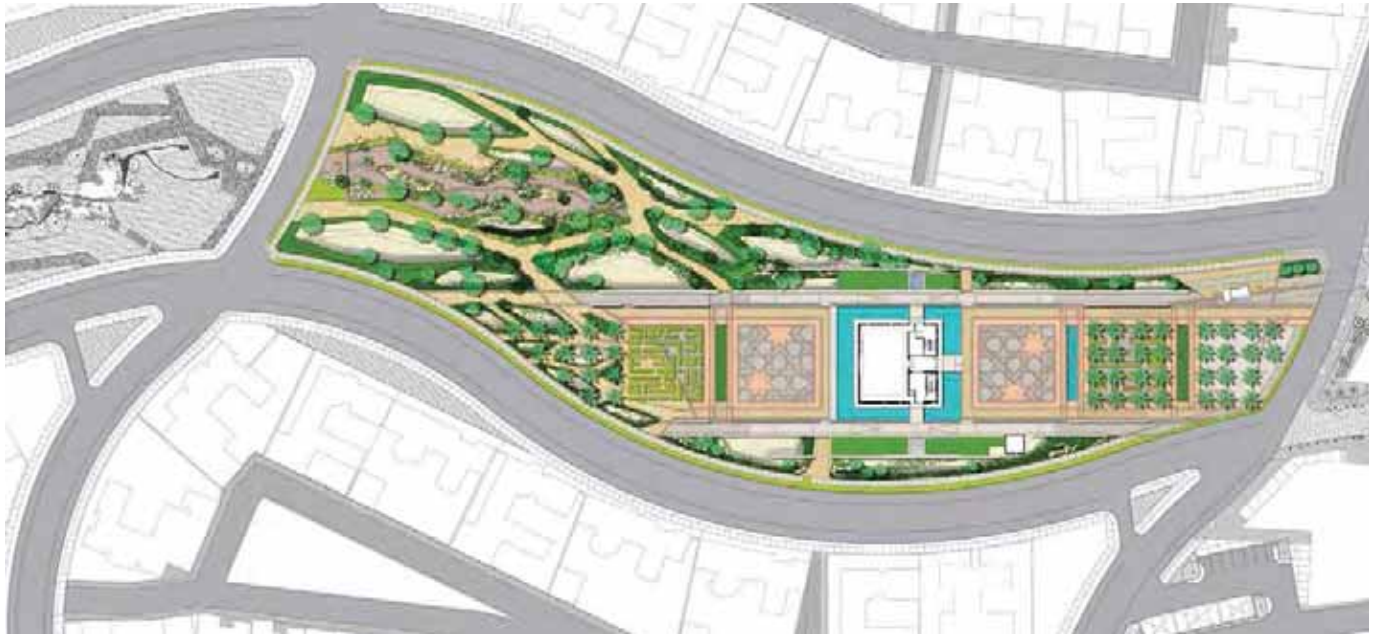
As node and center of the KAPSARC residential community, the mosque creates an iconic and contemplative space of worship, reflection and repose. A unique and contemporary space, the design is forward looking, yet firmly rooted in traditional, local and cultural precedents.

KAPSARC Mosque

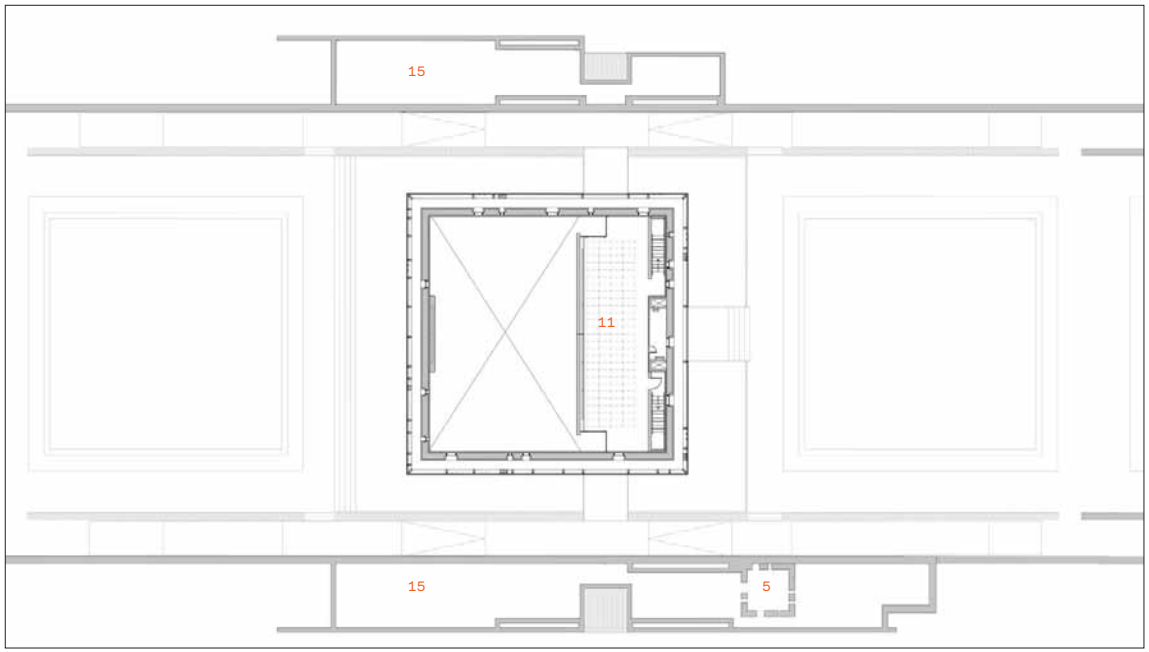
Riyadh, Saudi Arabia

◄ mosque entry forecourt

KAPSARC master plan ▲ N



mosque site plan ▲ N



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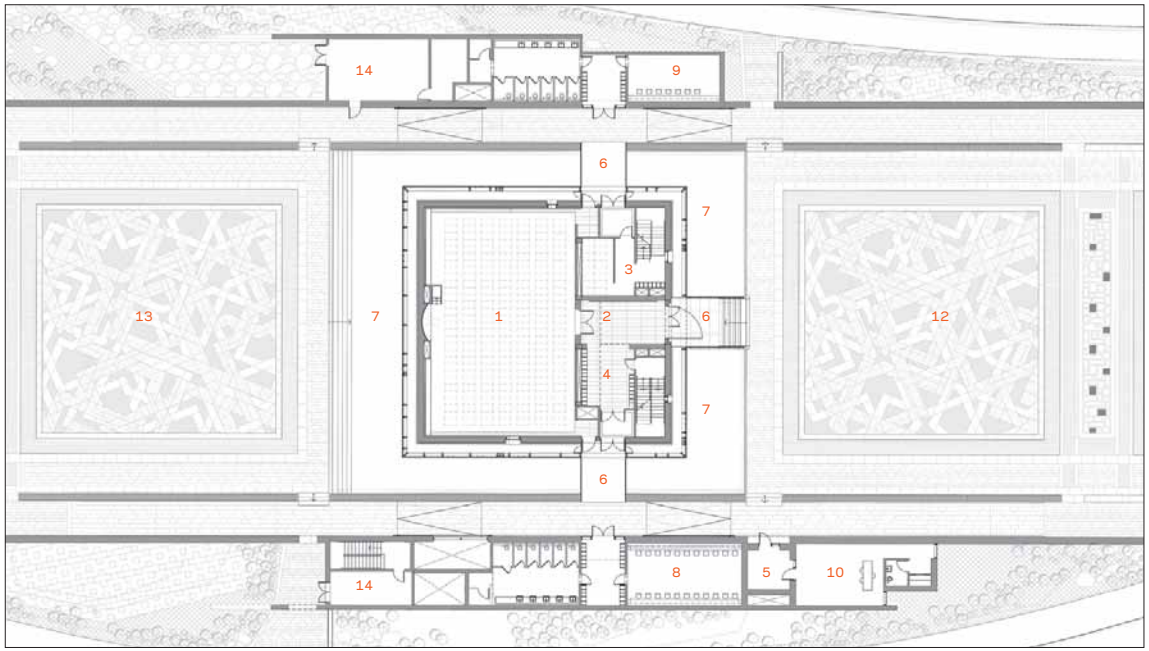
◄ mezzanine level plan



N

◄ ground level plan

1 main prayer hall
2 foyer
3 women's shoe storage
4 men's shoe storage
5 minaret
6 glass bridge
7 reflecting pool
8 men's ablution
9 women's ablution
10 imam's office
11 mezzanine prayer level
12 forecourt
13 rear court
14 support
15 roof

early concept model ▲

early concept sketch ▲

early concept rendering ▲

exterior skin rendering ▲

model photograph ▲

east elevation | front court rendering ▲

east-west section ▲

early concept | interior rendering ▲

final concept | interior rendering ▲

east entry forecourt ▲

view from community center ▲

minaret with view south to Princess Nourah University ▲

west elevation | rear court ▲

main entryway ▲

2 Materiality

The mosque's facade is a careful juxtaposition of architectural motifs and elements, namely:

- Solid versus Void
- Monolithic versus Delicacy

facade detail ▲

skin type "d" [exterior exoskeleton] ▲

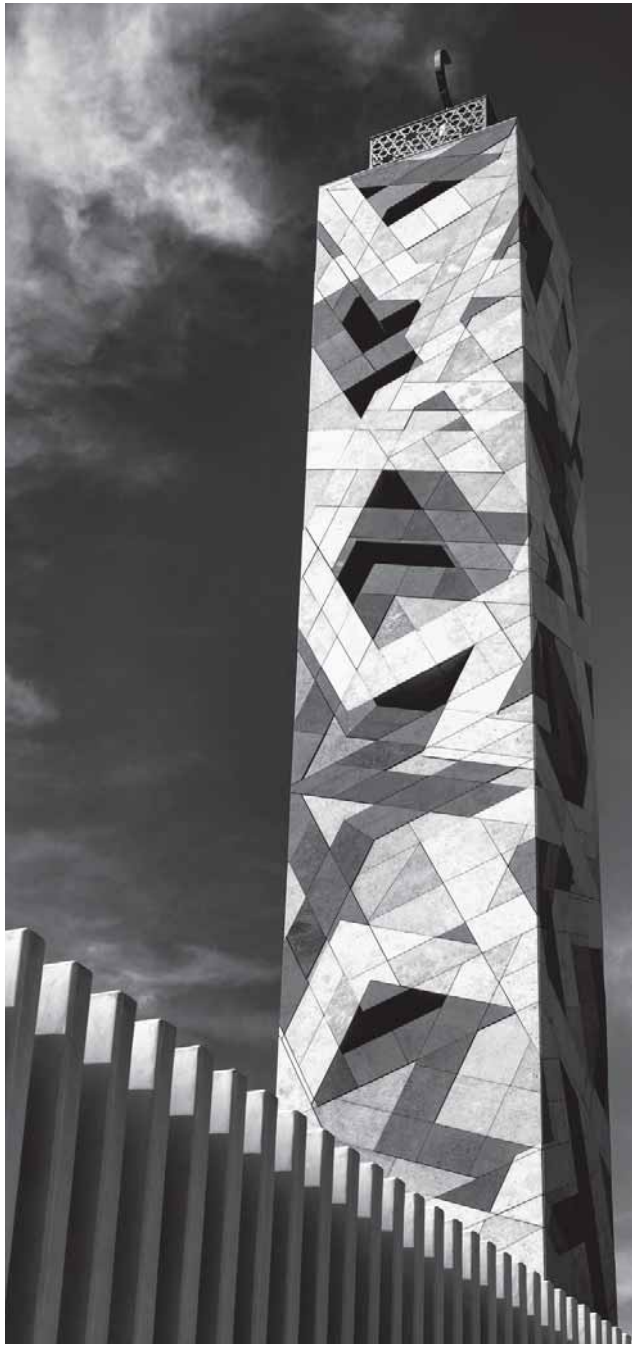
skin type "c" [structure] ▲

skin type "b" [sound attenuation] ▲

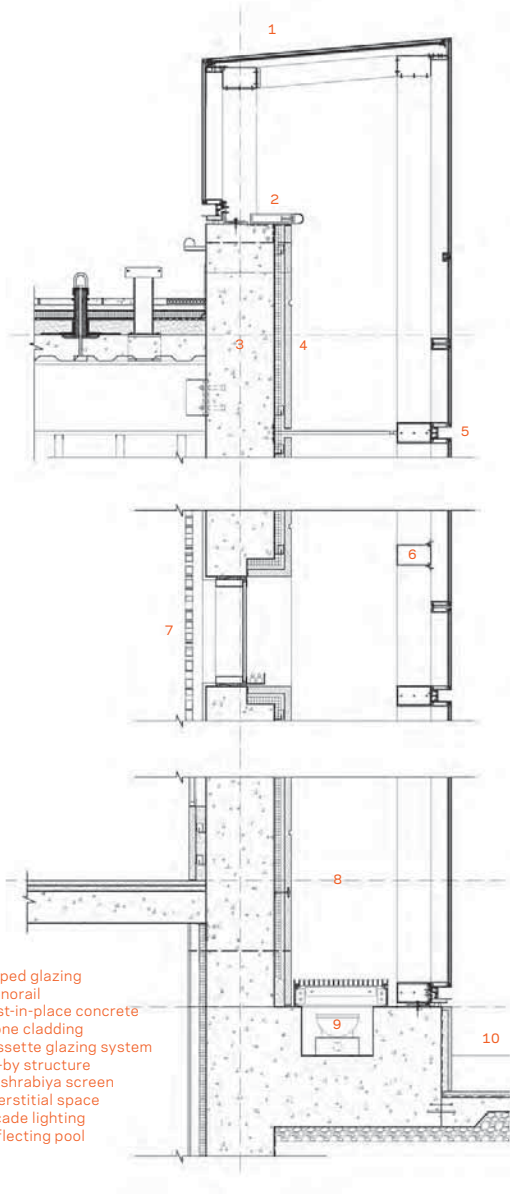
skin type "a" [interior surface] ▲

exterior views | forecourt ▲

exterior views | main entry ▲



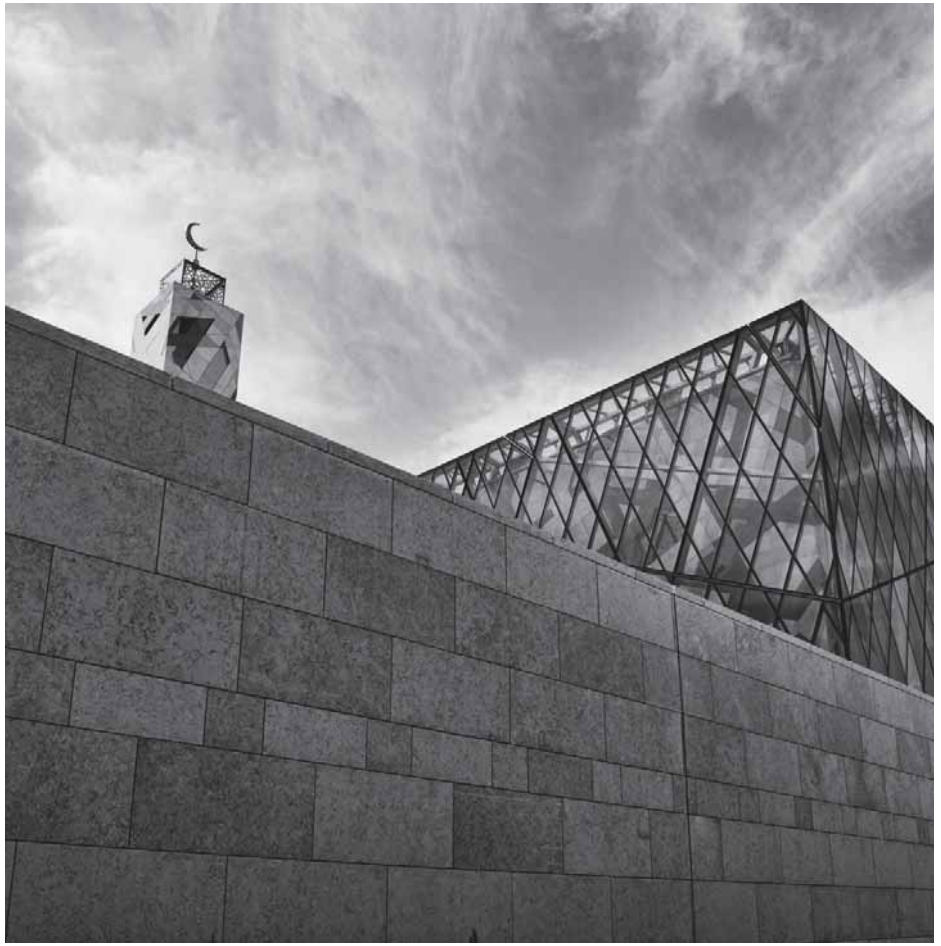
exterior views | minaret ▲



1 sloped glazing
2 monorail
3 cast-in-place concrete
4 stone cladding
5 cassette glazing system
6 fly-by structure
7 mashrabiya screen
8 interstitial space
9 facade lighting
10 reflecting pool

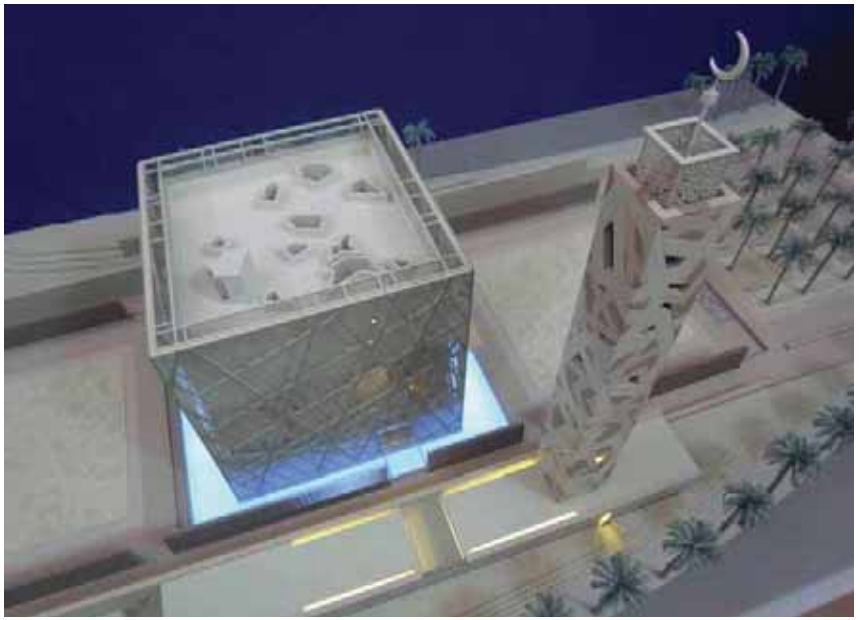
exterior | facade detail ▲

exterior | aluminum and steel cassette framing system for curtain wall ▲



exterior | forecourts protected with limestone enclosure walls ▲

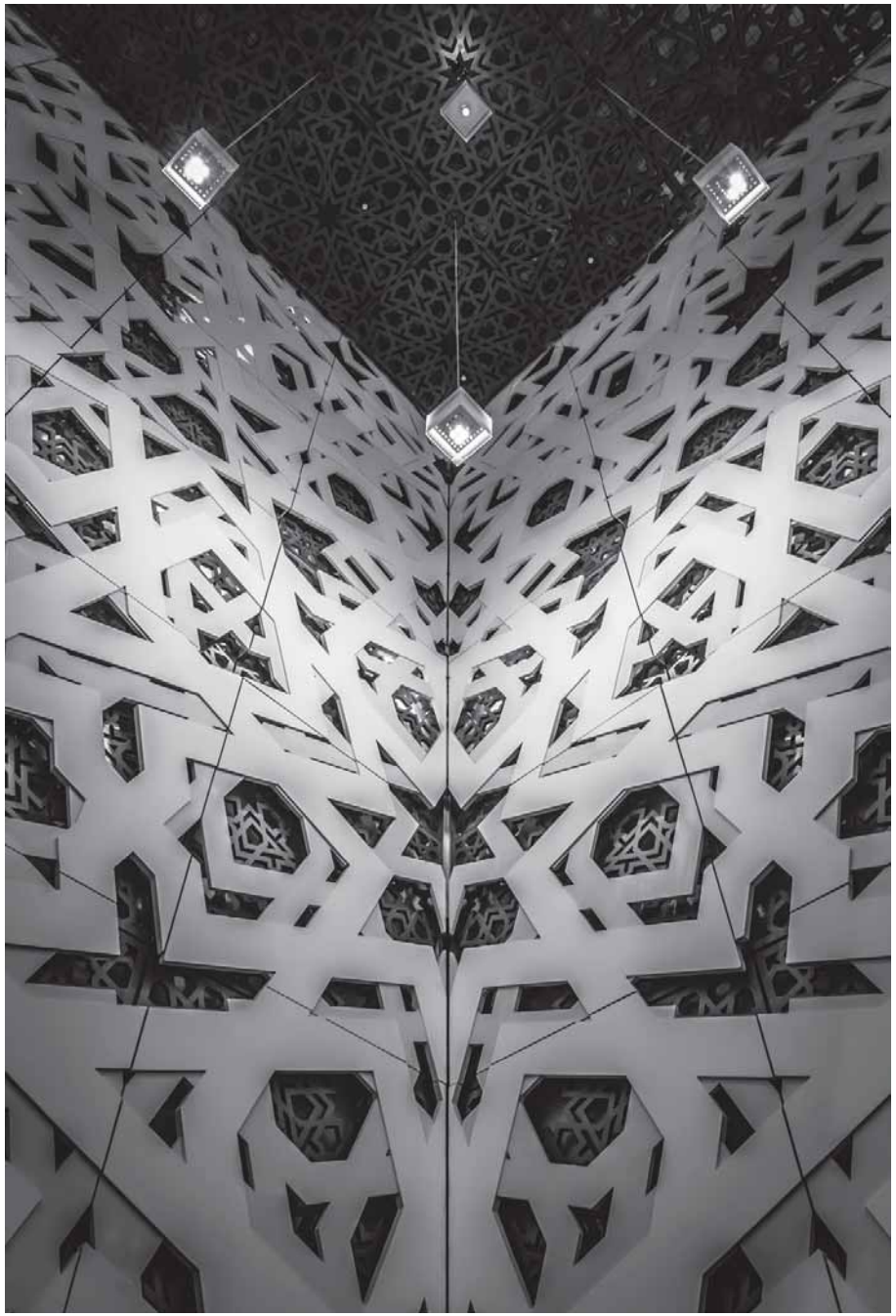
limestone site walls ▲



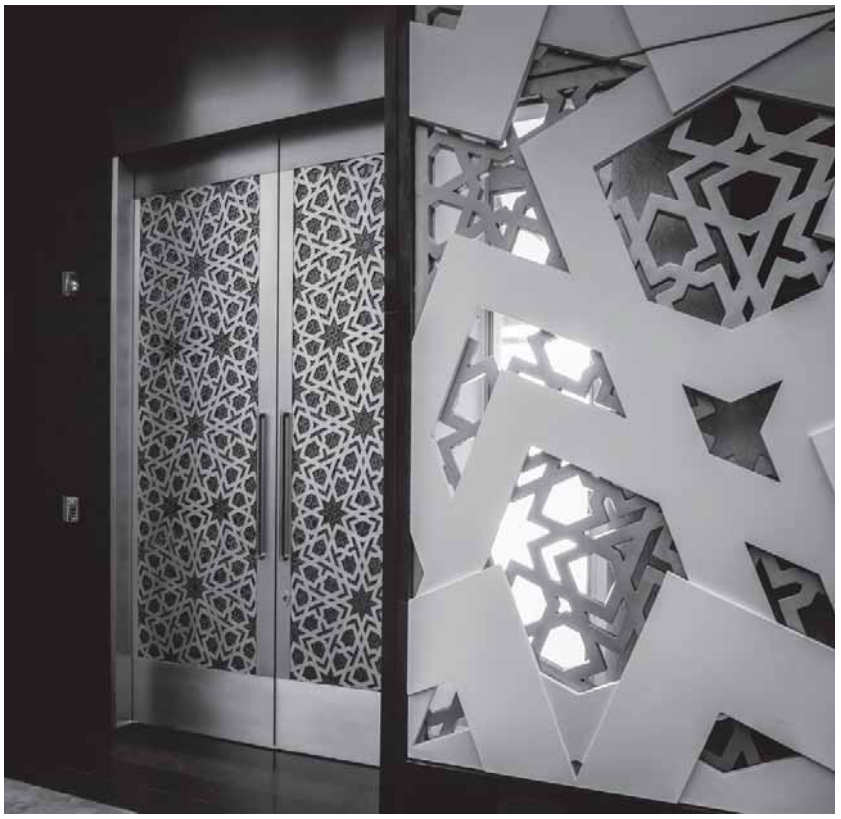
study model photograph ▲

interior | main prayer hall ▲

interior | view from mezzanine level ▲



interior | corner detail ▲



interior | mashrabiya panels of glass-reinforced gypsum ▲

interior | miyrab wall and minbar ▲

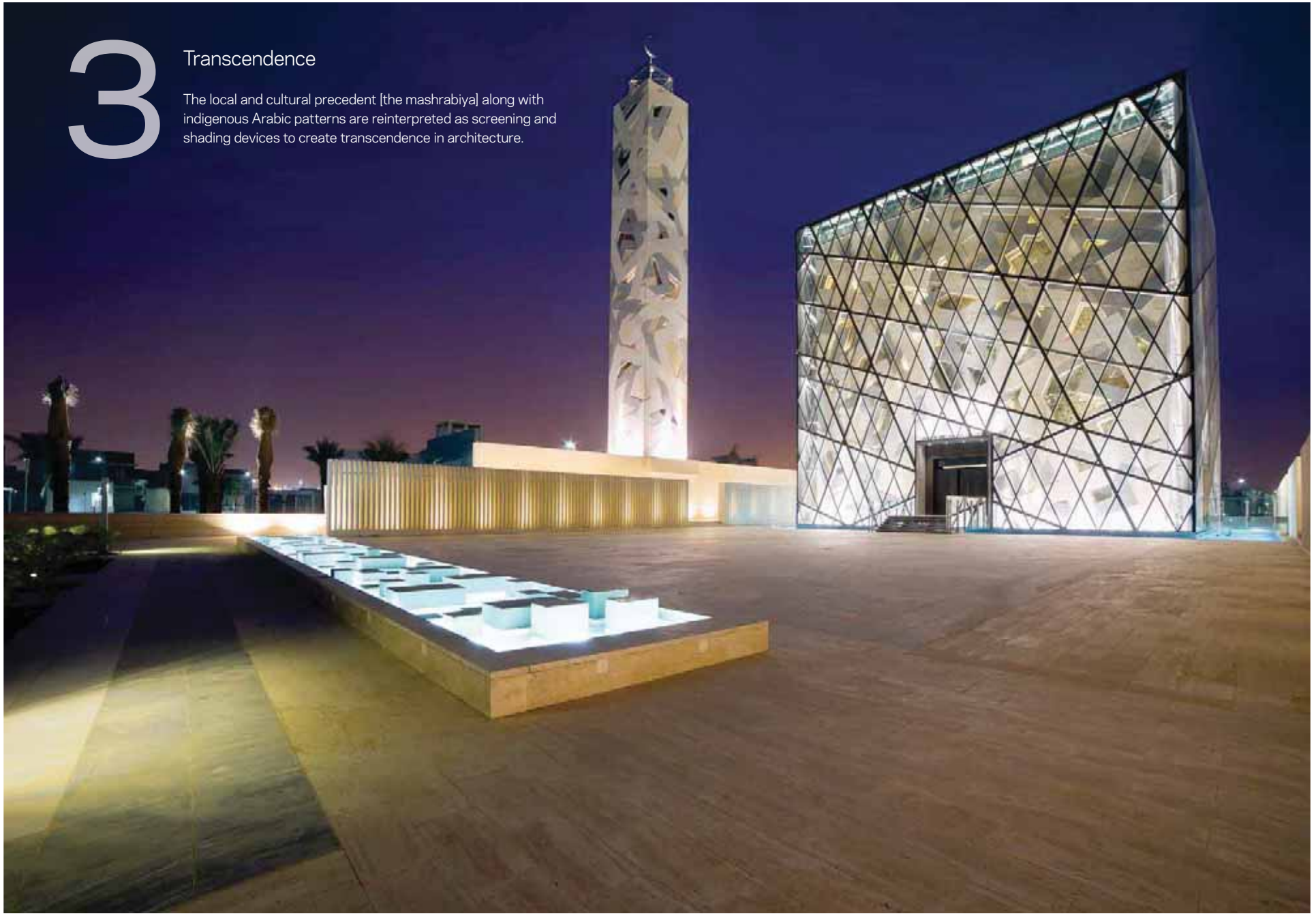
interior | entry hall ▲

interior | men's ablution area ▲

interior | bronze screen panels and mosaic tiles on mihrab wall ▲

3 Transcendence

The local and cultural precedent [the mashrabiya] along with indigenous Arabic patterns are reinterpreted as screening and shading devices to create transcendence in architecture.



forecourt at dusk ▲

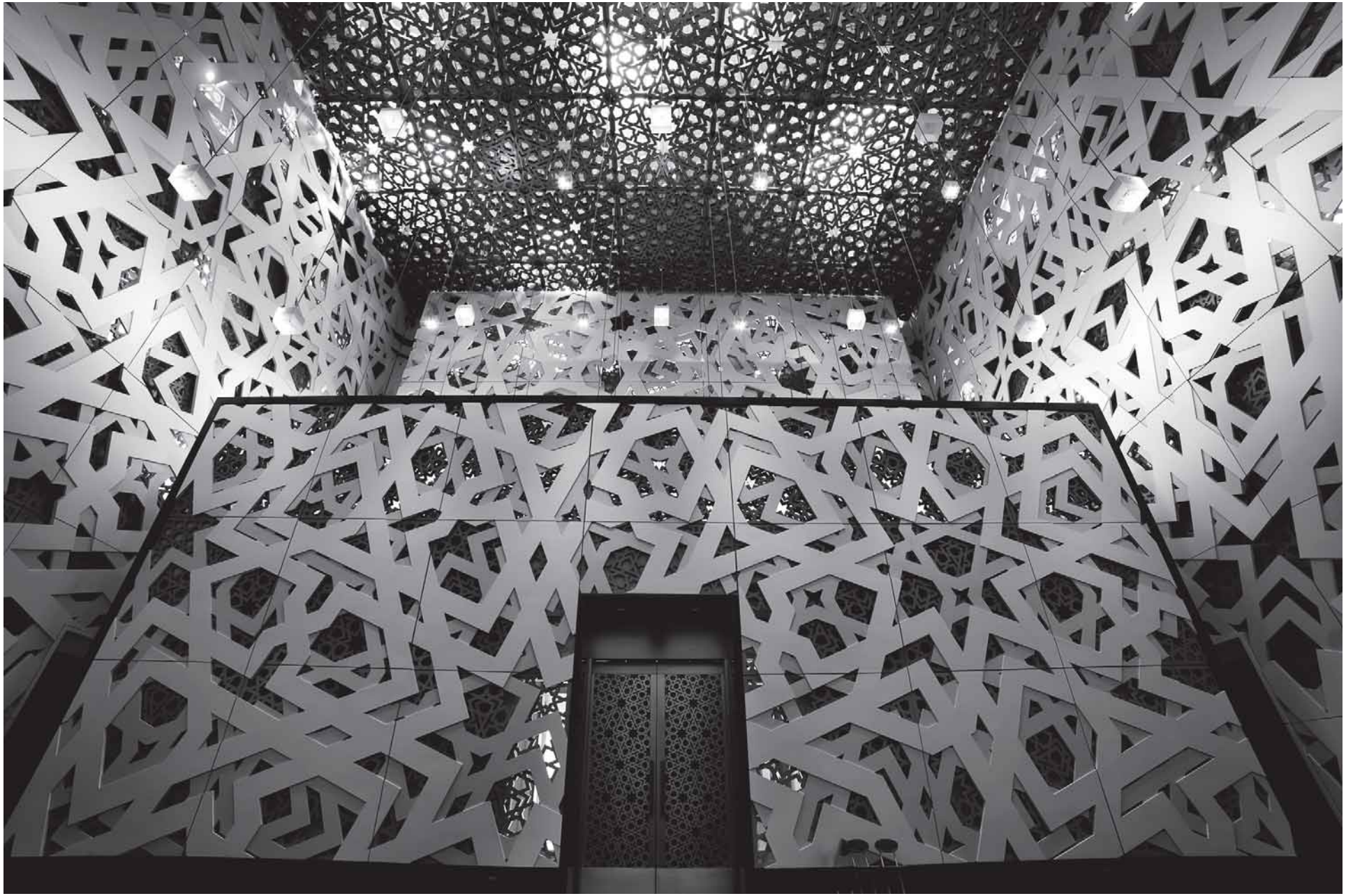
mosque community garden ▲

reflecting pool | entry ▲

evening prayer ▲

landscape and public amenities ▲

symbolically crossing from the profane to the sacred ▲



interior | main prayer hall ▲

mosque as lantern in the landscape ▲

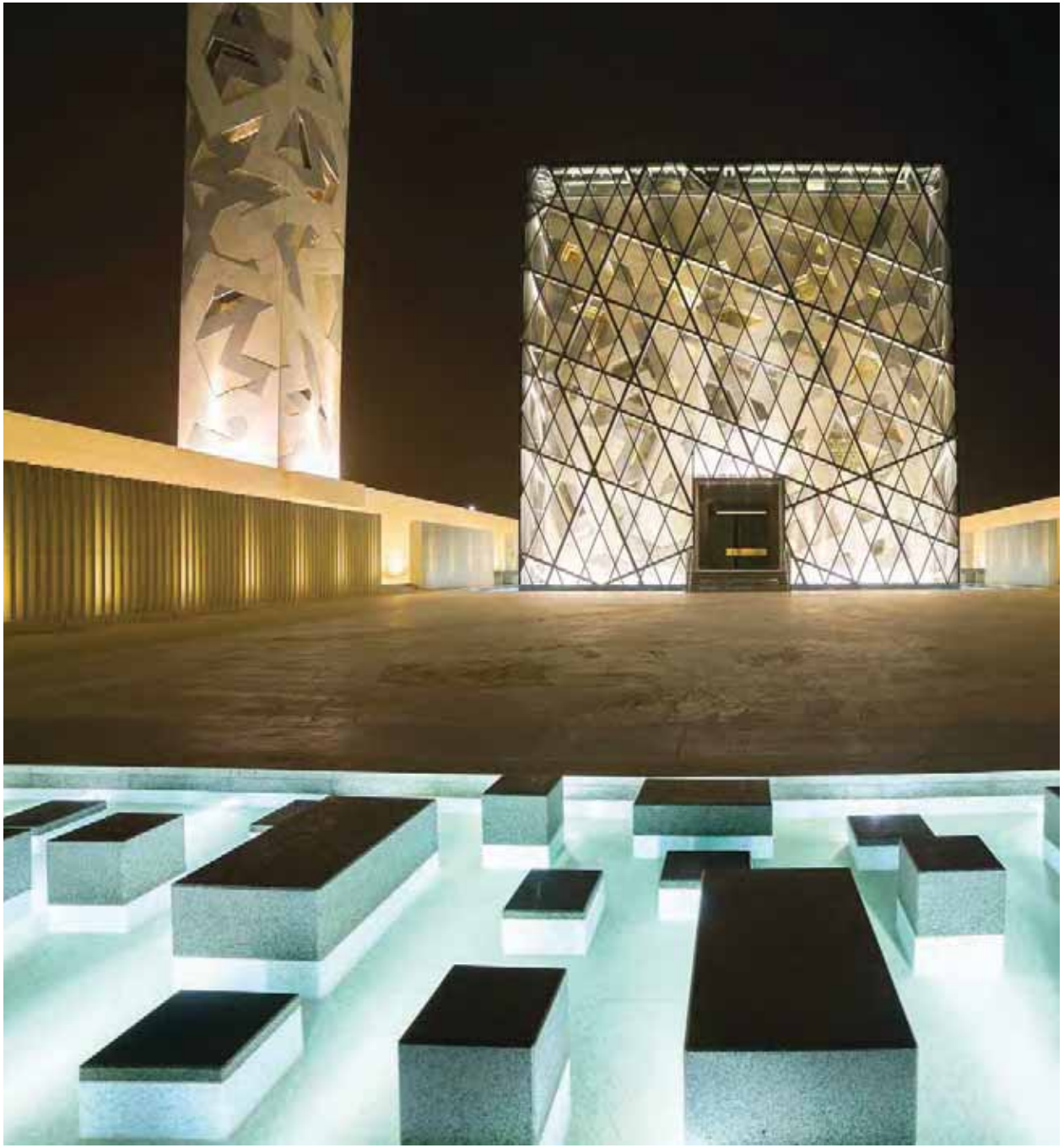
4 Sustainability

The mosque contains a series of moves to integrate sustainable design into the building. Two of these strategies are integral into the building's form.

First, the building was designed with a 5-sided mass wall of cast-in-place concrete that is 500mm thick. The mass walls provide energy efficiency through mass rather than insulation value. The mass allows them to store energy during the day and release it through the night. In the right climate, such as Saudi Arabia, they can be a better choice than walls that are lightly framed and heavily insulated. These walls have minimal openings; they are punctuated with small openings to bring patterns of natural light into the mosque but allow little heat gain.

Second, the building was designed with an interstitial space between the mass wall and the curtain wall. This space is used to reject heat from the mechanical units, located in the basement. The units exhaust air into the bottom of this space, which is vented at the back of the upper parapet, thereby creating a ventilated double skin for the project.

mosque in the landscape ▲



WATER

Water is an extremely precious resource in Saudi Arabia. KAPSARC is designed to retain water in the natural cycle. Water is drawn from wells on site and treated to potable standards, moving through the community via high performance flush and flow fixtures.

42%

Percent reduction of regulated potable water

Wastewater is treated in the Sewage Treatment Plant shared with the adjacent university. In Phase 2 wastewater will be treated at KAPSARC campus in a constructed wetland. 100% of wastewater from the KAPSARC campus is treated to tertiary standards and returned for non-potable uses, such as irrigation, cleaning and makeup.

100%

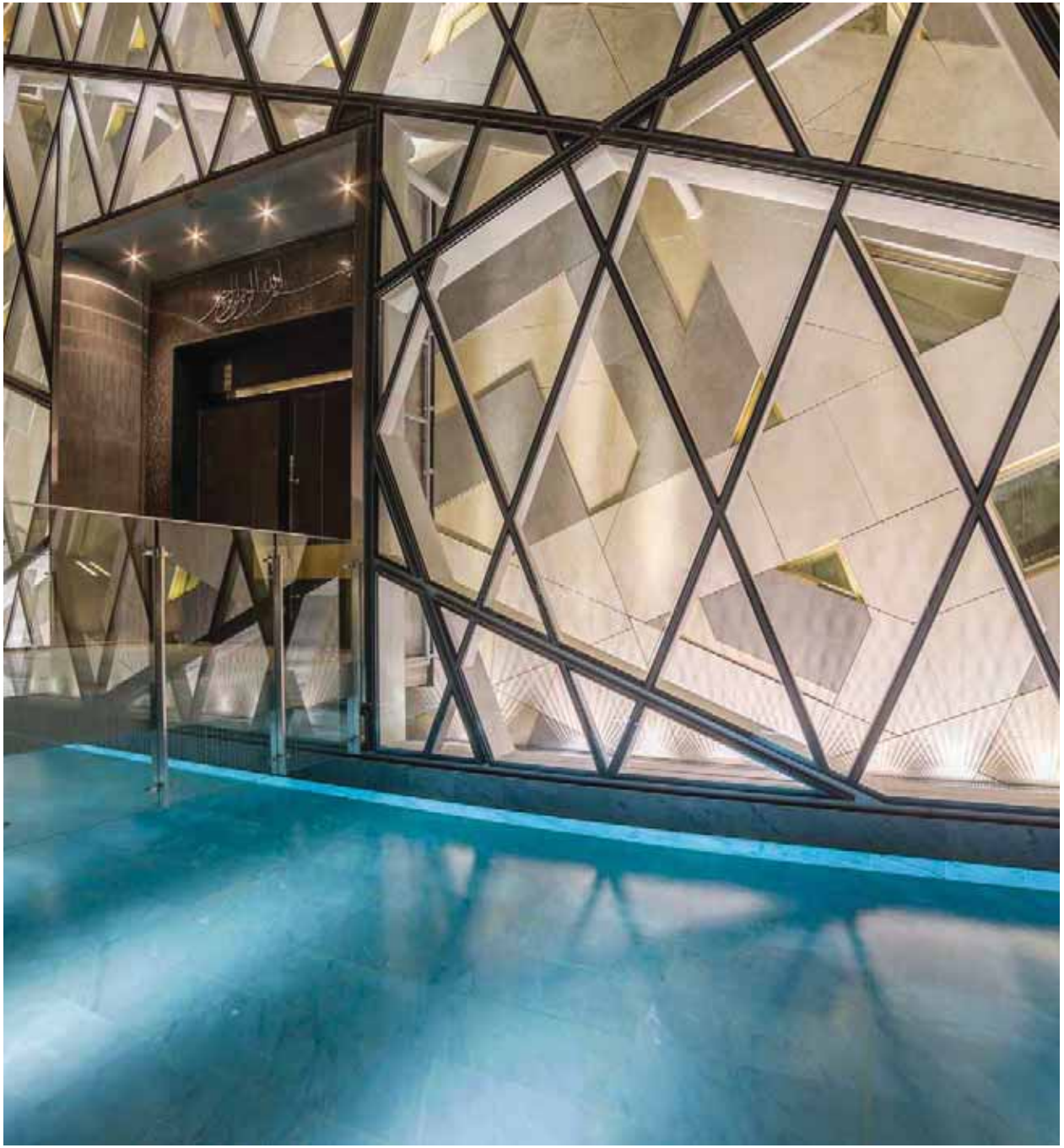
Waste water reused on site

ENERGY

Solar energy is abundant in Saudi Arabia. But before relying on renewable energy, it's critical to reduce demand. The mosque is designed to be asenergy efficient as possible, employing high performance thermal envelopes, mechanical systems, lighting and equipment. Daylight and heat gain control are an integral part of the building architecture, filtering solar radiation as well as providing privacy with louvers and the more traditional mashrabiya.

Strategies such as sensors and controls, energy recovery ventilation and natural daylighting augment efficient envelopes and systems. Energy performance was also emphasized in the construction process. Extensive commissioning for the mosque ensures performance of envelope and energy systems. Solar energy is harvested through rooftop solar thermal hot water panels and a 5 MW solar farm at the west end of the campus. The solar farm is built with room for expansion as the KAPSARC community grows, positioned to be Net Zero Energy at full build out. Current solar energy meets 35% of demand, demonstrating Saudi Arabia's movement from fossil fuels towards its alternative energy economy.

55%
Regional Energy Reduction



MATERIALS

Construction materials for KAPSARC were selected for their local availability, constructability and reduced waste. The mosque is structured with concrete frame and concrete wall infill, readily available using local aggregate, sand and fly ash. The concrete construction –coupled with rigid foam insulation – provides a high performance thermal envelope, reducing external energy loads.

Finish materials were sourced locally wherever possible (21.5% by cost). Materials were selected for durability, recycled content, regional sourcing, indoor air quality impacts, performance, and beauty. Building envelopes were commissioned to eliminate opportunities for infiltration and exfiltration, thermal bridging and moisture control issues.

21%

of finish materials were locally sourced

Building materials were selected to be low- and no-emitting, including paints, coatings, adhesives, sealants, flooring, composite wood, ceiling and wall materials. Indoor air quality was maintained during construction through vigilant housekeeping, construction best practices and advanced filtration. IAQ testing prior to occupancy confirmed low levels of VOC emissions, CO2, formaldehyde and particulates.