

# Kuala Lumpur, Malaysia

## NATIONAL MOSQUE

BUILT IN THE 1960'S TO CELEBRATE THE INDEPENDENCE OF MALAYSIA, THE MOSQUE WAS RENOVATED, AND ITS ROOFS WERE WATERPROOFED

Known as Masjid Negara (Masjid is an Arabic word for “mosque”, while Negara means “national”), the national mosque of Malaysia has been classified as a Class 1 Heritage Building by the city’s authorities and is a well-known national monument around the whole of Malaysia. In August, 1957 Malaysia won its independence from Great Britain and the Prime Minister of the time, Tunku Abdul Rahman, proposed building a national mosque to celebrate the event. The new government had the idea of creating new symbols that would unite the country and, apart from developing various sec-

tors of industry and the economy, it also considered the promotion of architecture to be of strategic importance.

### THE STAR-SHAPED ROOF

Inaugurated in 1965 after two years of building work, Masjid Negara was designed by the English architect Howard Ashley and the Malaysian architects Hisham Albakri and Baharuddin Kassim, who proposed a building in a contemporary style that would be different from the mosques built in the Moorish-Mughal style typical of the Islamic buildings constructed during the era of British rule.



A view of the National Mosque in Kuala Lumpur.

The roof of the mosque has the form of a 16-point star; 11 of the points represent the states of Malaysia (at the time Borneo was not yet part of the federation), while the other 5 represent the Pillars of Islam. The roof covering the entire complex, on the other hand, is characterised by rows of small cupolas and pyramids, which were originally covered with pink mosaic tiles and then replaced with blue mosaic tiles when the mosque was renovated in 1987.

The blue windows were made in Italy and, just outside the main hall, stands the minaret of the mosque (73 m high). Behind the central body of the mosque, which can hold up to 15,000 worshippers and is characterised by a roof in the form of a 7-point star, there is the Makam Pahlawan (the Heroes' Mausoleum) which houses the tombs of the Malaysian Prime Ministers.

#### MAPEI SYSTEMS AT WORK

In 2015, to mark the golden jubilee of the mosque, the government gave the go-ahead for a series of interventions that had become necessary over the years to repair and waterproof the roof of the religious complex.

The intervention included replacing and repositioning the mosaic tile covering for the cupolas and pyramids.

The Public Works Department commissioned with the task of choosing which products to use decided to present the

tender specifications to several companies and to invite them to carry out a survey of the site.

Mapei recommended using PURTOP 1000 two-component, solvent-free pure polyurea membrane and KERAPOXY improved, slip resistant, reaction resin adhesive and the proposal received the approval of the client.

#### THE SOLUTIONS PROPOSED

The long rows of cupolas and pyramids on the roof of the religious complex had been covered with two layers of ceramic tiles as a result of the work carried out previously. To carry out the waterproofing work, Mapei Technical Services recommended removing the top layer of tiles by hydro-blasting. Once the substrate had been prepared, it was treated with a coat of PRIMER SN two-component, fillerized

epoxy primer mixed with ADDITIX PE, a powder used to increase the viscosity and thixotropy of epoxy-based and polyurethane-based resin products.

Then, while the primer was still wet, the surface was broadcast with QUARTZ 30/60, which is distributed in Malaysia by Mapei Malaysia Sdn Bhd.

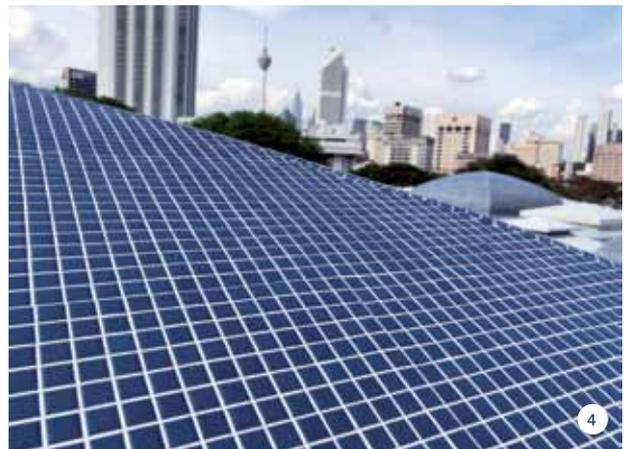
After removing all the dust from the surface, a 2 mm thick layer of PURTOP 1000 two-component, solvent-free pure polyurea membrane was applied by spray with a high-pressure, bi-mixer type pump. PURTOP 1000 membranes

#### IN THE SPOTLIGHT

##### PURTOP 1000

Two-component, solvent-free pure polyurea membrane applied by spray with a high-pressure, bi-mixer type pump, to form waterproof coatings for hydraulic works, roofs and bridge decks directly on site. PURTOP 1000 is suitable for waterproofing membranes on storage tanks, basins and hydraulic works in general as well as for the type of structure that requires a high-performance waterproofing membrane.





**PHOTO 1.** The frames embedded between the pyramids and the cupolas were first cleaned by hydroblasting. **PHOTO 2.** The substrates of the cupolas were waterproofed with PURTOP 1000. **PHOTO 3.** To provide further protection, the frames were treated with MAPECOAT PU 15 finish. **PHOTO 4.** The mosaic tiles were bonded to the cupolas with KERAPOXY and joints were grouted with KERACOLOR FF + FUGOLASTIC

are characterised by their high chemical resistance to alkalis and diluted acids, exceptional flexibility and tear strength, and make the surfaces immediately waterproof after application.

KERAPOXY improved, slip resistant, reaction resin adhesive was chosen to install the mosaic tiles (blue tiles for the cupolas and grey tiles for the pyramids which, from above, form a coloured chess-board effect), while for the joints the preference was for KERACOLOR FF polymer-modified, water-repellent, cement-based grout mixed with

FUGOLASTIC polymer admixture to improve its resistance to abrasion and reduce its porosity and water absorption rate.

On the roof there are also frames embedded between the pyramids and cupolas that needed to be waterproofed because they were causing damp on the ceiling below. In this case, too, work commenced by using hydro-blasting equipment to remove the old waterproofing treatment and any deteriorated areas of the roof. The deteriorated areas were then reintegrated with PLANITOP G40

SP polymer-modified mortar (which is distributed in Malaysia by Mapei Malaysia Sdn Bhd). The next step was to apply a coat of PRIMER SN with a roller and to broadcast the surface of the primer while still wet with QUARTZ 30/60 (distributed in Malaysia by Mapei Malaysia Sdn Bhd), followed by the application of a 2 mm thick coat of PURTOP 1000 by spray. Work was completed by applying a coat of MAPECOAT PU 15 two-component, aliphatic, solvent-based polyurethane finish, which resistant to wear and ultraviolet rays.

**TECHNICAL DATA**

**National Mosque,** Kuala Lumpur (Malaysia)

**Design:** Howard Ashley, Hisham Albakri, Baharuddin Kassim

**Period of construction:** 1963-1965

**Period of the intervention:** 2016-2018

**Intervention by Mapei:**

supplying products for waterproofing and protecting the roofs, installing mosaic tiles and grouting joints on the domes

**Design:** M. Azahari Architect

**Client:** Wilayah Persekutuan Islamic Religious Council

**Installation company:** Structural Repairs (M) Sdn Bhd

**Mapei coordinator:** Dino

Vasquez (Mapei SpA, Italy), Hanson Foong, Lim Kean Meng, Simon Yap (Mapei Malaysia Sdn Bhd, Malaysia)

**MAPEI PRODUCTS**

Preparing substrates: Additix PE, Primer SN, Quartz 30/60\*, Planitop G40 SP\*

Waterproofing: Purtop 1000

Installing mosaics and grouting

joints: Kerapoxy, Fugolastic, Keracolor FF  
Coatings: Mapecoat PU 15

\*These products are distributed in Malaysia by Mapei Malaysia Sdn Bhd

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