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MAPEI®

Concrete and Masonry

- Repair & Protection
- Structural Strengthening
- Heritage Building Conservation

Reference Projects

Concrete and Masonry: Repair & Protection



Parliament Building, Kuala Lumpur

In 2013, refurbishment works were carried out to fix problems with water leakage.

Repairs to the perimeter concrete gutters on each floor of the main building and the tower to ensure rainwater is efficiently channelled to the ground drains.

Works procedures with Mapei materials:

- Bonding slurry with **PLANICRETE SP** additive
- Patch repairs and leveling with **PLANITOP G40 SP**
- Curing with **MAPECURE SP**



Application of PLANITOP G40 SP

Concrete gutter after repairs



Sekolah Menengah Sains Miri, Sarawak

In 2012, contract works were awarded for repair & protection of the school's RC structures which had deteriorated mainly due to chloride attack.

Works procedures with Mapei materials:

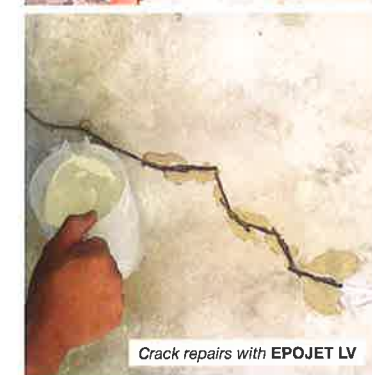
- Crack repairs with **EPOJET LV**
- Crack sealing with **ADESILEX PG2 SP**
- Rebar protection with **MAPEFER 1K**
- 'Letter box' placing of **MAPEFILL MC 06** to replace deteriorated concrete
- Soffit repairs with **MAPEGROUT THIXOTROPIC**
- Anti-carbonation protection with **MALECH + ELASTOCOLOR PAINT**



Spalled concrete at column



Rebar protection with MAPEFER 1K



Crack repairs with EPOJET LV



Spray application of MAPEGROUT THIXOTROPIC



General Hospital, Kuala Lumpur

The Kuala Lumpur General Hospital is the largest health-care facility under the Ministry of Health and is considered one of the largest in Asia.

With the objective of becoming a world class, user-friendly hospital to benefit the thousands of patients who visit daily, various upgrading initiatives were carried out. The scope of works included concrete repairs, structural upgrading and waterproofing.

Rehabilitation works completed in 2015 with MAPEI products and systems:

- Patch repairs with **PLANITOP G40 SP**
- 'Form-and-pump' placing of **MAPEFILL 318** to replace deteriorated concrete

- Strengthening of floor joists with **CARBOPLATE system**
- Re-waterproofing RC flat roof with **MAPEPLAN TM**



Dermatology Department roof slab re-waterproofing with Mapeplan TM



Urology Department structural strengthening of floor joists with Carboplates



St Mary's Cathedral, Kuala Lumpur

Heritage building repairs under JWN supervision

The foundation stone for "the first brick church erected in the native States of Malay Peninsula" was laid in Feb, 1894 and St Mary's Cathedral was consecrated a year later in Feb, 1895.

In 2015, further repair works were carried out on exterior masonry wall damaged by rising dampness.

Consultations with JWN and the contractor based on preservation and conservation principles led to approval and implementation of the following repair methods and materials:

- Removal of the existing wall render (plastering layer)
- Drill and install hoses, apply **MAPESTOP** by gravity method, a chemical barrier against capillary rising damp
- Application of **MAPE-ANTIQUE RINZAFFO**, a salt-resistant, scratch coat mortar



Application of MAPESTOP



Application of MAPE-ANTIQUE RINZAFFO

- Application of **MAPE-ANTIQUE MC**, a cement-free, dehumidifying render
- Application of **MAPE-ANTIQUE FC CIVILE**, a cement-free, fine skim coat
- Application of a coat of **SILEXCOLOR PRIMER** and two coats of **SILEXCOLOR PAINT**, a silicate paint for interior and exterior use

Protection, Structural Strengthening, Heritage Building Conservation - Reference Projects



Batu Kawa Bridge, Kuching

Built in the 1990s, and being one of only two road links between Kuching and the western areas of Sarawak, the bridge had been heavily used.

In 2013, repair & strengthening works were carried out to restore its structural integrity and reinforce the main structural sections, making it safe for increased traffic loads.

Completed in 2013 with MAPEI repair & protection and structural strengthening systems comprising:

- a) Injection crack repairs with **EPOJET LV**



Application of Carboplate

- b) Crack sealing with **ADESILEX PG2 TG**
- c) Strengthening of RC slab with **CARBOPLATE System**
- d) Anti-carbonation protection with **COLORITE PRIMER 800 S + COLORITE 880 W**

Police Quarters at Cheras, Bagan Luar & Sungei Way

Works to rehabilitate and upgrade police quarters throughout the country were awarded in 2011 covering:

- repairs of cracks & areas of spalled concrete
- structural reinforcement of beams and floor slabs to increase loading capacity
- re-waterproofing of leaking toilets
- treatment of expansion joints on roof slabs

Upgrading works with MAPEI systems in 2012:

- a) Injection crack repairs with **EPOJET LV**
- b) Sealing of cracks with **ADESILEX PG2 SP**
- c) Stopping water seepage from cracks with **RESFOAM 1 KM**
- d) Rebar protection with **MAPEFER 1K**
- e) Patch repairs with **PLANITOP G40 SP**
- f) 'Form-and-pump' placing of **MAPEFILL SP** to replace deteriorated concrete



Structural strengthening with MAPEWRAP FRP System

- g) Strengthening of beams and slabs with **MAPEWRAP System**
- h) Re-waterproofing toilet areas with **PLANISEAL 288**
- i) Expansion joint treatment with **MAPEBAND TPE System**



Godowns before refurbishment



Structural strengthening with CARBOPLATE & MAPEWRAP FRP System

The Rice Miller Hotel, Penang

Godown rehabilitation and conversion project under Jabatan Warisan Negara's (JWN) supervision

The main thrust of this project was the conversion of old, disused godowns into residences, a boutique hotel, restaurants and other commercial outlets.

The architectural challenge was to revive the waterfront part of the port city while preserving evidence of the social evolution of the city of Georgetown in an area which is a **UNESCO World Heritage Site**.

Rehabilitation & strengthening works completed in 2012:

- a) Injection crack repairs with **EPOJET LV**
- b) Rebar protection with **MAPEFER 1K**
- c) Patch repairs with **PLANITOP G40 SP**
- d) 'Form-and-pump' placing of **MAPEFILL GP** to replace deteriorated concrete
- e) Strengthening of beams, slabs and columns with **MAPEWRAP System**
- f) Strengthening of beams with **CARBOPLATE System**



Rebar protection with MAPEFER 1K



Spray application of MAPEGROUT THIXOTROPIC

Institute of Medical Research, Kuala Lumpur

The **Institute for Medical Research (IMR)** began with a recommendation in 1900 to establish a Pathological Institute in Malaya to "...carry out scientific and sustained research into the causes, treatment and prevention of such scourges as beri-beri and all forms of malaria fevers".

Since those early days, IMR has contributed significantly to the research and study of major tropical diseases in the country and the region.

In 2014, works were carried out to repair areas damaged by fire, and to re-waterproof the roof slab to restore the serviceability of the building.

Rehabilitation works completed in 2014:

- a) Injection crack repairs with **EPOJET LV**
- b) Sealing of cracks with **ADESILEX PG2 TG**
- c) Rebar protection with **MAPEFER 1K**
- d) 'Letter box' placing of **MAPEFILL MC 06** to replace deteriorated concrete
- e) Re-profiling slab soffit with **MAPEGROUT THIXOTROPIC** by spray application
- f) Re-waterproofing of RC flat roof with **PLASTIMUL PU**

Descriptions of products used in the reference projects

PRODUCT	DESCRIPTION
For crack repairs	
ADESILEX PG2 TG	Two-component, thixotropic, epoxy adhesive for structural bonding
EPOJET LV	Low-viscosity, epoxy resin for injection crack repairs
For concrete repairs: mortars and grouts for reinforcement protection and concrete replacement	
MAPEFER 1K	One-component, corrosion-inhibiting, cement mortar for the protection of reinforcing rods
MAPEFILL 318	Pumpable, multi-purpose, shrinkage-compensated, cementitious grout
MAPEFILL GP	General purpose, shrinkage-compensated, cementitious grout
MAPEFILL MC 06	Shrinkage-compensated, super-flow, micro-concrete
MAPEFILL SP	Premium super-flow, shrinkage-compensated, cementitious grout
MAPEGROUT THIXOTROPIC	Shrinkage-compensated, fibre-reinforced, thixotropic mortar for concrete repair
PLANITOP G40 SP	Polymer-modified, cementitious repair mortar
For protective and decorative coating	
COLORITE PRIMER 880 + COLORITE 880 W	A penetrating solvent-based primer + water-dispersed, acrylic-based, protective coating for concrete
ELASTOCOLOR PAINT	Elastomeric paint for crack-bridging protection
For structural strengthening	
CARBOPLATE SYSTEM	Pultruded, carbon fibre plates for structural strengthening and epoxy adhesive for structural bonding
MAPEWRAP SYSTEM	High-strength, carbon fibre fabrics and epoxy resin adhesive for external reinforcement
For waterproofing and joint treatment	
MAPEBAND TPE	TPE tape for flexible sealing and waterproofing of expansion joints
MAPEPLAN TM	Roofing and waterproofing TPO synthetic membrane
PLANISEAL 288	Flexible, cementitious, waterproofing mortar
PLASTIMUL PU	Liquid-applied, elastomeric, waterproofing membrane
RESFOAM 1KM & RESFOAM 1KM AKS	Ultra fluid, one-component, polyurethane injection resin with adjustable reaction times, for waterproofing structures, grounds and rocks subject to intense water seepage & accelerator
For repair and protection of masonry structures	
MAPESTOP	Concentrated, silane and siloxane-based, silicone micro-emulsion applied by injection to form a chemical barrier against capillary rising damp
MAPE-ANTIQUE RINZAFFO	Salt-resistant, transpirant, scratch-coat mortar, based on lime and Eco-Pozzolan, used as first layer when applying dehumidifying, transpirant and "structural" renders
MAPE-ANTIQUE MC	Macroporous, salt-resistant, dehumidifying render, based on lime and Eco-Pozzolan, for restoring old masonry, including on buildings of historical interest
MAPE-ANTIQUE FC CIVILE	Salt-resistant, transpirant, fine-texture, skimming mortar, based on lime and Eco-Pozzolan, for a natural finish on render
SILEXCOLOR PRIMER	Silicon-based primer
SILEXCOLOR PAINT	Silicate paint with high vapour-permeability for protection against atmospheric agents in internal and external applications