



INTERNAL WALLS RENOVATION,
SURROUNDING WALL RESTORATION
AND PROTECTION OF THE CONSTRUCTION VAULTS
IN THE CHURCH OF THE PREVIOUS MONASTERY
OF DISCALCED CARMELITES IN KLODAWA



The complex in Kłodawa, consisting of the Church and the previous Monastery of Discalced Carmelites was founded in 1623, according to the baroque architectural style. Present buildings were raised from 1718 until 1755, the church's construction works were completed in 1755, whereas its towers were put into operation in 1765. From this moment on the object was reconstructed and renovated several times, and underwent through last restoration between 1991-2005, which included roof repairs, window carpentry works and electric installation replacement. The object entered the National Register of Historic Places.

The complex includes the mentioned Church, adjacent Monastery building with the virydary and the church's precincts surrounded by brick wall, the so called "Gethsemane". In the northern part the outbuildings are situated, consisting the monastery courtyard, while the eastern part hosts the garden area. According to the contemporary building practice, the building was raised from bricks installed with lime mortar.

The investment included renovation of internal walls in the church, the Monastery surrounding wall restoration and protection of the construction vaults in the Church.

Because of the monumental character of the building, renovation plasters from POROMAP range were suggested. In the scope of restoration works the horizontal and vertical insulations of the foundations were not provided, however the works included a draining channel, which has been created around the building. For this action an adequate material should have been characterized by perfect adherence to a totally non-homogeneous substrate and high transpirant properties. Therefore a two layer solution was applied: the basecoat layer of POROMAP RINZAFFO under the dehumidifying layer and the dehumidifying layer itself of POROMAP INTONACO. POROMAP RINZAFFO enhances the adherence of the macro-porous plaster to difficult substrates (as for example to stone walls) and levels the absorption of mixed structure walls (the brick-stone ones). The mortars prepared with POROMAP INTONACO, regarding the color, mechanical strength, elastic modulus and their porous structure are similar to historic lime and pozzolanic ash-lime mortars or the ones based on hydraulic lime, which was primarily used for raising monumental buildings.

However, in comparison to original mortars, the ones based on POROMAP INTONACO are very durable, thanks to resistance to many different aggressive environmental agents, such as precipitations (acid rains as well), freeze-thaw cycles, micro cracks (the result of plastic shrinkage), the alkali-aggregate reaction, aggressive influence of sulfates contained in walls, originating also from the ground. The renovation plaster was applied up to 1,5 m from the ground level.

A totally different task in the whole operation was the buttresses reinforcement. Before fulfilling this point of the plan, the buttresses condition analysis, which quality is the key matter for an effective reinforcement was necessary. The tests included surface tear strength with pull-off method, humidity level, surface temperature and evenness measurement. This works stage required carbon fiber plates CARBOPLATE E165/100/1,4 installation, which were bonded with ADESILEX PG1, an epoxy adhesive, which was also used for leveling the brick substrate before bonding the CARBOPLATE material. The reinforcement was executed with plates 1,4 mm thick and 100 mm wide and of elastic modulus equal to 165 GPa, which were cut to fit the demanded size and bonded afterwards to the previously prepared substrate, three CARBOPLATE tapes on each buttress.

Furthermore, basing on Mapei products church surrounding walls renovation was executed. Because of major structure degradation, a different technology ought to be applied. After uncovering the foundations, a horizontal insulation with MAPESTOP PL (transparent concentrated silicone micro-emulsion) injections were made. As a result of chemical reaction (the agent reacts with free lime ions and carbon dioxide), a chemical barrier, which permanently constricts and closes the capillaries, is formed. Additionally, MAPESTOP PL provokes an internal hydrophobic reaction of the dampen wall area. Thanks to this, inside the wall structure a double barrier against rising damp with soluble salts through capillary pores is formed. The next step was to protect the underground concrete elements with PLASTIMUL, a solvent-free bituminous emulsion. Its composition is based on especially selected bitumen in aqueous emulsion and fine-grained fillers. A thixotropic, viscous consistency of PLASTIMUL ensures easy application on both vertical and sloping surfaces and after applying it on the substrate creates a durable and efficient waterproofing. Afterwards, on the brick substrate a renovation plaster coating was created with PoroMap Intonaco with prior coat of POROMAP RINZAFFO.



Internal walls being dehumidified (above) and after dehumidification (bellow).



MAPEI PRODUCTS

The products mentioned in the article belong to the "Building Speciality Line" range. The technical data sheets are available at the website: www.mapei.pl. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504. Mapei mortars for render have been awarded CE mark in compliance with EN 998 standards. More than 150 Mapei products contribute to obtain LEED (Leadership in Energy and Environmental Design) certification.

ADESILEX PG1 (CE EN 1504-4) Thixotropic, two-component epoxy adhesive for structural bonding.

CARBOPLATE Pultruded carbon fibre plates pre-impregnated in epoxy resin, protected by a double film of plastic.

MAPESTOP PL Agent for injection, composed of silicone micro-emulsion for creating a chemical barrier against rising damp in the masonry.

PLASTIMUL Bitumen waterproofing emulsion for general purpose use.

POROMAP RINZAFFO (CE EN 998-1) Pre-blended salt-resistant mortar to be applied by hand before the dehumidifying and thermal insulating render PoroMap Intonaco.

POROMAP INTONACO (CE EN 998-1) Grey coloured, pre-blended, dehumidifying and thermal insulating salt-resistant mortar, for the restoration of damp stone, brick and tuff masonry to be applied by hand.

REFERENCE FILE FORM: MAPEI POLSKA SP. Z O.O.

DATE: 06-2011

REFERENCE NUMBER:

CHECKED BY (INITIALS AND DATE): MARKETING:

TECHNICAL ASS:

THE MANAGEMENT:

NAME OF BUILDING INTERVENTION: THE CHURCH OF THE PREVIOUS MONASTER OF DISCALCED CARMELITES IN KŁODAWA

YEAR / PERIOD OF CONSTRUCTION: 2010 – 2011

YEAR / PERIOD OF MAPEI INTERVENTION: 2010 – 2011

INTERVENTION BY MAPEI: RENOVATION WORKS

DESIGNER: PROF. JERZY JASIEŃKO

CUSTOMER: KRÓL COMPANY KŁODAWA POLAND

SITE MANAGER: JANUSZ KRÓL

MAIN CONTRACTOR: KRÓL COMPANY KŁODAWA POLAND

MAPEI COORDINATOR: ENG. MIKOŁAJ ALEXANDROWICZ, DR KRZYSZTOF POGAN, ENG. PIOTR WYSZYŃSKI

PHOTOS: YES

DESCRIPTION: YES

MAPEI PRODUCTS	MATERIAL INSTALLED	SUBSTRATE	QUANTITY OF PRODUCT	SURFACE	INSIDE/ OUTSIDE	NEW / RENOVATION	PRODUCT LINE
	DO NOT COMPLETE FOR BUILDING PRODUCTS						
MAPESTOP PL OP. 200KG			1800 KG		OUTSIDE	RENOV.	BUILDING LINE
POROMAP RINZAFFO OP. 25KG			12750 KG		OUTSIDE	RENOV.	BUILDING LINE
POROMAP INTONACO OP. 20KG			30900 KG		OUTSIDE	RENOV.	BUILDING LINE
PLASTIMUL OP. 30KG			90 KG		OUTSIDE	RENOV.	BUILDING LINE
ADESILEX PG4 (KOMPL. 6KG)			180 KG		OUTSIDE	RENOV.	BUILDING LINE
CARBOPLATE E165/100/1,4 ROT.50 MT			200 MT		OUTSIDE	RENOV.	BUILDING LINE

A/ PRIVATE
(PRYWATNE)

- COMMERCIAL CENTRE
- BANK
- HOTEL
- RESTAURANT
- CAR SHOW ROOM
- OTHER

B/ PUBLIC
(PUBLICZNE)

- CHURCH
- HOSPITAL
- SCHOOL
- MUSEUM
- LIBRARY
- OTHER

C/ INDUSTRIAL
(PRZEMYSŁOWE)

- WAREHOUS
- STORAGE
- FACTORY
- OFFICE
- OTHER

D/ TRANSPORT

- AIRPORT
- RAILWAY
- METRO
- ROAD
- TUNNEL
- BRIDGE
- SHIP
- OTHER

E/ RESIDENTIAL
(REZYDENCJE)

- APARTMENT / FLAT
- HOUSE
- APARTMENT / BLDG
- OTHER

F/ SPORT

- POOL
- TRACK
- STADIUM
- GYM
- OTHER