

Martina PEŘINKOVÁ¹**THE RESEARCH OF LONG TERM EFFECT OF RECONSTRUCTION MONASTERY ON THE MOUNTAIN OF MOTHER OF GOD IN KRÁLÍKY****Abstract**

Historical buildings are reconstructed by many methods which with view on their degradation form. The most common problem of these buildings is damp which sing into constructions by many ways. One of a lot of protection methods is application of redevelopment plasters. It seems necessary to dwell research of their long term effect.

Keywords

Reconstruction, restoration plaster, moisture, porosity.

Abstrakt

Historické objekty jsou sanovány mnoha způsoby a to především s ohledem na způsob jejich degradace. Nejčastějším problémem těchto budov je vlhkost pronikající do konstrukcí mnoha způsoby. Jedním ze způsobů ochrany stěn je aplikace sanačních omítek. Je nutné se zabývat průzkumem jejich dlouhodobé účinnosti.

Klíčová slova

Rekonstrukce, sanační omítky, vlhkost, pórovitost.

1 INTRODUCTION

Using plaster of rehabilitation of historic buildings has its own specifics. This type of plaster has not historic tradition due to its composition. For this reason restoration plasters are perceived negatively by representatives of heritage preservation and their usage on historic buildings is strictly regulated.

On the historically valuable buildings is often difficult to implement some of the most effective redevelopment measures such as undercutting, grouting, electro-osmosis and others. The causes are mainly in the protection of monuments, furthermore technical and economic problems. Very often is not really possible to consistently prevent the moisture from the ground into the supporting structures. We have to reckon with the fact that the moisture in the walls will continue to occur and will affect the function of redevelopment plasters. If the remediation system should work for a long time we have to at least significantly reduce the access of soil moisture. Only after that the redevelopment plasters have chance to work.

2 HISTORY OF BUILDING

Marian place of pilgrimage the mountain of Our Lady expands over the city Kraliky on the very border with Poland below Kralicky Sneznik more than 300 years. The city with almost five thousand

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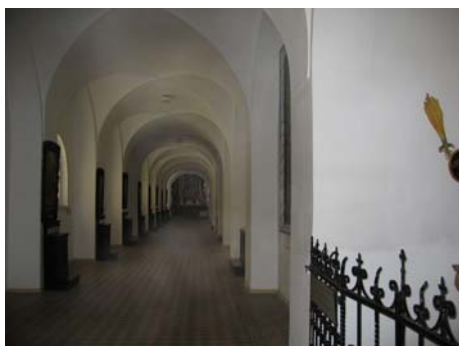
people Kraliky recalls first in the 1367. Above it at an altitude of 760 meters on the mountain which was formerly known as Lysa, Tobias Jan Becker, the native of Kralice, canon of St. Vitus and later bishop of Hradec Kralove founded monumental pilgrimage complex.

The pilgrimage complex began to build in the year 1696. According to some evidences there was pre-Christian shrine on the site of pilgrimage church. People brought with own hands material on the construction – timber and stones and helped at the construction without compensation. Construction grew by respectable pace and already in four years, on 21.8.1700, the love portrait was transferred to the church and the church was consecrated. According to the wishes of founder Tobias Jan Becker the Lysa Mountain was from that day called as a mountain of Mother of God.

After the pilgrimage site was build the construction of the convent began. Bishop Becker called the priest of the Servite order and they moved to a new church in 1710.

In the late 70th of the 20th century the modern history of the Our Lady Mountain began to write. At that time ill compatriot Franz Jentschke visited pilgrimage site and coaxed his recovery. Later he began to repair the Calvary chapels. Seeing how much investment will be needed, he established Foundation „Muttergottesberg-Stiftung“ which cares about renovation of pilgrimage site to this date.

The area of monastery consists of cloister, church and convent building. Cloister has four wings, there are octagonal chapels in the corners. Church of the Assumption of the Virgin Mary is three-aisled basilica.



Photography No. 1 and 2: Interior of monastery corridors

3 STATE OF BUILDING PRIOR TO SANATION

The building is a brick structure in the area of plinth from the stoned masonry, above plinth from the brick masonry. The bases are traditionally stoned. Plasters inside the building were already before redevelopment partially removed up to a height where the masonry is disrupted by moisture and by the reaction of undesirable salts. There was visible local damage on the plaster mainly in the bottom part of the window and significantly darker border at the paint showing the changeover of wet and dry masonry which ranged between 1,5 to about 3 meters.

Increased resistance was on the inner wall in side hallway and gradually subsided. The outer wall showed equal height of moisture resistance and salinity about 1,0 to 1,8 meters. The biggest moisture did not likely get into the walls by capillary action of the bases but by the condensation in the warmer seasons when the temperature in the corridors is lower than outside.

Moisture in the bottom part of walls was running off (didn't evaporate and therefore there was lower concentration of salinity in the lower part). In the upper part of corridor in the place of evaporation the concentration of salt in the plaster increases. It was therefore necessary to ensure an adequate height of implementation of redevelopment plaster.

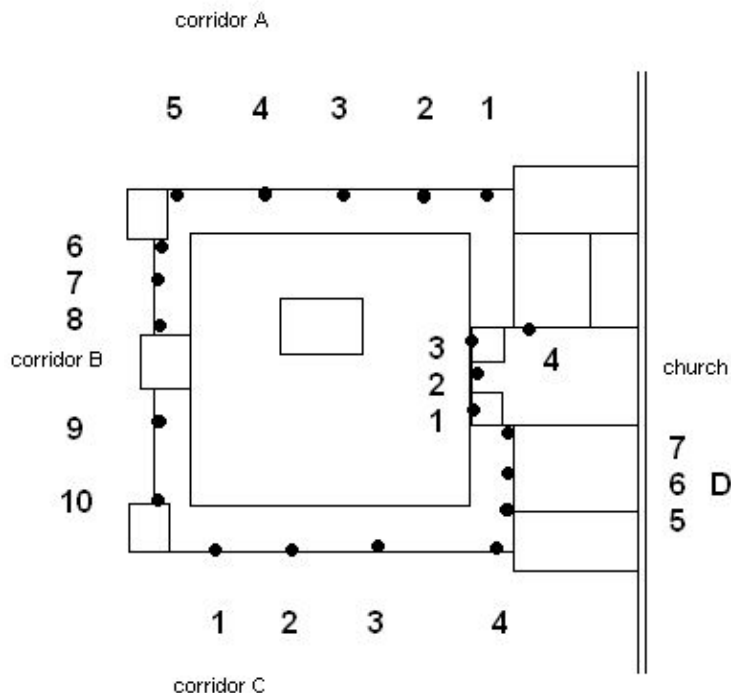
In the summer months, when in corridors increases condensation of moisture, it's necessary to secure increased ventilation or an increase of temperature to prevent condensation of moisture on cold walls.

4 TECHNOLOGICAL METHODS OF REDEVELOPMENT

Restoration plasters in the monastery were made in stages. The first one was made in 2004, the second one in 2005 and the third one in 2006. Figure 1 indicates the measurement points and in the tables 1-6 and graphs 2-4 is recorded how the stages were carried out. The exact designation was important in order to divide the implementations according to exposure time and was specified right data for statistical analysis.

The building is historically preserved and there wasn't permitted other redevelopment repairs. Also their use was strictly regulated and takes into account the presence of historical records on the original plasters and beneath them.

The plasters on the corridors were removed to the required height and joints were scraped to the depth of 20 mm. Further the masonry was cleaned with steel brushes. Product Kieselfest was applied on the clean walls and subsequently was made spraying SANIER - Vorspritzmörtel 205. Cavens after removed, incoherent and crumbled part of wall away, slot after installation and significant inequality were accompanied by compensatory sanitation Mostar SANIER - Porenausgleichsputz 208. Core plaster SANIER - Porenausgleichsputz 208 in thickness of 10-25 mm was implemented on the whole surface as another layer. Next layer consists of restoration plaster SANIER - Wandputz 200 in thickness of 20-25 mm. After the core redevelopment plaster had dried the sanitation stucco Feinputz 212 in thickness of 2 mm was applied. Finishing was made with a paint, color SILIKAT Innenanstrich 760 – inner silicate paint.



Picture No. 1: Designation of places of measurement and sampling, S ▲

3 CONDITION OF THE BUILDING IN 2007

The building is carefully maintained and is in a very good technical condition. The plasters are without fault but it wasn't possible to take samples for laboratory analysis of salt. Therefore it was made a thoroughly measurement of moisture by hygrometer UNI 2.

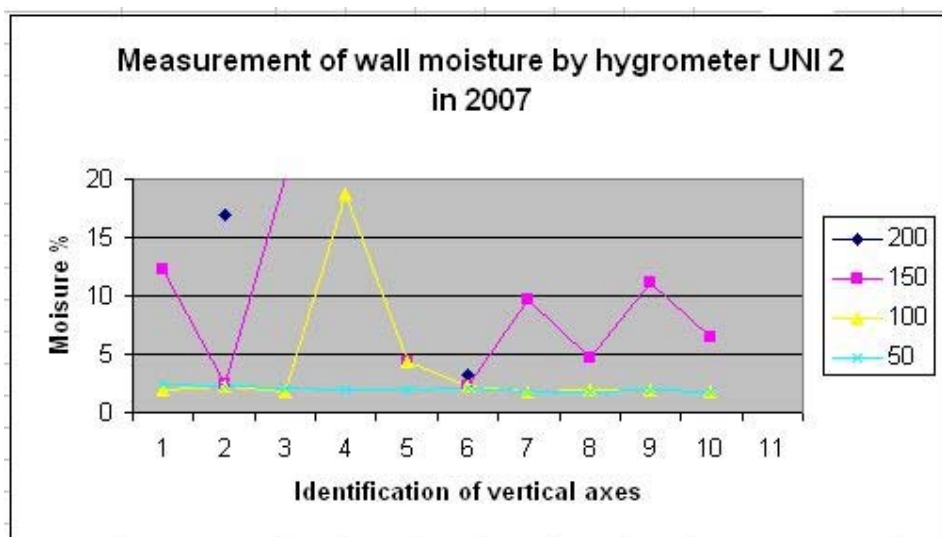
Because the height of redevelopment plasters was strictly regulated the measurement of moisture was done under the transitive of redevelopment plaster on regular plaster and above it. The measurement above redevelopment is marked by yellow color in the tables.

Table No. 1: Measurement of wall moisture by hygrometer UNI 2 in 2004 and 2005, corridor A+B

Measurement of wall moisture by hygrometer UNI 2 in 2004 and 2005											
Hight of measurement cm	Measured value of masonry moisture in %										
	Identification of vertical axes										
	2004							2005			
	1	2	3	4	5	6	7	8	9	10	11
200											
150		5,21	18,50		5,71	5,28	4,45		2,80	4,60	
100		6,51	8,50		5,45	6,55	4,52		3,50	5,50	
50		8,70	8,90		6,98	7,82	5,26		3,90	6,10	

Table No. 2: Measurement of wall moisture by hygrometer UNI 2 in 2007, corridor A+B

Measurement of wall moisture by hygrometer UNI 2 in 2007											
Hight of measurement cm	Measured value of masonry moisture in %										
	Identification of vertical axes										
	1	2	3	4	5	6	7	8	9	10	11
200		17,0				3,19					
150	12,29	2,47	20,10		4,40	2,32	9,72	4,60	11,06	6,51	
100	1,97	2,27	1,75	18,71	4,40	2,25	1,85	1,86	1,92	1,83	
50	2,36	2,28	2,15	1,86	1,86	2,11	1,84	1,84	1,93	1,78	



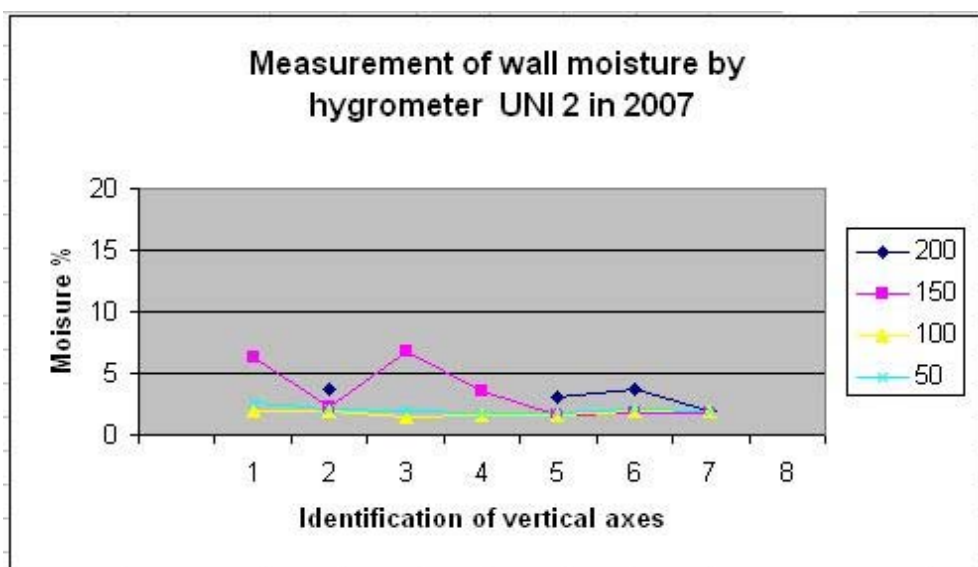
Picture No. 2: Measurement of wall moisture by hygrometer UNI 2 in 2007, corridor A+B

Table No. 3: Measurement of wall moisture by hygrometer UNI 2 in 2005 -2006, corridor C+D

Measurement of wall moisture by hygrometer UNI 2 – corridor C + D								
Height of measurement cm	Measured value of masonry moisture in %							
	Identification of vertical axes							
	Relisation in 2005				Relisation in 2006			
	1	2	3	4	5	6	7	8
200								
150	2,80	3,30	5,40	2,10	5,20	4,70	2,50	
100	4,12	4,00	5,50	3,50	6,60	5,90	3,40	
50	3,90	4,40	6,10	5,50	7,10	7,00	5,30	

Table No. 4: Measurement of wall moisture by hygrometer UNI 2 in 2007- corridor C+D

Measurement of wall moisture by hygrometer UNI 2 in 2007 – corridor C+ D								
Height of measurement cm	Measured value of masonry moisture in %							
	Identification of vertical axes							
	1	2	3	4	5	6	7	8
200		3,70			3,04	3,70	1,86	
150	6,31	2,20	6,80	3,61	1,64	1,75	1,81	
100	1,86	1,97	1,40	1,67	1,64	2,00	1,86	
50	2,60	2,17	1,88	1,76	1,75	2,17	1,95	



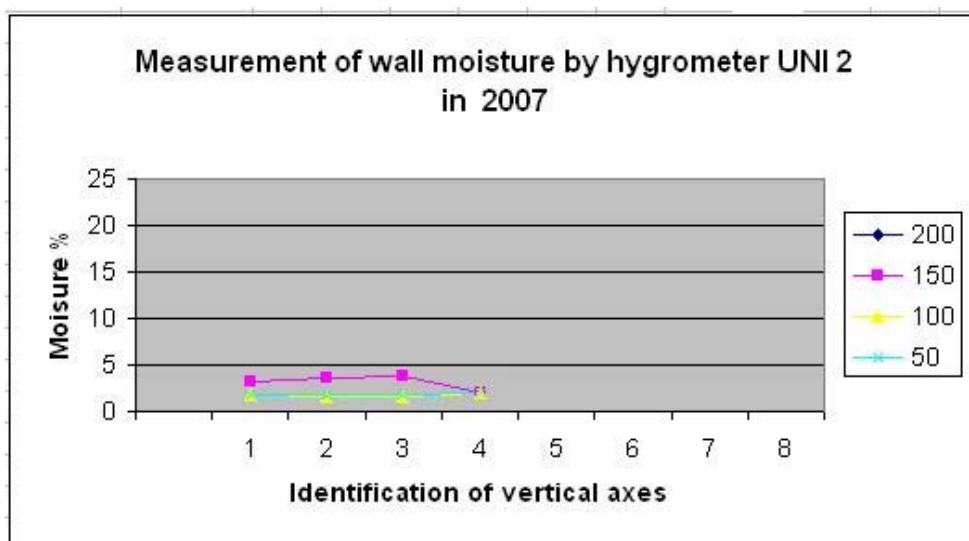
Picture No. 3: Measurement of wall moisture by hygrometer UNI 2 in 2007- corridor C+D

Table No. 5: Measurement of wall moisture in the church by hygrometer in 2006

Measurement of wall moisture by hygrometer UNI 2 in 2006								
Height of measurement cm	Measured value of masonry moisture in %							
	Identification of vertical axes							
	1	2	3	4	5	6	7	8
200								
150	4,80	2,20	5,20	6,00				
100	5,50	2,20	6,60	7,10				
50	6,10	3,30	7,10	7,70				

Table No. 6: Measurement of wall moisture in the church by hygrometer UNI 2 in 2007

Measurement of wall moisture by hygrometer UNI 2 in 2007								
Height of measurement cm	Measured value of masonry moisture in %							
	Identification of vertical axes							
	1	2	3	4	5	6	7	8
200								
150	3,12	3,70	3,79	2,10				
100	1,75	1,54	1,57	1,92				
50	1,75	1,77	1,84	2,05				



Picture No. 4: Measurement of wall moisture in the church by hygrometer UNI 2 in 2007

5 CONCLUSION

The results of this implementation show us important information. First of all there you can not fail to notice the differences of moistures under and above border of redevelopment. This demonstrates the failure of supplier's recommendation on sufficient height of redevelopment plaster which should be at least 50 centimeters above the critical moisture. An effort of heritage care to preserve identity of historic buildings is certainly understandable but here we see here possible consequences of half-hearted decisions. Wrong and inconsistent solutions can destroy the entire implementation and in the final result it's a waste of investment which can't be no longer expended.

Since the application of plasters haven't elapsed sufficient time yet, the consequences are not destructive. There are places of visible differences of moisture on the face of plasters. The building will be continually monitored and there will be done further measurement of moisture.

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