

# Use of New Materials in a Restoration

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This article will present the subject from an architects' point of view.

Use of new materials in a restoration of cultural heritage objects is related with many problems. First of all – traditions, their physical and esthetical relations with authentic historic elements and materials.

Each country had its specific building elements that did not change too much during the history. Continuity of their use is a necessary condition for restoration, renovation or the adaptation for the new use of heritage building or the building which is located in the visual influence zone.

New economic relations and recreation of property rights changed the previous state control of all heritage conservation works in the country. New financial resources appeared, and the state financing of conservation works became much smaller during the last decade.

New immovable cultural property owners have their opinion regarding necessary repair or restoration works. This opinion not necessary corresponds with requirements of heritage conservation specialists. Together with new property owners new building contractors come and they are not acquainted with specific of heritage conservation works.

During first years of Lithuanian independence (since 1990) it became clear that a lot of unqualified work and use of unsuitable materials should be controlled by the introduction of special licenses (for building companies) and qualification certificates for architects-restorers and conservation experts. Now everybody who wants to work with cultural heritage objects has to attend special training course and then to get a qualification certificate. This way we can expect that building contractors would keep approved rules and requirements in the use of materials and in the realisation of technological processes.

In the times of soviet economy there were no similar problems. When political and economical situation changed in Lithuania, the supply of building and restoration materials became similar to European countries level, but the possibilities to use these new materials were defined by economic leverage.

In spite of occupation regime policy heritage conservation works were received by Lithuanian specialists as the way to realise our cultural identity. Small part of educated Lithuanians who escaped the Russian exile tried to preserve nations' cultural identity as in the spiritual level, as in the material historical values level.

## 1. Conservation in Lithuania before 1990

Heritage management and heritage conservation had a good methodological basis and resources of specialists in Soviet Lithuania. Conservation works were implemented according methodology which consisted of all necessary parts – historical, archaeological, polychromic, architectural and all special chemical research. In spite of quite small financing, during this period complex research was implemented in many cultural heritage monuments (buildings and ensembles of buildings, parks and technical heritage). Restoration and adaptation projects were prepared on the base of research.

Next step for the revitalisation of the monument is building-repair-restoration works. This stage gave most of troubles for users and projects' authors.

If not to mention poor building quality, the main trouble was the supply of building materials. The choice of materials was so minimal that sometimes architects-restorers were

kidding that there would be better if there were no works in the object at all. I was once invited as a project author to select a colour for the facade and the choice for me was just one – it was a white colour.

## **2. Facades restoration**

The variety of materials after 1991 disturbed the judgement of researchers and restorers in some sense. We had to “invent the bicycle” again, to discover materials that were known for us only theoretically, to analyse their characteristics and work technologies.

First of all it was exterior paint, that we did not use before. Wealth of colour was very attractive for unspoiled architects-restorers. Facades of Vilnius Old Town were painted with big enthusiasm from the beginning. After some time, the quality of work and paint was tested. Some paint faded away, plaster fell in some places, salt began to ooze out from plinths.

First experimentations were good lessons for a future. Next works were prepared more carefully: all characteristics and datum of materials, all work technologies were tested before the works started.

At the moment majority of Vilnius Old Town streets' facades are repaired and painted, rainwater drainage is improved. All renewal works are implemented according to the annual municipal Vilnius Old Town Renewal Programme, that is financed from special state and municipal subsidy for the world heritage site (Vilnius Old Town was included into UNESCO World Heritage List in 1994).

The other problem related with facade restoration is use of plasters. Heritage conservation principles require to preserve historical plasters. Historical plasters were made on lime basis that do not always match with new materials. The other problem is that systems of rehabilitating plasters require to remove old plaster first and then to keep technologies according to the new materials. Plinths in the Old Town are hardly damaged by chemical corrosion. We usually have long considerations before accepting a suitable solution in each case.

Buildings that were restituted to their previous owners were usually in a bad physical condition. In the transitional period while juridical documents of ownership were under preparation, part of those buildings were not used (empty) and this way their physical state became even worse.

## **3. Roofing**

It is natural that in this case works should start from the roof repair. In my practice renewal of two large monasteries (Jacobins' and Carmelites' monasteries in Vilnius) started from the roof. It is very important to choose the right roofing. Conservation specialists require to use only traditional roofing materials – ceramic tiles and roofing iron that were used during centuries. Tiles choice is very big now, tiles can be made in Lithuania, Germany, Estonia or other country. Concrete tiles are officially not allowed, but they are popular among clients as they are relatively cheaper and their wealth of colours is even bigger than of ceramic tiles.

The Carmelites' Monastery was built in 1637 and it is one of the most interesting architectural ensembles in Vilnius. It is located near the Gate of Dawn and City Defence Wall. Roofing of Carmelites Monastery was renewed from concrete tiles. Special permit to use concrete tiles for this case was issued by the Department of Cultural Heritage Protection. In this case the concrete tiles do not spoil the general view of the ensemble too much, their material is not very visible from the distance.

The Jacobins' Monastery is located at the corner of Dominikonu and Ignoto street in the centre of the Old Town. The roof of the monastery was renewed by German ceramic tiles. Works were partly financed from the Municipal budget. The research was done in the monastery in 1978-1998 by the specialists of Monuments Restoration Institute. The monastery complex is one of the oldest buildings ensembles in Vilnius, which had long history of

development. Due the lack of financing owners (religious community) changed only part of roofing.

The requirements of Heritage conservation institutions are really based on local situation. Vilnius Old Town is located in a valley between hills. There are many sightseeing places where one can see colourful city panoramas with towers of churches and belfries and red tiled roofs dominating.

During recent years new roofing material was introduced to the market - it is rifled roofing colourful iron which imitates ceramic tiles. The conservation specialists do not encourage the use of this material, but economic criteria overcome again.

Bituminous tiles became very popular because of their good esthetical view and relatively small price. These tiles are used for the repair of roofs of 19th and beginning of 20th centuries buildings. Image of this material reminds historical slating roofs.

Majority of necessary for building and restoration materials are produced in Lithuania, but their quality is not satisfactory enough that we could recommend them for our clients with real confidence.

#### **4. Masonry**

This can be said also about traditional red and yellow clay bricks. Buildings in historic centres are built from clay bricks and during reconstruction all additional brick walls have to be built from the same type of bricks (with the same qualities). This postulate is commonly accepted and it can not be changed. Sadly, local bricks are not resistant enough for the meteorological factors.

Special technology of fragmented bricks accretion is widely used while restoring collapsed historical masonry walls.

In the influence zone of the Old Town thin finishing bricks sometimes are used for the imitation of real brick wall. This solution can not be used in a heritage objects.

#### **5. Windows**

Wooden elements: doors, windows, staircases are very important part of heritage buildings. New constructions of windows occupied the market. Economy requires hermetic and isolated windows. What should we do in historic buildings where the variety of windows and building solutions do not correspond any modern evaluation criteria? For example in the Jacobins' Monastery there are about twenty types of windows from various periods registered. If the restoration - adaptation works would start in this object, the main problem will be to keep historic unique elements of the building. Sadly, decisions of owners and users are often defined by finances that they can afford.

A new edition of the Law of Immovable Cultural Properties is under preparation. The new edition of the law provides for compensations for the implementation of special conservation requirements. Unfortunately, the general economic situation in the country do not allow the real financial compensations yet.

The only possible solution regarding changing of windows is a requirement to use wood and to keep historical subdivisions of window frames.

There are no requirements to use wood for the commercial windowshops in the ground floors, so they can be made from metal, aluminium or other modern materials, though plastic is not recommended.

## **6. Historical interiors**

Historical buildings usually have very rich variety of doors. Usually owners decide to change or to restore these doors, so very often these elements are lost forever. There is a lack of preservation mechanisms.

Historical interiors can hardly accept modern materials. In the case of restoration of state importance objects: the President's House, National Museum, Verkiai Estate – there was a maximum use of traditional materials achieved for the respect of historical truth. The results achieved are considered pretty good as the financing was also quite normal for these state objects.

Modern materials are used more often in the case of less important buildings. The priority for the tradition as one of the main criteria of restoration is not always used in this case.

It is often necessary to change floors in damaged interior spaces. It happens that in the process of repair works we find several layers of floors from different periods. They may be made of simple bricks laid in herringbone, or from wooden deal, from wide diagonal boarding, or 90 cm strips of boards separated by 12 cm strips of boards and filled with diagonal strips in the middle of the wider strips.

Recreation of such complicated floor requires special financing, and owner usually do not agree with arguments of conservation specialists. Then it is necessary to find other solutions. Sometimes it is a parquet, sometimes – ceramic or rock tiles, or there may be a laminat floor.

Rock tiles are quite often used, because their esthetical and technical characteristics seem really suitable, for example for corridor floors in the monasteries.

The least acceptable material is a laminat, though the selection of types of wood imitation and technical characteristics is quite big.

## **7. Constructions**

Monolit reinforced concrete beams are used quite often when it is necessary to change ceiling construction during the restoration. Small blocks from cement filling, cellular concrete or ceramic blocks fill the space between beams. When we need to preserve existing ceiling décor, we put additional wooden or rolled beams between existing wooden beams. This construction allows to preserve existing authentic elements of ceiling decoration.

Cement splint slabs "Cetris" (made in Czech Republic) are often used. The selection of slab thickness is very wide, so the slab is used as a ceiling basis instead of bearing –lining layer for the covering underground channels.

Cutting panels are often used as a flooring for a roof, a flooring for a floor, building a framework of walls.

When we need to change the run-out roof construction in representative buildings we often use plywood constructions. This is not a new material, it was always produced in Lithuania, but the use of plywood was limited because of relatively high price.

## **8. Paving**

New materials are widely used for paving of roadways, yards and runways. Use of cobbles had deep historical roots in Lithuania, cobbles were used for paving of roadways and yards since 15<sup>th</sup> century. Flumes for rainwater in streets and yards were formed from cobbles too. During archaeological research near the Jacobins' monastery we have found three cobble pavings from different cultural layers.

Ceramic bricks built in various patterns created unique beauty of the old town streets. During soviet times conservation specialists gave a big attention to the recreation of ceramic

bricks pavings in the old town. Unfortunately, there were no local production of ceramic bricks for paving. Then we thought about import of paving bricks from Poland, but the prices were too high for that time.

Now paving of the old town streets is included into the Old Town Renewal Programme. We try to find best solutions for projects realisation.

At the moment we leave only small fragments of cobble paving as it is not very practical to use such streets. The main part of roadway is usually paved by various concrete blocks and only sides of the roadway is paved by cobbles. The supply of suitable concrete blocks is enough and their prices are quite acceptable.

Chopping granit blocks, granit slabs, concrete and ceramic blocks and cast concrete with historical patterns are used for the paving of squares and yards. Vilnius Old Town is rich in closed yards. The yards now often have a public use, so the paving of yards have a quite representative character.