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## **WP4**

# **Platy limestone as cultural heritage**

## **Supplement 3.II**

### **Cross-border issues in conservation and restoration of platy limestone**

## **Appendix 3.II.4**

### **Final report for the project area in Croatia (South Dalmatia)**

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**Split, 14. December, 2014**



The project is co-funded by the European Union  
Instrument for Pre-Accession Assistance



REPUBLIC OF SLOVENIA  
MINISTRY OF ECONOMIC DEVELOPMENT  
AND TECHNOLOGY



## **CULTURAL HERITAGE AND LIMESTONE – CONSERVATION ISSUES IN THE DUBROVNIK-NERETVA COUNTY - PROJECT AREA KORČULA AND PELJEŠAC**

### **INTRODUCTION**

Material and immaterial heritage as a way of experiencing someone's culture and customs are focal points on the path of acknowledgment of social, economic, historical and political circumstances that created one's cultural identity. Traditional architecture is a dominant element that spreads on the shorelines of the whole Mediterranean, but even so, this patrimony was regarded as less valuable and therefore never accompanied by public interest and subsequently with national legislation that would enable some level of protection, and subsequently its future existence.

Without proper legal frames to cope with such issues, many objects of vernacular heritage have been devastated. In better cases, traditional objects and structures were subjected to unprofessional restoration, which led to kind of pseudo-traditional architecture, which is still popular. Without proper knowledge of material and tradition and with absence of strategic managing and legal frame for such cultural heritage, good protection standards will be not achieved very soon.

On the national level, The Act on the Protection and Preservation of Cultural Goods (Official Gazette 69/99) is the basis of heritage conservation through listing of heritage buildings, but also with involvement of local town planning and conservation acts. All of the acts have one common goal – to preserve cultural heritage for future generations and to enhance a sense of cultural identity.

Platy limestone as one of the main elements of the vernacular heritage has not achieved special status within conservation legislation. This project aims to emphasise the importance of platy limestone as natural and cultural heritage thorough out project area including Croatia, Bosnia and Herzegovina, Slovenia and Italy.

### **Karstic architecture as listed cultural heritage in Dubrovnik-Neretva county**

When it comes to platy limestone as one of the main cultural elements of architecture typology in this part of Mediterranean, the situation is somewhat promising. In a residential rural architecture, tradition of covering roofs with platy limestone, was abandoned in 18 and 19 and especially in 20<sup>th</sup> century, as soon as ceramic roof tiles became available (cheap), leaving only lower layer (usually first two-three rows) of roof covered with stone tiles. The rest of the roof would be then covered with ceramic tiles, a practice that is still visible in urban and rural areas. Such a distinctive visual element of traditional and sustainable management of natural resources is more of an exception today, and therefore needs to be re-established as common practise at least in a protected (landscape) areas.

For this purpose, objects or assembly of them can be gathered in catalogue units by criteria of function, aesthetic and connection with the ambient, with emphasis on natural context – sites with stratified limestone which enabled such architecture.

Evaluation by conservation categories:

1. Category representing objects of great cultural, historic or artistic value. Objects are characterized with great architectural and ambient values and preservation of original appearance.
2. Category objects are significant in the terms of architectural or ambient value, and original composition is visible with preserved original elements.
3. Category objects have ambient value only with most of the original elements preserved.
4. Category objects are either devastated with no distinctive elements whatsoever or without special ambient/conservation value

The whole valorisation process is based upon subjective assessment, the role of selected objects/show cases in broader cultural landscape and the usage level of platy limestone. With three basic categories (good/medium/bad), all the objects are categorized, with “good” preservation state representing the highest category in which are objects whose characteristics contribute to architectural typology of the area. The lowest category includes objects serving as

examples of bad practise restoration in pseudo-traditional style or devastated without visible original elements.

### **Vela luka show case**

The ambient landscape of Vela Luka show case is dominated by typological traditionally built objects, and it has survived on the edge of the urban area, without interpolation of contemporary structures. Therefore the entire area is suitable for becoming a preventive protected zone and a heritage site in the future. It is clear that with small intervention, such site could be restored to its original state. The instrument of preventive protection is relatively easy “tool” and a first step in the process of protection of traditional architecture as immovable cultural heritage. The time frame for such measure is three years, in which all the parameters of cultural heritage prescribed by law (The Act on the Protection and Preservation of Cultural Goods 1999.) must be achieved, for the full protection registration. In that sense, for protecting and presenting traditional architecture heritage, it would be advisable to document all the objects and start restoration actions on the objects that are not covered in traditional stone tiles. On almost all of the (problematic) objects, limestone tiles were replaced with asbestos plates which are mounted on the original wooden construction, so the change would not require extensive restoration work. The main problem in reconstruction of these objects is lack of skilled professionals trained to work with traditional materials and construction techniques. So that kind of reconstruction is far more expensive in the beginning, which is initially repulsive to those who want to do in traditional way. The second issue is, of course, procurement of the material, particularly bonding materials such as lime mortar.

Since all of the platy limestone (thin bedded bioclastic) used on roofs and eaves is type Crna FM (albian-cenoman), and can be found in the vicinity, small amounts of identical material could be excavated for the purpose of renovation of demolished roofs. Mitigating circumstance is that in many cases, original platy limestone is stored close by, and can be reused. Small surface quarries can be traced around the area of few kilometres, which were widely used, especially during construction of these houses (between two World Wars). Material used for other elements such as main walls, corner stones and window frames are of

Gornji Humac-PL Vela Luka type, located in the northern part of the island, where there is still few active quarries from which replacement material can be extracted.

Since these objects are all of single space/enclosed volume, gable roofs should be pitched (approx. 20-23 degrees), adjusted to traditional stone tiles covering method (three layers). No upgrades or any kind of extensions are permitted. Since all of the objects lie in cadastral parcels divided by dry stone walls, special attention should be paid to maintenance of traditional fences in the “good shape”, keeping courtyard organization clear and visible and with indigenous horticultural organization. Generally, a better level of awareness of local community about preserving traditional architecture and heritage should be achieved through various workshops. Stables of Vela Luka are not covered by any kind of protection measurements whatsoever, although the church of St. Roko and cemetery with arbour walk is registered in the national register of cultural heritage. Also, the wider area of Vela Luka abounds in archaeological sites (especially Vela spilja) dating since Palaeolithic and with cultivated agro/rural landscape (dry stone terraces) surrounding fertile Blato field.

All the catalogued and preventive protected sites of cultural heritage on the island of Korčula are under the jurisdiction of Ministry of Culture, Conservation department in Dubrovnik.

In most cases objects are private property, but burdened with unresolved ownership issues. Nevertheless, in many cases objects are used as storage spaces, usually for tools for cultivation of the surrounding small fields. Although owners of selected object were not met, owners of other traditionally built objects were very keen about possible restoration actions. Although selected object lost its original function, the roof covered with platy limestone was completely rearranged some twenty years ago, and it was used frequently until owner has deceased. It would be advisable that selected show case object with other typological objects becomes extended part of already established protection area in the sense of rural/urban settlement.

### **Žrnovo/Postrana show case**

All that is said about conservation of stables in Vela Luka, can be addressed to Žrnovo/Postrana showcase. These traditionally built agriculture houses, interconnected with each other and surrounded with boundary wall, represent typical coastal type architecture with preserved platy limestone roofs, including one special feature. Just few meters away from the

common courtyard, there is a quarry that was used at least for last two hundred years, if not for a longer time. Objects are built from different types of stone, and platy (medium to thin-bedded) limestone is type Milna PL-Žrnovo of Cenomanian age. By geological analysis it is revealed that all the platy limestone is from nearby quarries. Three of them are very close by, measuring 20 x 30 meters and represent a possible site of a small scale extraction of material for maintenance of this showcase houses.

Objects were built around the end of the 19<sup>th</sup> century, when the vast majority of dry stone infrastructure was built during the rise of Dalmatian wine industry. However, this rural assembly has united all of the elements of traditional way of living, making it a great example of how the whole landscape of Korčula changed. The abundance of stone and presence of small surface and large scale quarries meant that people had a large selection of material to choose from, which is very noticeable in the way they have built these secondary objects. Stones are mostly hewn, with lots of interpolation with platy limestone, with relieving arches, revealing high level of stone craftsmanship, even on agricultural objects that were used as seasonal dwellings. As a special architectural uniqueness there is a roof ridge of platy limestone still preserved in its original condition that needs just smaller scale rearranging of tiles. Such example is very rare, not just on the island of Korčula, but also on the whole coastal area of Croatia, and therefore needs to be protected.

Although the owner of this object is known, he was not introduced to the Roof of Rock project and possible actions regarding conservation of these objects. Since the whole property is abandoned at least for the last twenty years, the environmental conditions caused deterioration of the site, but significant structural damage has not been evidenced. For the purpose of RoR show case visibility, minor cleaning actions are needed, as well as remixing roof tiles. Since this secondary settlement is very near to the main island road, some form of signalization and a marked path should be made. So once marked, this rural complex could be representative object in a network of sites representing local architectural heritage, thus enabling their owners a possibility to create tourist spot and to secure sustainable way to maintain the site.



### **Donja Nakovana show case**

Once inhabited by several hundreds of people, small hamlet on the Pelješac peninsula is now reduced to just one inhabitant. The process of deruralization and emigration in the 20<sup>th</sup> century, and especially during and after the WW II, left this once prosperous area fully abandoned and left to decay. Rich with archaeological sites that date back to Neolithic times (Nakovana cave / Z-4482), this whole area which is protected as a historic settlement ( Z-1423), has continuity of living for several thousands of years, yet it managed to retain its original and modest spatial organization. Although two rural settlements Gornja i Donja Nakovana are focal points of this area overlooking important Pelješac channel, hamlet of Donja Nakovana where the show case house was chosen, is somewhat more interesting and contains a very wide and beautiful display of vernacular heritage. From small auxiliary dry stone objects for keeping animals, threshing floors and pavement paths through whole village to two storey residential houses with roofs once covered with platy limestone.

In case of village Nakovana, both types of platy limestone - Milna PL-Pelješac (well bedded to grainy) and Gornji Humac PL-Pelješac - were used for covering roofs. In village area there is an abandoned quarry of Milna limestone, which was probably the main resource for extraction of platy limestone. Some kilometres to the West near the village of Lovišta the biggest outcrops of Gornji Humac PL Pelješac are situated, where locals probably extracted material used for building residential houses and for trading. There is a unconfirmed story that in the past people of Nakovana were trading with platy limestone, and due to their seamanship tradition, they were selling it all over the Mediterranean, and supposedly, one whole street in Istanbul is covered with platy limestone of Nakovana origin. Architectural elements such as door posts, window frames and such are probably produced by professional manufacture in Korčula, since the thick-bedded to massive light-gray limestone with rudist is typical Korčula limestone, and could be excavated in famous Piske, Humac od Vrnika quarries. All of the dressed material such as lintel, door posts and facade openings are from Korčula, and are in good shape. Those elements which must be replaced, it should be purchased from quarries in Korčula. If there is a need to close façade openings with doors or windows, these should be strictly made of wood with iron fittings.

Outer walls were built with massive and dressed stone blocks, with the use of lime mortar as bonding material, and structurally they are in very good condition.

The roofs are the most deteriorated elements, being built out of the short-lived material such as wood. The main elements of decay - gravity and environmental pollution left no great damage, and further consolidation work is not needed. A human factor represents the major menace for the survival of the heritage, in particular negligence and ignorance regarding traditional material and techniques. Actually the emotional value perceived by descendants of former residents has been the only remaining relation to this heritage. Sadly, that approach is not sufficient to prevent decay, and often produces ad hoc solutions to extend the life of patrimony, without respect for aesthetics, history and functionality.

Typical issue in restoration of this kind of architecture is inadequate structural improvements regarding dry stone walls. The use of Portland cement, as cheap and customary “adhesive” for dry stone structures is widely accepted, which can be clearly seen on old kitchen house in the village of Donja Nakovana. Inappropriate material (cement) injected in structural gaps between limestone blocks, causes several other problems, such as calcification of stone and eventual deterioration of stone elements. Besides, once cement is chemically bonded with stone, it can be only removed physically, and it causes cracks sooner because it is stiffer and more brittle material than lime. Portland cement is watertight, so once capillary moisture enters the walls, and it can come from foundations, it is very hard to desiccate the walls, and with extreme temperatures this water can cause breaking of the stone. Practically any use of cement mortar is not advisable, both for inside walls and surrounding dry stone walls. If the use of interior plaster is inevitable, it is recommended to use lime mortar in a way that external joints are recessed into walls.

Traditional lime mortar was also used for plastering inner spaces, and for centuries has proven to be not just a great bonding material, but also more natural and healthier insulator. With such properties it was used for the purpose of stronger bonding of limestone tiles on the roofs. In some areas lime was used not just for bonding of slates, but also to reflect sun beams, and for disinfection of water that ran down from roofs to cisterns.

Another result of a widespread misuse of cement in the reconstruction of traditional houses, are floors made of thin cements layers, often causing heavy structural damage. Such fixed and rather heavy interpolations develop forces towards outer walls and causing them to crack. Traditionally these floors joists were made with wooden beams, a relatively cheap and durable solution, which allowed the structure to breathe.



Traditional skills are crucial for successful conservation work, and in terms of difficulty this kind of reconstruction work is actually undemanding. Yet, real professionals with practical knowledge of traditional processing of stone and wood elements, are very difficult to find, and very expensive to hire.

## **CONCLUSION**

Before the declaration of dry stone building technique as a immaterial cultural heritage of republic of Croatia in 2012, immense dry stone heritage was subordinated only to large scale protection acts, such as cultural landscapes (Bakar terraced vineyards or Starigrad plain/UNESCO protected site) or as rural areas. But strict conservation rules imposed by national legislation often mean slowing down the process of restoring heritage, rather than accelerating. The provision of the law determining owners of heritage objects that restoration works can be done at their own expense created an aversion among people towards proper restoration works, and let ironically to larger decay of patrimony, looting and degradation of whole hamlets.

Platy limestone as a cheap and easily accessible material was mainly used for covering roofs, and in that sense it has become widely recognisable element of karstic architecture until the first half of the 20<sup>th</sup> century. Using inexpensive and readily available materials such as asbestos boards and tiles, landscape features and visuals of whole hamlets have been degraded and alienated from tradition. Also, the skill of manually extracting platy limestone has been abandoned, despite long tradition of stone processing on island of Korčula, there are only few people who still practice this long forgotten tradition.

Rural areas of peninsula Pelješac and island of Korčula, especially auxiliary objects (stables, kitchen houses) have remained intact to a large extent, allowing a rare insight in to original appearance of vernacular architecture. It is also a chance to document the current state and with that background it will be possible to base all future reconstruction actions. Such broader approach is not just a way of conserving lost heritage, but in the new economic opportunities (such as rural / eco / sustainable tourism), could guarantee a connection between past tradition and future development.

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