

# PROCEEDINGS



# GLOBALSTONE CONGRESS2018

**ILHEUS (BAHIA)  
BRAZIL**

April 26-29, 2018

## CONNECTING MINDS IN THE WORLD OF STONE

**April 26-29, 2018 / 26-29 de abril de 2018  
ILHEUS (BAHIA) - BRAZIL**

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## **Marble Museum of Vila Viçosa, Portugal A mirror of geological and mining heritage**

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### **Synopsis**

Raquel de Castro Marble's Museum was built in an old quarry of ornamental marble located in one of the entrances of Vila Viçosa, Alto Alentejo – Portugal. It's a space intended to preserve all the knowledge acquired over decades of exploitation and processing of the Worldwide know stone, regionally called "White Gold".

The importance of this industry to the region's economy has profoundly affected the lives of its people and is always strongly linked to the natural stone sector.

The contents arranged logically and sequentially, frame the visitor in the most varied aspects, from the geological, historical, technological, environmental and social framework.

All the themes are approached in a scientific and practical way, making the museum an area of knowledge and culture constituting a portrait where the populations and industrialists of the region can be reviewed.

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### **Keywords**

Marble, Portugal, Museum, Estremoz marble.

### **Introduction**

The old quarry of Gradinha, at the gates of Vila Viçosa, had been deactivated and abandoned for many years, with several environmental impacts and safety risks for the population of the village. The city council of Vila Viçosa acquired this space, projecting it and reactivating it, in a museological way.

The proximity to an urban center (Fig. 1) and the fact that it has an old open pit exploitation with well development, typical of the extraction units of the region, heap with mine waste and all the support structures, has made this space an exceptional place for the installation of a museum dedicated to the marble.

At present, the Museum of Marble has a huge and rich collection of around three hundred pieces, a number that is increasing thanks to the donations and generosity of industrialists and individuals, as well as the support of institutions, where pontificates the University of Évora.

The project that is now underway represents a new museological trend, aiming at improving the quality of exposure, with a redistribution and labeling of the pieces in a logical way and the improvement of scientific and technological information related to all the geological, industrial, anthropological and environmental patrimony.

### **A trip by the Museum**

A 500 m<sup>2</sup> covered pavilion is divided into coherently arranged thematic areas, leading the visitor through the different fields of knowledge related to marble. The geological setting of the Estremoz Anticlinal represents the beginning of the journey by the marble industry as ornamental rock.

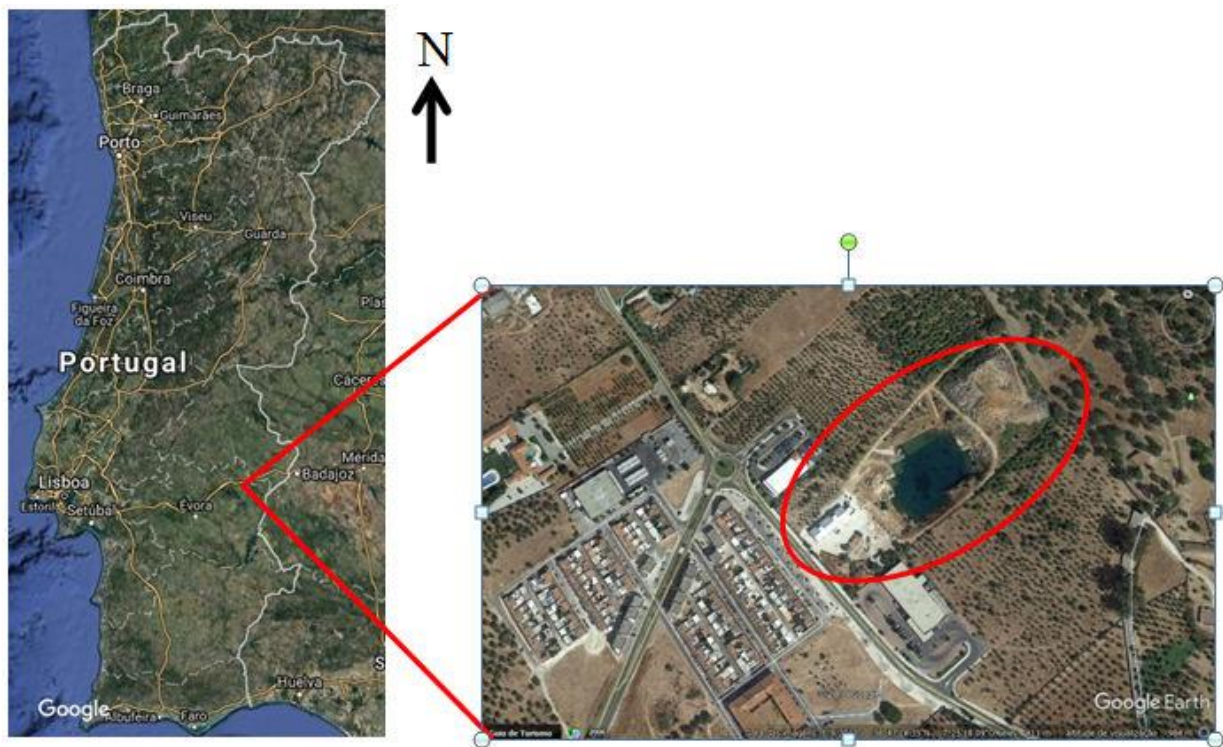


Fig. 1 Geographical location of the Vila Viçosa Marble Museum. Google Earth image. No scale.  
 $38^{\circ}47'18,62''N$ ;  $7^{\circ}25'25,16''O$ .

The museum's introduction is done with two polished slabs in open book, where visitors can realize that, what is observable in the typical veins of different colors, faithfully represents the geological phenomena occurred regionally (Lopes & Martins, 2014, 2015).

Following is the History and Ethnography sector. The importance of Portuguese marble dates back to the Roman period, and traces of exploitation of this period have been discovered. After centuries of intermittent exploitation, the modern phase of exploitation began in the early twentieth century. In this section we highlight the rich testimony of workers of the quarries, many of them perpetuated in verse.

This section will also constitute an imperceptible "bridge" for the next, more technological section. In the section dedicated to the extraction of marble, the centerpiece is a marble quarry model, 3.00 m long and 1.16 m wide, at 1:50 scale consisting of an open and an underground module, designed in 2008, by the Department of Geosciences of the University of Évora and improved in 2016.

Gradually it has been completing with equipment's involved in the quarry cycle works at scale 1:50, created by the Engineer José Patrício, previously modeling in Solid Works and then realized in 3D printer Makerbot and filament PLA, faithfully respecting all the details.

This exhibitor also includes an interactive screen where the visitor can select an operation, such as cutting with diamond wire, dismantling, removal, etc., allowing the viewing of a film and lighting a led in the model indicating the respective operation. For this purpose, the software was developed by the students of the Masters in Mechatronics of the University of Évora.

At the top of the model is a mural of 3.00 m in length and 0.40 m in height, painted by the artist Maria de Fátima Compõete. The piece is completed with a panel of 3.00 m x 1.50 m, explaining the operations performed in open and underground extraction units, carried out by students of the Master in Geological Engineering of the University of Évora (Fig. 2).



Fig.2 Assembly phase of the model and detail of the underground exploitation and drilling in open pit.

Following the logical circuit of the museum, after the extraction of the marble blocks, one enters the section dedicated to the transformation (marble processing). Here an image of the techniques used in ornamental rock processing is given.

The local artists' sector is especially dedicated to the artists of Estremoz's Anticlinal who work in marble and have artistic work done with this type of stone. It is a space to pay homage to the sculptors of the Municipalities of Estremoz, Borba and Vila Viçosa, people deeply knowledgeable with the marble who perform fantastic works of great cultural interest, revealing great mastery and sensitivity (Ruben et al. 2012; 2016).

In the sector dedicated to the environment, the aim is to make known the important role that quarries assume in the dynamics of local biodiversity, demystifying preconceived ideas that the impact of these spaces is negative from any perspective. Despite the impacts caused by the extractive activity during the active life of a marble quarry, especially at the level of the landscape, geomorphology and ecosystems, several studies indicate that the end of the extraction and consequent deactivation of a quarry will bring new opportunities for wildlife, and may even increase the diversity of fauna and flora (see Lucas *et al.*, 2011; Germano, 2013).

The open area has a high potential space, not only of a museological nature, but also perfectly adapted to other leisure and cultural activities, such as musical concerts, theater plays, as happened in the past and possible sculpture contests. The exterior area of the Museum has four distinct zones: 1 - an olive grove with about 2300 m<sup>2</sup>, adapted for a picnic area; 2 - exhibition area with 1200 m<sup>2</sup> for the exhibition of large equipment used in the extraction of marble, where he pontificates an Ingersoll Rand compressor manufactured in 1917 and used till 1954 in marble quarries. It is a rare and invaluable piece donated to the Museum by the company, Sociedade Luso Belga de Mármore, S.A.; 3 - a cavity from which the marble was extracted, has a perimeter of 350 m and usually has a water accumulation of approximately 52135 m<sup>3</sup> by interception of a surface aquifer and runoff of rainwater, giving a scenario of great beauty and tranquility (Fig. 3). The heap is an artificial element consisting of marble without ornamental quality is about 20 m high and an approximate area of 6400 m<sup>2</sup>. It represents a fantastic element to finish a visit to the Marble Museum, since it constitutes a viewpoint from where one can observe the quarry and if one glimpses to the North, one of the extractive cores of the Borba Municipality, to the South Vila Viçosa and to the Northeast part of the Tapada Real and the Alentejo flat land.



Fig.3 General view of the quarry and museum building. Photo taken on top of the heap.

## Acknowledgments

This study was co-financed by the European Union through the ICT project (UID/GEO/04683/2013) with reference POCI-01-0145-FEDER-007690; E-TechStone POCI-01-0247-FEDER-017882 and is a contribution for the UNESCO IGCP-637.

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