



## **Lioz: The Stone that made Lisbon reborn – A Global Heritage Stone Resource Proposal**

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Explored since the Roman Period, the Lioz (Cenomanian age microcrystalline fossiliferous limestone) is the main stone used in the buildings and monuments of Lisbon. After the great cataclysm of 1755 (earthquake, tsunami and fire) of 1755, the already known great quality and the near occurrence of these limestones were wisely used in the great reconstruction of the “Capital do Império” (Capital of the Empire).

At the time, Lisbon was one of the largest European cities and great business center of the World, so the necessary and urgent reconstruction was not so difficult to start. Sebastião José de Carvalho e Melo, better known as "Marquês de Pombal", Secretary of King José I, successfully took up the challenge of rebuilding Lisbon.

Inside the actual Portuguese capital geographical limits, several quarries of the Cretaceous limestone were explored; some still exist and are classified as geomonuments (i.e. Rio Seco Geomonument, 38 ° 42'21 .67"N; 9 ° 11 '30.37"W). As the City boundaries expanded, the quarries stopped and now there is no one asset in Lisbon.

The most important exploitation and processing Lioz stone center was situated in Pêro Pinheiro, 20 km NW of Lisbon. Most of the stones used in the National Palace-Convent of Mafra (1717) belongs to the four main types of Lioz (the cream/white “Abancado”, the pink/dark pink “Encarnadão”, the yellow “Amarelo de Negrals” and the blueish grey “Azulino”), either cut “against” (perpendicular to the bedding plane) or “along” (parallel to the bedding plane). The orientation stone cut deeply controls texture and mechanical properties of the rocks that behaves as different ones were considered.

In the last two decades, the Lioz extraction was almost extinguished. However, some of the old quarries was re-activated and produces first quality blocks needed both for new works and restoration of historic buildings and monuments.

The importance of this stone goes beyond borders since it was profusely used during the Portuguese maritime expansion from the 16th century and there are several examples of application in Brazil and in the African countries of Portuguese official language, but not only.

Taking in account the historical and widely use of this stone, its mechanical properties several times determined, many scientific published papers, etc. the Lioz full fill the criteria to be part of the GHSR Interim list and a reference paper to promoted it as “Global Heritage Stone Resource” is proposed.

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