Macrocategoria: Materiali e Pavimentazioni

Titolo articolo: Sardinia Granite Scraps Application in Road Pavement Layers

Autori: Rombi J.; Maltinti F., Coni M..

Nome rivista/atto di convegno: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics).

Anno di pubblicazione: 2022

Numero rivista, pagine (o article number): Volume 13382 LNCS, Pages 613 - 623

DOI: https://doi.org/10.1007/978-3-031-10592-0_44

Abstract: Sardinia is the second-largest island of Italy after Sicily, in this region, large volumes of granite scraps deriving mainly from the ornamental quarry industry, lie abandoned in stockpiles. The ornamental query industry, very active in the region since the late 1900s, has produced large volumes of granite scraps causing several environmental and landscape issues. Therefore, there is a need to find potential applications for such materials, previously extracted, for which energy has already been consumed and CO2 emitted. This research focuses on the possibility of introducing granite scraps for road construction processes. Achieving several benefits, ecological by restoring landscape integrity and reducing CO2 emissions, economical by decreasing road construction costs. For this reason, three types of granite scraps, obtained from the same granitic body using two types of excavation methods and treatment, were studied. In the first phase of the research the evaluation of the environmental compatibility of the scraps, based on Italian regulations, was investigated. Also, chemical, and mineralogical analyses were performed to establish the correct granite family. Mechanical properties were evaluated to assess the possibility of using them to their fullest extent in booth unbound and hydraulically bound pavement layers. From the test conducted useful information were obtained showing how granite scraps, can achieve good physical and mechanical performances if compared with those of natural aggregates normally used in road pavement layers. The test conducted demonstrated how granite scraps can be used with high performances in road pavement structures, contributing to the reduction of quarrying new materials, and introducing a circle economy approach with several benefits for the Sardinian Island.

Keywords: Circular economy; Granite scraps; Pavement layers; Quarry waste; Recycle.