



## Rock Cycle and Rock Properties

Guest Editor:

**Dr. Carlos Alves**

Centre of Geological Research

Management and Valorisation of Resources (CIG-R)

University of Minho (Portugal)

E-mail: [casaix@dct.uminho.pt](mailto:casaix@dct.uminho.pt)

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Dear Colleagues,

I seek your collaboration on a Special Issue concerning how geological processes affect rock properties and hence impact the built environment.

The idea of a rock cycle can be considered part of the foundational concepts of modern Geology and to be contained in the famous phrase of James Hutton: "We find no vestige of a beginning—we see no prospect of an end" (see Theory of the Earth, Volume 1 (of 4), by James Hutton, available at <http://www.gutenberg.org/files/12861/12861-h/12861-h.htm>).

A rock cycle is seen here as including everything that has influenced the present state of the rocks, such as deformation processes and alterations related to hydrothermal and weathering phenomena. This Special Issue focuses on the relations between rock cycle processes and the characteristics and properties of the rocks and hence their properties and behavior in the built environment. It is hoped that this Special Issue contributes to the search of bridges between basic petrological research and the more applied perspectives of the geosciences.

In this issue we will like to consider how rock genesis and evolution affect the role of rock massifs in Engineering works when construction of built environments is initiated. Questions related to massif recognition (how geophysical measurements relate to petrological features), excavation (namely the effects of alterations) and stability (such as the influence of joint coatings on friction angles) will be relevant.

Rock characteristics affect the properties of geologic materials used in the built environment as such (e.g. building stones) and in combination with other materials (e.g., aggregates), conditioning their behavior and durability. Several properties can be relevant, such as mechanical strength (e.g., tensile strength), density (which is relevant for lightweight aggregates), water absorption (which influences pollutant penetration and migration, as well as materials decay) and specific surface (which affects chemical reactivity). Rock material properties (including color and workability) can also lend certain rocks cultural significance, should such properties become associated with a their use in the cultural heritage and could be considered further in replacement operations.

As was proposed previously in Geosciences (Special Issue "Geoscience of the Built Environment", [http://www.mdpi.com/journal/geosciences/special\\_issues/built\\_environ](http://www.mdpi.com/journal/geosciences/special_issues/built_environ)) the same weathering processes that act on rock outcrops continue to act on the stony materials placed on the built environment. Consequently, geological materials experience transformations that can be considered deleterious.

In light of the above, this Special Issue invites papers that investigate the relationship of stony materials' present day characteristics with the geological past of such materials. Research on susceptibility of various rocks' to organic and inorganic pollutants will also be useful. Knowledge on these topics can have broader social implications on issues, such as construction industry sustainability and the conservation of cultural heritage. The study of the variations of rock properties will also be relevant for surveying built works (namely in the context of non-destructive testing).

Finally, geological processes also affect the properties of geologic materials that are relevant to other uses in the built environment, such as environmental protection and remediation. Such properties include specific surface and metal retention. Contributions on these topics will be desirable as well.

Dr. Carlos Alves  
Guest Editor