



## International Course on Stone Conservation SC13

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**SESSION:** Diagnosis & treatment of granite & Case study conservation of granite

**INSTRUCTOR:** José Delgado Rodrigues

**TIME:** Monday, 17<sup>th</sup> June/ 9:30 – 11:00 (1.5 hours) & 11:30 – 13:00 (1.5 hours)

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### SESSION OUTLINE

#### ABSTRACT

The session will present a synthetic description of the typical characteristics of granitic rocks. It will look at their mineralogic composition, texture and void space and investigate how these characteristics affect the physical and mechanical properties of this rock type. The role of inherited alteration will be highlighted. Deterioration mechanisms and degradation conditions of granite will be illustrated and possible conservation treatments discussed. Consolidation of granite poses particular challenges and this will be addressed in some detail.

The lectures will close with a few case-studies which illustrate how the theoretical approaches earlier discussed were actually implemented. The case studies are taken from the lecturer's practice and illustrate all the basic actions that can be foreseen for a monument made of granite.

Participants will be asked to discuss the concepts presented and to raise doubts (present comments or ask questions) at any time during the presentations as well as at the end of each session.

#### OBJECTIVES

- To understand the basic properties of granitic rocks and of their specificities when compared to other common rock types;
- To identify degradation forms and to understand their corresponding decay mechanisms;
- To understand the basic concepts and specificities regarding the conservation treatment of granite.

#### CONTENT OUTLINE


- Typical characteristics of granitic rocks
  - Mineralogic composition
  - Texture
  - Void space
- The relationship between the above characteristics and the physical and mechanical properties of granitic rocks
- Inherited alteration
- Deterioration mechanisms related to granitic rocks
- Granitic rock degradation conditions
- Conservation treatment of granitic rocks
- Consolidation
- Case studies of granite conservation



READINGS

 = Essential reading material

 = Available online

-  Rodrigues, J. Delgado. 1996. Conservation of granitic rocks with application to the megalithic monuments. In *Degradation and conservation of granitic rocks in monuments : Proceedings of the ec workshop held in santiago de compostela (spain) on 28-30 november 1994*. edited by M. A. Vicente Hernández, J. Delgado Rodrigues and J. Acevedo, 161–242. Brussels: European Commission, Directorate-General XII, Science, Research and Development.
- Delgado Rodrigues, José, and Dória Costa. 2008. The Conservation of Granite in Évora Cathedral: From Laboratory to Practice. In *Stone Consolidation in Cultural Heritage: Proceedings of the International Symposium: Research and Practice: Lisbon, 6-7 May, 2008*. edited by José Delgado Rodrigues and João Manuel Mimoso. 101-10. Lisboa: LNEC, Laboratório Nacional de Engenharia Civil.
- Costa, Dória, and José Delgado Rodrigues. 2008. Evaluation of Consolidation Treatments Applied to Granitic Materials: Experience and Critical Overview of Laboratory Testing. In *Stone Consolidation in Cultural Heritage: Proceedings of the International Symposium: Research and Practice: Lisbon, 6-7 May, 2008*. edited by José Delgado Rodrigues and João Manuel Mimoso. 389-98. Lisboa: LNEC, Laboratório Nacional de Engenharia Civil.
- Costa, Dória, and José Delgado Rodrigues. 2008. Consolidation Treatment of Salt Laden Materials: Methodology for Their Laboratory Study. In *11th International Congress on Deterioration and Conservation of Stone, 15-20 September 2008, Torun, Poland: Proceedings*. edited by Jadwiga W. Łukaszewicz and Piotr Niemcewicz. Vol. 2. 827-35. Toruń: Uniwersytetu Mikołaja Kopernika.
- Delgado Rodrigues, J. 2010. "Stone consolidation: research and practice." Paper presented at the International Symposium on "Works of Art and Conservation Science Today" Thessaloniki, Greece, 26-28 November 2010.

