

Air lime mortars: the influence of calcareous aggregate and filler addition

Ana Fragata^{1,a}, Rosário Veiga^{2,b}

¹Civil Engineer, PhD student, Laboratório Nacional de Engenharia Civil, (LNEC), Lisbon, Portugal

²Civil Engineer, PhD, Senior Researcher, Laboratório Nacional de Engenharia Civil, (LNEC),
Lisbon, Portugal

^aafragata@lnec.pt, ^brveiga@lnec.pt

Keywords: aggregates, calcareous aggregates, siliceous aggregate, filler, lime mortars.

Abstract. Many historical buildings with renders based in air lime still exist in Portugal. These old mortars have proved to be durable and reliable materials. However, new lime mortars prepared nowadays to be used in conservation practice, often present low strength in comparison with cement mortars.

This paper presents a study of the viability of improving the performance of lime mortars through the use of different nature aggregates (Tagus river siliceous sand and crushed calcareous sand) as well as different size distributions, varying the filler contents. For that purpose a set of mortars with volumetric proportion of 1:3 (lime:aggregate), using silicious sand from Tagus river or calcareous sand and including different volume percentages of aggregate replacement by filler (0% of incorporation, 5% of incorporation, 10% of incorporation), were prepared. An evaluation of the main characteristics of this set of mortars was made in terms of: i) hygric behaviour (water absorption by capillarity), and ii) mechanical resistance (flexural and compressive strength and elastic modulus). This study aims to assess the viability and possible advantages of using calcareous aggregate in lime mortars and to evaluate the possibility of improving characteristics through a better compaction obtained by the incorporation of different ratios of filler.