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Author Güney, Bilge Alp.

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Summary The use of lime mortars with pozzolanic additives is of special importance for the repair of historic masonry. In this study, the effect of pozzolanic materials on the final characteristics of mortars was investigated. Metakaolin, fly ash and historic brick powder were used as pozzolanic materials in mortar mixes with varying binder:pozzolan:aggregate ratios. Historic mortar samples from rubble stone masonry of Kahta Castle, a medieval structure in close vicinity of the Nemrut Dağ Monument, were also investigated to serve as a starting point for the preparation of repair mortars. Physical and physicomechanical tests, optical microscopy, chemical tests, SEM-EDX and XRD analyses were used to assess the properties of the historic mortars and repair mortars. Fat lime was found to be used in historic mortars with a high binder/aggregate ratio. They were observed to have relatively low density and high porosity with an average compressive strength of 7.4 MPa. Historic mortars were determined to have relatively high water vapour permeability and low water impermeability characteristics. In repair mortars setting was found to be predominantly due to carbonation along with pozzolanic reactions. However, abundant presence of stratlingite in mortars with added metakaolin indicated that the pozzolanic reactions preceded carbonation in those mortars. Use of pozzolanic materials increased the uniaxial compressive strength and modulus of elasticity of mortars compared with control samples. Using the same

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