



Historic Mortar Analysis

Purpose Statement:

The purpose of a basic acid digestion mortar analysis is to determine the approximate proportions of three principal components of historic mortars—aggregate, binder, and fines. Certain additives may also be detected via this method, but their proportions may not be accurately determined. A basic mortar analysis is primarily used to help ascertain general details about composition of a mortar for the purpose of recreating a historic blend or as a prelude to further instrumental analysis. Thus, this test is most useful for identifying whether cement, lime, and sand are present and in what quantities. Acid digestion can be an important part in developing plans for repairing and main-taining historic structures.

However, while this test protocol is useful for distinguishing general characteristics associated with different binders, it is important to note that the test is subjective, based on the interpretation of data and physical properties, rather than unequivocal. Interpretation relies not only on the data produced while testing, but also on observed physical characteristics such as color, texture, hardness, cohesiveness, and visual properties of aggregate. Additional clarification on specific properties or additives of a mortar, such as additional pigments, modifying additives, cement type, or mineralogy, would require further instrumental analysis (X-Ray Diffraction, SEM-XEDS, petrography, and other tests) which can be arranged at a client's request for fees to be determined on a case-by-case basis. It is important to note that testing cannot determine several other important factors in mortar which are difficult or impossible to accurately ascertain, including original water mix, mixing and pointing method, rate of drying, or original condition/origin of aggregate.

LimeWorks staff will use information gathered during this test to recommend a compatible material from our products and any additional steps or services if necessary or requested. These recommendations can be found in Section 3.0.

LimeWorks personnel conduct these analyses with care to produce accurate results to the greatest degree possible. However, it is up to the client to confer with owners, conservators, masons, and/or installers to determine material appropriateness, installation methods, and performance testing of recommended products beyond data provided by the manufacturer.