



International Course on Stone Conservation SC13

SESSION: Introduction to mortars – history, constituents and chemistry

INSTRUCTOR: John Fidler

TIME: Thursday, 2nd May/ 9:30 – 11:00 (1.5 hours)

SESSION OUTLINE

ABSTRACT

Most masonry walls rely on mortars for their construction. But mortars are also found in stone roofs, wall veneer and floor claddings, and as surface wall coatings (renders, stucco and plasterwork) besides floor finishes. Mortars consist of binders, aggregates and water. Common binders include clay, gypsum, air-lime, natural hydraulic lime, natural cement and ordinary Portland cement, and aggregates are usually based on sand. Dependent upon the binder type and its behavior, admixtures can also be included to amend the mortar characteristics during application and / or its performance during service life in the building. They include pozzolans (e.g., Pozzolana, rice husk ash, powdered brick dust, Trass, meta-kaolins, pulverized fuel ash, ground granulated blast-furnace slag) as set additives; set accelerators; set retarders (gluconates); air-entrainers / plasticisers; pigments; and fiber reinforcement.

This session provides an introduction to mortar binders, their historical development, constituents and manufacture and how they set with examples of their use.

OBJECTIVES

To provide an overview of mortar binders and mortar systems encountered in historic building construction and to highlight the similarities and differences between them. **Participants will be encouraged to discuss the binders and mortars used in their own countries.**

CONTENT OUTLINE

- Nature of binders and materials which are added to them;
 - how they have developed (e.g. Portland cement);
- differences in setting mechanisms of various binders;
 - how they have been applied and how they are affected by environmental factors.

READINGS

 = Essential reading material

 = Available online

 Ashurst, John. 2002. *Mortars, plasters and renders in conservation*. 2nd ed. London: Ecclesiastical Architects' and Surveyors' Association, pp 2-42.

Cummings, U. 1898. *American Cements*, 1st Ed., Chapters 1,2, 5 and 6, Rogers & Manson, Boston MA: facsimile reprint Chapman D (Ed.) 2006, Atlanta: Natural Binders Press.

SESSION OUTLINE CONT'D

Henry A. and Stewart J., eds. 2011, *Materials and History of Use*, Chapter 1, in English Heritage "Mortars, Renders and Plasters," Practical Building Conservation series. Ashgate: Farnham, pp 1-120

Hill, N., Holmes S., and Mather D. 1992. *Lime and Other Alternative Cements*. London: Intermediate Technology Group.

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