



Seminar Title: CE1 - Introduction to lime based mortars and traditional materials for the repair of civil engineering structures

Duration: 1 Day

Description:

This one day introductory workshop introduces the range of lime and early patented cement based mortars that have been used in the past for the construction of masonry arch bridges, culverts, tunnels, light houses, viaducts, canals, harbours, retaining walls, piers and other masonry structures which contribute so much to the richness of our built heritage. But in many cases, we are asking these structures to outperform any of the expectations that their original designers intended which can leave us with various 'headaches' to deal with, without spoiling their beautiful aesthetics. There are now a wide range of lime and natural cement binders and other additives (based on historic additives) that can be used to emulate both the technical and aesthetic performance of original mortars.

Learning Outcomes:

- Recognising common types of failures in masonry construction;
- Ability to recognise different types of mortar, what are original and what are later interventions;
- Understanding masonry unit construction in solid walls and the role of mortars;
- Identifying the mortar performance requirements of replacement mortars on different elements of a structure, including above and below high and low water marks, cut waters, piers, abutments, aprons and the like, bridge spandrel walls subject to heavy road traffic, parapets in general, retaining walls; embankments, undersides of arches, tunnel walls and the like;
- Use of additives to augment the working and final performance characteristics of replacement mortars;
- Design of appropriate mortars for repair, maintenance and conservation programmes of work;
- Making and using mortars with accuracy and consistency;
- Application and curing of mortars for repointing and rebuilding works.
- Appreciation of when it is appropriate to grout masonry structures and the principles of grouting.

Course Outline:

- Health and Safety issues
- Historic use of lime mortars and other early binders
- Common types of failures and remedies appropriate to masonry arch bridges and other mass masonry structures
- British and European Standards for building limes and natural cements
- Choosing appropriate sands and aggregates

- Additives for use in replacement mortars
- Best practice for proportioning materials for accurate and consistent mortar mixing
 - Inspecting masonry for repair works
 - Preparing masonry joints to receive replacement mortars
 - Techniques of working including the use of pinning stones
 - Placing of mortar for repointing
 - Joint finishing
 - Curing and protection regimes
- Principles of grouting mass masonry

Suitable for: This masterclass is suitable for Structural & Civil Engineers and their technicians including those that look after our roads and railway network, contractors working on unprotected masonry structures and custodians of our industrial heritage.