International Course on Stone Conservation SC13

SESSION: Masonry systems – stonework & mortar

INSTRUCTOR: John Fidler

TIME: Friday, 3rd May/ 9:30 – 11:00 (1.5 hours)

SESSION OUTLINE

ABSTRACT

This session focuses on stone and mortar (masonry) as parts of building construction systems including structural elements, components and finishes. Stone conservation is not limited to surface treatment of isolated objects such as free-standing sculpture. When stone belongs to a building, its structural role must be understood before any interventions are planned. Even when stone does not perform a structural role, as in floors, wall veneers or roof cladding, its relationship to the construction and to other building materials must be properly understood. Nearly every culture has made use of stone in masonry, yet masonries can be very different from one another: examples will be presented to show various ways in which stone and mortar can work together. Basic structural forms – column, architrave, wall, vault, dome etc., will also be presented with examples and their typical failure discussed.

OBJECTIVES

- To understand the use and function of stone not merely as a single element or as a surface, but as part of a building or architectural system;
- To understand the fundamentals of the structural nature of masonry;
- To be able to identify a few of the most common stone structural systems and explain their behavior.

CONTENT OUTLINE

This session will cover the different uses of stone for structure, construction, and floor, wall veneer and roof cladding. We will explore the implications of stone as it functions as part of a whole system, the need to look beyond the surface, the characteristics of traditional structures, and the relationship and uses of mortar and stone. We will review different types of masonry systems and how different elements function within those systems; e.g., from dry stone wall construction; why wood ties are often embedded in masonry; how columns can be built of monolithic stone, stone drums and stone cladding; the function of architraves, masonry walls, arches, vaults, metal ties, spires and domes.

READINGS

🕮 = Essential reading material
💻 = Available online

Mainstone, R. J. 2001. *Developments in Structural Form*. 2nd ed. Oxford and Boston: Architectural Press.

Warland, E. G. 1929. *Modern Practical Masonry*. 1st ed. Batsford, London; Reprint Shaftesbury: Donhead, 2006

McKay W. B. 1971. *Building Construction*, Volumes 1 &2, Longman, London especially Vol 1, Chapter 2 Masonry Walls," pp 35-55 and Vol 2, Chapter 3, "Masonry," pp 94-129.

Heyman J. 1995. *The Stone Skeleton: structural engineering of masonry architecture*. Cambridge: Cambridge University Press.

Hill P and David J.C. E. 1995. *Practical Stone Masonry*. Shaftesbury: Donhead.