

# The plaster ceilings of Buckingham Palace and Windsor Castle: their construction, condition and conservation

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## CASE STUDY - ABSTRACT

Following the partial collapse of the Apollo Theatre ceiling in London in 2013 professional guidance was introduced requiring the inspection and certification of all historic plaster ceilings by suitably qualified plaster specialists and structural engineers. Consequently Alan Conisbee & Associates were engaged by the Royal Household Property Section to inspect and assess the unique and prestigious historic plaster ceilings and their supporting structure within Buckingham Palace and Windsor Castle, each of international historic significance and importance in differing but distinct ways. Both buildings are Grade I listed residences of the United Kingdom's sovereigns and are regularly used for state visits, investitures, receptions and public tours. Windsor Castle is also a Scheduled Monument and the largest continuously occupied castle in the world.

The ceilings in both buildings are generally of the early- to mid-19<sup>th</sup> century and constructed from lath and plaster, significantly augmented at Windsor Castle by several 17<sup>th</sup> century ceilings and much older supporting structure. Conisbee together with plaster specialist Richard Ireland and members of the wider team assessed the condition of the ceilings, analysed their integrity and undertook essential monitoring and repairs requiring detailed 'hands on' inspection of 128 ceilings in total throughout Buckingham Palace and Windsor Castle. This constitutes a total area of 13,000m<sup>2</sup> and is the largest known single assessment of historic lath and plaster ceilings ever undertaken.

This paper presents the key challenges of the project included the facilitation of temporary access to ceiling soffits often high above floor level and located within significant historic interiors, encapsulation and removal of asbestos from complex and delicate historic plasterwork, provision of safe access routes above ceiling level to enable future inspection and maintenance, and inspection of historic structure within constrained and often inaccessible spaces requiring the use of high quality photogrammetry and three dimensional point cloud surveys to understand ceiling morphology monitor and monitor non-planar movement and form the basis for future conservation projects.

We discuss the nature of the defects discovered including insect- and moisture-related degradation of timber, localised failure of timber-to-timber connections, and the assessment and repair techniques adopted. We also discuss the key project outcomes including a best practice methodology for the inspection and appraisal of historic plaster ceilings together with an evaluation of the practicalities of accessing these challenging spaces. We also present the research currently underway to investigate the load resistance of handmade square cross section wrought iron nails which are a common feature of the timber-to-timber connections above the ceilings throughout Buckingham Palace and Windsor Castle.

### **Keywords:**

Historic, Structure, Plaster, Ceilings, Lath, Nails, Timber, Inspection, Assessment, Monitoring

### **References:**

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