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2013 MSc Research Grant Scheme – Executive Summary

Project title:
Passive Lock-in Thermography for internal defects and moisture mapping in masonry arch structures

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Nottingham Trent University

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Project summary:
This study makes a practical assessment as whether it is possible to use a passive lock-in method of thermographic imaging in order to detect internal defects and moisture mapping in masonry structures. Essentially it asks the question as to whether passive thermographic techniques can exploit natural heat cycles in order to optimise the thermographic imaging results. Previous research has been conducted on passive thermographic techniques, but less focuses on specific practical applications.

A more effective means to survey for internal defects and moisture in masonry construction is necessary to facilitate effective remedial repairs; which are often hampered by the lack of information that can be made conveniently available. This is important because these issues have the potential to threaten up to an estimated 120,000 masonry arch structures which are in current service in the UK's transportation network today.

Whilst the passive lock-in thermographic technique shows potential to be implemented for such use; it is clear that obtaining accurate results in the practical assessment of masonry structures is inundated with potential difficulties. Future study would need to analyse in greater detail external effects on imaging results (predominantly weather conditions) and the effective use of pixel processing software; in order that the technique could become a reliable method for professionals to implement for means of assessing the internal condition of masonry construction.