

## Project Snapshot

Company: PAYE Stonework and Restoration  
Business: Repairing and conserving historic buildings

Project: Developing, testing and implementing a novel, resource efficient, cleaning system using a natural substance, ice

Building Services

## The new ice jet that cleans our most treasured buildings

A novel ice particle system replaces damaging chemical alternatives

Repairing and conserving historic buildings has become a very important and highly skilled area of work requiring a thorough understanding of both traditional construction and new technology. PAYE Stonework and Restoration have an impressive history of cleaning many of our country's national monuments including The Tower of London, St Pancras Station, The Savoy Hotel and Westminster Cathedral to name just a few. In recent years however it has become apparent that with constraints on both time and resources and pressure from environmentalists, the old systems of using abrasives or chemicals to clean buildings, which are both damaging to the building and the environment, needs to be revolutionised. A KTP project with London South Bank University has done exactly that.

In developing PAYE's initial ideas, KTP Associate Alex Paurine has gone on to develop, test and implement a novel, resource efficient, cleaning system using a natural substance, ice. This technology will provide a more efficient and sustainable cleaning service that will settle concerns over the environmental credentials of the current chemical technologies that are being used, which are not only energy and water intensive but allow residual chemicals to pollute the surrounding area and in many cases aggressively damage the building's surface. "We

are really looking forward to using more sustainable, environmentally friendly technology to conserve our nations heritage," says Adrian Paye, Managing Director at PAYE.

The first stage Alex needed to work on was creating an ice crusher that crushed the ice to the right size for cleaning. He then constructed an air motor that would run the crusher and then designed and manufactured the jet pump which sucks the ice particles into the hose and the cleaning gun that is actually held by the cleaning operator. "The new machine uses much greener technology as it actually runs on air. The new system has also been designed so it only needs one person to operate it, a real money saver for PAYE," comments Alex. The project is now at the final testing stage before it can be dismantled and taken to site for use. "I also needed input from PAYE cleaning staff as they are going to be the ones using the machine. Their opinions were critical when designing the cleaning gun as I needed to know how heavy it needed to be and how it needs to be held against the body," explains Alex.

The construction of this machine has taken place in the fully equipped LSBU technical workshops and has been supervised by LSBU's engineering experts, Professor Graeme Maidment and Dr Alan Dunn. "The PAYE project has provided a fantastic cross disciplinary collaboration. It is great to work with such a forward thinking, innovative company who are pushing the boundaries, and by working outside our normal field has

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