

UNDER PRESSURE

Can modern underground waterproofing systems control the River Thames in full flood?



▲ View from bedroom during flooding



▲ Rear pump outlet



▲ The flooding – view from above



▲ The flooding – view from a boat



▲ Front pump outlet

Graham Stone (Stonehouse Property Care LTD) relates a success story ...

At a recent BWPDA regional meeting one member company stated that his company avoided 'tanking' works due to the high risk of failure" and subsequent costs. Driving back to the office I could not help but muse over the Boathouse project we had recently completed.

We received an enquiry relating to an old boathouse on the River Thames, which originally had a wet dock but had been back filled many years ago and capped with a concrete floor. The client wished to use the ground floor for a bedroom, but during the last flood the water level had reached 500 mm internally. Could we design and install a 'basement' waterproofing system that would remain dry even under these extreme conditions?

To be honest, I wasn't sure, but really it's no different to waterproofing a basement where the water table rises and falls, just this was visible.

I recommended the client employ Phil Hewitt Associates and confirmed that if he were comfortable with the design principle, then we would happily carry out the works to his specification and guarantee it!

Phil's greatest concern was one of floatation and so it was recommended that the slab be increased by an additional 250 mm of reinforced concrete. Both Phil and I preferred a cavity drain membrane system as both had experienced excellent results in very wet basements over the previous years.

The Boathouse had ground floor thresholds, and so

the doors and windows to the front elevation were to be blocked up using high-density concrete blocks to prevent the floodwater entering at these gaps in the structure. The client decided what the minimum height of water protection was reasonable and new windows were constructed at this point.

System 500 by John Newton and Co. Ltd. was decided upon as the cavity drain waterproofing system, with Newton 500 Lath chosen for the walls, Newton 520 to the floor with a Basedrain ring around the perimeter. Two Newton Titan sump chambers were installed, each with a NP1 and NP3 sump pumps included, together with a Newton NP12 Battery Back-up Pump System.

In designing the system we were expecting the structure to resist water ingress to a rate of flow that would be comfortably managed by the waterproofing system. Our experiences had proven that even in very wet conditions, the rate of water ingressing the structure was relatively low, and that to date, water ingress had always proven to be much lower than the capacity of the pumps. Rather than holding water pressure back, we accepted the river would penetrate the structure and it would then be pumped out in much the same way as a boats' bilge pump, faster than the water enters. The theory was sound, but would we really be able to prevent a one-metre deep River Thames from ingressing the opulent bedroom?

The system is designed so that ingressing water is depressurised by the Basedrain and then moved around the Basedrain ring to the two Titan Sump chambers. The chambers each had 40mm discharge lines exiting the structure just below the windowsills where water could be pumped out. Both pump systems had non-return

valves fitted so should the river rise over the level of the pipe the pumps would still be effective.

Stonehouse installed the system in little over a week, and water tested it before and after the screed was laid and awaited the first real test.

This major test happened in January 2003 and even with Old Father Thames bearing against the property to a depth of over one metre, the waterproofing system coped with the water ingress as designed. At the height of the flooding all 3 pumps in each sump chamber were operational.

As can be seen from the photographs the system was fully successful.

The system is subject to an annual maintenance contract for which we recommended David Bucknell of Basetec. The provision of maintenance jetting eyes allow the Basedrain to be jetted out, the chambers cleared of any sediment (very little, the building acted as an excellent filter!) and the pumps to be cleaned and tested.

This does illustrate the importance of employing specialist companies who know what they are doing. It is no coincidence that all the people involved in the above project are members of the newly formed S.W.G. and have the ability and knowledge to understand water penetration of buildings and design systems that can **control** the water ingress.

Contractor:
Stonehouse Property Care Ltd.01491 577560

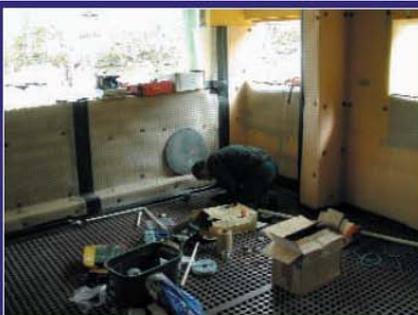
Consultant:
Phil Hewitt Associates 01626 830214

Maintenance:
Basetec Supplies Ltd.01603 483122

Manufacturer:
John Newton & Co. Ltd. 020 7237 1217



▲ Pump chamber maintenance by Basetec



▲ Fitting the pumps, note the blocked up front entrance and reduced depth windows.



▲ Screen laid

All joints in membrane were overteped for added security



▲ The flood test upon completion of works



▲ The completed bedroom