

Project name	Hampton Waterworks		
Design note title	Basement Impact Assessment		
Client	Waterfall Hampton Investment Ltd		
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1. INTRODUCTION

Hydrock have been engaged by the developer of the Hampton Waterworks site to advise on civil and structural engineering matters related to the proposed conversion of the existing Listed buildings. Hydrock are also engaged in various other disciplines, including Flood Risk Assessment and Geotechnical / Geoenvironmental engineering consultancy.

This note has been written in accordance with LB Richmond Upon Thames' Basement Assessment User Guide document, and is in response to the Planners' comments that a Basement Impact Assessment should be provided to support the engineering proposals.

2. SITE SCREENING ASSESSMENT

2.1 Site description

The development site comprises four buildings arranged along an east-west axis alongside Upper Sunbury Road outside the village of Hampton.



From west to east, the four buildings are:

- Karslake Waterworks building (comprising 3 adjoining blocks in a line)
- Workshop building
- Waterworks cottages
- Ruston Waterworks building (comprising 3 separate blocks in L-shape, adjoining a workshop retained by Thames Water; hence a party wall)

2.2 Topography

The site itself is about 6400m² area and generally flat, roughly following the road levels, although the site stands a little above the road at the east end and a little below it at west end.

2.3 Ground conditions

A separate Phase 1 Ground Conditions Desk Study report has been undertaken by Hydrock and submitted to Planning, report reference 12193-HYD-XX-DS-RP-G-1000. Further detailed reference should be made to that document, but the salient points are outlined below.

2.3.1 *Geotechnical conditions*

The ground conditions are thought to be river terrace gravels on London Clay. The area was historically reclaimed from the Thames river basin, so there is a possibility of made ground or alluvial material overlying the gravels. That said, there is no evidence of any subsidence issues to buildings or ground slabs. Also there is no historical or visual evidence of any levels re-working since the waterworks have been in existence that might suggest extensive made ground.

2.3.2 *Geoenvironmental conditions*

There is no visual or olfactory evidence of widespread contamination, although there are some discarded oil drums and some oil tanks present and hot spots of TPH's may exist.

2.4 Hydrology

No intrusive ground investigations have been undertaken, although shallow (6m deep) record boreholes on the BGS website taken near the site suggest some ground water seepage at 3-4m below ground level.

The desk study suggests some potential for groundwater flooding.

2.5 Flood risk

A separate Flood Risk Assessment report has been undertaken by Hydrock and submitted to Planning, report reference 12193-HYD-XX-XX-RP-FR-0001. Further detailed reference should be made to that document, but the salient points are outlined below.

The site has been concluded as being at a low risk from all assessed sources of flooding.

The proposed development is therefore concluded to meet the requirements of the Sequential Test. The proposed scheme will not result in a loss of floodplain storage or redirect any surface water overland flows onto adjacent land / properties.

Preliminary surface and foul water Drainage Strategies have been prepared (via separate report) which demonstrate that the site can be satisfactorily drained without detrimental effects to third party land.

3. EXISTING BUILDINGS

3.1 Structural description

The two main buildings, Karlake and Ruston are similar in form and character. They both comprise a pair of tower blocks book-ending a single storey central range. They are Victorian Grade II Listed loadbearing masonry structures. The various blocks were built in sequential phases between 1853 and 1882.

The ranges were originally the boiler houses and are single storey with no basement.

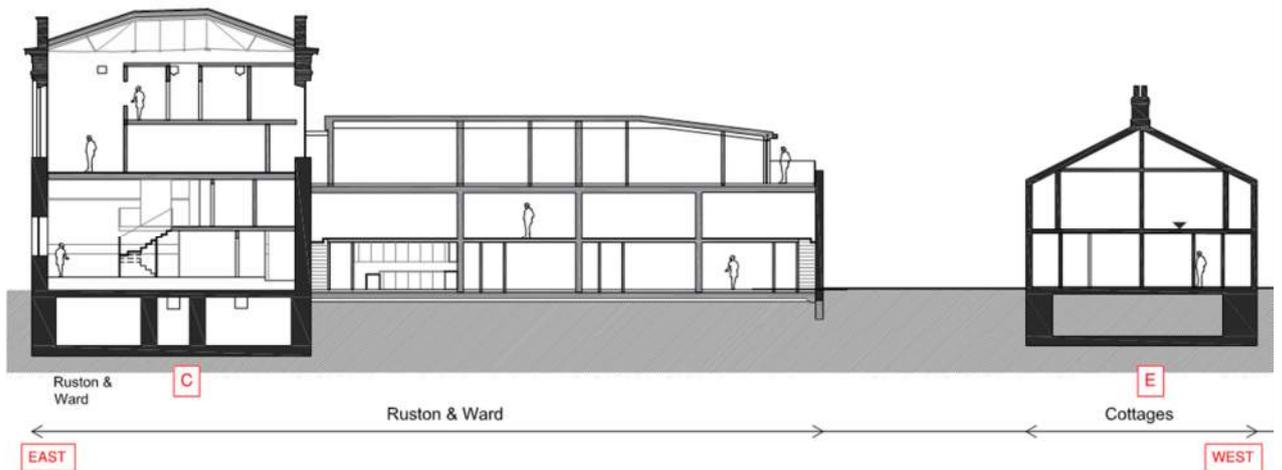
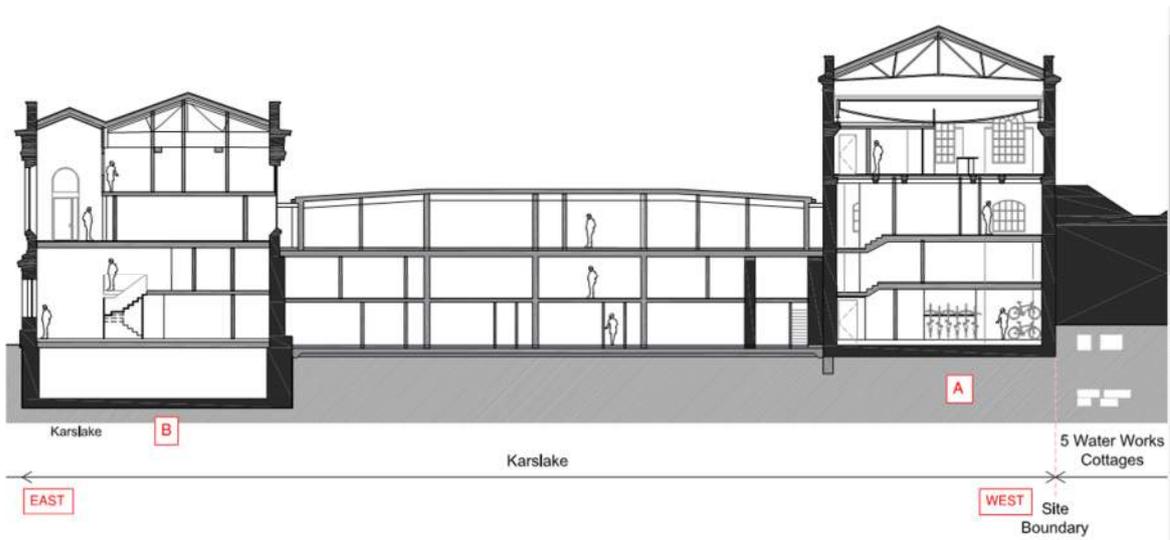
The towers were originally pump houses, and there are some basements present as follows:

- A. West tower block to Karlake – a partial basement / undercroft. The west gable end partially retains ground and the east elevation has an “at grade” ground level entrance.
- B. East tower block to Karlake – a full basement exists.
- C. East tower block to Ruston - a full basement exists.
- D. Workshop adjoining Ruston - a full basement exists.
- E. Cottages – a small basement exists in each cottage

The areas of basements are referenced and highlighted in red on site plan below.



Site sections through the Karslake and Ruston / cottages buildings respectively are presented below, with basement references accordingly.



3.2 Structural condition

Structural site inspections have been undertaken in all buildings except the cottages which were not accessible at time of survey.

All buildings were generally in very good structural condition with generally only minor defects present associated with age and decay. The defects were entirely within the expected context of such buildings of this age.

Notable defects in the context of the basements are as follows:

- Karslake west tower (area of basement B) shows roof leaks and timber decay in the roof structure. Leaks reported date from the 1960's.
- There is standing water in the Karslake west tower basement B. Depth estimated to 600mm deep.

4. BASEMENT PROPOSALS

The proposed development works within the context of basement works are as follows.

4.1 Building structures

- Karslake east tower "undercroft" is to be brought into residential use as a cinema / gym room for the residents. The ground floor slab will be removed and a new insulated ground slab installed, with FFL's to match existing ground levels. There will be some lowering of sub-base associated with this work. There are no other structural alterations or enlargement associated with the space.
- Karslake east tower "undercroft" will be subject to tanking works to retained walls. The specification of such works is subject to intrusive ground investigation and detailed design development. However it will entail double protection layer in accordance with requirements for a Grade 3 habitable basement as described in BS8102.
- Karslake range is to be brought into residential and plant room use. The ground floor slab will be removed and a new insulated ground slab installed, with FFL's to match existing ground levels. There will be some lowering of sub-base associated with this work.
- Karslake west tower basement is to be brought into residential use. The ground slab will be retained and a new insulated screed installed. There are no other structural alterations or enlargement associated with the space.
- Karslake west tower basement will be subject to tanking works to retained walls. The specification of such works is subject to intrusive ground investigation and detailed design development. However it will entail double protection layer in accordance with requirements for a Grade 3 habitable basement as described in BS8102. A possible solution would be internal tanking and cavity wall drainage.
- Ruston range will be subject to the same works as Karslake range.
- Ruston tower and workshop basements will subject to the same works as Karslake tower basement. It is noted that there are no major civil or structural defects present in these areas within the context of basement waterproofness.

- The cottages have not been accessed. It is presumed they will also be subject to tanking improvements on the same lines as the Ruston and Karlake basements.

4.2 Below ground drainage

A separate Drainage Strategy report has been undertaken by Hydrock and submitted to Planning, report reference 12193-HYD-XX-ZZ-RP-C-0001. Further detailed reference should be made to that document, but the salient points are outlined below.

- The strategy adopts good practice SUDS features within the design proposals to reduce the run-off from the site to the local surface water outfall. This is in line with the Lead Local Flood Authority's requirements and policies.
- The scheme entails all surface water collected on the ground going directly through permeable paving into a tanked stone sub-base which contains and attenuates the flow. It is released to the existing surface water sewer at a lower rate than existing.
- Roof drainage is collected via existing rainwater pipes and discharged into the existing surface sewer as per the current arrangement.

This strategy of collecting the surface water run off from the ground and discharging it in an engineer manner is seen as a betterment to the existing surface water arrangement which is presumed to be soaking into the ground and possibly contributing to the observed collected water in the basement.

5. BASEMENT IMPACT ASSESSMENT

5.1 Subterranean characteristics

The basement is an existing structure. There are no proposals to create new basement space, nor alter in any way the existing basement.

There are no recorded existing subterranean characteristics that would affect the proposed basement works, given no physical structural alterations are proposed.

The groundwater noted on historical records is described as seepage and as such there is an acceptably low level of risk associated with high groundwater flows acting on the basement walls.

It is acknowledged that the reason for the ponded water in Karlake east tower is not clear. Anecdotal reports suggest it is from roof leaks, but it could be ground water ingress through the structure. When intrusive surveys and design development progresses, it is proposed that the basement water will be tested, pumped out and disposed of in appropriate manner. At that point structural inspections and groundwater monitoring will be undertaken to inform on tanking measures.

All existing basements will be tanked to meet habitable basement standards.

5.2 Land stability

The Phase 1 geotechnical desk study does not record any risk of land stability. The land is noted as having been raised in the past, but given the site has been developed for 150 years with no apparent ground related problems no risk is perceived in this regard.

The works themselves do not require any structural alterations to deepen, enlarge or otherwise alter the basements. There will be shallow excavations “at grade” for new foundations and sub-base works but this will clearly not present any land stability issues.

5.3 Flood risk

No flood risk issues are perceived. Given the basements are existing there will be no consequential loss of storage space. The FRA has considered the impact of the scheme as a whole and not identified and concerns.

5.4 Drainage

The proposed drainage strategy will collect all surface run-off across the site and discharge through tanked sub-bases to piped outfall. As such any surface run-off that might have been contributing to basement leaks will be removed as part of the works.

6. CONCLUSION

As there are no proposals to create new or alter any existing basement spaces at the project it is therefore concluded that there are no adverse impacts due to the proposed at this development.

Finalised designs of basement conversion are subject to intrusive site investigation and design development works yet to be progressed. They will not extend beyond minor repairs, waterproofing and thermal upgrade works.