Linden Wates (West Hampstead)

Basement Hydrology Assessment

Proposed Residential Development - Former Gondor Gardens Reservoir.

880113 BIA R5 (1)

JANUARY 2012

RSK

RSK GENERAL NOTES

Project No.: 880113 BIA R5 (1)

Title: Proposed Residential Development - Former Gondor Gardens Reservoir

Client: Linden Wates (West Hampstead)

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Status: Final

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1 HYDROLOGY (SURFACE FLOW AND FLOODING SCREENING)

This section of the report provides requisite hydrological information for the purpose of 'surface flow and flooding' screening in accordance with CPG4 and addresses all questions raised within that section of the document. A table summarising the screening flowcharts is shown below.

Question	Answer	Evidence	Further Action Required?
Is the site within the catchment of the pond chains on Hampstead Heath?	No	Section 2.0 and 2.1	No
As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run off) be materially changed from the existing route?	No	Section 3.0	No
Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	Section 3.0	No
Will the proposed basement result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No	Sections 2.0 and 3.0	No
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	Sections 2.0 and 3.0	No
Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	No	Section 4.0	No.

2 NEAREST WATERCOURSE

There are no ponds, streams or drainage ditches on or adjacent to the site, and with reference to current and historical map data and figures 12 and 14 of the ARUP report, the site is not within the vicinity of any sensitive surface water features or surface water catchment and drainage areas.

The nearest identified surface watercourse to the site are the Hampstead Heath Ponds, located approximately 2000m north east of the site. Three tributaries of the River Westbourne formerly ran to the north east and south of the site, some 1500m to 2000m from the site, but these watercourses have long since been diverted into the London sewer system.

The site is not located in an area where any known sensitive springs, shallow wells or watercourses are present and the proposed development works are, therefore, not considered to present a risk to, or likely to affect any changes to, any shallow hydrological features.

2.1 Springs, Wells and Watercourses

The geological boundary between the Claygate Beds and the London Clay Formation, which may potentially form a spring line, is mapped as lying approximately 50m to the north of the site. Although not shown on the historical maps, it is likely that springs were present in the area, feeding two water courses running some 1500m to 2000m to the east and south of the site. Since the urbanisation of the area, these watercourses are no longer shown on the maps, and it is very likely that they are culverted. However, the geological conditions found to prevail at the site and its immediate environs do not appear conducive to the formation of springs. It should also be noted that the area surrounding the site is heavily urbanised.

3 DRAINAGE AND SURFACE COVER

The proposals for the site include the uncovering of an existing reservoir. The cap of the reservoir would have acted as an impermeable surface and the removal will allow natural infiltration to occur. A GI for the site has confirmed that a thick clay layer (Circa 30m) underlies the site, therefore minimal infiltration will occur. Surface water generated from the developed site will be managed at source where possible, and will be pumped into the Thames Water sewer located within Gondor Gardens Road (Subject to approvals) at a rate to mimic the Greenfield run off rates from the site. Flow in excess of this will be retained on site.

The presence of London Clays below the base of the reservoir could result in a perched groundwater level. However as the site is to be landscaped away from the properties the flood risk from groundwater flows reaching the surface will be mitigated against. According to the GI for the site groundwater was not encountered in the boreholes, with the exception of BH1 where groundwater seepage was identified 13.0mbgl. The development will not significantly alter the hydrogeology of the area and groundwater levels are therefore not expected to vary from that at present.

4 FLOOD RISK

Information provided within the Risk Assessment report confirms that the site does not lie within 250m of any Zone 2 or Zone 3 Environment Agency Flood Zones. Additionally, there are no EA classified floodplains, flood defences, or areas benefitting from flood defences within 250m of the site. The report also confirms that there are no areas used for flood storage within 250m of the site.

Reference to the EA website indicates that the site does not lie within an area shown as being at risk from flooding from reservoirs.

With respect to potential flooding from surface water run-off, Figure 15 of the ARUP report shows a flood map for LB Camden. An area shown as an 'area with the potential to be at risk of surface water flooding' is indicated lying close to the site. This area could be associated with a topographic low points associated with railway cuttings. The identified area is at a localised site-specific scale, therefore, considered unlikely to present a significant risk to the site.

CPG4 provides a list (p.29) of streets in LB Camden that have historically been affected by surface water flooding. The site is not located within one of these areas and the proposed development will consider the impact of the development to ensure flood risk is not increased.

A number of Thames Water sewers have been identified in close proximity to the site. The adopted mains sewers in the area are a combined sewer accepting both foul and surface water run-off. The nearest sewer to the site is along the western boundary, where a 940mm x 635mm sewer flows in a southern direction. According to the sewer records supplied by Thames Water, a connection point existing to the southwest corner of the site, it is proposed to utilise this connection for the development.

Most adopted surface water drainage networks are designed to the criteria set out in Sewers for Adoption. One of the design parameters is that sewer systems be designed such that no flooding of any part of the site occurs in a 1 in 30 year rainfall event. By definition a 1 in 100 year event would exceed the capacity of the surrounding sewer network as well as any proposed drainage.

When exceeded, the surcharged pipework will lead to flooding from backed up manholes and gully connections. This will lead to immediate flooding within highways surrounding the site. There are no known issues with exceedance of the sewer system in this area.

Information provided within the Flood Risk Assessment report and additional geological data indicates that there is a negligible groundwater flooding risk. According to the GI for the site groundwater was not encountered in the boreholes, with the exception of BH1 where groundwater seepage was identified 13.0mbgl. Therefore groundwater inundation on the site is not expected

The Level 1 North London Strategic Flood Risk Assessment (SFRA) was completed in August 2008 and provides a useful regional overview of various forms of flood risk, however, the SFRA is not designed to provide the relevant detail at a site-specific scale. A brief review of the regional SFRA mapping has confirmed that the site lies in Flood Zone 1 and has not been affected by any other forms of flooding in the past.