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# KILN PLACE, CAMDEN

# FLOOD RISK ASSESSMENT

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# 1. INTRODUCTION

## 1.1. Brief

1.1.1. Ramboll has been instructed by EC Harris on behalf of Camden Council to assess the potential of flood risk to and from a proposed development at Kiln Place in Gospel Oak within the London Borough of Camden (LBC). It is understood that the assessment will be used to support the specification of detailed design and submission of the planning application for the development.

1.1.2. The proposed development includes new housing and improved landscaping at the existing Kiln Place social housing estate. The proposals cover six sites within the existing estate and comprise 15 new dwellings, including town houses, maisonettes and one new flat.

## 1.2. Planning Policy

1.2.1. The potential consequences of inappropriate development in a flood risk area for occupiers, either of the development or elsewhere, pose significant risks in terms of personal safety and damage to property.

1.2.2. The National Planning Policy Framework, NPPF (DCLG, 2012a) includes government policy on development and flood risk stating that:

1.2.3. *'When determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:*

- *Within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and*
- *Development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.'*

1.2.4. Technical Guidance to the NPPF (DCLG, 2012b) requires that at the planning stage, the developer should prepare and submit an appropriate flood risk assessment (FRA) to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed at the present time and while taking climate change into account.

1.2.5. The London Plan (2011), as updated by Revised Early Minor Alterations (2013), reiterates national policy on flood risk through Policies 5.12 and 5.13. Policy 5.12 'Flood Risk Management' states that:

1.2.6. '*Development proposals must comply with the flood risk assessment and management requirements set out in the NPPF and the associated Technical Guidance on flood risk over the lifetime of the development…'*

1.2.7. Policy 5.13 'Sustainable Drainage' states that:

1.2.8. *'Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the … drainage hierarchy.'*

1.2.9. Camden Council's local policy for flood risk management is set out within Core Strategy policy CS13 '*Tackling climate change through promoting higher environmental standards'* and Development Policies DP22 *'Promoting sustainable design and construction'*, DP23 '*Water*' and DP27 '*Basements and lightwells'*. Further information on the implementation of these policies is provided in the Camden Planning Guidance, CPG3 '*Sustainability*' and CPG4 '*Basements and lightwells'* relating to flood risk specifically.

1.2.10. Core Strategy policy CS13 requires developments to ensure that buildings and spaces are designed to cope with and to minimise the effects of climate change. This is further elaborated within DP22 which requires developments to be resilient to climate change by ensuring schemes include appropriate climate change adaptation measures, such as limiting runoff and including pervious surfaces, in order to enable water to infiltrate the ground, to reduce clay shrinking and flooding.

1.2.11. The requirements set out in DP23 'Water' are as follows:

1.2.12. *'The Council will require developments to reduce their water consumption, the pressure on the combined sewer network and the risk of flooding by:*

*a. Incorporating water efficient features and equipment and capturing, retaining and re-using surface water and grey water on-site;*

*b. Limiting the amount and rate of run-off and waste water entering the combined storm water and sewer network through the methods outlined in part a) and other sustainable urban drainage methods to reduce the risk of flooding;*

*c. Reducing the pressure placed on the combined storm water and sewer network from foul water and surface water run-off and ensuring developments in the areas identified by the North London Strategic Flood Risk Assessment and shown on Map 2 as being at risk of surface water flooding are designed to cope with the potential flooding;*

*d. Ensuring that developments are assessed for upstream and downstream groundwater flood risks in areas where historic underground streams are known to have been present; and*

*e. Encouraging the provision of attractive and efficient water features.'*

1.2.13. In addition, DP27 'Basements and lightwells' states that:

1.2.14. '*The Council will only permit basement and other underground development that does not cause harm to the built and natural environment and local amenity and does not result in flooding or ground instability.'*

1.2.15. Further information on the flood risk and its management strategy within the Borough is set out in the North London Strategic Flood Risk Assessment (SFRA) (Mouchel, 2008), Preliminary Flood Risk Assessment (PFRA) (Halcrow, 2011a), Surface Water Management Plan (SWMP) (Halcrow, 2011b) and Camden Flood Risk Management Strategy (2013).

### 1.3. Objectives

1.3.1. The objectives of this report are as follows:

- Identify and assess all sources of flooding to and from the proposed development in accordance with national, regional and local planning policy;
- Assess the suitability of the proposed site in flood risk terms;
- Advise on any necessary flood mitigation measures.

### 1.4. Constraints and Limitations

1.4.1. This report has been prepared for exclusive use by Camden Council for planning purposes. No other warranty whether express or implied is made to third parties in respect of the information presented within this report. Any liability arising out of the use by Camden Council or any third party of this report for purposes not wholly connected with the above shall be the responsibility of Camden Council and such third party who shall indemnify Ramboll against all claims, costs, damages and losses arising out of such use.

1.4.2. Ramboll has endeavoured to assess all available information during this site appraisal. This report summarises information provided from a number of external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.

1.4.3. The flood risk assessment addresses the flood risk posed to the proposed development and from it. The extent of the proposed development is shown in Figure 1.1. Any substantial changes to the proposed development extent and/ or use will require a reassessment of the implications of the risks identified. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

1.4.4. 

## 2. SOURCES OF INFORMATION

2.1.1. The information contained in this report is based on a review of readily available information pertinent to the site and consultation with relevant stakeholders. These are summarised below.

### 2.2. Records Review

2.2.1. Key documents and websites reviewed for this assessment are listed in Table 2.1.

**Table 2.1: Key information sources**

| Document/ website | Author/ Publisher | Date |
|---|---|---|
| North London Strategic Flood Risk Assessment | Mouchel | 2008 |
| London Borough of Camden Local Development Framework | Camden Council | 2010 |
| Preliminary Flood Risk Assessment (PFRA) | Halcrow | 2011 |
| Surface Water Management Plan (SWMP) | Halcrow | 2011 |
| Camden Flood Management Strategy | Camden Council | 2013 |
| Floods in Camden, Report of the Floods Scrutiny Panel | Camden Council | 2003 |
| Site Investigation Report | Ground Engineering | 2011 |
| GroundSure Data Report | GroundSure | 2011 |
| Environment Agency (EA) - online environmental data ('What's in Your Backyard?') | Environment Agency | Accessed January 2014 |
| Gospel Oak Flood Risk Study | Royal Haskoning DHV | 2013 |
| Thames Water Asset Location Search | Thames Water | 2013 |
| Kiln Place Infill Sites: Design and Access Statement Planning Report | Peter Barber Architects | August, 2014 |
| Kiln Place: Ground Investigation Report | Ramboll | 2014 |
| PBA existing and proposed site layout drawings | Peter Barber Architects | 2014 |
| Kiln Place Preliminary Investigation Report | Thames Water | 2014 |

### 2.3. Consultation

2.3.1. A summary of stakeholders consulted to date is presented in Table 2.2, with correspondence records reproduced in Appendix A.

**Table 2.2: Summary of consultation**

| Consultee | Date | Form of consultation | Summary of key points raised |
|---|---|---|---|
| London Borough of Camden (LBC) | 11/10/2013; 15/10/2013 | Email | • Drainage and surface water should be managed at source or as close to the source as possible, using SuDS techniques.<br>• Plans and application documents should describe how water will be managed within the development, including an explanation of the proposed SuDS and the reasons why certain SuDS have been ruled out.<br>• Developments need to achieve a Greenfield surface water run-off rate, once SuDS have been installed. As a minimum, surface water run-off rates should be reduced by 50% across the development.<br>• The public highway on the north-western corner of Kiln Place is deemed as a flood risk area. This is due to the existing public sewer being over capacity, and floods during a 1 in 40 year event. Therefore, it is essential that flows upstream of this zone are not increased.<br>• Any additional measures that could potentially reduce flows further to improve the existing condition should be considered. |
| Environment Agency (EA) | 04/10/2013 | Email | • No objection to the scheme.<br>• General advice on surface water management.<br>• Advised to adhere to the London Plan 2011, where it conflicts to NPPF. |
| Thames Water (TW) | 23/10/2013;<br>28/10/2013 | Email | • A build-over licence across an existing sewer within Site 1 will not be granted, as the sewer in question is an important 1395mm diameter trunk sewer.<br>• 3m offset from either side of the sewer would be required.<br>• Section 185 Application for a diversion of this sewer is suggested.<br>• All other connections will be assessed individually subject to a formal application. |
| | 12/06/2014 | Meeting | • Thames Water has reviewed revised proposals for Site 1 to consider a build-over agreement.<br>• Thames Water requested a CCTV drainage survey of all connections into the culvert.<br>• The abandoned brick egg sewer will need |

| Consultee | Date | Form of consultation | Summary of key points raised |
|---|---|---|---|
| | | | to be divested, Thames Water to confirm whether this is possible.<br>• Site proposals to be reviewed by Thames Water consultant GCG, where recommendations for acceptance will be made. |
| | 29/07/2014 | Thames Water Report | • Thames Water issued a Preliminary Investigation Report to highlight effects of the Kiln Place development on the culvert.<br>• The existing drainage connections in to the culvert may potentially require diversions around the proposed development<br>• The 3m easement Thames Water requires at ground level over their assets may potentially be enforced. |
| | 22/08/2014 | Phone | Discussion of the requirements for the Structural Impact Assessment (SIA):<br>• Construction method<br>• Vertical offset of the culvert to the buildings<br>• Piling method<br>• Method of analysis for assessing anticipated ground movements<br>• Offset from the additional existing connections which run under site 1 |
| | 17/09/2014 | Phone | Proposal for a meeting to review the draft SIA for the site which could note:<br>• Any problems encountered within the modelling<br>• Predicted ground movement calculations<br>• Proposed solutions |
| Kiln Place Tenants Association | 06/02/2013 | Phone | • Flooding has occurred on a few occasions at the corner of Oak Village and Lamble Street, next to the entrance to the estate, following heavy rainfall (approx. 3 times in 40 years). However no written records of the incidents are available. |

# 3. SITE SETTING

## 3.1. Site Location

3.1.1. The site is located within the existing housing estate of Kiln Place at Gospel Oak, London Borough of Camden (LBC). A site location plan can be found at Figure 1.1.

3.1.2. The estate is bounded by Lamble Street to the north, Carlton Road Junction railway line to the south, Meru Close to the east, and Grafton Road to the west. Both Meru Close and Grafton Road lead on from Oak Village, which joins the B518 Mansfield Road/Gordon House Road to the north.

3.1.3. The site is centred at grid reference TQ 28325 85440 with the closest post code being NW5 4AJ.

## 3.2. Description of Site and Surroundings

3.2.1. Kiln Place Estate is located within a residential area, with Gospel Oak station and amenities nearby. The site is bordered by the mainline Midland railway to the south which runs to St Pancras International. The London Overground railway lines lie to the east of the site, beyond Hemingway Close. The Gospel Oak Primary School and Parliament Hill Fields are located to the north of the site, Lismore Circus to the west and Highgate Studios to the east, across the London Overground lines.

3.2.2. The proposed development covers six sites within the existing Kiln Place estate which occupy a total area of approximately 0.15 ha (refer to Figure 1.1).

3.2.3. Site 1 includes a strip of steeply sloping amenity grassland to the east of Kiln Place. Site 2 comprises a rectangular strip of land between 65-96 Kiln Place and 117-164 Kiln Place, with both hardstanding and amenity grassland areas. Sites 3, 4 and 5 are infilled areas currently used for refuse storage within the existing estate. The building on Site 3 also includes a single storey entrance and a meeting room. Site 6 includes a strip of land at the base of 117-164 Kiln Place and incorporates two disused plant rooms of 117-164 Kiln Place.

3.2.4. A site specific topographical survey has been undertaken, indicating that the ground levels vary between approx. 40.5mAOD to 45.5mAOD, see Topographical drawings in Appendix B. In general, ground elevations decrease from south to north.

## 3.3. Geological Setting

3.3.1. The British Geological Survey 1:50,000 series sheet 256 (Solid & Drift edition) for North London indicates that the site is underlain by Eocene London Clay Formation (LCF). Approximately 100 metres north and west of the site the geological map indicates the presence of Eocene Claygate Beds overlying the LCF. Head deposits are shown 150 metres south and 200 metres northeast of the site, associated with steep slopes. Historic exploratory hole / water well records available from BGS confirm the anticipated geology identified from the BGS map and indicate the presence of head deposits and made ground overlying the LCF.

3.3.2. A ground investigation was undertaken by Ground Engineering in 2011, including one cable percussion borehole and two hand excavated trial pits located in the north eastern corner of the site within the footprint of Site 1. Made ground was encountered in all exploratory holes and described as brown and grey sand and gravel, comprising flint, brick and concrete fragments over firm locally soft clay, containing ash and brick fragments.

3.3.3. Beneath the made ground within the borehole, head deposits (brickearth) were located at a depth between 1.85m and 3.3m and described as firm to locally stiff orange brown and grey clay with occasional gravel of flint towards the base of the strata. Beneath the head deposits, the LCF was located at a depth of 3.3m and described as firm becoming stiff, fissured silty clay with occasional limestone (probably claystone) nodules.

3.3.4. Further ground investigation was undertaken by Harrison Group Environmental Ltd in March 2014, comprising two cable percussive boreholes constructed to a maximum depth of 15.0 metres below ground level (mbgl) and seven windowless sampler holes drilled to a maximum of 8.0mbgl. The ground investigation concluded that the geology across the site comprises made ground with variable composition and thickness up to 3.8 and 7.5 mbgl underlain by the LCF.

### 3.4. Hydrogeological Setting

3.4.1. The EA has developed Groundwater Source Protection Zones to assist in the assessment of risk to groundwater supplies taken from an abstraction point. The EA website indicates that the site does not lie within a Groundwater Source Protection Zone. In addition, there are no water abstraction licenses held on, or within 250 metres of the site.

3.4.2. The EA website also shows aquifers and provides designations which are in line with the Water Framework Directive and are based on maps produced by the BGS. Definitions for the aquifer types are provided below:

- **Principal aquifer**: 'layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow in a strategic scale.'
- **Secondary A aquifer**: 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.'
- **Secondary B aquifer**: 'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.'
- **Secondary 'undifferentiated' aquifer**: 'it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.'
- **Unproductive strata**: 'rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.'

3.4.3. The site is underlain by unproductive strata, comprising the London Clay Formation.

3.4.4. Groundwater levels of 1.5 mbgl to 5.6 mbgl were encountered within six exploratory holes during the ground investigation undertaken by Harrison Group Environmental Ltd (2014).

## 3.5. Hydrological Setting

3.5.1. The closest surface water features include a canal along Ingestre Road approx. 560m to the north east, Highgate Ponds approx. 830m to the north and Hampstead Heath Ponds approx. 1km to the north west of the Kiln Place estate.

3.5.2. The Hampstead Heath and Highgate Ponds were formed during the damming of the headwater streams of the River Fleet in the 18th century. Downstream of the ponds the River Fleet has been culverted and incorporated into London's sewer network. The Lost Rivers of London mapping shows the two former branches of the River Fleet passing the site to the east and west (see Figure 3.1 for a georeferenced estimate of the former course of the River Fleet).

## 3.6. Existing Drainage Regime and Surface Water Runoff

*Culverted watercourses/ pipes*

3.6.1. The earliest available Ordnance Survey historical map from 1863 shows a drain along an embankment next to the eastern boundary of the site (refer to Figure 3.1), which is thought to have been a flood relief line for the River Fleet. The drain is no longer shown on the 1894-96 map and hence, is assumed to have been culverted at that time.

3.6.2. Thames Water asset records show a combined sewer at this location (see Appendix C). Upon consultation with Thames Water, this was confirmed to be an important 1395mm trunk sewer, from which an offset of 3m or its diversion would be required.

*Public sewers and site drainage*

3.6.3. The existing sewer network at Kiln Place is shown in Appendix C. In addition to the 1395mm combined sewer east of the site, the site is serviced by a network of storm sewers. These run along Kiln Place Road, Grafton Road and Lamble Street, drain the site from south to north and connect to the 1395mm combined sewer at the corner of Lamble Street and Kiln Place Road. In addition, Thames Water GIS identifies an abandoned 'egg shaped' gravity sewer directly beneath Site 1.

3.6.4. On the basis of the topography of the site, it is assumed that the proposed development areas drain into the storm sewers on Kiln Place Road, which lead into the combined sewer on Lamble Street and east of the site.

3.6.5. A radar scan has been undertaken for the site which shows the extent and size of the drainage system through the site. However, the condition of the existing private drainage serving the site is unknown. A CCTV drainage survey is recommended to understand the level, condition and material of the private and public sewerage systems.

3.6.6. A CCTV survey has been undertaken for the 1395mm combined sewer. This revealed discrepancies on the pipe sizes for connecting sewers, as opposed to the information provided by the radar scan.

3.6.7. Preliminary calculations were undertaken in WinDes, developed by Micro Drainage, to estimate the existing peak discharge rates from the plots proposed for development and their equivalent greenfield run off rates. These are included in Appendix D and the results are summarised in Table 3.1.

**Table 3.1: Estimated existing Kiln Place discharge rates**

| Site | Catchment Area (ha) | Hard Standing Area (ha) | 1 in 1 year Discharge Rate (l/s) | 1 in 30 year Discharge Rate (l/s) | 1 in 100 year Discharge rate (l/s) | Greenfield Run-off rate (l/s) |
|---|---|---|---|---|---|---|
| Site 1 | 0.075 | 0.019 | 2.8 | 6.8 | 8.9 | 1.1 |
| Site 2 | 0.027 | 0.016 | 2.2 | 5.5 | 7.2 | 0.5 |
| Site 3 | 0.006 | 0.006 | 0.8 | 2.0 | 2.7 | 0.1 |
| Site 4 | 0.006 | 0.006 | 0.8 | 2.0 | 2.7 | 0.1 |
| Site 5 | 0.015 | 0.015 | 2.1 | 5.1 | 6.7 | 0.2 |
| Site 6 | 0.013 | 0.001 | 0.3 | 0.7 | 0.9 | 0.2 |

## 3.7. Flood zones and flood modelling

*Fluvial/ tidal flooding*

3.7.1. According to the EA website and the North London SFRA (Mouchel, 2008), the site falls within Flood Zone 1, due to the absence of nearby fluvial surface water features and the coastline. In addition, there are no flood defences within close proximity to the site.

3.7.2. Technical guidance to the NPPF (2012) states that Flood Zone 1 is assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any given year (<0.1%).

*Reservoir breach*

3.7.3. The EA website on flooding shows that the maximum extent of reservoir flooding from Hampstead Heath Pond No. 1 extends to the northern part of the site (refer to Figure 3.1). This is the largest area that might be flooded if a reservoir were to fail and release the water it holds. Since this is the worst case scenario, it is unlikely that an actual flood in the case of a breach would be this large.

*Groundwater*

3.7.4. Groundwater flooding is caused by the emergence of water from the sub-surface permeable strata. In a groundwater flooding event, water levels rise sufficiently to intersect the surface and inundate low lying land.

3.7.5. The BGS mapping indicates a negligible susceptibility to groundwater flooding at the site based on the underlying geology. Moreover, the North London SFRA identifies the site as lying within an area where groundwater typically lies at a depth between 70-80 mbgl within the Chalk aquifer which underlies the confining London Clay Formation. Due to this depth to the potentiometric surface, and the confining layer of the London Clay, the

potential for groundwater flooding at the site as a result of water pressure within the Chalk is low.

3.7.6. Perched water, however, is likely to be present within made ground, as discussed in paragraph 3.4.4.

3.7.7. The geological characteristics of the site together with absence of known recorded groundwater flooding incidents, give an overall low risk of groundwater flooding at the site.

*Surface water flooding*

3.7.8. Camden had a major pluvial flood event in 1975 and suffered widespread surface water flooding in the summer of 2002, both of which impacted the Gospel Oak area. The flood events were caused by excessive rainfall overflowing the main sewer system.

3.7.9. The 1975 flood event is the largest on record. It is reported that 170mm of rain fell in 2.5 hours, causing an event with a return period in excess of 100 years and hence, representing an extreme flood event. Within Gospel Oak, flooding occurred along Mansfield Road between the railway line at Gospel Oak Station and Agincourt road, and along Oak Village, which connects Lamble Street to Mansfield Road. However, no flooding was recorded at the Kiln Place estate or on streets surrounding the site.

3.7.10. Following the 1975 flood event, some improvements were made to the drainage system in the areas affected, including the construction of the North London Flood Relief Sewer in 1987.

3.7.11. During the 2002 event, 60mm of rain fell on Hampstead Heath in just under an hour, which is estimated to be the equivalent of a 1 in a 100 year rainfall event. The entire length of both Lissenden Gardens and Glenhurst Avenue to the east of Gospel Oak railway station were flooded. However, no flooding was recorded immediately adjacent to or within Kiln Place.

3.7.12. Flood modelling carried out for the Surface Water Management Plan of Camden showed deep flooding at Gospel Park, affecting Oak Village, Lamble Street, Grafton Road and Kiln Place. This appeared to be caused by the railway embankments creating a 'basin' into which surface water collects.

3.7.13. Subsequently, further modelling was carried out for North Camden during the Enhanced Surface Water Modelling project, in order to investigate flood risk hotspots in the area. The study concluded that the Gospel Oak and Gordon House Road showed significant flood risk and were considered to require flood alleviation.

3.7.14. As a result Royal HaskoningDHV undertook flood modelling specifically for Gospel Oak in 2013, also covering the Kiln Place estate. The study concluded that with the present day scenario, flood water would be found at a low spot at the corner of Kiln Place and Lamble Street, which is the location where the storm sewer network currently draining the eastern part of Kiln Place estate converges into the 1395mm combined sewer, as shown in Appendix C.

3.7.15. According to the flood modelling results, one property would be flooded in the 75-year event and 2 properties would be flooded in the 200-year event. With 100 years of climate change, i.e. assuming 20% increase in rainfall, and with no mitigation, one property

would be flooded in the 40-year event, 2 properties in the 75-year event and 4 properties in the 200-year event.

3.7.16. Appendix E includes the relevant flood hazard maps from the Gospel Oak Flood Report, calculated on the basis of predicted flood depth and velocity in accordance with the Environment Agency guidance.

3.7.17. On the basis of the flood modelling carried out for Camden Council, the EA surface water flooding maps show that the corner of Lamble Street and Kiln Place is at high risk of flooding.

3.7.18. Despite the flood modelling results, no records of flooding in the past at the corner of Lamble Street and Kiln Place road have been obtained. Anecdotal evidence of flooding in this location has been obtained from the Kiln Place Tenants Association (refer to record of communication in Appendix A) who have reported flooding at the entrance to the estate on a few occasions (approx. 3 times over the past 40 years) following heavy rainfall events.

# 4. SCHEME DESCRIPTION

## 4.1. Proposed Development

4.1.1. The proposed development comprises six plots within the Kiln Place estate, as shown in Figure 1.1. The proposed site layout plan is included in Appendix F. The proposals, as outlined in the PBA (2014) Design and Access Statement, are summarised below:

- **Site 1**: A row of six 3 bedroom houses with courtyards and lawned areas, following the curve of the street. Building heights alternate between one and four storeys high.
- **Site 2**: A row of two 2 bedroom houses with courtyards, following the curve of the street. Building heights alternate between one and two storeys.
- **Site 3**: Two 1 bedroom maisonettes proposed to complete the corner of existing buildings 65-80 and 81-96 Kiln Place. The building height varies between one and four storeys, completing the new terrace elevation formed by the cottages of Site 2.
- **Site 4**: One 3 bedroom house with a courtyard proposed to complete the corner of existing buildings 1-64 Kiln Place. The building height varies between one, two and three storeys.
- **Site 5**: One 2 bedroom upper maisonette, one 1 bedroom house and one 1 bedroom ground floor flat with a courtyard proposed to complete the corner of existing buildings 97-104 and 105-116 Kiln Place. Building heights vary between one, two and three storeys high.
- **Site 6**: A single storey 1 bedroom courtyard house in line with the existing gardens of 117-164 Kiln Place. The dwelling also provides three new south facing roof terraces for existing flats in 117-164 Kiln Place.

4.1.2. The proposed development does not include basements. However, the Borough of Camden has a long term strategy for introducing a below ground refuse and recycling storage system into the estate. Part of the works covered under the proposals are to provide the below ground infrastructure for this system, which the Borough hopes to implement in 2017.

4.1.3. There are a variety of options for consideration with respect to landscaping, particularly regarding wider improvements to the existing estate beyond the immediate environment to the new buildings. These are yet to be confirmed. However, current proposals include tree planting, new hard landscaping and courtyards, the enlargement of the existing playground, and the re-landscaping and re-levelling of the grassed area in the centre of the estate.

4.1.4. Existing records suggest that the new buildings proposed on Site 1 are to be constructed above a Thames Water's 125mm diameter HPPE connection main, the 1395mm combined sewer and a divested brick egg shaped sewer. The new properties will be arranged to cut into the existing slope with a retaining wall and terraced gardens at the rear. Ground floor levels of the new buildings will be at the level of the existing Kiln Place road.

4.1.5. A gyroscopic and CCTV survey of the 1395mm combined sewer was undertaken by InfoTech in February 2014 to confirm the exact location and condition of the sewer. The survey indicated that the alignment of the sewer may be 1-2m further east than the alignment shown on the Thames Water GIS records and that the invert level of the sewer is 7.09mbgl. Moreover, the survey showed that there may be at least four sewers connecting into the 1395mm trunk sewer and crossing the footprint of the proposed buildings. The proposed foundation work for buildings within Site 1 may impact on these. A Structural Impact Assessment will be undertaken for Site 1 to ensure that the foundation solution proposed will have minimal impact upon the culvert.

4.1.6. A build-over agreement is required with Thames Water to enable the proposed development. A formal process for a build-over agreement has already been entered into with Thames Water. The progress to date is summarised within Table 2.2 under Section 2.3 Consultation of this report.

## 4.2. Drainage Strategy

4.2.1. A sketch of the conceptual drainage strategy is included in Appendix G. This highlights preliminary drainage routes through the site and includes potential locations of SuDS.

4.2.2. As shown on the drainage strategy sketch, connection to the Thames Water combined sewer from Sites 1, 2, 3,4 and 6 is proposed downstream of the area at risk of surface water flooding shown on the flood hazard maps in Appendix E. For Site 5, the proposed strategy aims to utilise the existing private sewer network at the site.

4.2.3. Due to site constraints, such as available space, topography and existing ground conditions, options for SuDS are limited. An assessment of suitable options is included in Table 4.1.

4.2.4. SuDS measures recommended for consideration include:

- Porous paving;
- Flow controls;
- Green roofs; and
- Rain gardens.

**Table 4.1: Assessment of SuDS Options**

| SuDS option | Appropriate to the site | Comments |
|---|---|---|
| Soakaways | X | Excluded from the design due to poor infiltration rates across the site and offset from adjacent buildings. |
| Porous paving (infiltration/storage) | √ | Porous paving is being considered for inclusion at the site within the service road. It is not expected that this paving would be able to infiltrate into the ground due to an expectation poor infiltration rates across the site. There would be capacity for the surface water to be attenuated within the granular sub base, which would reduce the overall attenuation volume required for other SuDS options. |

| SuDS option | Appropriate to the site | Comments |
|---|---|---|
| Attenuation ponds/detention basins | X | There is little available area across the proposed site to accommodate a detention basin or attenuation pond. Therefore this option is not deemed to be appropriate for this site. |
| Rain Gardens | * | Could be included within the plots to discharge a proportion of the rainwater from the buildings into the associated gardens. This reduces the overall volume of water to be discharged into the public sewer. |
| Rainwater harvesting | X | Rainwater harvesting is not proposed within the drainage strategy due to the additional pipe work required to install the system and available locations to install the equipment. |
| Flow control devices | √ | Flow control devices have been proposed within the site to restrict the surface water outflow rates to 50% of the existing surface water flow rates into the Thames Water public sewer. The flow control devices proposed would need to be suitable for low flow demands, for instance through the use of geotextile screens. |
| Swales | X | Dry swales have not been included within site due to spatial demands. |
| Green roofs | √ | Green roofs are currently being considered within the design by the Client and Architect. Their inclusion provides attenuation volumes across the site and a small decrease in the discharge volumes from each plot due to evapotranspiration through the plants. |
| Blue roofs | X | Blue roofs are not considered within the proposed drainage strategy. Blue roofs could be used but are not favoured by the local council who would be responsible for their maintenance. |
| Attenuation tanks | X | Attenuation tanks have not been proposed at the site due to spatial demands. Attenuation is instead provided through source control features. |
| **Key:** | | |
| √ Suitable for use and included in the scheme | | |
| * Possibly suitable for use – not included with the initial hydraulic modeling calculations | | |
| X Not Suitable | | |

4.2.5. As summarised in Table 4.1, rain gardens could be incorporated into the drainage strategy to disconnect additional hardstanding areas from the below ground drainage network, reducing the overall volume of surface water runoff from the site. Porous paving systems could be used to both collect and attenuate the water in external hardstanding areas using a permeable geotextile to restrict the surface water discharge rates through the outfall pipe.

4.2.6. It is expected that the relatively small amount of attenuation required on each site could be served by these systems without the need for additional attenuation measures. However, the successful incorporation of SuDS would be dependent upon the efficiency of the chosen flow restrictor at low flows.

4.2.7. There may also be additional opportunities to incorporate rain gardens and water butts into the existing buildings to reduce the volume of water discharging into the existing sewer network.

4.2.8. It is suggested that the foul water flows generated by the development will be collected via an above ground system that will discharge to a private, below ground, gravity drainage network and finally outfall to the public sewer. Prior to discharging to the sewer, foul flows will be combined with surface water flows into a manhole upstream of the public sewer.

# 5. FLOOD RISK ASSESSMENT

## 5.1. Flood Risk to the Proposed Development

5.1.1. Based on our understanding of the scheme and the site setting, potential sources of flooding have been identified in Table 5.1.

5.1.2. The proposed development is to be used for residential dwellings and therefore, is classified as "More Vulnerable" by the NPPF. Table 3 of the NPPF identifies that an exception test is not required, and development is permissible within Flood Zone 1.

**Table 5.1: Potential sources of flooding to the development**

| Potential source | Pathway | Potential linkage to site | Justification |
|---|---|---|---|
| Surface water features (rivers/ seas) | Inundation of floodplains/ overtopping of flood defences/ breaching of flood defences | No | Based on a review of published information and the site setting, the site is assessed as having a less than 1 in 1000 annual probability of river flooding in any year (<0.1%) (Flood Zone 1). Hence, the overall risk of fluvial flooding is considered to be negligible. |
| Artificial waterbodies | Breaching of reservoirs | Yes | The maximum extent of reservoir flooding in the case of a breach of Hampstead Heath Pond No. 1 extends to the northern part of Kiln Place estate and reaches Sites 1, 2 and 6. Since this is the worst case scenario, it is unlikely that an actual flood in the case of a breach would be this large. The overall risk of reservoir flooding is considered to be negligible. However, it is recommended that Camden Council is consulted on whether the development proposals would need to take into account the local emergency plan for this reservoir. |
| Groundwater | Perched / shallow groundwater | Yes | Ground investigation results indicated that perched groundwater occurs within made ground between 1.5 mbgl to 5.6 mbgl across the site. Considering that the proposed development does not include basements, the risk of flooding from groundwater is considered to be negligible. Groundwater levels have been taken account of within the geotechnical and structural design for the proposed development and hence, no further assessment is considered to be required.<br><br>The locations and design of the below ground refuse storage areas are yet to be confirmed. These should be reviewed |

| Potential source | Pathway | Potential linkage to site | Justification |
|---|---|---|---|
| | | | against the groundwater monitoring results to confirm whether any mitigation measures would be required. |
| Surface Water Flooding – Sewer surcharge & overland flow | Surcharge in site drainage and public sewer network due to blockages or exceedance of capacity/ Runoff from undrained/ drained areas | Yes | Due to the topography forming a low point at the corner of Lamble Street and Kiln Place potential capacity issues of the existing sewer network have been identified, with potential for overflowing, as shown on the flood hazard mapping in Appendix E. Considering the modelled worst case scenario (i.e. 200 year flood with climate change) and that the ground levels on Site 1 may be lowered to the level of the Kiln Place road, flooding may reach the northernmost three buildings on Site 1. According to the risk classification from the EA surface water flood mapping, the northern section of Site 1 is at low to medium risk of surface water flooding and the northern section of Site 2 is at low risk of surface water flooding.<br><br>On the basis of the flood modelling results, no other plots proposed for development would be at risk from flooding. |

5.1.3. Based on this assessment, potential surface water flooding will require some basic mitigation measures to be included in the scheme for Site 1 and Site 2.

## 5.2. Flood Risk from the Development

*Change in surface water peak runoff rates*

5.2.1. The area of hardstanding will increase from approx. 0.019ha to 0.035ha on Site 1,from 0.016ha to 0.027ha on Site 2 and from 0.001ha to 0.013ha on Site 6 but will remain the same across the rest of the plots proposed for development. In addition, the improvements to the existing estate would include the conversion of an additional 0.19ha of amenity grassland into a new paved external pathway in front of 81-96 Kiln Place.

5.2.2. Given the proposed changes to the site layout, an assessment of the proposed runoff rate from the site is required to demonstrate that discharge rates from the development can be effectively managed without increasing flood risk elsewhere.

5.2.3. Proposed peak surface water discharge rates from the development plots and requirements for attenuation storage were calculated, providing a minimum of 50% reduction in existing brownfield runoff rates for a 1 in 100 year flood event with 30% increased rainfall intensity to account for climate change. This approach is in accordance with the Mayor's London Plan (2011) and Camden Planning Guidance. The results are summarized in Table 5.2.

**Table 5.2: Estimated proposed Kiln Place surface water discharge rates and attenuation requirements**

| Site | Proposed 1 in 100 year (+30%) peak surface water discharge rate (l/s) | Attenuation requirement based on an accepted discharge of 50% of existing surface water rates ($m^3$) |
|---|---|---|
| Site 1 | 4.5 | 17 |
| Site 2 | 3.6 | 8.7 |
| Site 3 | 1.4 | 1.5 |
| Site 4 | 1.4 | 1.5 |
| Site 5 | 3.4 | 3.7 |
| Site 6 | 0.5 | 6.2 |

5.2.4. As described in Section 4.2, a number of SuDS measures can be used to meet the surface water attenuation requirements, including rain gardens, porous paving and green roofs. With appropriate SuDS measures in place, a 50% reduction in surface water runoff rates from the six sites proposed for development can be achieved.

5.2.5. Moreover, the proposed drainage strategy transfers surface water runoff from Sites 1, 2, 3 and 6 which currently drain into the manhole at the corner of Lamble Street and Kiln Place via the storm sewer network, downstream of the low spot at risk of flooding. The connection of Site 4 into the combined sewer will remain downstream of the low point, while Site 5 will connect to the sewer network upstream.

5.2.6. While the runoff rate from proposed development plots is expected to reduce as a result of the proposed SuDS measures, the overall impact on surface water flows is expected to be minimal, due to the small catchment area of the development plots. Consequently, changes in runoff from the proposed improvements to the existing estate (e.g. the new external pathway) have not been calculated.

*Change in Peak Foul Water Flows*

5.2.7. It is expected that the proposed development will result in an increase in foul water flow rates due to the additional residential units. However, due to the small number of new residential units, this is not expected to be significant.

5.2.8. Proposed peak and average foul flow rates from the six sites are summarized in Table 5.3 below.

**Table 5.3: Proposed foul discharge rates**

| SITE NO. | PEAK FOUL FLOW RATE (l/s) | AVERAGE FOUL FLOW RATES (l/s) |
|---|---|---|
| **1** | 3.74 | 0.62 |
| **2** | 1.6 | 0.27 |
| **3** | 1.41 | 0.24 |

| SITE NO. | PEAK FOUL FLOW RATE (l/s) | AVERAGE FOUL FLOW RATES (l/s) |
|---|---|---|
| **4** | 1.56 | 0.26 |
| **5** | 1.88 | 0.31 |
| **6** | 1.32 | 0.22 |

*Impact on Receiving Sewer Network*

5.2.9. Given the volume of attenuation provided by the scheme, all surface water generated up to the 1 in 100 year +30%cc event will be reduced by 50%. The increase in foul water flows is yet to be confirmed.

5.2.10. The proposed drainage strategy will divert surface water and foul water flows from Site 1, 2, 3, 4 and 6 downstream of the connection to the combined sewer at the corner of Lamble Street and Kiln Place road currently predicted to be at risk of flooding. Flows from Site 5 will connect to the sewer network upstream of this low point.

5.2.11. Consultation with Thames Water is required to confirm whether there is sufficient capacity for the potential changes in sewer flows, once the increase in foul water flows has been confirmed.

5.2.12. Mitigation measures are set out in Section 5.3.

### 5.3. Mitigation

5.3.1. Flood risk management measures are proposed in Table 5.3 in order to both mitigate flood risk posed to the development and to assist with alleviation of the downstream flooding.

**Table 5.4: Proposed mitigation measures and residual risk assessment**

| Key Issue | Potential consequence | Risk before mitigation | Mitigation measure | Justification | Residual risk |
|---|---|---|---|---|---|
| Potential for surface water flooding – from sewer surcharge & overland flow | Potential flooding of properties in Sites 1 and 2 during extreme flood events, on the basis of flood modelling results | Low to medium | • Remedial works should be considered and undertaken to the existing/ retained drainage network, if deemed necessary following a CCTV survey of the network;<br>• Agree drainage proposals with Thames Water and Camden Council;<br>• The external areas of Sites 1 and 2 should be designed to ensure that any potential flood waters are directed away from the building entrances, and all access points;<br>• Routine inspection and maintenance of the drainage systems by the site management company and Thames Water. | In the event of foul, surface water or combined flooding occurring, the effect of flooding to the external areas and buildings will be minimised. | Low |
| Changes to hydrological regime may alter risk of flooding to downstream properties via the public sewer network | The proposed development will result in increases in foul water flows.<br>Changes in surface water flows as a result of landscaping improvements to the existing estate have not been calculated. | Low | • Confirm capacity of the public sewer network and agree discharge rates and outfall locations with Thames Water;<br>• Routine inspection and maintenance of the private drainage systems by the site management company, and Thames Water, as necessary;<br>• Inclusion of water saving fixtures where practicable and additional SuDS, where practicable. | Minimise the impact of increased foul water flows on the existing sewer network and ensure that predicted flood risk at the corner of Lamble Street and Kiln Place would not be exacerbated. | Low |

### 5.4. Residual Risks

5.4.1. Assuming the mitigation measures are adopted, the principal residual risks relate to blockages in the public sewers and site drainage. As long as the sewers and site drainage are maintained by Thames Water and site management respectively, the residual risk will be minimised.

### 5.5. Climate Change

5.5.1. Climate change has important implications for the assessment of flood risk. Planning policy requires that the effect of climate change is considered when assessing flood risk posed to future development.

5.5.2. Climate change has the potential to affect all sources of flooding at the site. The likely impacts of climate change relevant to the scheme are increased severity and frequency of storms, and wetter winters leading to increased groundwater levels (CIRIA, 2004).

5.5.3. The effects of climate change have been taken into account by the drainage design which allows for an increase in peak rainfall intensity in accordance with the NPPF. A 30% allowance for climate change was used in calculating the attenuation required for surface water runoff.

## 6. CONCLUSIONS AND RECOMMENDATIONS

6.1.1. Based on our understanding of the site setting and the development proposals, it is considered that the proposed development can be constructed and operated safely and without significantly increasing flood risk elsewhere.

6.1.2. The site is located in Flood Zone 1, and although it is within the maximum extent of reservoir flooding in the case of a breach of the Hampstead Heath Pond no.1; the risk of flooding from fluvial sources and the reservoir is considered to be negligible. It is recommended that Camden Council is consulted on whether the development proposals would need to take into account the local emergency plan for this reservoir.

6.1.3. The key concern with regard to flood risk is the potential for surface water flooding at the corner of Lamble Street and Kiln Place road, where the storm sewer network currently draining Kiln Place estate and nearby areas converges into a 1395mm trunk sewer. Previous flood modelling for Gospel Oak has determined that this area is at risk of flooding and anecdotal evidence of previous flooding incidents at this location have been obtained from the Kiln Place Tenants Association. On the basis of the EA surface water flooding maps, flooding within this area could extend to a part of Site 1 and Site 2 of the proposed development, posing a low to medium risk. A number of measures are proposed to mitigate this potential risk, as outlined in Section 5.3.

6.1.4. Although, the proposed development will result in a small increase in impermeable areas, due to the incorporation of SuDS measures, surface water runoff from the development plots will be reduced by 50% for a 100 year flood event, assuming a 30% increase in rainfall intensity with climate change.

6.1.5. The increase in foul water flows from the proposed development is yet to be confirmed. However, due to the small number of new residential units, this is not expected to be significant. In addition, the capacity of the existing public sewer network needs to be confirmed with Thames Water and the discharge rates and outfall locations agreed.

6.1.6. Assuming the mitigation measures are adopted, the principal residual risks relate to blockages in the public sewers and site drainage. As long as the sewers and site drainage are maintained by Thames Water and site management respectively, then the residual risk will be minimised.

6.1.7. Based on the available evidence, it is considered that the development would be at low risk from flooding, and would not increase flood risk down gradient of the site. On this basis, no further flood risk assessment is required.

## 7. REFERENCES

Camden Council (2003) Floods in Camden, Report of the Floods Scrutiny Panel.

Camden Council (2010) London Borough of Camden Local Development Framework

Camden Council (2013) Camden Flood Management Strategy.

DCLG (2012a) National Planning Policy Framework.

DCLG (2012b) Technical Guidance to the National Planning Policy Framework

Environment Agency Website (2014) Environment Agency Flood Maps. www.Environment-agency.gov.uk Accessed January 2014.

Ground Engineering (2011) Site Investigation Report.

Halcrow (2011a) Preliminary Flood Risk Assessment.

Halcrow (2011b) Surface Water Management Plan.

Mouchel (2008) North London Strategic Flood Risk Assessment.

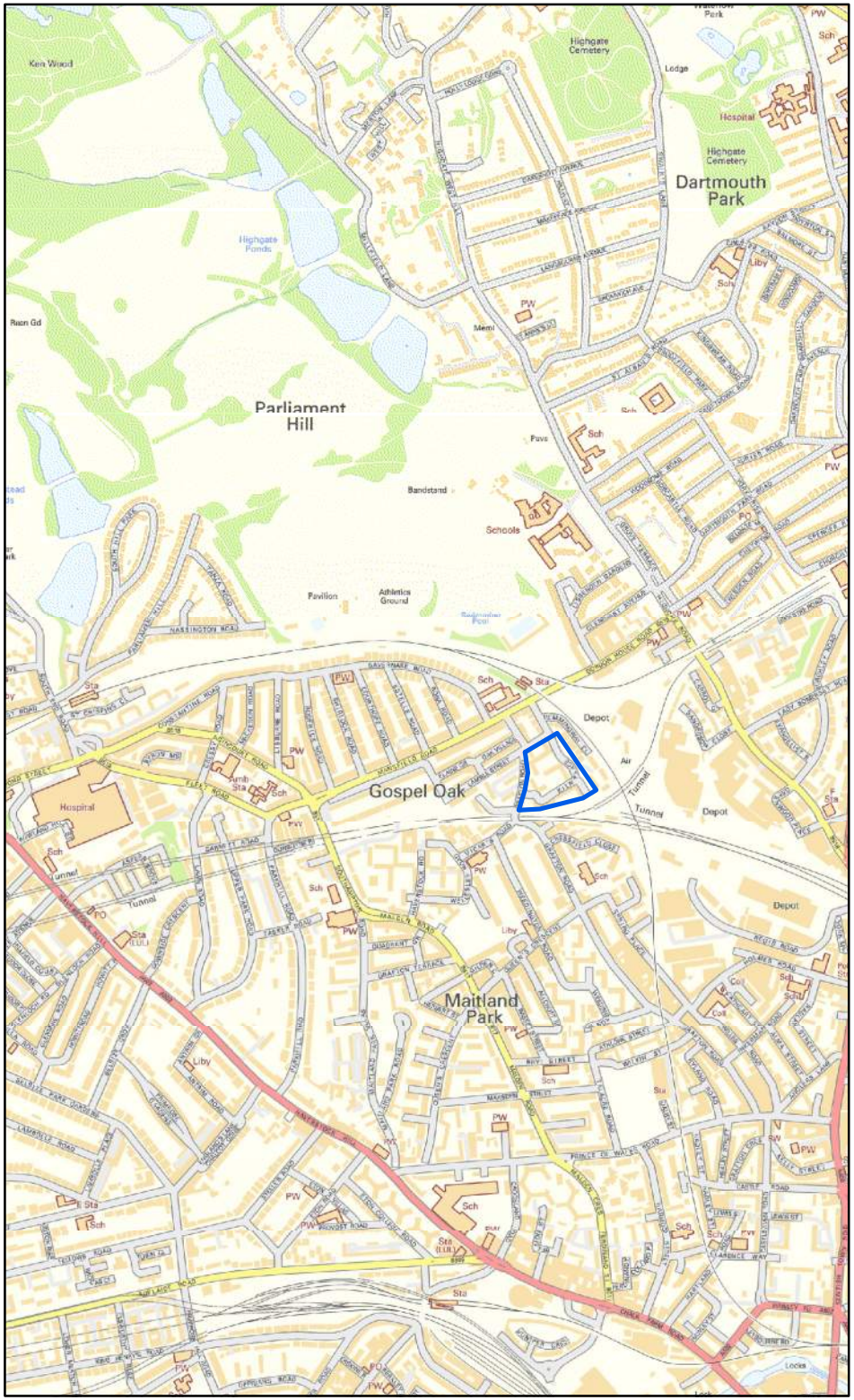
Peter Barber Architects (2014) Kiln Place Infill Sites: Design and Access Statement Planning Report.

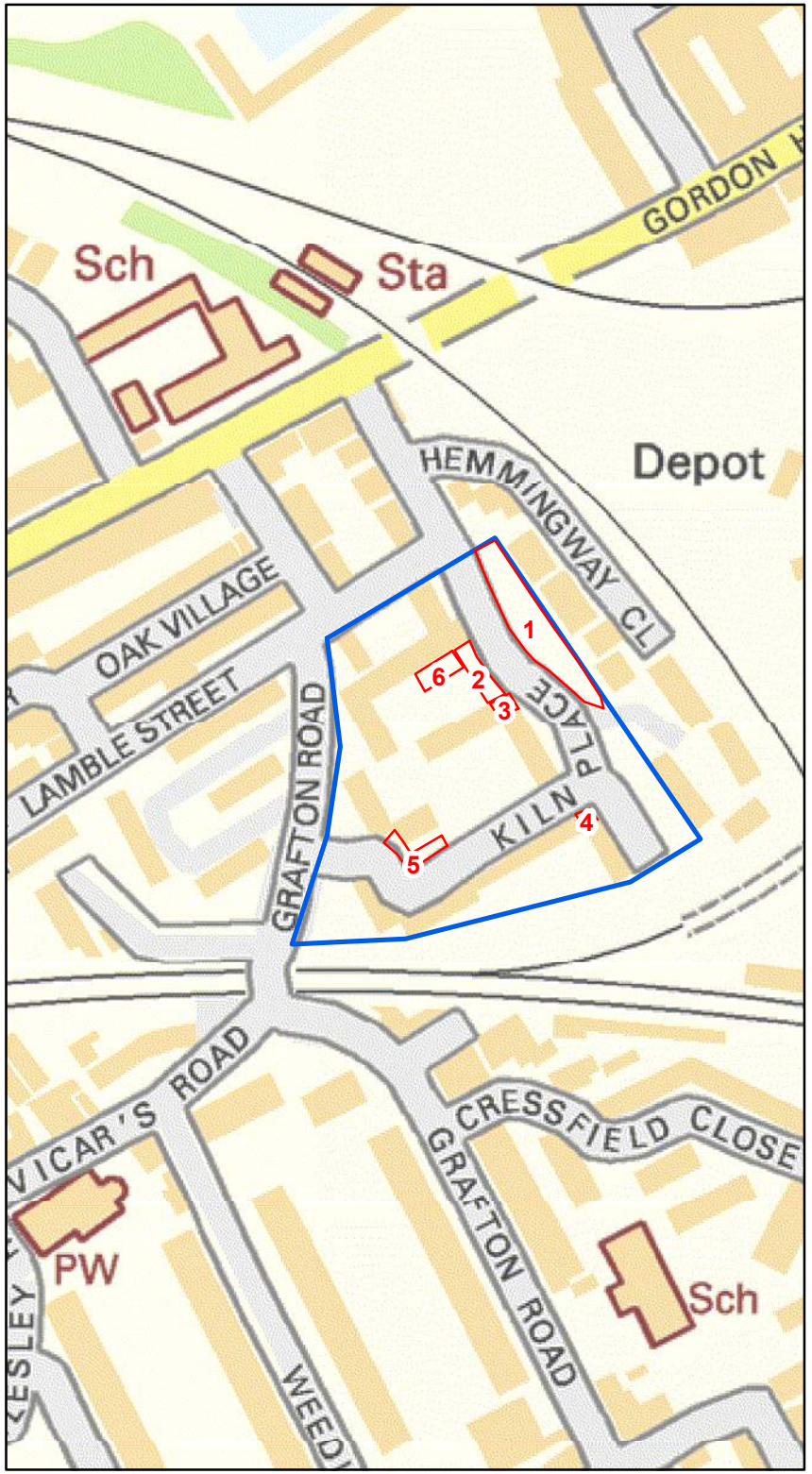
Ramboll (2014) Ground Investigation Report.

Royal HaskoningDHV (2013) Gospel Oak Flood Risk Study.

Thames Water (2014) Kiln Place Preliminary Investigation Report.

## FIGURES




## Key

- Development Plots
- Site Boundary

Note 1. Not to scale.



N

Client

**Camden Council**

Project Title

**Kiln Place, Camden**

Project Number

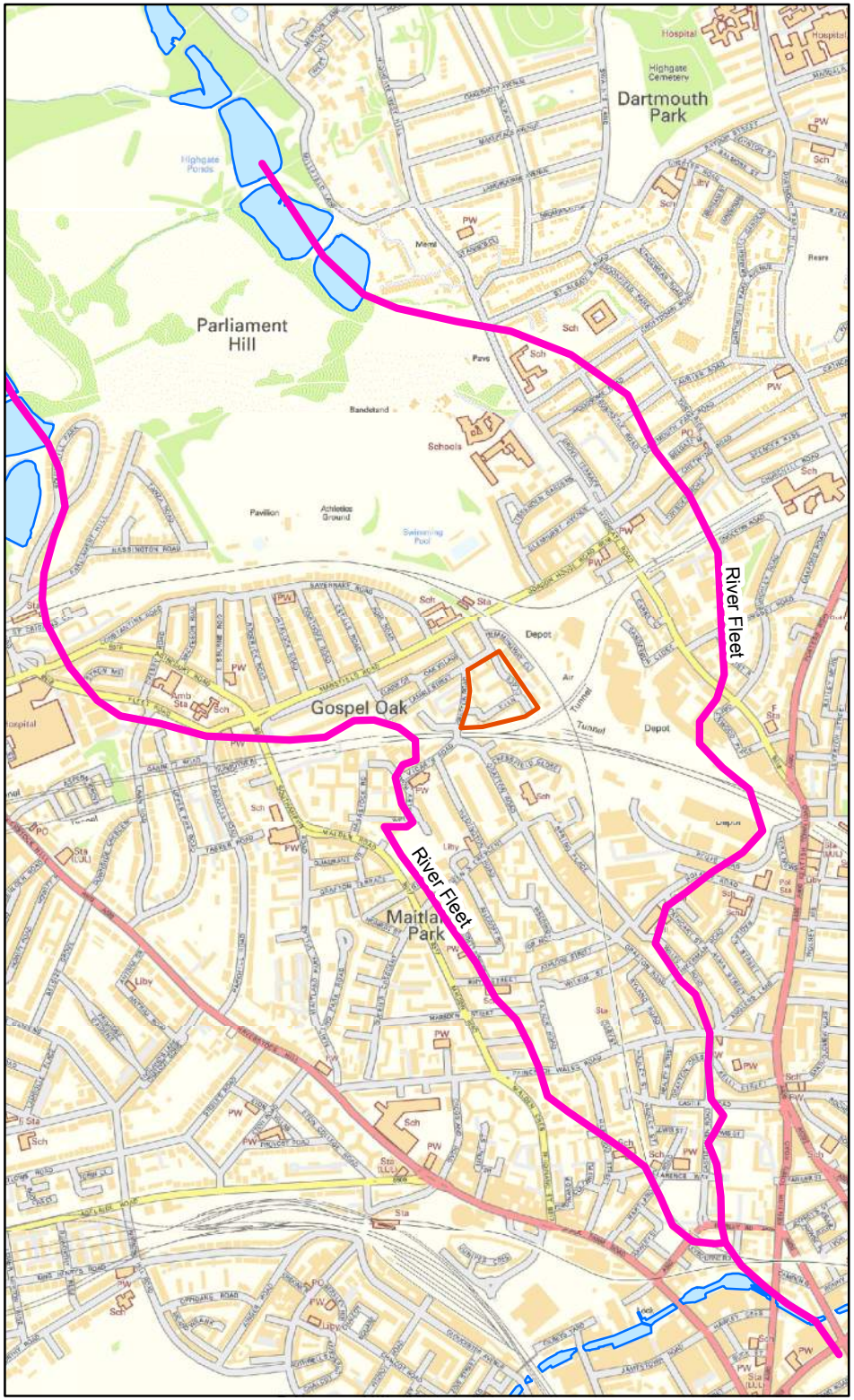
**61031879**

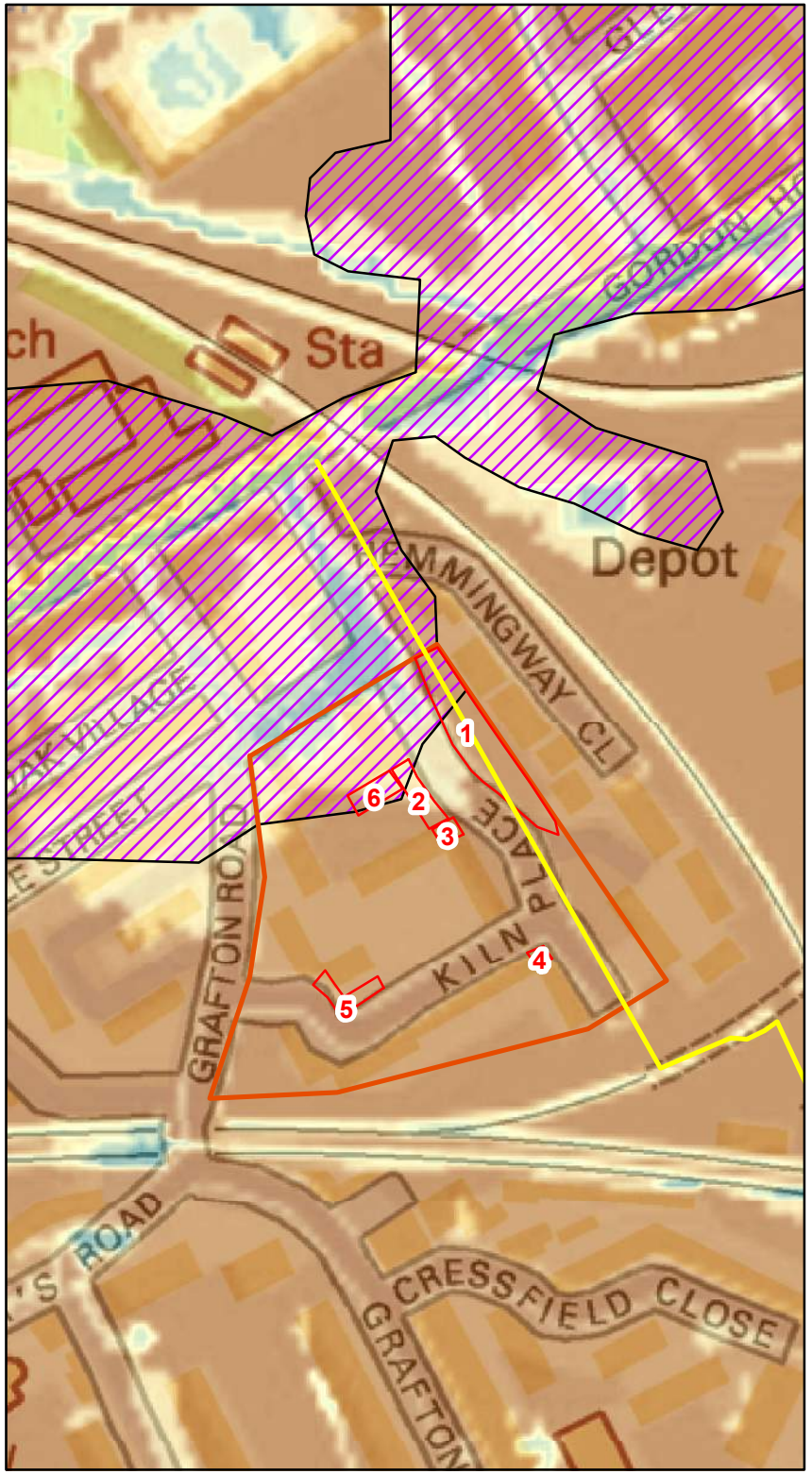
Figure Title

**Site Location Plan**

RAMBOLL
Tel: 023 8081 7500 southampton@ramboll.co.uk
Fax: 023 8081 7600 www.ramboll.co.uk

| Date | Prepared By |
|---|---|
| 19/09/2014 | AT |
| Figure No. 1.1 | Revision A |




## Key

- 1860s drain
- Site Boundary
- Maximum Reservoir Flooding Extent
- Surface Water Flooding Risk
  - No risk
  - High Risk

Note 1. Not to scale.
Note 2. Refer to EA website for risk of flooding from surface water.



N

Client
**Camden Council**

Project Title
**Kiln Place, Camden**

Project Number
**61031879**

Figure Title
**Hydrological Context**

RAMBOLL
Tel: 023 8081 7500 southampton@ramboll.co.uk
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| Date | Prepared By |
|---|---|
| 19/09/2014 | AT |
| Figure No. 3.1 | Revision A |

## APPENDICES

# APPENDIX A CONSULTATION RECORDS

## Astrid Tishler

**From:** planning, North London <northlondonplanning@environment-agency.gov.uk>
**Sent:** 04 October 2013 12:43
**To:** Glynn Irvine
**Subject:** RE: Camden Sites

Dear Glynn,

Regarding our earlier conversation.

As both sites are less than a hectare in size and in Flood Zone 1 (low risk) we would have no objections to either proposals as submitted.

When you submit your application to the Local Planning Authority, in this case Camden, we would send the below low priority response.

*Thank you for your consultation on the below planning application.*

*We have assessed this application and identified flood risk as the only constraint at this site. This site is in Flood Zone 1 and is under a hectare and therefore falls under cell F5 of our Flood Risk Standing Advice (FRSA) Flood Risk Standing Advice.*

*The main flood risk issue at this site is the management of surface water run-off and ensuring that drainage from the development does not increase flood risk either on-site or elsewhere.*

*We recommend the surface water management good practice advice in cell F5 is used to ensure sustainable surface water management is achieved as part of the development.*

*Surface water runoff rates and volumes from the site must be managed in accordance with the London Plan (July 2011) - which sets higher standards than the NPPF for the control of surface water run-off. Policy 5.13 - Sustainable drainage (page 155) of the London Plan states that "development should utilise sustainable urban drainage systems (SuDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible" in line with the drainage hierarchy.*

*If you have identified drainage problems at this site through your Strategic Flood Risk Assessment or Surface Water Management Plan, you may want to request a formal Flood Risk Assessment from the applicant in line with Flood Risk Assessment Guidance Note 1.*

*If you have any further questions about the above development or about our FRSA, please contact me.*

I hope this information proves useful, like i said if you do have any further questions please feel free to contact me.

Kind regards

Michael Devanny

Sustainable Places - Planning Advisor
Environment Agency | North East Thames
Ergon House|Horseferry Road|London|SW1P 2AL
☎ 0203 263 8105 | ✉ northlondonplanning@environment-agency.gov.uk

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**From:** Glynn Irvine [mailto:Glynn.Irvine@ramboll.co.uk]
**Sent:** 02 October 2013 13:02
**To:** Llewellyn, Ben
**Subject:** Camden Sites

Hi Ben,

Many thanks for your advice on the sites we discussed within the London Borough of Camden. I have provided below a brief description of each site for your information and some of the items we discussed for each site. If you could possibly confirm that I have the correct EA information for each site it would be very useful as we look to develop the planning submission (not due to be submitted until 2014).

**Kiln Place** – closest postcode NW5 4AP

Below is an extract to show the proposed sections of the site that are to be constructed, although this does not represent the redline boundary for the site; even including any additional enabling works, etc for the site which would increase the overall redline boundary area, the site would be substantially less than 1ha.
No alterations to existing buildings is required. Some new doorways will be required but these are envisaged to be in locations where doors have previously been removed. No structural alterations / issues are envisaged.

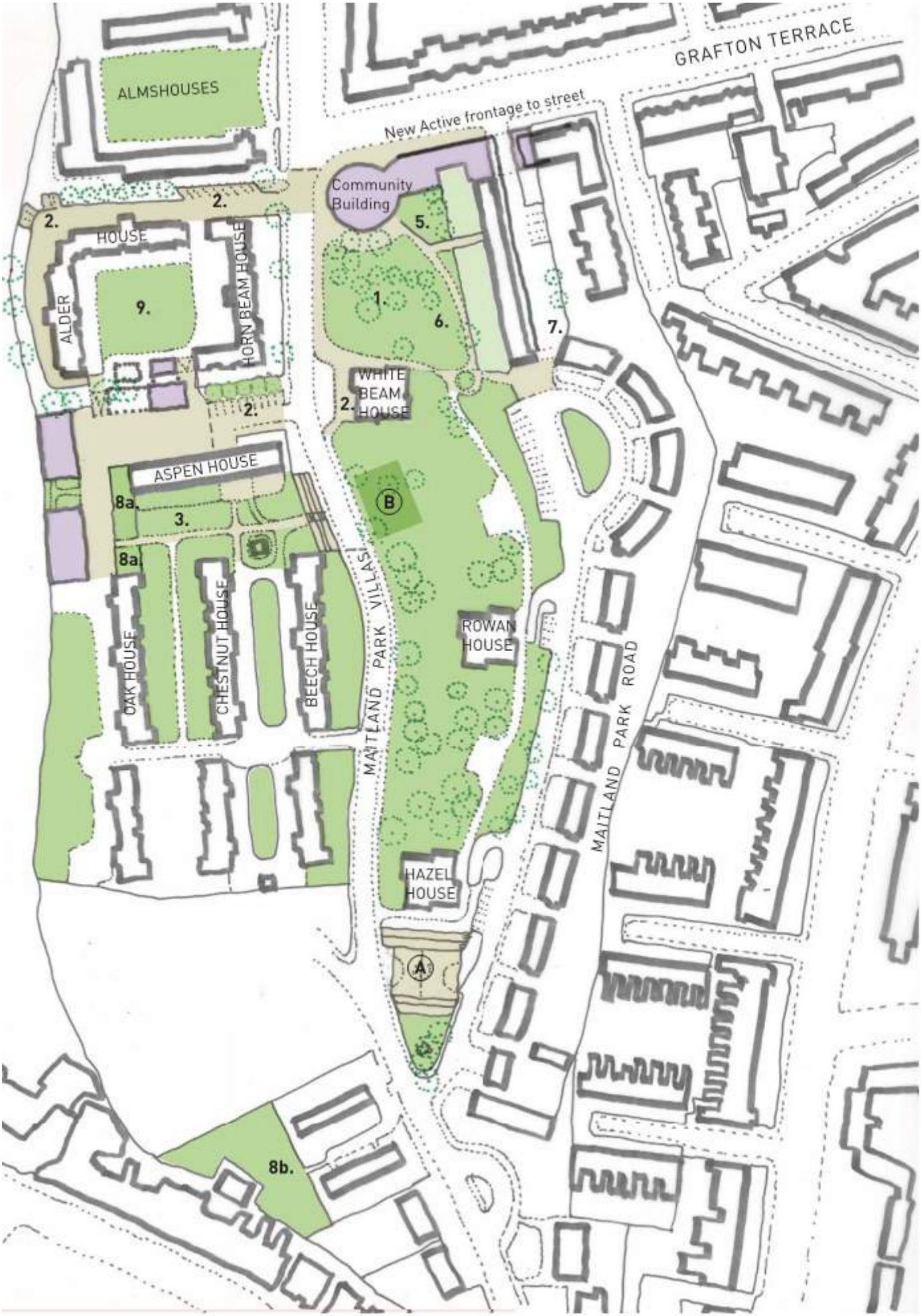
According to the initial information received from the London Borough of Camden, they believe that Fleet River is apparently culverted under the site (directly under site 1). From your search of the EA plans of London's lost rivers, you confirmed that the Fleet river did not appear to be running under the site but was running instead to the east of the railway, closer to Highgate Road.

As the site is less than 1ha and is within Flood Zone 1 I wouldn't imagine that the EA would raise many issues with the scheme but as noted, you may be within the list of statutory consultees, especially for the currently assumed culvert location. We discussed that the EA would not request particular offsets from any culvert found on site (as it does not form part of the EA's main rivers).


Site Plan @ 1:1000

**Maitland Park** – closest postcode (on Maitland Park Road NW3 2EX)

Below is an extract from the feasibility study for Maitland Park which shows the overall site plan. A building specific boundary (again not red line but this should not be more than 1 ha for the entire site) is attached to the email.
The scheme involves the demolition of Aspen House with new housing constructed within that area. The community building also is proposed to be redeveloped, as per the drawing attached.
Can you confirm again that there are no EA assets within the site which should be taken into account for the building layout and if there are any further items that you would wish us to address as part of the planning application and civils works.


GRAFTON TERRACE
ALMSHOUSES
New Active frontage to street
Community Building
2.
5.
1.
6.
7.
9.
HOUSE
ALDER
HORN BEAM HOUSE
WHITE BEAM HOUSE
ASPEN HOUSE
8a.
3.
B
OAK HOUSE
CHESTNUT HOUSE
BEECH HOUSE
MAITLAND PARK VILLAS
ROWAN HOUSE
MAITLAND PARK ROAD
HAZEL HOUSE
A
8b.

Let me know if you need any further information on the above, otherwise, I look forward to receiving your response.

Many thanks,

**Glynn Irvine**

MEng (Hons)
Design Engineer
Infrastructure

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_____

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## Astrid Tishler

**From:** Cattell, David <David.Cattell@Camden.gov.uk>
**Sent:** 05 February 2014 14:18
**To:** Humfrey, Nick; Astrid Tishler
**Subject:** RE: Kiln Place FRA

Sorry Nick and Astrid I cannot assist

David Cattell
Water Services Manager

Telephone: 0207 974 1259

---

**From:** Humfrey, Nick
**Sent:** 05 February 2014 10:43
**To:** 'Astrid Tishler'
**Cc:** Cattell, David
**Subject:** RE: Kiln Place FRA

Hi Astrid,

I don't have any records of flooding at the Kiln Place estate. I attach some drainage reports for the area which probably have the best data we have on the area.

I'm afraid that's all I can provide. Dave, do you have anything you can offer?

Thanks

Nick Humfrey
Sustainability Officer

Telephone: 0207 974 4027

---

**From:** Astrid Tishler [mailto:Astrid.Tishler@ramboll.co.uk]
**Sent:** 03 February 2014 12:16
**To:** Humfrey, Nick
**Cc:** Glynn Irvine; Ceara Shields; Colin Bath; Anthony Guay; Georgina Dowling; Cattell, David; Garner, Harold
**Subject:** Kiln Place FRA

Dear Nick,

Further to the email below, I just wanted to confirm whether Camden Council holds any records of flooding at the Kiln Place estate or at the corner of Lamble Street and Oak Village where the Gospel Oak Flood Risk report identified a high risk of surface water flooding? If so, would you have any further details of this?

Thank you in advance.

Kind regards
**Astrid Tishler**

BSc MPhil AIEMA
Environmental Consultant
CEEQUAL Assessor
Environment

T +44 (0)20 79278653
astrid.tishler@ramboll.co.uk

**From:** Humfrey, Nick [mailto:Nick.Humfrey@camden.gov.uk]
**Sent:** 11 October 2013 17:13
**To:** Glynn Irvine
**Subject:** FW: Kiln Place / Maitland Park

Glynn,

Apologies for the delay in getting these to you.

Please find attached the Gospel Oak study which states the flood risk for the area. Please let me know if you need any of the figures in the appendices. It would be useful if you could be explicit in the FRA that you've calculated the runoff goes the other way.

The key contact in housing is David Cattell. His number is 0207 974 1259 and his email is david.cattell@camden.gov.uk

With regards to planning policy, the key document is CPG3 which can be found here http://camden.gov.uk/ccm/content/environment/planning-and-built-environment/two/planning-policy/supplementary-planning-documents/camden-planning-guidance.en

The key points are these demands:

- All developments are expected to manage drainage and surface water on-site or as close to the site as possible, using Sustainable Drainage Systems (SUDS) and the hierarchy set out below (it's in the document but is fairly standard).

- The Council will expect plans and application documents to describe how water will be managed within the development, including an explanation of the proposed SUDS, the reasons why certain SUDS have been ruled out and detailed information on materials and landscaping.

- The Council will expect developments to achieve a greenfield surface water run-off rate once SUDS have been installed. As a minimum, surface water run-off rates should be reduced by 50% across the development.

I'll send snapshots in a separate email.

Nick Humfrey
Sustainability Officer

Telephone: 0207 974 4027

**From:** Garner, Harold
**Sent:** 03 October 2013 09:17
**To:** Humfrey, Nick
**Subject:** FW: Kiln Place / Maitland Park

Can we discuss please. Could be a great opportunity to deliver something in GO.

Harold Garner
Sustainability manager (technical projects)

Telephone: 0207 974 2701

---

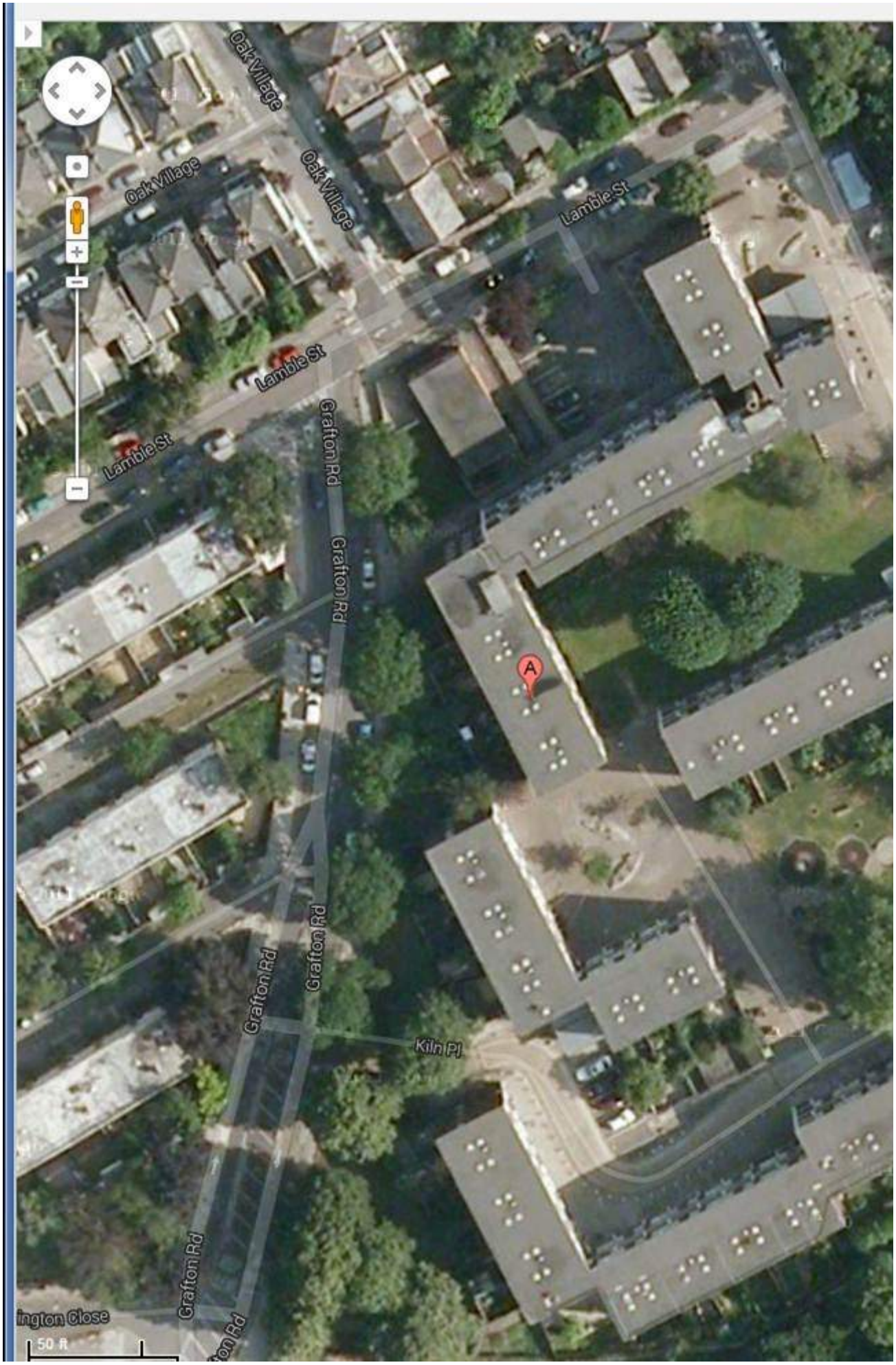
**From:** Glynn Irvine [mailto:Glynn.Irvine@ramboll.co.uk]
**Sent:** 02 October 2013 17:36
**To:** Garner, Harold
**Subject:** Kiln Place / Maitland Park

Hi Harold,

I am working on the civils works (particularly drainage) for Ramboll on the above sites. I was wondering whether we could discuss the schemes and if you had information available as follows. Apologies in advance for the long list of items, but thought it would be good to see if you had any information or know who we could ask to find this information from.

**Kiln Place:**

1. Flooding within the top corner of Lamble Street and Oak Village where this areas has experienced 'extreme flooding issues'. Do you know if this is flooding within the extreme storm events (1:100 and above) or if this is flooding on a regular basis during the frequent storms with large volumes of flooded water in the extreme storm events?
2. Are you aware of flooding within Kiln Place itself? If so, where does this flooding occur?
3. I have been forwarded on the CCTV survey for a section of the site (117-164 Kiln Place) but am having trouble tying this up with the survey plan that is issued by WinCan in their report. I believe the area they refer to is highlighted as the 'A' on the image below. The CCTV plan is shown to the right.


Oak Village
Oak Village
Oak Village
Lamble St
Lamble St
Lamble St
Grafton Rd
Grafton Rd
Grafton Rd
Grafton Rd
Grafton Rd
A
Kiln Pl
ington Close
50 ft

4. Do you have any information of any further onsite utilities (all services) – RUK are seeking asset records for services but there may be further infrastructure which is not adopted by the relevant undertaker and therefore would not be shown on the plans provided.
5. Are you aware of any existing drawings for the site's below ground drainage network that could help to point out where existing discharge locations are and their sizes? If you are in possession of these, can you forward them onto us please.
6. Are you aware of any attenuation currently allowed for within the existing scheme or any discharge restriction rates that were proposed for the foul / surface / combined (I assume) water?
7. We have been informed that there is a culvert which is running under the site to the east of the road name marked as Meru Close on the above image. This was originally believe to part of the Fleet River. I have checked with the EA and there is no major river designation showing up within this area on their maps and they believe that the Fleet is further to the East within Highgate Road. Is this something that has been identified on site and, as it is not a major river, under the ownership of LBC? Do you have any information pertaining to its route through the site and the depth, size, flow rates, manhole or inspection chamber locations, etc.?

**Maitland Park:**

1. Are there any flood concerns arising from the wider catchment surrounding the site?
2. Is there any historic flooding on the site itself?
3. Do you have any CCTV records for the onsite drainage showing the connection locations into the public sewer and drawings of as-built below ground drainage showing connection spurs from the existing buildings?
4. The EA also informed me that there are no main rivers of culverted main rivers running through Maitland Park that are shown on their maps. Are you aware of any further culverts surrounding the site which we should be aware of?
5. Do you have any further information of the onsite utilities?
6. Are you aware of any allowance for existing onsite attenuation (surface or foul) required within the existing scheme?

Again, apologies for the long list of questions, please feel free to ring should you need any further details of the above items.

Many thanks

**Glynn Irvine**

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## Astrid Tishler

**From:** BUILDOVERS@THAMESWATER.CO.UK
**Sent:** 28 October 2013 08:59
**To:** Shehan Wijesundera
**Subject:** RE: RE: IRef:1011396658 RE: Kiln Place development- Build over licence enquiry

Shehan

Re Kiln Place Development NW5

Each connection, subject to formal application, will be assessed on its own merits separate from any build over application.

regards

Jim Boerio

Developer Services Engineer

Original Text

**From:** Shehan.Wijesundera@ramboll.co.uk
**To:** BUILDOVERS@THAMESWATER.CO.UK
**CC:** Glynn.Irvine@ramboll.co.uk
**Sent:** 25.10.13 15:19:08
**Subject:** RE: IRef:1011396658 RE: Kiln Place development- Build over licence enquiry

Jim,

Thank you for your response, we have taken it into consideration.

The development area is split into a number of smaller plots, which will have their own separate connections to the public sewer. It was for one of these plots we were raising the build over licence query over. With this plot aside, would you have any objections in principle to our other proposed connections to the Thames Water sewer shown on the mark-up?

Kind regards
**Shehan Wijesundera**

MEng (Hons)
Graduate Engineer
Environment - Infrastructure

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**From:** BUILDOVERS@THAMESWATER.CO.UK [mailto:BUILDOVERS@THAMESWATER.CO.UK]
**Sent:** 23 October 2013 14:33
**To:** Shehan Wijesundera
**Subject:** IRef:1011396658 RE: Kiln Place development- Build over licence enquiry