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Executive Summary

This report summarises the proposed development at 326 Kensal Road and outlines how the proposed construction of the building conforms with the planning requirements for basement constructed in the Royal Borough of Kensington and Chelsea as set out in their document: Basements – Revised Supplementary Planning Document.

Heyne Tillett Steel (HTS) have been appointed by Resolution Property to produce this Construction Method Statement (CMS).

Both project director Andy Heyne and associate Mark Goodbrand attended site and have compiled and reviewed this report. Both are chartered members of the Institution of Structural Engineers, and have extensive experience of working with the construction of basements on sites throughout London.

1 Introduction

1.1 General

Heyne Tillett Steel have been appointed by Resolution Property as consulting structural engineers to produce a Planning Report for the proposed redevelopment of the Saga Centre/Old Gramophone Works, 326 Kensal Road, London.

The site consists of a collection of buildings located in Ladbroke Grove at the northern boundary of the Royal Borough of Kensington and Chelsea. The site is immediately adjacent to the Grand Union Canal (Paddington Branch) and is equidistant between Kensal Green, Ladbroke Grove and Westbourne Park Underground and Overground stations. It is not set within any known conservation area.

The site partially fronts onto and is accessed via Kensal Road which bounds the southern edge of the site. The canal towpath borders the northern edge of the site, and Adela Street enclosed the site to the east. The property is bordered to the west by Portobello Lofts, a 6 storey residential development.

The views and opinions expressed in this report are based on site inspections, desk-based research and geotechnical investigations including ground water monitoring and gas monitoring.

For the purposes of orientation we are considering the front of the building to be south facing.

1.2 Building Research and Archives

Several archive sources have been contacted and visited to understand the construction of the existing building, these include:

- London Metropolitan Archives
- Building Control Archives, RBKC
- Planning Archives, RBKC
- Local Libraries Studies, RBKC

The existing buildings are reasonably well documented with a selection of original architectural drawings being made available by the previous owner Yeo Associates. Archive information also comprises of drainage drawings by Industrial Productions Ltd in 1926 and the original architectural plans by Donald Hamilton Architects dating from 1955 (Appendix F).
2 The Site

2.1 Site History

Extracts from historic maps are presented in Appendix E and illustrate site usage from 1865 to 2014.

1865

The earliest available mapping shows the site to be occupied by a number of unknown buildings, some of which front onto the canal which lies immediately to the north. A Stone Yard abuts the eastern boundary and occupies a small portion of the site itself. To the east of the Stone yard lies a collection of unknown buildings, where a well is also noted. Four fairly large semi-detached structures line Kensal Road immediately south of the site, three of which contain wells. Land to the west and south is also well developed at this time and several wells are noted. Much of the development to the south appears to be residential in nature. Land to the north of the canal contains a Public House, a number of unknown building and a substantial property; Kensal House set within its own grounds.

1870

The site and immediate surroundings appear relatively unchanged although they reside within Kensal New Town. A large Gas Works (Western Gas Works) is located some 120 m to the south west and is bounded by a railway line to its south. No significant changes to the site or surroundings are noted.

1896

Only the very western portion remains as per the 1870 map. The remainder is now partially occupied by a number of square buildings which appear to be associated with the terraced housing which now lies immediately south of the site. A portion of the site is devoid of development. A row of terraced housing has also been constructed on the very eastern part of the site. The houses front onto Adela Street which has replaced the Stone Yard and additional housing is noted opposite. Land to the north of the canal and Harrow Road has been developed with housing. Land to the west has also been redeveloped and is now occupied by Kensington Wharf. A School has been built to the south.

In 1915, the site to remains essentially the same save for an additional structure on the north western part. Kensal House is now shown as a School. The large Gas Works to the south west is no longer depicted. The number of railway lines has increased and a carriage shed has been constructed in the far south west of the mapped area. A large garage is shown 110 m to the south east.

By 1955 the site has been redeveloped. A large, rectangular Paint Works occupies most of the site whilst an unknown structure has been constructed on the western portion. Housing still lies immediately south. A Biscuit Works lies 40 m east and a Furniture Works is noted 180 m to the east. What appear to be Gasometers are depicted on the site of the former Gas Works to the south west. A number of commercial premises are noted to the south and include; a Warehouse 100 m to the south west, Deco Works 100 m south, Laundries 200 m south and 280 m south east, Westbourne Works 250 m to the south east, a Motor Body Works 180 m south east and a Laundry 110 m also to the south east. The large garage to the south east is now shown as an Omnibus Depot.

World War II

Although the WWII bomb damage maps have not been viewed in person, online information does not record a direct strike on the site. However, a High Explosive bomb is recorded as striking close to Hawthorne Walk to the north east of the site on the other side of the canal.

By 1954, the Paint Works has expanded a little and includes a glazed area at its rear. The Furniture Works 180m to the east is now labelled as a Pharmaceutical Warehouse and has increased in size. The Deco Works (Electrical & Engineering) has expanded and also occupies the warehouse. 100 m to the south west, Westbourne Works. 250 m to the south east is now shown as Westbourne Cleanery (Dyers and Cleaners). A Printing Works is noted 190 m south and a Paint Depot is located 250 m to the south east. The Motor Body Works 180m south east has expanded and is adjacent to a Works, Electrical Engineering premises, Laundry, Garage and Warehouse. Land use to the north of the canal remains overwhelmingly residential in nature. A Day Nursery is shown within the former Gas Works area.

The partial mapping presented at 1969 has been included as it shows a change of use on site. The Paint Works is now shown as a Gramophone Record Works. The remaining portion of the mapped area appears relatively unchanged from the previous map although the Paint Depot 250 m south east is no longer shown.

1987 – 1991

The site remains essentially unchanged from the previous map. Land to the east has been redeveloped and is now occupied by the McKay Trading Estate (which is shown on a 1976 – 1980 map which is not included due to its poor quality and partial nature). The terraced houses immediately south of the site have been replaced by a large building which has the same footprint as the current building in this location. Indeed, much of the land south of the canal has undergone re-development. The Omnibus Depot is now shown as Middle Row Centre which has a number of Works to its north.

2.2 Bomb Damage

Bomb maps compiled during and post WWII do not indicate that the site was damaged. The nearest targeted area was a property in the adjacent Kensington Wharf, approximately 100m away, on the corner of Kensal Road and Ladbrooke Grove. The property was damaged beyond repair.

A High Explosive bomb is recorded as striking close to Hawthorne Walk to the north east of the site on the other side of the canal.

2.3 Site Geology

In summary, the below-ground conditions can typically be described as:

- Made Ground
- Superficial deposits
- London Clay

2.4 Ground Investigation

Intrusive geotechnical investigations have been undertaken by A P Geotechnics Ltd (Appendix A&B) to determine the existing ground conditions on site and therefore provide parameters required for the design and construction of the proposed development.

The investigations included an evaluation of potential chemical and gaseous contamination of the site.

In general, borehole logs and trial pits indicate that the site is founded on Made Ground superficial deposits overlying London Clay to a maximum depth of 25m.

The stratigraphy of the site as revealed by the investigation is described in detail at Appendix B and in general terms hereafter.
2.4.1 Made Ground

Made Ground was encountered in all exploratory locations under a surfacing of concrete or tarmac over concrete and was observed to a maximum depth of 2.60m in BH3.

The Made Ground encountered comprised both cohesive and granular material, the latter generally comprising fragments of brick, concrete and flint, often in a matrix of silt and sand sized particles. The cohesive Made Ground was represented by a sandy clay with fragments of the same man-made detritus found in the granular portion. Trial pits 1 and 2 were terminated in Made Ground whilst TP5 was terminated in concrete. The Made Ground in TP1 was odorous and stained with oil attributable to the high-voltage electricity cable housing in the canal towpath.

2.4.2 Superficial deposits

Although not mapped at this location by the BGS, material underlying the Made Ground in BH1 and TP3 is not considered representative of London Clay and has been classed as superficial deposits for the purposes of this report. The deposit was found to be thin in BH1 where 0.60 m was proved whilst TP3 was terminated in clay at 1.34 m depth. The deposits were represented by a dark grey and brown mottled clay.

2.4.3 London Clay

London Clay was proved beneath the Made Ground/Superficial Deposits and continued to the limit of investigation of 25m depth.

The London Clay was initially represented by a brown grey clay which is consistent with the upper, weathered portion of the London Clay and extended to between 7 and 8m depth.

This was underlain by a fissured dark grey clay which is typical of the unweathered material and continued to the limit of investigation.

Triaxial testing indicates the weathered London Clay to be firm to stiff whilst the unweathered portion is stiff to very stiff. An Atterberg Limit performed on a sample of London Clay confirms the very high plasticity expected of this material.

2.4.4 Groundwater

Boreholes 1 and 2 and trial pits 2 to 5 were dry during drilling/excavation. Borehole 3 recorded a slow seepage at 4.8m depth which only rose to 4.75m during the subsequent 20 minute observational pause in drilling. However, the speed of drilling and the use of casing to support the bore may have masked any small inflows and impinged upon the accuracy of the observations.

Trial pit 1 recorded water in the Made Ground below 0.64 m depth but this is believed to be seepage from the towpath adjacent.

Details of all groundwater observations during drilling/excavation are provided on the appropriate Borehole and Trial Pit Records.

Standpipe readings taken during subsequent monitoring visits recorded the depth to groundwater in BH1 decreasing from 6.40 to 4.66 m whilst water in BH3 rose from 1.66 to 1.54 m depth.
3 Buried Infrastructure

3.1 Thames Water

A Thames Water (TW) Asset location search has revealed that Kensal Road is serviced by a 1500mm x 750mm trunk combined sewer (TCB) located to the south of the site boundary within the carriageway.

There is also a 1143mm x 762mm diameter spur connection into this TCB beneath Adela Street which runs under the canal in a northern direction to Harrow Road and beyond. The depth of this main is not provided by TW.

A CCTV drainage survey carried out by SDI-Unistride drainage Solutions (Appendix G) has confirmed that the existing site has a combined drainage system. Surface water is collected at roof level and dispersed down rain water down pipes where it connects with drained gullies collecting surface water from hard landscaped external areas. A series of manholes run across the site to the south-west corner at ground floor level collecting foul water and sewage. All drainage falls by gravity to the final manhole in the internal courtyard and then out under the site entrance arch where it then appears to combine and connect into the Thames Water combined sewer.

3.2 London Underground and Rail Infrastructure

London Underground have confirmed that they have no assets located within 50 metres of the site.

The Westcoast mainline into Paddington runs approximately west-east, 175m to the south of our site. Westbourne Grove Station which is serviced by the Circle Line and Hammersmith and City Line is situated 1km to the south-east of the site.

Ladbroke Grove, also serviced by the Circle Line and Hammersmith and City Line is situated approximately 1km to the south of the site.

3.3 Crossrail

We have also reviewed Crossrail development maps and can confirm that the site sits well outside the safeguarding zones relative to both the east-west (Crossrail 1) and north-south (Crossrail 2) lines.

3.4 Mail Rail

There are no mail rail tunnels or infrastructure running below the site.

3.5 High Voltage Electricity Cables

Discussions with the Canal and River Trust (CRT) have revealed the presence of a high-voltage electricity cable that runs in part along the northern boundary of our site in the existing canal tow path. The cable is understood to be encased in a separate housing and surrounded by oil.

When undertaking a trial pit to expose the footings of the party wall at the northern boundary of our site along the back face of the canal towpath our contractor became concerned about the presence of oily deposits within the excavation. As these oily deposits were not encountered anywhere else on the site during our investigations, their presence so close to the canal wall have been attributed to a localised leak in the housing of the high-voltage cable and CRT have been notified (refer to AP Geotechnics Report in Appendix B for further details).

3.6 The Canal and River Trust (CRT)

We have met with the CRT on a number of occasions to discuss the proposed development.

Our discussions were productive and in general they have been accepting of the development, subject to agreement of the detailed design and temporary works.
4 Existing Structures

4.1 General Construction

For the purposes of this report the existing buildings on site are referred to as the following:

- The Saga Building – Facing on to Kensal Road in the south-western corner of the site
- Infill Courtyard Building – On the western site boundary between the Saga Building and Canal Side Courtyard Building
- Canal Side Courtyard Building – Facing the canal in the north-western corner of the site
- The Back Building – Occupying the majority of the northern boundary of the site adjacent to the canal towpath.

The Saga Building

The current use of the building is a mix of office and recording studios and is assumed to have been designed for a live load of 2.5kN/m².

The building is clad in rendered RC concrete panels approximately 100mm thick. Notional horizontal and wind loads in both the north-south and east-west directions are assumed to be resisted by the cladding which spans vertically between RC floors. These floors in turn act in diaphragm action distributing loads into RC lift cores in the south-eastern and north-western corners of the building. These cores then act in bending combining horizontal loadings with vertical loadings to resist the overturning of the structure and distribute at foundation level where they are resisted by the bearing pressures of the soils beneath.

The cores extend to four storeys above ground as it intended at the time of construction that the building could be further extended by an additional two number floors. These were never realised.

4.2 The Saga Building

The ‘Saga Building’ was constructed over four floors above ground with basement under in 1925. It is formed as an RC frame with columns on a 4.2 x 6.5m regular grid. Slabs are typically 125mm thick with downstand beams at close centres.

The stability of the building to resist lateral loads is assumed to be provided by RC cores in combination with column sway action.

Foundations are indicated on historic archive drawings to be trapezoidal RC bearing pads foundations bearing on to clay.

4.3 Infill Courtyard Building

The infill ‘Courtyard Building’ is known to have been constructed in the early 1900’s from traditional materials of load-bearing masonry walls with timber roof over. The ground and first floor slabs were not viewed assumed to be similar.

The building is currently being occupied by office use and has not yet been subject to intrusive investigation.

4.4 Canal Side Courtyard Building

The Canal Side Courtyard Building is constructed over four floors, with the fourth floor known to be a latter-day addition.

The building was originally used to store paints and a large central storage/mixing tank. As such it is formed from an RC frame with infill masonry walls around a large internal triple-height space. The first floor can be seen from the underside to be formed from a filler joist system spanning on to large down-stand beams with a single central RC column.

The foundations to both of these courtyard buildings have been proven by trial pits to be shallow ground-bearing corbelled footings.

4.5 The Back Building

The ‘Back Building’ is understood to have been erected in 1935 and is constructed over two storeys plus basement in reinforced concrete. Floors are typically 225mm thick with downstand RC beams spanning on to large diameter internal circular columns. These columns sit on large trapezoidal concrete foundation formed at basement slab level.

The current use of the building is a mix of office and recording studios and is assumed to have been designed for a live load of 2.5kN/m².

The building is clad in rendered RC concrete panels approximately 100mm thick. Notional horizontal and wind loads in both the north-south and east-west directions are assumed to be resisted by the cladding which spans vertically between RC floors. These floors in turn act in diaphragm action distributing loads into RC lift cores in the south-eastern and north-western corners of the building. These cores then act in bending combining horizontal loadings with vertical loadings to resist the overturning of the structure and distribute at foundation level where they are resisted by the bearing pressures of the soils beneath.

The cores extend to four storeys above ground as it intended at the time of construction that the building could be further extended by an additional two number floors. These were never realised.

4.6 Visual Assessment of Existing Buildings and Neighbouring Buildings

A visual assessment of the existing buildings and neighbouring structures was undertaken and there were no recorded signs of movement to properties on the site or adjacent buildings.
5 Proposed Structure

The proposals are split into three buildings for the purposes of this discussion:
- Saga building
- Saga 2 building
- Old Gramophone Works

5.1 Saga Building

5.1.1 Superstructure

This is an existing RC framed building as discussed in detail in Section 4.2; it is founded on large concrete upstand pad foundations. The building has a partial basement with four storeys of offices above ground level.

The proposals are to demolish the existing RC roof structure and RC columns to the top of the existing third floor slab. A new fourth floor and roof will be added as a lightweight steel frame with timber infill (timber joists and plywood). New steel columns will be located directly on top of the existing RC column positions to maintain the existing vertical load paths. The existing RC roof structure has a saw-tooth profile which will be replicated in the new steel framed extension. Large roof lights will be provided in the north facing pitches of the roof shape. Between basement and third floor only minor interventions are proposed including new riser openings.

The existing perimeter walls are formed of exposed reinforced concrete. These will be retained and re-clad with a lightweight cladding system. To enclose the building on the new upper levels a lightweight studwork system will be provided.

No strengthening works are proposed to the existing building based on a comparison between existing and proposed loading including demolition.

5.1.2 Substructure

No strengthening works are proposed to the existing foundations based on a comparison between existing and proposed loading including demolition. The new foundation pressures have been justified to be within 10% of the existing values which is generally accepted for buildings founded on London Clay due to consolidation of the ground since the building was built.

5.1.3 Retaining Structures

The existing basement is assumed to be formed of all round RC retaining walls and/or masonry infill. To form the new basement level to Saga 2 building (see Section 5.2) the north boundary retaining wall will need to be underpinned by approximately 1.5m depth. This mass concrete underpinning will be carried out in an agreed sequence as detailed in Section 7.0.

5.1.4 Stability

The lateral stability of the existing building is assumed to be provided from a combination of RC moment frames and perimeter RC walls. For the purposes of the design any stability provided by the existing lift shaft (of unknown structure) on the north of the building has been ignored. The existing concrete floor slabs are assumed to act as diaphragms transferring the applied lateral loading to the RC columns and walls.

In the proposed condition the new steel frame will be designed with moment connections to transfer the applied wind loads in bending and shear in the beams and columns. The bases of the new columns will be pinned above the existing third floor slab to transfer lateral shear only. The additional shear from the single storey extension (above the original roof level) is likely to be minor and within the capacity of the existing concrete frame.
5.1.5 Disproportionate Collapse

The existing building can be classified as 2A based on Part A3 Approved Document A, for an office building not greater than four storeys.

The proposed building is classified as 2B, for an office building greater than four storeys therefore the proposals mean that the building classification for disproportionate collapse is more onerous than the existing case.

Class 2B will be achieved in the new steel framed extension by the provision of horizontal and vertical ties.

There are a number of ways of justifying the existing building for the more onerous condition as follows (in order of preference);

- Check notional element removal (70m^2 or 15% of the floor area of that storey)
- For a typical 6.5x4.5m existing column grid it is foreseeable that this could be achieved within the existing structure
- It is foreseeable that this could be achieved for a regular steel column and beam arrangement/grid without transfer elements.

- Check the existing RC frame for horizontal and vertical tying requirements, and strengthen as required
- It is foreseeable that this could be justified for a robust concrete frame in reasonable condition.
- Vertical tying forces between the existing third floor RC slab and new steel columns would be onerous to achieve (through-bolts and plated connection)

- Check existing third floor RC slab as a ‘strong floor’
  The existing floors below third floor remain classified as 2A.
  The existing third floor is checked for the collapse load of the new extension above, and strengthened as required.

The chosen solution will need to be agreed with the approved inspector.

5.2 Saga 2 Building

5.2.1 Superstructure

This new building will be sited in the location of the existing 3-4 storey ‘Cube’ and ‘Shed’ buildings to be demolished, on the north-west corner of the site.

The proposed building will consist of seven storeys of above ground mixed office and residential use, with a single storey basement plant room.

The basement will be formed as part of a new combined basement with the Old Gramophone Works (OGW).

A number of superstructure options were considered during the concept design stage for the upper floors as follows:

- RC flat slabs, columns and shear walls
- Post-tensioned (PT) slabs, RC columns and shear walls
- Composite metal decking slabs supported on universal beams (UC/UB sections) and steel columns
- Composite metal decking slabs supported on fabricated steel beams (Fabsec/Westok) and steel columns
- Composite deep decking slabs supported on USFB (Ultra Shallow Floor Beams (Westok) or similar) and steel columns

The architectural desire for exposed concrete in combination with the building heating/cooling strategy led us to select a RC frame. We have since proceeded on the basis of option 1 with the option to consider reducing slab thicknesses using PT slabs with future contractor input.

For exposed concrete slabs and columns minimum element sizing in terms of overall thickness and cover to reinforcement will need to be provided as per Eurocode design standards.

Staircases are assumed to be formed of in situ RC to provide diaphragm action between slab regions.

There are a number of balconies which will need thermal breaks to avoid cold bridging.

The proposed cladding solution is a combination of standing seam and masonry. Masonry support angles will be required to support any masonry with cast-in channels around the slab edge (or similar).

The proposed roof construction is to be a lightweight steel frame with timber infill (rafters and plywood).

5.2.2 Substructure

The basement slab will be formed of a suspended in situ RC cast over clay heave protection (clayboard or similar approved). The slab will be designed to resist the long-term heave pressures (uplift less that accounted for by the clayboard itself).

Internal CFA bearing piles will be installed to support the basement slab as well as internal RC walls and columns. The piles will be designed primarily in skin friction in London Clay as well as end-bearing to resist the vertical forces.

5.2.3 Retaining Structures

New embedded retaining walls will be formed of a secant piled wall to the full perimeter excepting the boundary with Saga 1 building to be underpinned. The piled wall will be designed to resist lateral earth and water pressures in addition to surcharge loading (from neighbouring buildings, canal and roads) in the temporary condition prior to forming a permanent RC liner wall. In the permanent condition the RC liner wall will be designed as a retaining wall spanning between the basement and ground floor slabs. On the boundary with the canal towpath the retaining structure extends to first floor level where this slab acts as a permanent prop.

To fully enclose the new basement box the existing basement retaining wall to Saga 1 building will be underpinned by approximately 1.5m. A RC liner wall will be formed in front of the mass concrete underpinning to act as a permanent structure.

5.2.4 Stability

Due to the change in site levels from south to north of approximately one storey the compression generated in the first floor slab will be unbalanced. This unbalanced propping force will be transferred via additional bending and shear in the basement to first floor columns and walls to be resolved via the slabs.

The lateral stability of the building will be provided by RC shear walls located around lift and stair cores. These walls will be designed as vertical cantilevers to transfer wind forces from each slab level to the piled foundations through bending and shear.

5.2.5 Disproportionate Collapse

Based on Part A3 of Approved Document A the new seven storey building will be designated as Class 2B for a mixed use building greater than four storeys. The requirements for disproportionate collapse will be achieved through the provision of horizontal and vertical ties throughout the new structure. In addition any key elements will be identified and checked accordingly.

5.3 Old Gramophone Works (OGW)

The OGW scheme follows the same design as discussed for the Saga 2 building above therefore only additional features which are unique to OGW are discussed below.
5.3.1 Superstructure

A new seven storey mixed-use building is proposed on the site of the existing OGW building. The building is proposed to be divided into basement to third floor commercial units with three floors of residential apartments above. A single storey basement will be formed below the existing ground floor to accommodate further commercial space, gym, recording studio and plant use.

Each floor plate is approximately 65m x 25m which dictates that movement joints to control cracking should be considered in the RC floor slabs, typically required in slabs greater than 50m in any direction. Rather than form a movement joint/s it is proposed to design the slab for the restraint forces generated due to long-term drying shrinkage.

The fourth floor RC slab will be designed as a transfer slab to support an engineered timber cross-wall system from fourth to roof level. These upper floor levels are proposed to be formed of CLT (cross-laminated timber) wall and floor panels with supplementary glulam or steel beams and columns as required where spans exceed efficient CLT limits (or to support glazing).

Various other light weight structural solutions remain as options for these upper storeys including timber cassettes, METEC metal framing or simple steel frames with conventional timber infill.

The ultimate solution to these floors will be guided by price and programming.

5.3.2 Substructure

See 5.2.2

5.3.3 Retaining Structures

See 5.2.3

5.3.4 Stability

See 5.2.4

5.3.5 Disproportionate Collapse

See 5.2.5
6.2 Flood Risk Statement (FRS)

A FRS has been prepared by HTS as part of a separate report (Reference 4).

The Environment Agency (EA) provides information on flood risk classification for planning purposes in the form of maps. The development site is confirmed to be in an area which is at very low risk of flooding. The EA classify this site as Flood Zone 1 - land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

The site is not in a critical drainage area and the Paddington Branch canal, immediately north of the site, does not pose a flood risk. It is also anticipated that the proposed works have a very low probability of affecting the flood defences or watercourses. The development site is at low risk of surface water flooding.

Overall the site is at low risk of flooding and the proposed scheme is considered to be safe.

6.3 Proposed Condition

6.3.1 Surface Water Strategy

A SWMP has been prepared by HTS as part of a separate report (Reference 5).

The post-development site is required to not exceed the pre-development run-off rates and discharge volume. The post-development runoff volume is greater than it would have been prior to the assessed site’s development due to climate change alone. The additional volume of run-off for the 100 year 6 hour event (storm event including climate change) is required to be prevented from leaving the site by using infiltration and other sustainable drainage systems (SuDS) techniques.

SuDS mimic natural processes to drain surface water and encourage groundwater recharge to reduce the flow of surface water from a developed site to something akin to that of an undeveloped site. The following SuDS options have been considered as part of the drainage strategy in the order of most sustainable.
Surface water can be managed in a number of ways in line with the SUDS hierarchy. Infiltration techniques is not feasible due to the existence of a basement development and the anticipated constraints with adequate easements therefore, is it ruled out at this stage.

The inclusion of living roofs is anticipated to bring about an overall positive improvement, more so than tanked systems alone. Living roofs are likely to reduce the peak discharge rate and therefore lower the volume of water required to be stored within the tanked system.

Attenuation measures are deemed the most feasible options for managing surface water on the site. The overall concept is to retain water within the site boundary for as long as practicably possible whilst maintaining a controlled discharge into the sewer network. The intentions are to reduce the peak discharge within the public sewers in line with BREEAM.

Surface Water is proposed to be captured on the roof of the building and is conveyed via rainwater pipes down to the basement floor level and discharged into an attenuation device which will store water and discharge into the public sewer using the existing outfall on site at ground floor level and discharged into an existing sewer. The footprint of the building consumes much of the site boundary.

<table>
<thead>
<tr>
<th>Rank</th>
<th>SUDS Technique</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Living Roofs</td>
<td>192m² of green roof is currently proposed. The use of a Living Roof is anticipated to bring an overall positive impact to the development.</td>
</tr>
<tr>
<td>2</td>
<td>Basins and Ponds</td>
<td>There is inadequate space on site for ground level SUDS such as basins or ponds to work effectively. The footprint of the building consumes much of the site boundary.</td>
</tr>
<tr>
<td>3</td>
<td>Filter Strips and Swales</td>
<td>There is inadequate space on site for filter strips and swales types of SUDS to work effectively.</td>
</tr>
<tr>
<td>4</td>
<td>Infiltration Devices</td>
<td>There is inadequate space on site for infiltration devices to work effectively. The site is located in a densely developed area and therefore adequate easement around infiltration devices is unachievable.</td>
</tr>
<tr>
<td>5</td>
<td>Permeable Surfaces and filter drains</td>
<td>Permeable surfaces and filter drains have the potential to help with the surface water management for the site.</td>
</tr>
<tr>
<td>6</td>
<td>Tanked systems</td>
<td>There is scope to introduce tanked systems into this development.</td>
</tr>
</tbody>
</table>

The post development site meets the Royal Borough of Kensington and Chelsea sustainability policy by limiting the surface water run-off rate to 5 l/s. This also provides a betterment which exceeds the minimum required by BREEAM.

A total of approximately 155m³ of surface water storage is required, the attenuation devices will be installed below the basement level directly under the plant room area. Using a 1m depth attenuation tank, a total area of 155m³ is required to provide adequate means of storage (the size also accounts for a 95% void ratio of a typical cellular storage module). The drainage strategy drawing illustrates the use of the two 28.5m³ tanks which collect water from either end of the site.

Flow control devices are used to restrict the outflow discharge rate. For the purposes of a preliminary overall drainage design, this is to be explored in greater detail at later stages.

In response to a pre-development enquiry TW noted that they will accept surface water flows into their sewer if infiltration techniques or discharge into a watercourse cannot be achieved. As discussed previously infiltration techniques cannot be satisfied on the site.

The Paddington Branch is immediately to the north of the site. The discharge of surface water into the watercourse has been investigated in cooperation with the Canal & River Trust. This has been discounted due to:

1. Relative levels of the canal and the proposed ground floor
2. Risks associated with the construction of canal wall
3. Clashes with existing towpath underground services

Surface water flows, once restricted through the pump device are proposed to discharge into an existing combined drainage network and then discharge under gravity into the existing combined public sewer under Kensal Road. Liaison with TW regarding an indirect sewer connection is to be applied for beyond planning stage.

In the event of the public sewer surcharging the final outfall position will be fitted with a non-return flood valve to prevent flooding of the development site. Regular maintenance of the aforementioned non-return flood valve and all other proposed SUDS devices should be carried out in line with the manufactures recommendations. The existing TW owned assets are to be protected from damage at all times during the construction as far as practicably possible.

Surface Water is proposed to be captured on the roof of the building and is conveyed via rainwater pipes down to the basement floor level and discharged into an attenuation device which will store water and discharge into the public sewer using the existing outfall on site at ground floor level and discharged into an existing sewer. The footprint of the building consumes much of the site boundary.

The tank has been sized to accommodate the 100yr + 30% climate change storm event. The volumes and type of attenuation device may vary during the detail design stages once storage within the network pipes and manholes have also been considered as part of the
6.3.2 Foul Water Drainage Strategy

Foul water generated from the site at basement level is proposed to be conveyed to a higher level using a pump or other similar mechanical device. The foul water generated above the ground floor will be diverted at high-level basement, along the underside of the ground floor slab, and will be discharged via gravity where practicably possibly to minimise the storage requirements and dependency on mechanical devices.

Once foul flows are above the available discharge point, they will be conveyed under gravity towards the public combined sewer under Kensal Road. Following a pre-development enquiry the TW response states that the existing combined sewer in Kensal Road has sufficient capacity to accommodate the foul water discharge from the proposed development.

6.4 Hydrogeology

The existing lowest level for the majority of the existing site varies between 26.6–28.3m AOD. The proposed founding level of the new basement slab is approximately 23.2m AOD. The overall excavation to form the new basement is between 3.4–5.1m. The excavation is almost fully carried out within London Clay soil strata.

The London Clay Formation is classified by the Environment Agency (EA) as an unproductive strata (in terms of aquifer designation), which is described as rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flows. The geotechnical investigation (Appendix B) states that some residual inflows can be expected during the excavation but these are expected to have low rates of ingress and should be able to be controlled by conventional pumping from shallow sumps. Based on this significant ground water is not expected during the excavation and as such ground water flows under the site will not be affected.

The site is not located within 500 m of a groundwater source protection zone (SPZ). No groundwater, surface water or potable water abstraction takes place within 1500 m of the site.

The site located in flood zone 1 and not at risk of tidal flooding. The site is not located in a Surface Water Flood Risk Hotspot. The EA also classes the site as being at very low risk of flooding from surface water from online historical flood maps.

The site is bounded by the Grand Union Canal (Paddington Branch). Based on meetings and correspondence with The Canal and River Trust the canal is assumed to be formed of historic concrete sheets. The worst-case depth of the water along the central course is approximately 2m. The proposals will not impact the canal structure or surface water intake. Reference to 'The Lost Rivers of London' indicates that the site is not located on an historic water course.
7 Temporary Works and Sequence of Construction

7.1 Site Setup (To be read in conjunction with Construction Management Plan (Reference 3))

It is assumed that deliveries, removals and access for operatives will take place from Adela Street. A secondary delivery/removal and access point may be required on Kensal Road, directly in front of the Saga building. These entrances will be manned throughout operational hours by a banksman to ensure construction deliveries do not pose a potential risk to pedestrians.

Construct site hoardings, entrance gates and any temporary pavement tunnels to provide protection to passers-by from site activities. It is assumed site accommodation and welfare facilities will be provided within the lower levels of the Saga building until construction of the new buildings is sufficiently progressed to allow alternate accommodation to be provided elsewhere on the site.

Install monitoring survey targets on party walls to monitor any potential movement that may occur during the works, and begin monitoring to an agreed frequency and accuracy in line with a traffic light warning system (See Section 8.3). This will be as agreed during the party wall negotiations but an initial movement monitoring plan has been included at the end of this document. Terminate/protect services, temporarily divert all active drainage. Install temporary drainage as required for site facilities.

7.2 Proposed Sequence of Construction

7.2.1 Demolition of Existing Structures (following completion of strip out works)

- Contractor to provide method statements and risk assessments for all demolition works prior to commencement.
- Commence safe sequential demolition of existing buildings in a “top-down” sequence.
- Site waste to be removed and recycled in accordance with ICE Demolition Protocol 2008.
- Control and minimise dust through water spraying and hydraulic crushers.
- Install temporary propping of existing retaining walls on canal/towpath and Adela Street boundaries.
- Prior to excavating on the north-east and north-west corners of the site install temporary trench sheets and trench props to retain existing soil in location of existing shallow boundary foundations.
- Temporary works will not be removed until the new floor diaphragms at basement, ground and first floors are installed to reinstate the restraint condition.
- Remove all hard landscaping to external areas however retaining those required for plant routing etc.
- Install temporary roof over Saga 1 building where existing third floor and roof are to be demolished.

7.2.2 Secant Piled Wall

- Import piling mat material and where possible use crushed demo material.
- Grade piling material to enable piling rig access across the site.
- Cast guide wall for perimeter piles.
- Install perimeter piles to form secant retaining wall.
- Install bearing piles to support new superstructure, pile cut off level at proposed basement formation.
- Install additional number of piles (to be specified by M&E engineer) on a regular grid and linked to ground some heat pump.
- Install piles for crane bases, to contractors design.
- Install plunge pile to support mid span of temporary props (subject to temporary works design).
- Form capping beam to secant piled retaining wall.

7.2.3 Temporary Props, Excavation and Underpinning

- Install temporary propping to full perimeter capping beam.
- Excavate to foundation level with additional lateral/raking propping as required to suit the temporary works design.
- The principles for the removal of spoil shall be agreed with the contractor.
- A localised area of contamination (oily deposits) were found adjacent to the canal towpath and these areas may need to be disposed of properly to a appropriately licensed tip.

(Note that the contractor may choose to install the ground floor slab before excavating the basement in a “top – down” sequence to minimise the need for temporary propping to the head of the piles)

- Allow for temporary dewatering wells and discharge of ground water.
- Sequentially breakdown internal piles in line with excavation.
- Once the excavation has reached the underside of the existing foundations against the boundary with Saga 1 building install underpinning in an agreed sequence. If groundwater seepage is encountered submersible pumps will be used to keep the excavation dry.
- The contractor who carry out the underpinning are to be members of The Considerate Contractors Scheme and the Association of Specialist Underpinning Contractors (ASUC).
Underpinning is to be carried out in short sections of maximum 1.0 metre length. The underpinning will be completed using trench sheets and trench props to brace the excavation (or similar approved).

The sequence is to be such that no two adjacent pins are cast within 48 hours of one another. Typically the underpins are cast in a “six-stage” 1 3 5 2 4 1 sequence.

The undersides of the footings are to be cleaned of dirt and soil or loose materials carefully removed before underpinning in mass concrete.

Dry-pack to be installed tight between top of pins and underside of existing foundations at least 24 hours after casting. Back fill excavations to the underside of the existing foundation level prior to starting the excavation for the next underpin in the sequence.

Form RC liner wall to the face of the underpinning.

7.2.4 RC Basement Box

Breakdown internal piles to suit cut-off level, expose pile heads and form RC pile caps.

Install below slab drainage runs, pumps and attenuation tank.

Install proprietary heave protection below concrete blinding.

Form RC lift pits.

Cast RC basement slab.

Cast RC liner walls from basement to ground floor.

Cast ground to first floor RC retaining walls on canal/towpath boundary.

7.2.5 Superstructure from Basement to First Floor

Form RC cores walls and columns in sequence with RC floor slabs.

Temporary works to remain in place until the basement, ground and first floor slabs have been cast and cured.

7.2.6 Superstructure from First Floor to Fourth Floor

Form RC core walls and columns in sequence with RC floor slabs.

Form fourth floor RC transfer slab.

7.2.7 Superstructure from Fourth Floor to Roof

Form RC core walls to roof level with tying detail to CLT (cross-laminated timber) superstructure.

Install two storeys of modular construction as load-bearing CLT walls and slabs (or alternative modular system or lightweight steel framing solution with timber “infill”).

7.2.8 Follow on Trades

The main structural works are now complete and work can concentrate on making the building weather tight, upon which the finishing trades can commence.
8 Impacts of Subterranean Developments on Neighbouring Properties and Structures

8.1 Stability of Existing Buildings

Temporary works will be utilised to support the perimeter piled wall during the excavation to minimise movement of the adjacent buildings. In the permanent condition the concrete box construction will provide the horizontal and vertical stability of the building. The temporary works framing will not be removed until all of the permanent works are completely installed between basement and first floor. As described above, the stability and structural integrity of the surrounding earth and the neighbouring properties will be maintained throughout construction without any structurally detrimental effect to existing conditions.

8.2 Expected Movements and Damage to Adjoining and Adjacent Properties

HTS have considered the anticipated movements of the adjacent buildings in accordance with the CIRIA 580 report. The following paragraphs set out the key criteria used to ensure the neighbouring building movements can be categorised as "very slight" and never more than "slight" as defined by CIRIA 580 report table 2.5, Reference 1. The method for calculating damage assessment adopts a tensile strain limit, as described by Burland et al (1977), Boscardin and Cording (1989) and Burland (2001).

A detailed ground movement assessment has been undertaken by Geotechnical Consulting Group (GCG) to verify that the construction type and sequence is in line with the movement limits; a likely requirement of the party wall process. The following discussion directly references the findings of the GCG report (Appendix H). Refer to Appendix H for full assessment details.

8.2.1 Stages of Potential Movement

Due to the nature and volume of soil to be excavated the clay below the new basement is expected to heave. The effects on the neighbouring buildings will be limited by the secant piled wall which will surround the new excavation. The secant piled wall will act to confine the heave and will therefore minimise the effect on the neighbouring buildings.

Each construction stage where ground movement is envisaged has been considered as follows;

Stage 1 – Demolition

Demolition of the existing buildings will cause a vertical unloading anticipated to result in ground heave. These effects have purely been considered in terms of short-term soil parameters assuming there will be no break in construction following demolition. Prior to demolition below the existing first floor lateral propping of the existing perimeter retaining walls will be required. See stage 3 for commentary of lateral propping required during the demolition.

Stage 2 – Installation of secant piled wall / Underpinning Saga Centre

The secant piled wall will consist of interlocking 450/600mm diameter RC piles. It will be constructed with a guide wall to limit tolerance to 25mm positional and 1:125 inclination (to be agreed with the contractor). Installation of a secant piled wall will result in ground movements as the ground around tends to move towards the pile bores. Guidance within CIRIA CS80 report is based on the behaviour of embedded walls at numerous sites across London for walls predominantly embedded in London Clay. Hence the conditions at this site are compatible with the dataset on which CS80 is based. The widely considered conservative approach adopted by CIRIA suggests the maximum exhibited horizontal and vertical movements as 0.05% of the pile length (Reference 1).

Recent projects have demonstrated that with good quality workmanship, maximum horizontal and vertical movements were limited to 0.025% of the pile length and extending up to 1.5 times the pile length from the piled wall.

The Saga Centre will be underpinned along the boundary with proposed Saga 2 building to form a lower basement level to the new building.

The existing north boundary wall of the Saga Centre building acts as a ~3m height retaining wall. This is assumed to be a masonry retaining wall construction.

The ground movements resulting from the installation of underpinnings will be highly dependent on the care and skill with which the works are undertaken. The underpinnings will be carried out in short sections up to 1m in length and cast in a 6-stage "hit-and-miss" approach, as standard for this type of construction.

Underpinnings may extend within the clay strata to the new foundation level, approximately 1.5m below the existing foundations.

By adopting the approach described above and ensuring the work is undertaken to a professional standard, preferably by a member of the Association of Specialist Underpinning Contractors (ASUC), then the movement of the existing structure can be minimised. It is assumed that the underpinning process causes up to 5mm of settlement immediately behind the underpinned wall and zero movement beyond a horizontal distance equal to the full width of the building. In addition it is unlikely that any significant horizontal movements can be induced by the underpinning process.

During the excavation process the clay should not be removed to provide stability to the ground behind. Trench sheets and trench props should be provided to brace the excavation (or similar approved by HTS). The design ground water level has been taken at existing ground level based on the findings of the ground investigation. It is assumed that excavation within the clay strata to form the shallow underpinning may require localised pumping to control ground seepage. Any ground water inflow will be local to the boundary with Saga building having already completed the perimeter secant piled wall, and unlikely to be more than minor seepage given the semi-impermeable soil conditions.

Stage 3 – Bulk excavation for new basement

The depth of proposed excavation below the existing basement/gound floor levels typically varies between 3.4-5.1m.

Temporary works will be designed to resist the lateral earth pressures (at-rest), hydrostatic and surcharge loading. Bulk excavation for the new basement level will commence once the lateral propping has been installed, likely fixed to the capping beam to the head of the piled wall. These temporary props can be classified as having a high support stiffness as defined in CIRIA CS80 report. For a rectangular excavation with high support stiffness, CS80 indicates the maximum ground movements behind the wall as 0.15% of the excavation depth horizontally and 0.075% vertically. The influence of these movements becomes negligible beyond 3.5 and 4 times the excavation depth from the wall for vertical and horizontal movements respectively.

### Table 1: Damage Categories after Burland (1991)

<table>
<thead>
<tr>
<th>Category</th>
<th>Damage level</th>
<th>Level (mm)</th>
<th>Degree of damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>Slight</td>
<td>0 - 25</td>
<td>Slight</td>
<td>Minor</td>
</tr>
<tr>
<td>Very slight</td>
<td>25 - 100</td>
<td>Very slight</td>
<td>Severe</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt;100</td>
<td>Severe</td>
<td>Extremely Severe</td>
</tr>
</tbody>
</table>

For a rectangular excavation with high support stiffness, CS80 indicates the maximum ground movements behind the wall as 0.15% of the excavation depth horizontally and 0.075% vertically. The influence of these movements becomes negligible beyond 3.5 and 4 times the excavation depth from the wall for vertical and horizontal movements respectively.
Stage 4 – Installation of RC liner wall (long-term)

The proposed RC retaining/liner walls will provide the permanent retaining structure. The retaining walls will be designed to limit the cumulative movement to within "very slight".

8.2.2 Summary of Predicted Movements to Critical Structures

The following calculations have been based on the sections shown in Appendix C. These are considered to be the sections which have the most risk of causing damage to the adjacent buildings.

 Movements are based on cumulative predictions (excepting the favourable effects of long-term heave) as follows:

 Horizontal – movement towards the basement is positive
 Vertical – settlement is positive / heave is negative

8.2.2.1 Portobello Lofts – assumed masonry clad, steel framed building

\[ H = 20m, W = 20m, L = 22m \]

Maximum predicted ground movements:
Horizontal = +6mm, Vertical = +6mm

Based on these the building movement can be classified as "very slight" (category 1).

8.2.2.2 Grand Union Canal – assumed piled canal wall with adjacent towpath

\[ H = 2m \text{ (water depth)}, W = 15m, L = \infty \]

Maximum predicted ground movements:
Horizontal = +5mm, Vertical = +9.5mm

Based on these the building movement can be classified as "very slight" (category 1).

8.2.2.3 Saga Centre (within boundary of proposed development) – exposed reinforced concrete framed building

\[ H = 16m, W = 20m, L = 22m \]

Maximum predicted ground movements:
Horizontal = +6.5mm, Vertical = +7mm

Based on these the building movement can be classified as "very slight" (category 1).

8.2.2.4 316–324 Kensal Road – assumed masonry clad, reinforced concrete framed building

\[ H = 8m, W = 16m, L = 60m \]

Maximum predicted ground movements:
Horizontal = +6mm, Vertical = +11mm

Based on these the building movement can be classified as "very slight" (category 1).

8.2.2.5 Horse Ramp, Corporation Yard

A grade II listed (English Heritage) horse ramp exists within 15m of the western site boundary, within the grounds of Corporation Yard. The horse ramp is assumed to be a heavy masonry structure on traditional shallow masonry foundations. Portobello Lofts is situated between the ramp and the new basement boundary which means that we do not expect any detrimental effects to the listed structure and none more onerous than the worst-case building discussed above. The findings of the GCG report confirm this as follows:

Maximum predicted ground movements:
Horizontal = +0.5mm, Vertical = +2.5mm

Based on these the building movement can be classified as "negligible" (category 0).

8.2.2.6 Quayside House – assumed masonry clad, unknown building construction

A mixed-use, up to six storey, building approximately 20m to the eastern site boundary.

Maximum predicted ground movements:
Horizontal = +1.5mm, Vertical = +4mm

Based on these the building movement can be classified as "negligible" (category 0).

8.3 Preliminary Movement and Monitoring Strategy

A movement monitoring strategy will be agreed as part of the party wall awards prior to starting demolition. A set of monitoring targets will be installed onto the external walls of all neighbouring properties subject to party wall awards. These will be monitored regularly throughout the building process for 3 dimensional movements. This will act as an early warning system to identify any unexpected movement allowing time for works to cease whilst remedial action is taken if necessary. The following observations are based on experience and local knowledge of the geology within the locality of the site.

A preliminary movement monitoring strategy has been appended to this document; this will need to be agreed with the adjoining owners through the party wall awards and may be subject to further revisions.

<table>
<thead>
<tr>
<th>Status of Alert</th>
<th>Max. vertical or horizontal Displacement</th>
<th>Action(s) in the event of a trigger level being exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>4mm</td>
<td>No action other than carry out work to original method statements and planned frequency for monitoring. Issue weekly or fortnightly reports to interested parties.</td>
</tr>
<tr>
<td>Amber 1</td>
<td>5mm</td>
<td>Inform SEng &amp; Temporary Works Engineer that green trigger exceeded. Continue work but with increased vigilance required monitoring at least once per day. Issue daily reports (where practical) to interested parties.</td>
</tr>
<tr>
<td>Amber 2</td>
<td>7mm</td>
<td>Stop all works and await instruction. Increase monitoring at critical zones to more than twice daily and continue twice daily elsewhere. Issue reports within 24 hours to interested parties.</td>
</tr>
<tr>
<td>Red 1</td>
<td>10mm (movement ceased)</td>
<td>Stop all works and Temporary Works Engineer immediately. Stop all works and await instruction. Increase monitoring at critical zones to more than twice daily and continue twice daily elsewhere. Issue reports within 24 hours to interested parties.</td>
</tr>
<tr>
<td>Red 2</td>
<td>10mm (movement continuing)</td>
<td>Stop all works and seek immediate instruction. Increase monitoring to constant readings until movement ceased. Issue reports within 24 hours to interested parties. Advise adjoining occupiers in the unlikely event that continued movement leads to evacuation of the site.</td>
</tr>
</tbody>
</table>
9 Response to Basements Revised Draft Supplementary Planning Document Section 5.0

In this section we provide a specific response to section 5 of the RBKC Basements Revised Draft Supplementary Planning Document (June 2015). We have broken this into separate sub-headings, and some of the information contained within the responses is duplicated from elsewhere in this proposal.

A) The desk study information and an analysis of the findings in relation to the proposals. A thorough desk study must be carried and presented in the Construction Method Statement. The desk study should establish at least the following:

- The site history
  Refer to Section 2.1
- The age of the property
  Refer to Section 2.1
- The topography
  Refer to Section 2.3
- The geology and ground conditions – overall sections should be drawn using information obtained from the site investigation and British Geological Society borehole logs
  Refer to Section 2.3
- Rivers and watercourses whether existing or old
  Refer to Section 3.6
- The surface water and ground water regimes
  Refer to Section 2.3
  - Flood risk issues
  Refer to Section 6.2
  - Fluvial flooding
  - Surface water flooding
  - Critical Drainage flood areas
  - Groundwater flood potential
  Refer to Section 6.2
- Underground infrastructure, particularly London Underground Limited assets, main drains and utilities
  Refer to Section 3.0
- B) The site investigations with an engineering interpretation of the results.
  Refer to Section 6.2
- B.2.1 Visual assessment of the existing building and its neighbours
  Refer to Section 2.3
- B.2.2 Physical site investigations Borehole Investigation
  Refer to Section 2.3 & 4.0
- B.2.2 Physical site investigations Groundwater Monitoring
  Refer to Section 2.3 & 4.0
- B.2.2 Physical site investigations Trial Pits
  Refer to Section 2.3 & 4.0
- C) An appraisal of the existing building structure and an understanding of the structural arrangement and condition of the adjoining buildings (and listed walls) with particular reference to condition and history of movements. Ongoing movements should be considered.
  Refer to Section 4.0
- D) A statement on groundwater with relevant proposals to deal with it when the new basement is below the water table level. In such cases, consideration should be given to the possible cumulative effect of the basement with other basements nearby, on the groundwater regime. Where the groundwater at a site lies close to the underside of existing ground or lower ground floor levels of the building or those of its neighbours, the potential for the new basement to cause a local rise in the water level of the Upper Aquifer should be carefully considered and dealt with in the proposals.
  Refer to Section 6.4
- E) An analysis of the surface water conditions on the site and how surface water will be dealt with when the basement has been constructed, demonstrating how the status quo is maintained without increasing surface water flows into the curtilage of adjoining properties. The policy requires the provision of SuDS and section 9 provides further guidance.
  Refer to Section 6.4
- F) A statement on flooding and flood risk taking account of fluvial flooding, surface water flooding and Critical Drainage issues (including sewer flooding) explaining how these are accounted for in the design. Sites within Critical Drainage Areas require a full Flood Risk Assessment (NPPF compliant).
  Refer to Section 6.2
- G) Consideration by the designer as to how the basement structure is likely to be built. This should include the envisaged sequence of construction, temporary propping and the relationship between the permanent and temporary works. In particular, attention must be paid to how the vertical and lateral loads are to be supported and balanced at all stages especially when there is to be load transfer and what must be done to limit movements of the existing structure and adjoining buildings. This should be presented in either written or drawn form.
  Refer to Section 5.0 & 7.0
- H) An assessment of movements expected and a written statement of how these will affect the existing property, adjoining buildings and other adjacent structures. This assessment can be from computer modelling or use empirical means (such as those set out in CIRIA 2 C 580 Embedded Retaining Walls: Guidance for Economic Design) with appropriate justification. The assessment needs to cover both short term and long term movements relating to the construction and the performance of the permanent works. The design and construction methodology should aim to limit damage to the existing building on the site and to all adjoining buildings to Category 1 as set out in Table 2.5 of CIRIA report C 580 and should never be more than Category 2. The CMS should explain clearly how this is to be achieved. (Category 1 is ‘very slight’ up to 1 mm, Category 2 is ‘slight’ up to 5mm)
  Refer to Section 8.0
- I) The extent of root protection areas and tree protection proposals.
  There are no trees within the existing site boundary or within proximity of the boundary to consider.
  Refer to Section 8.0
- J) Details of any building or site specific issues which may be affected by the basement proposal should be included.
  There are no site specific issues other than those presented in various sections of the report.
  Refer to Section 8.0
- K) Provide details of noise, vibration and dust in a discrete section of the CMS using the guidance provided in section 6 and the Code of Construction Practice (CoCP) when it becomes available.
  A construction management plan (reference 3) has been prepared by Galliford Try containing a detailed review of the impacts of noise, vibration and dust on Page 15 of the report. A relevant extract from the named report is provided below.

Control of Dust and Noise

This is always a very critical issue in terms of the local environment and especially being adjacent to an occupied operational and residential area.

Detailed method statements for all potentially sensitive breaking out activities will be prepared prior to any works commencing.

The buildings to be demolished will be encapsulated in a fully monoflexed scaffold.

Noise and vibration levels will be closely monitored throughout the period of works. Over the course of numerous similar projects, we have carried out noise assessments on all items of plant and machinery to be used. Every measure will be taken not to exceed the permissible Db levels.

Dust will be contained by damped down and light water spray.

No radios will be permitted on sites.

Site and access road conditions will be continuously, monitored with adequate facilities in place for cleaning as necessary.
10 Conclusion

This report summarises the proposed development at 326 Kensal Road and outlines how the proposed construction of the building conforms with the planning requirements for basement constructed in the Royal Borough of Kensington and Chelsea as set out in their document: Basements – Revised Supplementary Planning Document.

A sequence of construction is provided within the report that seeks to minimise the impact on any neighbouring properties during the construction of the works. The impact on neighbouring properties is negligible.

Protection will be provided to the existing fabric whilst the works are being completed.

The new basement will not significantly alter the flow of groundwater as the basement will be constructed above the water table.

The excavation of basements adjacent to existing buildings is specialist work and HTS will be involved in the selection of an appropriate Contractor who will need the relevant experience and expertise for this type of project. Thereafter HTS will have an on-going role during the works on site to review that the works are being carried out generally in accordance with our design and specification. This role will typically involve weekly site visits at the very beginning of the Contract and fortnightly thereafter. A written report of each site visit is provided for the design team, Contractor and Party Wall Surveyor. The site visit reports will act as an on-going snagging tool which will be signed off by the Contractor at the end of the project.

The proposed development can be safely undertaken and will not impact on the structural stability of the existing or neighbouring buildings given the works are completed in accordance with our design and specification.

References

Appendix A

Phase 1 Environmental Assessment. AP Geotechnics, August 2015
326 KENSAL ROAD
LONDON W10

Phase 1
Environmental Assessment

Client
Resolution Property Limited

Agent
Heyne Tillett Steel

Report No. 4336-1
21 August 2015

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APPENDIX
A Figures
B Current Industrial Data
Synopsis

A Phase I Environmental Assessment has been carried out into the past and present usage of land currently occupied by No. 326 Kensal Road on the instructions of Heyne Tillett Steel, Consulting Engineers to Resolution Property Limited. The purpose of the study was to conduct a visual appraisal of the site and to research available data with reference to chemical constraints that may impinge upon the proposal to redevelop the site for both commercial and residential use.

The investigation comprised a walkover survey followed by examination of historic map records. In addition, searches were carried out of various databases held by the Environment Agency and others. The information obtained from these sources is summarised herein.

It is considered that previous activities on or in the immediate vicinity of the site constitute a low risk of significant or widespread contamination. An intrusive investigation has been commissioned to determine the physical characteristics of the soil with respect to foundation design and related matters and will be extended to assess environmental aspects of the development. Public Health England do not consider that Radon protection will be required.

1
Walk over survey

The area under investigation is an ‘L’ shaped portion of land extending to some 0.25 hectares located between Kensal Road and the Grand Union Canal Paddington Branch. The site is currently occupied by the Saga Centre on the western portion whilst The Old Gramophone Works covers the central section. The current general arrangement is given at Figure 1 at Appendix A.

The site is bound to the north by the Grand Union Canal Paddington Branch, to the east by Adela Street, to the south by No. 324 Kensal Road and to the west by the 5 storey Portobello Lofts building. The Saga Centre is four storeys high on the Kensal Road frontage whilst No. 324, which is occupied by a courier company, is only two storeys high. The Old Gramophone Works is also two storeys high. The Saga Centre and Old Gramophone Works both provide various sized units and offices for a variety of commercial uses. No internal inspection was carried out of the various units.

The site is located within a mixed use environment comprising commercial, residential, schools and a church.

There was no visual of olfactory evidence of gross contamination noted during the walk over survey.

2
Historic map records

Extracts from historic maps are presented at Figures 2 - 11 of Appendix A and illustrate site usage from 1865 to 2014.
1865

The earliest available mapping is given at Figure 2 and shows the site to be occupied by a
number of unknown buildings, some of which front onto the canal which lies immediately to
the north. A Stone Yard abuts the eastern boundary and occupies a small portion of the site
itself. To the east of the Stone Yard lies a collection of unknown buildings, where a well is also
noted. Four fairly large semi-detached structures line Kensal Road immediately south of the
site, three of which contain wells. Land to the west and south is also well developed at this
time and several wells are noted. Much of the development to the south appears to be
residential in nature. Land to the north of the canal contains a Public House, a number of
unknown building and a substantial property; Kensal House set within its own grounds.

1870

The site and immediate surroundings appear relatively unchanged although they reside within
Kensal New Town. A large Gas Works (Western Gas Works) is located some 120 m to the
south west and is bounded by a railway line to its south. No significant changes to the site or
surroundings are noted.

1896

The large scale of Figure 4 shows the site in great detail. Only the very western portion
remains the same. The remainder is now partially occupied by a number of square buildings
which appear to be associated with the terraced housing which now lies immediately south of
the site. A portion of the site is devoid of development. A row of terraced housing has also
been constructed on the very eastern part of the site. The houses front onto Adela Street
which has replaced the Stone Yard and additional housing is noted opposite. Land to the
north of the canal and Harrow Road has been developed with housing. Land to the west has
also been redeveloped and is now occupied by Kensington Wharf. A School has been built to
the south.

1915

Figure 5 at Appendix A shows the site to remain essentially the same save for an additional
structure on the north western part. Kensington House is now shown as a School. The large Gas
Works to the south west is no longer depicted. The number of railway lines has increased and
a carriage Shed has been constructed in the far south west of the mapped area. A large
Garage is shown 110 m to the south east.

1935

The site has been redeveloped. A large, rectangular Paint Works occupies most of the site
whilst an unknown structure has been constructed on the western portion. Housing still lies
immediately south. A Biscuit Works lies 40 m east and a Furniture Works is noted 180 m to
the east. What appear to be Gasometers are depicted on the site of the former Gas Works
to the south west. A number of commercial premises are noted to the south and include; a
Warehouse 100 m to the south west, Deco Works 100 m south, Laundries 200 m south and
280 m south east, Westbourne Works 250 m to the south east, a Motor Body Works 180 m
south east and a Laundry 110 m also to the south east. The large Garage to the south east
noted on Figure 5 is now shown as an Omnibus Depot.

World War II

Although the WWII bomb damage maps have not been viewed in person, online information
does not record a direct strike on the site. However, a High Explosive bomb is recorded as
striking close to Hawthorne Walk to the north east of the site on the other side of the canal.

1954

The Paint Works has expanded a little and includes a glazed area at its rear. The Furniture
Works 180 m to the east is now labelled as a Pharmaceutical Warehouse and has increased in
size. The Deco Works (Electrical & Engineering) has expanded and also occupies the
warehouse noted on Figure 6; 100 m to the south west. Westbourne Works, 250 m to the
south east is now shown as Westbourne Cleanery (Dyers and Cleaners). A Printing Works is
noted 190 m south and a Paint Depot is located 250 m to the south east. The Motor Body
Works 180 m south east has expanded and is adjacent to a Works, Electrical Engineering
premises, Laundry, Garage and Warehouse. Land use to the north of the canal remains
overwhelmingly residential in nature. A Day Nursery is shown within the former Gas Works
area.

1969

The partial mapping presented at Figure 8 of Appendix A has been included as it shows a
change of use on site. The Paint Works is now shown as a Gramophone Record Works. The
remaining portion of the mapped area appears relatively unchanged from the previous Figure
although the Paint Depot 250 m south east is no longer shown.

1987 - 1991

The site remains essentially unchanged from the previous Figure. Land to the east has been
redeveloped and is now occupied by the McKay Trading Estate (which is shown on a 1976 -
1980 map which is not included due to its poor quality and partial nature). The terraced
houses immediately south of the site have been replaced by a large building which has the same
footprint as the current building in this location. Indeed, much of the land south of the canal
has undergone redevelopment. The Omnibus Depot is now shown as Middle Row Centre
which has a number of Works to its north.

2010

No large scale maps are available from 1987 to the present day and small scale maps have
therefore been included. The map scale allows the site to be seen within its wider context.
Land use is predominately residential but also includes commercial premises, schools and
churches, amongst others. A Superstore has been built on the site of the former Gas Works
although a Gas Works is depicted further west.

2014

Figure 11 at Appendix A shows the site and surrounding area much as it is today and no
significant changes are evident.

3

Database searches

Database searches have revealed the following information, generally within a 250 m radius of
the site.

3.1

Environmental permits, incidents and registers

3.1.1

Negative search results within 500 m of search centre

Historic IPC authorisations.
Part A(1) and IPPC authorised activities.
Water industry referrals (potentially harmful discharges to the public sewer).
Red list discharge consents (potentially harmful discharges to controlled waters).
List 1 or 2 dangerous substances inventory sites.
Category 3 or 4 radioactive substances authorisations.
Licensed discharge consents.
Hazardous substance consents and enforcements.
Environment Agency (EA) List 1 recorded pollution incidents within 250 m.
The Local Authority have not determined any sites as Contaminated Land under Part IIa of the EPA 1990.

3.1.2 Part A(2) and Part B Activities

One current permit has been identified by the database search, as detailed in Table 1.

Table 1: Part B Activities and Enforcements

<table>
<thead>
<tr>
<th>Distance, m</th>
<th>Direction</th>
<th>Activity</th>
<th>Enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>233</td>
<td>SW</td>
<td>Petrol filling station</td>
<td>None</td>
</tr>
</tbody>
</table>

3.1.3 COMAH & NIHHS sites

Two historical sites have been identified, both of which relate to the gas works land to the east. An historical NIHHS site was located 112 m west and an historical COMAH site was located 484 m west.

3.1.4 List 2 recorded pollution incidents

Three incidents have been recorded within 500 m of the study site, as detailed in Table 2.

Table 2: List 2 recorded pollution incidents

<table>
<thead>
<tr>
<th>Distance, m</th>
<th>Direction</th>
<th>Date</th>
<th>Pollutant</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>179</td>
<td>W</td>
<td>17/07/2002</td>
<td>Oils and fuel</td>
<td>Water: Minor Land: No impact Air: No impact</td>
</tr>
<tr>
<td>206</td>
<td>W</td>
<td>08/07/2003</td>
<td>Oils and fuel</td>
<td>Water: Minor Land: No impact Air: No impact</td>
</tr>
<tr>
<td>468</td>
<td>W</td>
<td>31/08/2004</td>
<td>Animal and vegetable oil</td>
<td>Water: Significant Land: No impact Air: No impact</td>
</tr>
</tbody>
</table>

3.2 Landfill and other waste sites

3.2.1 Landfill sites

No operational or non-operational Environment Agency (EA), Local Authority or BGS/DoE landfill sites have been identified within 1000 m of the search centre.

3.2.2 Other waste sites

No records of operational or non-operational waste treatment, transfer or disposal sites have been found within 1000 m.

No EA licensed waste sites have been identified by the database search within 1000 m.

3.3 Current land use

3.3.1 Potentially contaminative industrial sites

As befits its urban location, 43 records of potentially contaminative industrial sites have been identified, four of which are electricity substations and are not considered significant. Older substations have the potential to contain polychlorinated biphenyls although they are generally considered to be relatively immobile. However, the search is quite broad in its remit and only those activities deemed potentially contaminative are listed. The records are presented at Appendix B.
3.3.2
Petrol and fuel sites

A petrol filling station is located at Sainsbury’s 245 m to the south west.

3.3.3
High voltage underground electricity cables

Electricity transmission cables run beneath the towpath of the canal immediately north of the site. The database search has revealed that they are Pirelli 275 kV oil filled PB sheath cables installed in 1967.

3.4
Geology

Published records of the British Geological Survey (BGS) indicate the site to lie on London Clay. No superficial deposits are mapped at the subject site.

3.5
Hydrogeology and Hydrology

3.5.1
Groundwater vulnerability

Information supplied by the EA indicates that the London Clay is classed as Unproductive in terms of aquifer designation.

The site is not located within 500 m of a groundwater Source Protection Zone (SPZ).

3.5.2
Abstraction licences

No groundwater, surface water or potable water abstraction takes place within 1500 m of the study site.

3.5.3
Flooding

The EA RoFRA5 database indicates that there is a very low risk of flooding at the centre of the site.

No flood defences are located within 250 m of the site and no areas benefiting from flood defences are located within 250 m. No flood storage areas have been identified within 250 m.

3.6
Environmentally sensitive sites

No designated environmentally sensitive sites are located within 1000 m of the study site.

3.7
Natural hazards

The British Geological Survey combine data sets for ground stability and conclude the following:

- Shrink / swell clay: Moderate
- Landslides: Very low
- Soluble rocks: Negligible
3.8 Mining

No coal mining areas are located within 75 m of the study site and no non-coal mining areas are located within 50 m.

4 Development proposals

It is intended to refurbish the Saga Centre and to extend The Old Gramophone Works to provide both commercial and residential space. A double height basement is also proposed beneath the latter. The general arrangement is given at Figure 12 of Appendix A although the design is still evolving.

The general arrangement is presented at Figure 12 of Appendix A.

5 Discussion

5.1 Solid and liquid phase contaminants

The development history of the site and its immediate surroundings have been summarised in the foregoing, as far as could be ascertained within the present remit.

The site was already developed on the first available mapping of 1865 with a number of fairly large structures fronting the canal on the central and eastern portion whilst the western part contained a mixture of buildings and unknown structures. It remained in such a configuration until some time between 1870 and 1896. Figure 4 of 1896 shows all but the very western portion of the site to have been redeveloped with a number of square buildings. Those on the southern part of the central portion of the site appear to be associated with the houses immediately south. Terraced housing has also been constructed on the very eastern part of the site. Figure 5 of 1915 shows some small alterations to building footprint in the north west corner of the site with the remainder unchanged. By Figure 6 of 1935 the site had undergone wholesale redevelopment; a large, rectangular Paint Works has been constructed on the main portion of the site and a fairly large building now occupies the western part. The configuration remains generally the same albeit with some minor modifications in building footprints. Figure 8 of 1969 shows the Paint Works to be a Gramophone Record Works.

The site has been subject to both residential and commercial use since at least 1865. Residential land use is not considered to represent a significant risk of contamination. However, the use of part of the site as a Paint Works does have the potential to have left a legacy of contamination in the ground.

The surrounding land use has also been subject to both residential and commercial land use. Of particular note is the large Gas Works previously located to the south west. A number of other potentially contaminative land uses have also been identified, as discussed on the various Figures. A number of electricity substations are located within the mapped area.

The database searches have revealed activities within the surrounding area which could potentially give rise to contamination.