3 Existing Conditions

3.1 Existing Ground Conditions

Published borehole records (British Geological Survey, 2006) for the area indicate the geology of the site to consist of the following strata:

Unknown thickness	- Made Ground
6.7 – 10.6m	- London Clay (weathered)
20.4m	- London Clay (unweathered)
15.25m	- Lambeth Group
6.0m	- Thanet Sand
72.54+m	- Chalk

The existing topography and history of development of the site suggests that made ground should also be expected beneath the site.

A borehole has been carried out from ground level in 65 Bayham Place to assess the existing subsoil conditions, obtain geotechnical data and determine the contamination status of the ground beneath the site. A standpipe was also installed to measure ground gas and groundwater levels (borehole logs are contained within the RSK report in Appendix E).

The borehole was drilled to a depth of 30m below ground level with the ground consisting of the following strata:

0.0 –- 0.3m	Concrete
0.3 – 1.2m	Made Ground (Dark brown slight sandy gravelly silty CLAY)
1.2 – 7.8m	Firm brown mottled grey silty CLAY (LONDON CLAY FORMATION)
7.8 – 14.5m	Stiff fissured dark grey silty CLAY (LONDON CLAY FORMATION)
14.5 – 21.0m	Stiff / very stiff dark grey slightly sandy silty CLAY (LONDON CLAY FORMATION)
21.0 – 22.95	Very stiff fissured dark grey silty CLAY (LONDON CLAY FORMATION)
22.95–24.0m	Very stiff dark grey slightly sandy silty CLAY (LONDON CLAY FORMATION)
24.0 – 25.0m	Stiff / very stiff dark greyish brown silty CLAY (LONDON CLAY FORMATION)
25.0 – 25.4m	Stiff / very stiff sandy silty CLAY. (HARWICH FORMATION - SWANSCOMBE MEMBER)
25.4 – 30.0m	Very stiff fissured brown mottled blue-grey CLAY (LAMBETH GROUP)

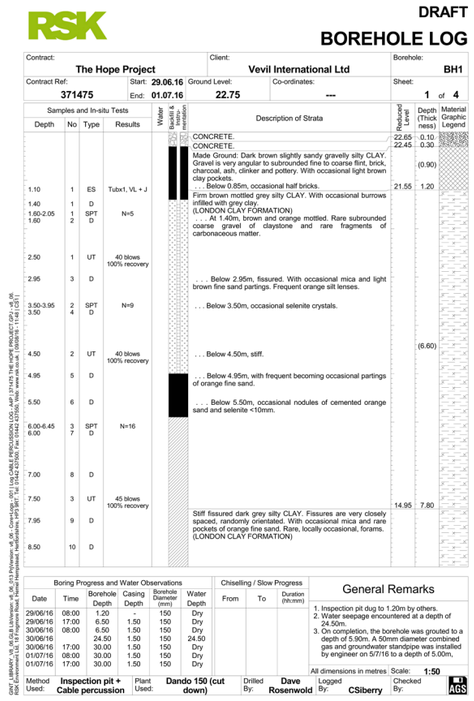
Two shallow window sample boreholes were drilled within the sub-basement and basement of KOKO to obtain geotechnical data and facilitate the installation of shallow gas and groundwater monitoring standpipes.

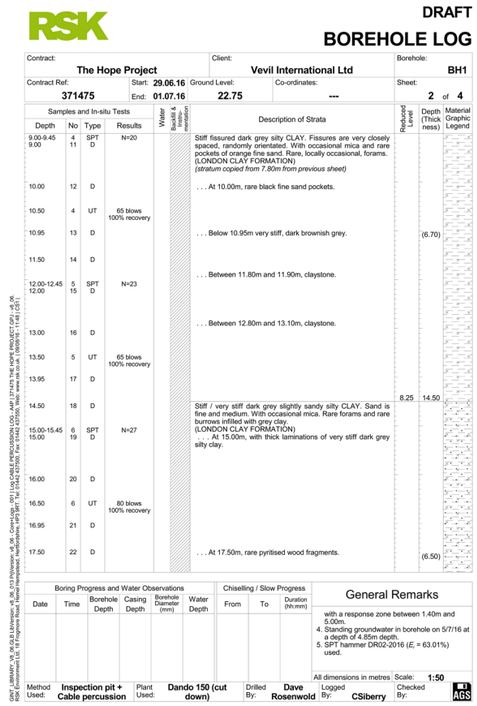
Hand excavated trial pits were carried out at locations across the site to expose the existing foundations to the various buildings and level changes and to retrieve samples for chemical testing. RSK trial pit records can be found in Appendix E.

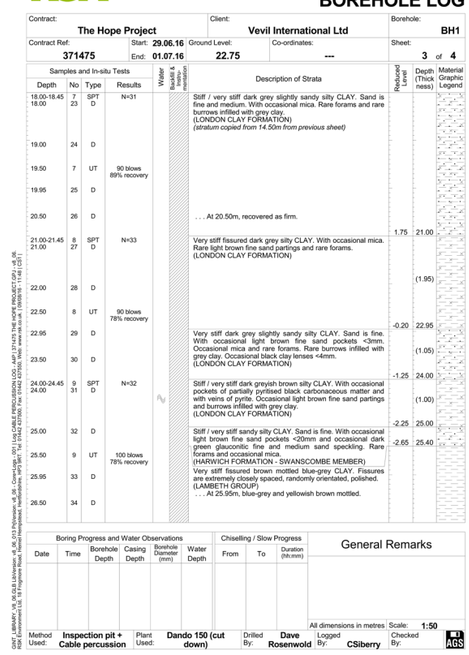
Across the site, the made ground ranged in thickness from 0.18m to 2.12m underlain by London Clay.

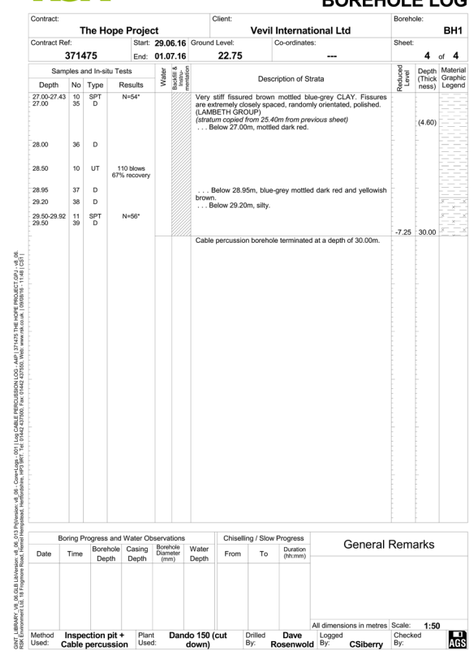
Groundwater was encountered within the borehole at a depth of 24.5m below ground level. A perched groundwater table was found in the London Clay at an elevation of approximately 18.5m AOD. Water was also encountered within several trial pits which is considered to reflect groundwater accumulated around foundations and perched within the made ground. Localised dewatering may be required during the construction of new foundations.

Gas monitoring confirmed that the site falls into Characteristic Situation 1, for which no gas protection measures are required. Should any excavation be undertaken in the area of WS1, it is recommended that the localised air quality should be checked before and during the works.


DRAFT
BOREHOLE LOG
Contract: The Hope Project | Client: Vevil International Ltd | Borehole: BH1
Contract Ref: 371475 | Start: 29.06.16 End: 01.07.16 | Ground Level: 22.75 | Co-ordinates: --- | Sheet: 1 of 4
Samples and In-situ Tests: Depth | No | Type | Results | Water Strikes & Installation
Description of Strata
Reduced Level | Depth (Thickness) | Material Graphic Legend
1.10 1 ES Tubx1, VL + J
1.40 1 D
1.60-2.05 1 SPT N=5
1.60 2 D
2.50 1 UT 40 blows 100% recovery
2.95 3 D
3.50-3.95 2 SPT N=9
3.50 4 D
4.50 2 UT 40 blows 100% recovery
4.95 5 D
5.50 6 D
6.00-6.45 3 SPT N=16
6.00 7 D
7.00 8 D
7.50 3 UT 45 blows 100% recovery
7.95 9 D
8.50 10 D
CONCRETE. 22.65 0.10
CONCRETE. 22.45 0.30
Made Ground: Dark brown slightly sandy gravelly silty CLAY. Gravel is very angular to subrounded fine to coarse flint, brick, charcoal, ash, clinker and pottery. With occasional light brown clay pockets. (0.90)
. . . Below 0.85m, occasional half bricks.
Firm brown mottled grey silty CLAY. With occasional burrows infilled with grey clay. 21.55 1.20
(LONDON CLAY FORMATION)
. . . At 1.40m, brown and orange mottled. Rare subrounded coarse gravel of claystone and rare fragments of carbonaceous matter.
. . . Below 2.95m, fissured. With occasional mica and light brown fine sand partings. Frequent orange silt lenses.
. . . Below 3.50m, occasional selenite crystals.
(6.60)
. . . Below 4.50m, stiff.
. . . Below 4.95m, with frequent becoming occasional partings of orange fine sand.
. . . Below 5.50m, occasional nodules of cemented orange sand and selenite <10mm.
Stiff fissured dark grey silty CLAY. Fissures are very closely spaced, randomly orientated. With occasional mica and rare pockets of orange fine sand. Rare, locally occasional, forams. (LONDON CLAY FORMATION) 14.95 7.80
Boring Progress and Water Observations: Date | Time | Borehole Depth | Casing Depth | Borehole Diameter (mm) | Water Depth
29/06/16 08:00 1.20 - 150 Dry
29/06/16 17:00 6.50 1.50 150 Dry
30/06/16 08:00 6.50 1.50 150 Dry
30/06/16 24.50 1.50 150 24.50
30/06/16 17:00 30.00 1.50 150 Dry
01/07/16 08:00 30.00 1.50 150 Dry
01/07/16 17:00 30.00 1.50 150 Dry
Chiselling / Slow Progress: From | To | Duration (hh:mm)
General Remarks
1. Inspection pit dug to 1.20m by others.
2. Water seepage encountered at a depth of 24.50m.
3. On completion, the borehole was grouted to a depth of 5.90m. A 50mm diameter combined gas and groundwater standpipe was installed by engineer on 5/7/16 to a depth of 5.00m.
All dimensions in metres Scale: 1:50
Method Used: Inspection pit + Cable percussion | Plant Used: Dando 150 (cut down) | Drilled By: Dave Rosenwold | Logged By: CSiberry | Checked By:
AGS


DRAFT
BOREHOLE LOG
Contract: The Hope Project | Client: Vevil International Ltd | Borehole: BH1
Contract Ref: 371475 | Start: 29.06.16 End: 01.07.16 | Ground Level: 22.75 | Co-ordinates: --- | Sheet: 2 of 4
Samples and In-situ Tests: Depth | No | Type | Results | Water Strikes & Installation
Description of Strata
Reduced Level | Depth (Thickness) | Material Graphic Legend
9.00-9.45 4 SPT N=20
9.00 11 D
10.00 12 D
10.50 4 UT 85 blows 100% recovery
10.95 13 D
11.50 14 D
12.00-12.45 5 SPT N=23
12.00 15 D
13.00 16 D
13.50 5 UT 65 blows 100% recovery
13.95 17 D
14.50 18 D
15.00-15.45 6 SPT N=27
15.00 19 D
16.00 20 D
16.50 6 UT 80 blows 100% recovery
16.95 21 D
17.50 22 D
Stiff fissured dark grey silty CLAY. Fissures are very closely spaced, randomly orientated. With occasional mica and rare pockets of orange fine sand. Rare, locally occasional, forams. (LONDON CLAY FORMATION) (stratum copied from 7.80m from previous sheet)
. . . At 10.00m, rare black fine sand pockets.
(6.70)
. . . Below 10.95m very stiff, dark brownish grey.
. . . Between 11.80m and 11.90m, claystone.
. . . Between 12.80m and 13.10m, claystone.
8.25 14.50
Stiff / very stiff dark grey slightly sandy silty CLAY. Sand is fine and medium. With occasional mica. Rare forams and rare burrows infilled with grey clay. (LONDON CLAY FORMATION)
. . . At 15.00m, with thick laminations of very stiff dark grey silty clay.
(6.50)
. . . At 17.50m, rare pyritised wood fragments.
Boring Progress and Water Observations: Date | Time | Borehole Depth | Casing Depth | Borehole Diameter (mm) | Water Depth
Chiselling / Slow Progress: From | To | Duration (hh:mm)
General Remarks
with a response zone between 1.40m and 5.00m.
4. Standing groundwater in borehole on 5/7/16 at a depth of 4.85m depth.
5. SPT hammer DR02-2016 (E_r = 63.01%) used.
All dimensions in metres Scale: 1:50
Method Used: Inspection pit + Cable percussion | Plant Used: Dando 150 (cut down) | Drilled By: Dave Rosenwold | Logged By: CSiberry | Checked By:
AGS


DRAFT
BOREHOLE LOG
Contract: The Hope Project | Client: Vevil International Ltd | Borehole: BH1
Contract Ref: 371475 | Start: 29.06.16 End: 01.07.16 | Ground Level: 22.75 | Co-ordinates: --- | Sheet: 3 of 4
Samples and In-situ Tests: Depth | No | Type | Results | Water Strikes & Installation
Description of Strata
Reduced Level | Depth (Thickness) | Material Graphic Legend
18.00-18.45 7 SPT N=31
18.00 23 D
19.00 24 D
19.50 7 UT 90 blows 89% recovery
19.95 25 D
20.50 26 D
21.00-21.45 8 SPT N=33
21.00 27 D
22.00 28 D
22.50 8 UT 90 blows 78% recovery
22.95 29 D
23.50 30 D
24.00-24.45 9 SPT N=32
24.00 31 D
25.00 32 D
25.50 9 UT 100 blows 78% recovery
25.95 33 D
26.50 34 D
Stiff / very stiff dark grey slightly sandy silty CLAY. Sand is fine and medium. With occasional mica. Rare forams and rare burrows infilled with grey clay. (LONDON CLAY FORMATION) (stratum copied from 14.50m from previous sheet)
. . . At 20.50m, recovered as firm.
Very stiff fissured dark grey silty CLAY. With occasional mica. Rare light brown fine sand partings and rare forams. (LONDON CLAY FORMATION) 1.75 21.00
(1.95)
Very stiff dark grey slightly sandy silty CLAY. Sand is fine. With occasional light brown fine sand pockets <3mm. Occasional mica and rare forams. Rare burrows infilled with grey clay. Occasional black clay lenses <4mm. (LONDON CLAY FORMATION) -0.20 22.95
(1.05)
Stiff / very stiff dark greyish brown silty CLAY. With occasional pockets of partially pyritised black carbonaceous matter and with veins of pyrite. Occasional light brown fine sand partings and burrows infilled with grey clay. (LONDON CLAY FORMATION) -1.25 24.00
(1.00)
Stiff / very stiff sandy silty CLAY. Sand is fine. With occasional light brown fine sand pockets <20mm and occasional dark green glauconitic fine and medium sand speckling. Rare forams and occasional mica. (HARWICH FORMATION - SWANSCOMBE MEMBER) -2.25 25.00
Very stiff fissured brown mottled blue-grey CLAY. Fissures are extremely closely spaced, randomly orientated, polished. (LAMBETH GROUP) -2.65 25.40
. . . At 25.95m, blue-grey and yellowish brown mottled.
Boring Progress and Water Observations: Date | Time | Borehole Depth | Casing Depth | Borehole Diameter (mm) | Water Depth
Chiselling / Slow Progress: From | To | Duration (hh:mm)
General Remarks
All dimensions in metres Scale: 1:50
Method Used: Inspection pit + Cable percussion | Plant Used: Dando 150 (cut down) | Drilled By: Dave Rosenwold | Logged By: CSiberry | Checked By:
AGS


DRAFT
BOREHOLE LOG
Contract: The Hope Project | Client: Vevil International Ltd | Borehole: BH1
Contract Ref: 371475 | Start: 29.06.16 End: 01.07.16 | Ground Level: 22.75 | Co-ordinates: --- | Sheet: 4 of 4
Samples and In-situ Tests: Depth | No | Type | Results | Water Strikes & Installation
Description of Strata
Reduced Level | Depth (Thickness) | Material Graphic Legend
27.00-27.43 10 SPT N=54*
27.00 35 D
28.00 36 D
28.50 10 UT 110 blows 67% recovery
28.95 37 D
29.20 38 D
29.50-29.92 11 SPT N=56*
29.50 39 D
Very stiff fissured brown mottled blue-grey CLAY. Fissures are extremely closely spaced, randomly orientated, polished. (LAMBETH GROUP) (stratum copied from 25.40m from previous sheet)
. . . Below 27.00m, mottled dark red.
(4.60)
. . . Below 28.95m, blue-grey mottled dark red and yellowish brown.
. . . Below 29.20m, silty.
-7.25 30.00
Cable percussion borehole terminated at a depth of 30.00m.
Boring Progress and Water Observations: Date | Time | Borehole Depth | Casing Depth | Borehole Diameter (mm) | Water Depth
Chiselling / Slow Progress: From | To | Duration (hh:mm)
General Remarks
All dimensions in metres Scale: 1:50
Method Used: Inspection pit + Cable percussion | Plant Used: Dando 150 (cut down) | Drilled By: Dave Rosenwold | Logged By: CSiberry | Checked By:
AGS

Borehole logs

3.2 Existing Drainage and Utilities

A below ground CCTV survey has confirmed that the surface and foul water drainage from the site is combined within the site and discharges into the existing combined Thames Water sewer system along Bayham Place, Bayham Street and Crowndale Road.

It is understood that the existing surface and foul water drainage is taken out of the buildings at their lowest level (ground, basement or sub-basement).

There are a series of 4no. linked underground sump chambers within the sub-basement of KOKO. These run in a southwest-northeast direction. A pump discharges from the northernmost sump and is understood to connect with the Thames Water sewer network below Bayham Place. It is understood that the sumps are used to deal with high (perched) groundwater levels within the existing sub-basement. The BGS geological maps noted worked ground beneath/close to the site. The high (perched) groundwater table beneath KOKO may therefore be a residual effect from the perched water collecting within the disturbed/worked ground.

3.3 Existing Hydrogeology and Hydrology

RSK have carried out an assessment of the existing hydrogeology and hydrology which can be found in Appendix E. In summary:

The hydrogeology of the site is likely to be characterised by the presence of an aquitard comprising the London Clay Formation. Confined by the London Clay Formation is a deep aquifer, comprising a sequence of deposits consisting of the lower part of the Lambeth Group and Thanet Sands (Basal Sands) and the White Chalk. These units are expected to be in hydraulic continuity.

Based on the BGS borehole records and nearby site investigations, the anticipated depth to the groundwater table is in the order of 22.50m below ground level.

The EA status report issued in 2015 'Management of the London Basin Chalk Aquifer' indicates that the potentiometric surface of the groundwater in the deep aquifer in the site area in January 2015 was at approximately -36.00m AOD, i.e. approximately 58.80m below ground level.

The soils beneath the site are classified as having no leaching potential.

In view of the recorded depth to groundwater in the deep aquifer beneath the site the site risk of rising groundwater to the proposed development is considered low.

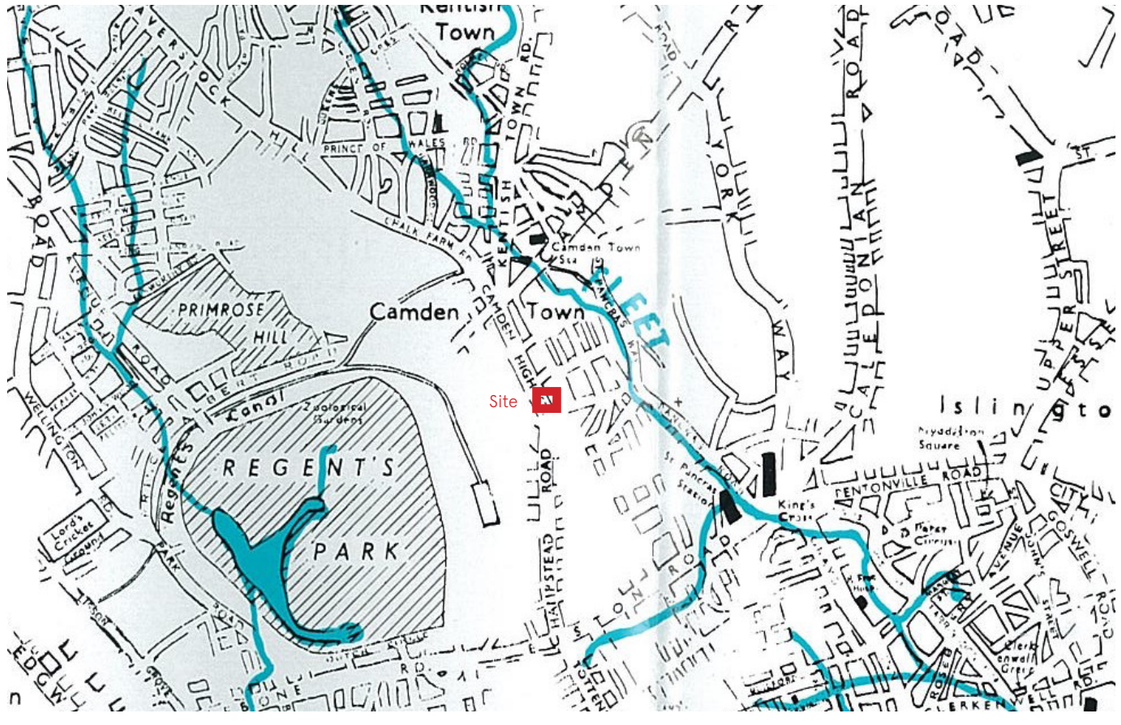
Information available on the EA website indicates that the site does not lie within a currently designated groundwater Source Protection Zone.

The nearest identified surface watercourse to the site is the Regent's Canal located approximately 540m to the northeast of the site. The canal starts to the west of the site, goes around the top of Regents Park, around 600m to the north of the site, before heading southeast/east.

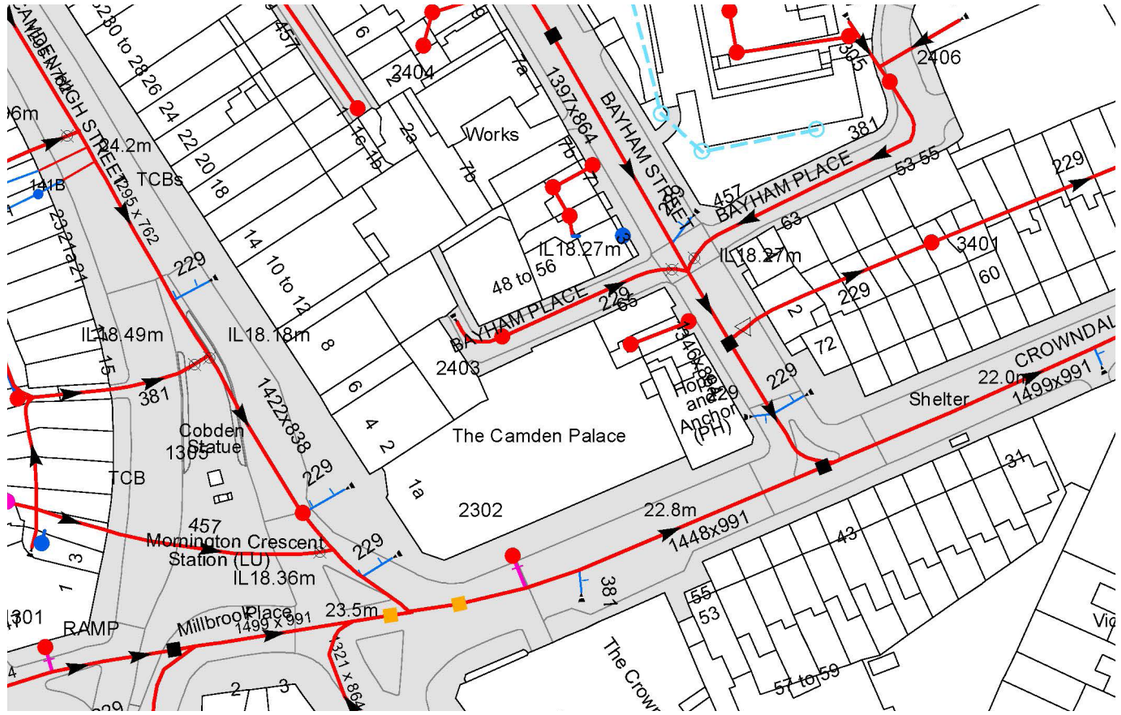
The Lost Rivers of London (Barton, 1992) show the course of the historical Fleet River, which flows southwards into the River Thames, to be located approximately 325m east of the site, near St Pancras Hospital. The river is now culverted.

There are no licensed discharge consents within 500m of the site.

The indicative floodplain map for the area, published by the EA, shows that the site does not lie within the designated floodplain of the River Thames. The risk of flooding each year has been assessed by the EA as very low, i.e. 0.1% (1 in 1000) or less.



London Lost Rivers map



Thames Water asset map

HEYNE TILLETT STEEL