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NOTES:

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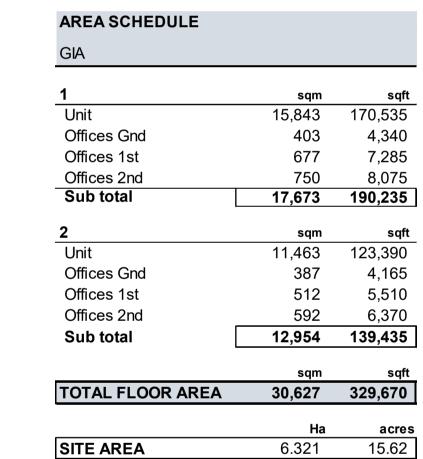
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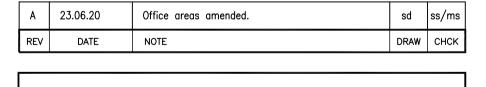
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IRONBRIDGE ROAD, HAYES

SITE LAYOUT PLAN

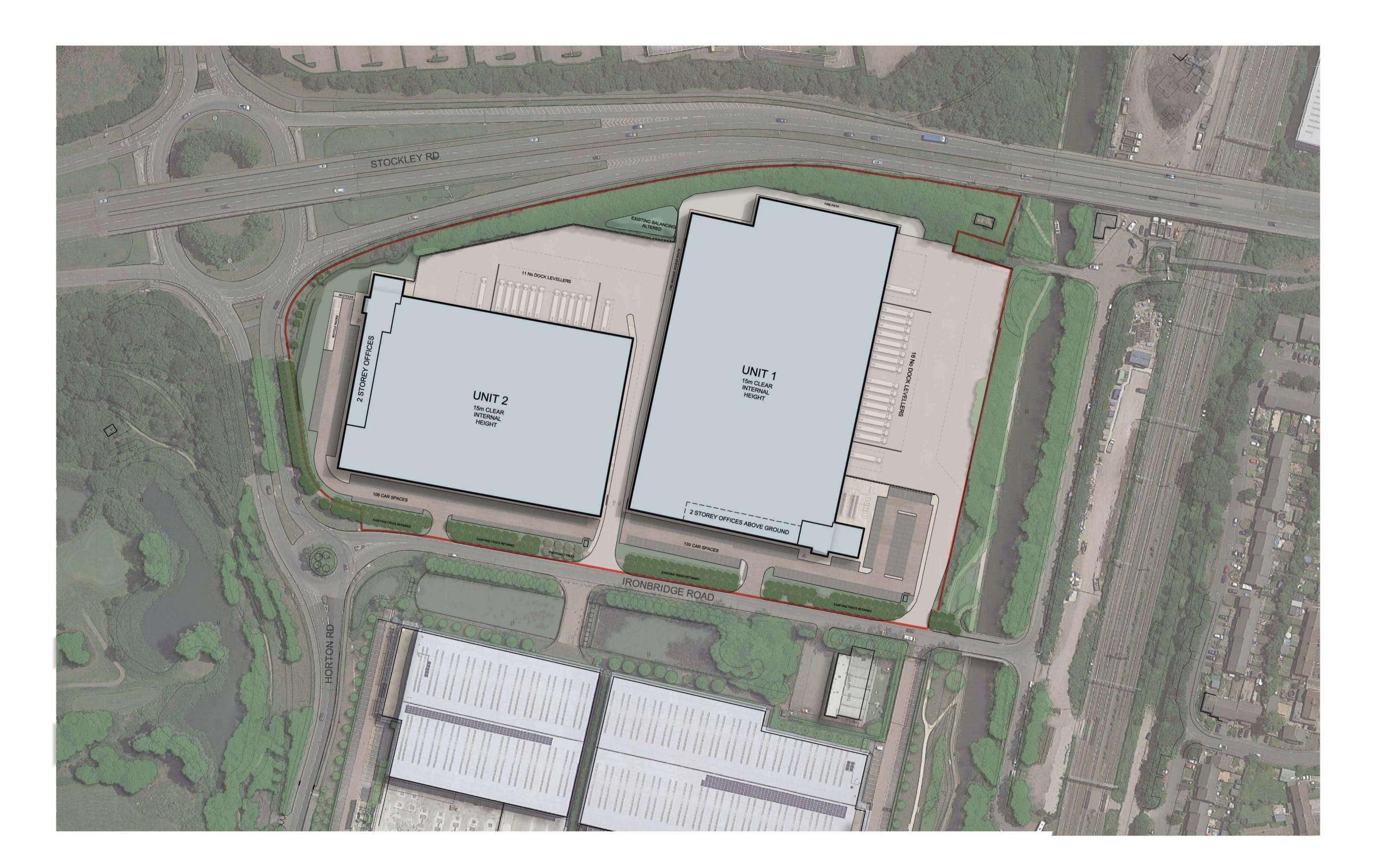
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JUNE 2020 1:1000@A1 PF

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DRAWING NUMBER
30928-PL-201A



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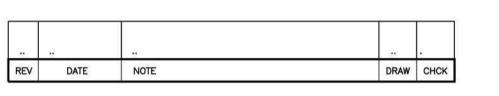
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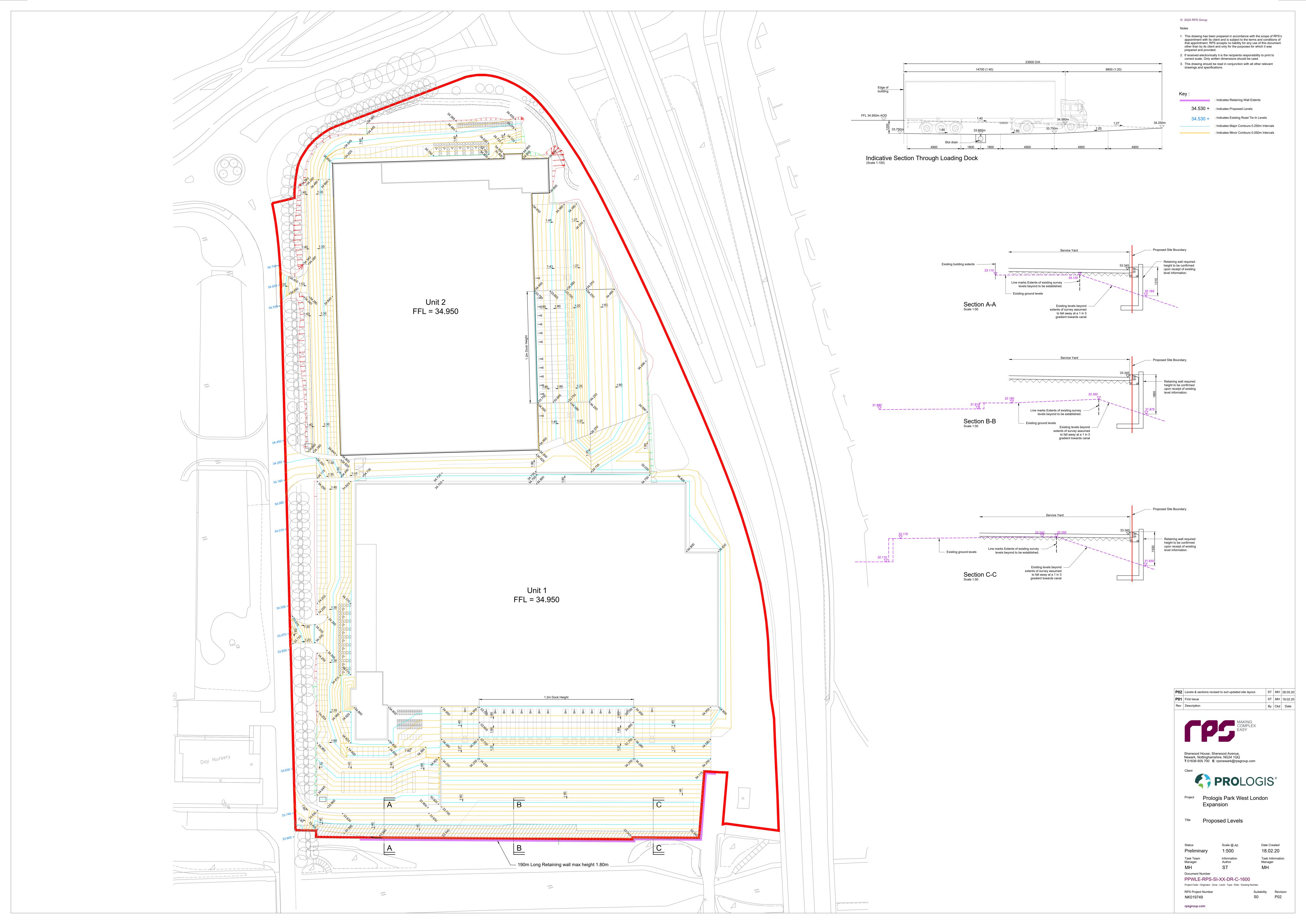
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IRONBRIDGE ROAD, HAYES COLOUR SITE LAYOUT PLAN

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	STATUS	CHECKED
	FEASIBILITY	MS/GZ/SD





Appendix C.2

TOPOGRAPHICAL SURVEY







Station	Easting (m)	Northing (m)	Level (m)
GH1	507518.211	180162.745	35.322
GH2	507486.864	180058.701	34.835
GH3	507528.668	180242.494	36.503
GH4	507514.349	180256.116	35.769
GH5	507563.793	180235.127	36.198
GH6	507607.288	180224.714	34.831
GH7	507622.943	180161.958	33.771
GH8	507600.085	180091.801	33.504
GH9	507636.936	180064.823	34.292
GH10	507627.854	180016.318	33.400
 GH11	507622.357	179959.826	33.498
GH12	507599.399	179967.726	31.969
GH13	507569.066	179967.932	31.901
GH14	507542.077	179986.088	31.942
GH15	507530.345	179989.189	32.334
GH16	507521.223	179971.564	33.097
GH17	507456.742	179986.241	33.195
GH18	507520.339	180049.371	34.876
GH19	507556.184	180049.961	33.834
OS Note	· ·		

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only. Surveyed Buildings

This survey has been orientated to the Ordnance Survey (O.S) National Grid OSGB36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net). A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models.

The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

Buildings	Overhead Cable	IC	Inspection chamber	Во	Bollard
Wall	Concrete edge	Plnv	Pipe invert	IB	Illuminated bollard
Kerb line	Tarmac edge	Gy	Gully	Bin	Rubbish bin
Line marking	Grass verge	Bg	Back gully	Vp	Vent pipe
Drop kerb	Canopy/Overhang	Dp	Down pipe	Grl	Ground light
Centre line	Verge	Pipe	Pipe above ground	Lbox	Letter box
Top of bank	Bottom of bank	МН	Manhole	Stmp	Tree Stump
. 1	Station and Name	WL	Water level	Sty	Stile
100.000	Station Level	FI	Flood light	IFL	Internal floor level
		Lp	Lamp post	THL	Threshold level
(·)⊙ *	Tree / Bush / Sapling	Тр	Telegraph post	Sp	Sign post
	Area of Undergrowth	Ep	Electricity post	TH	Trialhole
~ · · ·	Area or Oridergrowth	TI	Traffic light	ВН	Borehole
کی کھ	Woodland	Bus	Bus stop	ELC	Electric
R:	Ridge Level	Sv	Stop valve	BT	British Telecom
E:	Eaves Level	St	Stop tap	C'box	Control box
F:	Flat Roof Level	Er	Earth rod	TT	Tactile
	Gate	Wm	Water meter	BP	Brick paved
Fence types		Gas	Gas valve	CPS	Concrete paving slabs
-I—I—I—I—	Interwoven	Av	Air valve	CVR	Cover
-111	Iron Railings	ICU	Unidentified inspection	R/wall	Retaining wall
	Wire Mesh	Wo	Wash out	TWL	Top of Wall Level
P\R	Post & Rail	Re	Rodding eye	TCL	Tree canopy level
P\W	Post & Wire	BB	Belisha beacon	G:	Girth
C\L		CTV	Cable tv	MG	Multi girth
WP	Chain Link	Mkr	Marker post	IC	Inspection chamber
+	Wooden Panels	Gmkr	Gas marker post	CL:	Cover level
C\B	Close Boarded	So	Soffit	IL:	Invert level
S\P	Steel Palisade	Fh	Fire hydrant	UTL	Unable to lift



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Stockley Park West Drayton, Uxbridge UB11 1BT

Topographical Survey

		SCALE		DATE		
		A1@ 1: 500		24.06.19		
		DRAWN	QUALITY RE	F		
		LB	GH5472			
		Level datum Grid orientation	See note			
.		Job number 33				
		Drawing No.			Rev.	
		3386		0		

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client. All dimensions should be checked on site prior to design and construction. Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Appendix C.3

WSP GEO-ENVIRONMENTAL REPORT





2. SITE SETTING

2.1. SITE DESCRIPTION AND CURRENT USE

Table 2 summarises the Site details presented in the PRA and obtained over the course of the intrusive works. A Site location plan and current layout plan are presented in Drawings 1 and 2 in **Appendix A.**

Table 2 - Summary of Site Details

Detail	Comment		
Name of Site	Prologis Park West London: Expansion Land.		
Address of Site	1-3 Ironbridge Road, Stockley Park West, Iron Bridge Road North, West Drayton, Uxbridge, UB11 1BT.		
Location and National Grid Reference (NGR)	The Site is located in the west of London, approximately 4.5 km south-east of Uxbridge. The Site is situated on the Stockley Park business park at approximate NGR 507560, 180120. The Site can be accessed via Ironbridge Road North, adjacent to the west of the Site.		
Site Area and Topography	The Site is broadly rectangular in shape and covers approximately 5.4 ha. The topography of the Site raises by approximately 1.5 m from the southern section towards the centre of the Site. The ground level in the north-west section of the Site reduces by approximately 1.5 m towards the northern Site boundary.		
Site Description and Current Use	The Site is owned and occupied by GSK, a pharmaceutical company. The Site comprises the GSK offices, which includes four large buildings on-site; one in the north, one in the centre, one in the south-west and a multi-storey car park in the south-east corner. The remainder of the Site is covered in hardstanding (used as car parking) with limited landscaped areas. Two large surface waters feature are present; one located in the north of the Site and one in the east. It is understood the water feature in the east of the Site is a surface water balancing pond used to attenuate surface water car park discharge, prior to discharge to the Grand Union Canal. The surface water feature to the north is for aesthetic purposes. 3 x 30,000 litre underground diesel storage tanks (USTs) are present on-site; one associated with each building to power back-up generators (located on the roofs). The USTs were linked via underground fuel lines to fuel risers that were installed up the external side of the buildings. The fill points are located adjacent to the USTs. The USTs were reportedly installed in the early 1990s and decommissioned in 2014,		
	which comprised emptying the tanks of fuel and filling each with foam. Each backup generator was served by a dedicated above ground tank (AGTs), approximately 500 litres in capacity. Reportedly the AGTs were emptied at the same time as the USTs were decommissioned. It is unknown whether the ancillary fuel pipes have been decommissioned or foam filled. Three electrical substations present on-site; located in the north-west, east and south. It is not known whether these substations contained polychlorinated biphenyls (PCBs).		

PROLOGIS PARK WEST LONDON: EXPANSION LAND

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Detail	Comment
	Waste storage areas are present to the east of Building 10 (in the centre of the Site), to the east of Building 11 (in the south of the Site) and to the west of Building 9 (in the north of the Site).
Ground Cover	The Site is predominantly covered by block paving with soft landscaping and trees between the parking bays. The block paving is generally in good condition.
Surrounding Area	The following land uses were observed in the area surrounding the Site:
	North – A408 junction with Horton Road and Bennetsfield Road with Stockley Park golf course beyond.
	East – A408 with further industrial units of Stockley Park beyond.
	South – Grand Union Canal, Iron Bridge Road South, railway line and residential properties.
	West – Iron Bridge Road North and industrial units of Prologis Park: West London beyond.
Observations of Impact	During the Site walkover, no external staining of the ground was observed. No evidence of vegetation stress was noted.

2.2. ANTICIPATED GEOLOGY AND HYDROGEOLOGY

A review of the publicly available geological information has been undertaken, with sources including the regional British Geological Survey (BGS) 1:50,000 maps, information available on the BGS online Geology of Britain Viewer and local BGS borehole logs. These indicate that the underlying superficial geology on Site comprises "worked ground" above natural superficial deposits comprising the Lynch Hill Gravel Member (sand and gravel) across the majority of the Site and the Langley Silt Member (clay and silt) along the southern and eastern boundaries. The bedrock geology comprises the London Clay Formation (clay, silt and sand).

According to Council records obtained by Ramboll Environ, anticipated ground conditions beneath the structures comprises 1.75 m thick structural fill (compacted granular fill), 0.4 m approved fill (excavated gravel/site won/imported material) over unexcavated Lynch Hill Gravel above the London Clay. Anticipated ground conditions in external areas were likely to comprise 150 mm hardstanding/paving; over 450 mm sub-base; over a 300 mm reported capping layer; over landfill material; all over unexcavated Lynch Hill Gravel (approximately 450 mm thick) and London Clay.

The Lynch Hill Gravel Member is classified as a Principal Aquifer and the Langley Silt Member and London Clay Formation are designated as Unproductive Strata. The Site is not situated within a groundwater Source Protection Zone (SPZ) and there are no operational groundwater abstraction licences for potable water supply within 1 km of the Site. The closest abstraction is approximately 42 m north-west of the Site and relates to abstracting groundwater for make-up or top-up water (i.e. to make up water levels in ponds, canals, boilers, lagoons). It is understood this abstraction was used to maintain water levels in the surface water features located to the west of Ironbridge Road North.

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2.3. HYDROLOGY

Two surface water ponds are present on-site; located in the north and east. The nearest off-site surface water feature is the Grand Union Canal, which lies adjacent to the southern boundary. The section of the canal between Iron Bridge and Brent was given a General Quality Assessment (GQA) Grade of D (i.e. Fair) in 2000. No recent water quality data for the canal is available from the Environment Agency. The River Crane is located approximately 3 km east of the Site and has an overall water body quality classification of poor (2016).

The closest surface water abstraction point (for process water) is located approximately 156 m southeast of the Site.

2.4. SITE HISTORY

ON-SITE

The following summary of the Site history has been produced from a review of the historical mapping provided in the PRA and regulatory information provided in the Ramboll Environ report.

The earliest available historical maps from 1868 indicate the majority of the Site to be undeveloped, comprising three fields.

By 1895 a gravel pit is present in the south-east corner of Site. The central field is shown as an orchard with three small buildings constructed; one in the centre and two on the eastern boundary. An additional building is present in the south-east corner of Site.

By 1914, the southern two thirds of the Site is a gravel pit with a flooded excavation in the west. By 1934, further excavation has occurred along the western half of the Site. The previously flooded section of the gravel pit in the west of the Site has been extended north and formed into a navigable channel connected to the canal to the south.

Historical reports indicate that the gravel extraction was followed by progressive filling in the 1930s to 1940s and again in the 1960s.

In 1960 the channel is no longer connected to the canal and the building at the northern end is no longer present. The Site is marked as rough pasture. The northern ends of two long buildings cross the western boundary.

By the mid 1960s, the channel had been backfilled and a depot had been constructed in the south of the Site. The long building that crossed the western boundary is part of a piggery with additional related buildings present in the eastern half of the Site. By 1975 a plant hire works has been built cross boundary to the south of the piggery.

By the early 1990s, the Site is redeveloped into its current day configuration with the exception of the multi-story carpark in the south-east corner (constructed in the late 1990s).

The Envirocheck report indicates the majority of the Site to be infilled land with a small area of landfill in the north-west.

Council records obtained by Ramboll Environ suggest remediation occurred on-site and at the adjacent (west) site from 1987 to 1988 involving the removal of 1,116,000 m³ of landfill material. Further information is provided in the Ramboll Environ Phase 1 report and the WSP PRA.

PROLOGIS PARK WEST LONDON: EXPANSION LAND

Project No.: 70055718 | Our Ref No.: 70055718-P2



GROUND AND GROUNDWATER CONDITIONS ASSESSMENT 3.

3.1. **GROUND CONDITIONS**

SUMMARY

An exploratory hole location plan is presented in Drawing 3 in **Appendix A**. The exploratory logs are provided in Appendix D with a photographic record in Appendix E. Geological cross-sections are included as Drawings 4 and 5 in Appendix A.

The ground investigation carried out between February and March 2019 is consistent with the ground conditions provided by the BGS regional maps. A summary of the strata recorded across the Site during the investigation is provided in Table 5. All the exploratory holes were drilled in areas of hardstanding (outside of the existing building footprints).

Table 5 - Summary of Strata Encountered During Investigation

Stratum	Depth to Base of Strata (m bgl)	Level at Base of Strata (m AOD)	Thickness (m)
Hardstanding	0.08	36.27 to 31.76	0.08
Made Ground (sand and limestone aggregate subbase)	0.15 to 0.50	36.15 to 31.54	0.07 to 0.42
Made Ground (infilled material)	0.52 to 6.00 (1.50)	33.94 to 28.72 (30.54)	0.20 to 5.70 (1.35)
Made Ground (reworked natural)	3.00 to 6.20 (6.50)	30.54 to 28.36 (28.72)	0.20 to 4.60 (2.70)
Langley Silt Member	2.65 to 3.00	32.84 to 29.10	0.40 to 1.00
Lynch Hill Gravel Member	3.60 to 6.50 (6.45)	29.64 to 28.22 (27.91)	0.30 to 2.70 (0.50)
London Clay Formation	Not proven (>14.95)	Not proven (<16.95)	Not proven (>12.15)

^{*} Brackets indicate maximum proven depth/ thickness and the minimum elevation at the base, in exploratory holes terminated within the stratum.

HARDSTANDING

Brick block paving was encountered at the surface in all exploratory hole locations.

MADE GROUND

Both granular and cohesive Made Ground was recorded during the ground investigation as detailed below in Table 6. However, the source of this Made Ground is further defined as highlighted in Table 5 and the Sections below. For the purpose of the geotechnical assessment in Section 7, the Made Ground has been differentiated into Granular Made Ground (GMG) (which includes the granular



subbase and some infilled material) and Cohesive Made Ground (CMG) (which includes the majority of the infilled material and the reworked natural clay).

Table 6 - Summary of Made Ground

Geotechnical Unit	Description	Minimum and Maximum Thickness [Average] (m)
Granular Made Ground (GMG)	Light brownish yellow slightly gravelly medium and coarse sand (subbase) and dark brownish black gravelly fine and medium sand with frequent wood and ash and rare ceramic and glass (regular GMG). Gravel is fine and medium angular of flint. This layer is located over the Cohesive Made Ground (CMG), it forms the pavement build-up of the areas of hardstanding (found in every exploratory hole).	0.18 – 4.62 [0.72]
Cohesive Made Ground (CMG)	Soft locally firm brown slightly gravelly slightly sandy clay, containing wood, bricks, concrete, asphalt, and other manmade material. CMG was recorded below the GMG in all exploratory holes except boreholes BH03, WS10 and WS13.	0.57 – 6.05 [3.02]

GRANULAR MADE GROUND

The proven thickness of GMG ranged from 0.18 m in WS03 to 4.62 m in BH03. Typically, the greatest thicknesses of Made Ground were encountered towards the south-east of the Site.

COHESIVE MADE GROUND

The full thickness of the CMG was proven in 14 exploratory hole locations. The proven thickness of Made Ground ranged from 0.57 m in WS03 to 6.05 m in WS06. Typically, the greatest thicknesses of CMG were encountered towards the north and centre of the Site.

MADE GROUND (SUBBASE)

The block paving was underlain by a thin layer of light yellow / light brown / light yellowish brown fine to coarse sand over a granular subbase typically comprising pinkish or reddish brown gravelly sand or sandy fine to coarse angular to subrounded gravel of limestone.

A black geotextile membrane was encountered in the majority of locations underlying the subbase over the current road and parking areas.

MADE GROUND (INFILLED MATERIAL)

Made Ground was encountered in all exploratory hole locations and was variable in composition and thickness across the Site. Typically, the Made Ground was cohesive comprising soft to firm brown / orangish brown gravelly sandy silty clay; gravel is fine to coarse angular to sub-rounded of flint, brick, concrete and limestone. The cobble content was typically low; cobbles are angular of brick, flint and limestone. Rare inclusions of plastic, glass, wood, clinker, metal, bone, ceramic and ash were also noted.

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The full thickness of the infilled material was proven in 13 exploratory hole locations. The proven thickness of Made Ground ranged from 0.20 m in WS01 to 5.70 m in BH01.

MADE GROUND (REWORKED NATURAL)

Possible reworked natural clay was encountered beneath Made Ground in eight exploratory hole locations (BH01, WS01, WS04, WS06, WS07, WS08, WS09 and WS11) as soft locally firm brown / orangish brown sandy silty occasionally slightly gravelly clay. The greatest proven thickness (4.38 m) was encountered in WS01 in the north-west corner of the Site.

LANGLEY SILT MEMBER (LASI)

The Langley Silt Member (LASI) is not very well represented in the area and was only recorded in four locations, namely; BH02 and WS15 in the west of the Site and BH04 and WS12 in the south-east. Despite the BGS maps showing LASI along the east and south of the Site, it was recorded along the west and south-east of the Site. The LASI was typically described as firm or stiff orangish brown or greyish brown mottled orangish brown slightly gravelly silty clay; gravel is fine to coarse angular to rounded of flint. The average thickness of the Langley Silt Member was 0.61 m, ranging from 0.40 m in WS15 to 1.00 m in BH04.

LYNCH HILL GRAVEL MEMBER (LHGR)

The Lynch Hill Gravel Member (LHGR) was encountered in nine of the twenty exploratory hole locations (BH01, BH02, BH03, WS07, WS08, WS09, WS11, WS12 and WS15). LHGR was found below the LASI or CMG units and overlying the London Clay. The Lynch Hill Gravel Member was typically described as brown / light brown sandy fine to coarse angular to rounded gravel of flint or yellowish brown / orangish brown slightly gravelly silty fine to coarse sand; gravel is fine to coarse angular and subangular of flint. The average proven thickness of the Lynch Hill Gravel Member was 0.70 m, ranging from 0.30 m in BH01 and BH03 (in the north and east, respectively) to 2.70 m in BH02 towards the west of the Site. The thin layer of gravel is consistent with records which indicates the majority of the Site to have been subject to historical gravel extraction.

LONDON CLAY FORMATION (LC)

The London Clay Formation was encountered in eight exploratory hole locations (BH01, BH02, BH03, BH04, WS01, WS09, WS11 and WS12) and was proven to 15 m bgl, although the thickness was not confirmed. The London Clay was typically described as stiff locally very stiff dark grey or brownish grey silty clay with occasional pyrite nodules and gypsum crystals. Claystone was encountered between 8.30 m and 8.60 m bgl and between 10.75 m and 10.87 m bgl in BH04.

EVIDENCE OF CONTAMINATION

Selected soil samples were collected during the advancement of investigation locations for headspace screening. Photo Ionisation Detector (PID) readings were typically below the limit of detection (< LOD) for the equipment with the highest reading recorded in BH02 at 4.00 m bgl (9.3 ppm), located to the west of Building 10.

The following visual or olfactory evidence of contamination was recorded during the ground investigation:

- Strong hydrocarbon odour at 4.00 m bgl within the Lynch Hill Gravel Member in BH02;
- Black leachate recorded between 3.00 m and 4.00 m bgl within Made Ground in WS04; and

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Strong hydrocarbon odour and black staining between 2.40 m and 2.75 m bgl within the Made Ground in WS06.

Organic odours were recorded within Made Ground in BH02, WS04, WS06, WS08, WS12 and WS14.

OBSTRUCTIONS

Obstructions encountered during the ground investigation are summarised in **Table 7**.

Table 7 – Obstructions Encountered During Ground Investigation

Exploratory Hole Location	Depth Obstruction Encountered (m bgl)	Elevation Obstruction Encountered (m AOD)	Remarks
BH03	0.60	33.11	Concrete
WS02	1.20	34.77	Concrete
WS03	0.83	33.49	Concrete
WS10	0.75	33.80	Concrete
WS10A	0.30	34.29	Concrete
WS13	0.65	33.61	Concrete
WS13A	0.67	33.59	Concrete
WS14	1.30	30.54	Concrete

3.2. **GROUNDWATER CONDITIONS**

GROUNDWATER CONDITIONS ENCOUNTERED DURING INVESTIGATION

Groundwater strikes recorded during the investigation are summarised in **Table 8**.

Table 8 – Groundwater Encountered During the Ground Investigation

Exploratory Hole Location	Depth Groundwater Encountered (m bgl)	Elevation Groundwater Encountered (m AOD)	Remarks
BH01	4.50	30.22	Seepage in Made Ground.
BH03	4.50	29.21	Strike in Made Ground.
WS04	3.10	30.74	Strike in Made Ground.
WS01	5.00	29.46	Strike in London Clay Formation.
WS06	5.50	29.72	Strike in Made Ground.

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Exploratory Hole Location	Depth Groundwater Encountered (m bgl)	Elevation Groundwater Encountered (m AOD)	Remarks
WS07	3.00	30.79	Strike in Made Ground. Rising to 2.90 m bgl after 20 minutes.
WS11	4.00	29.55	Strike in Made Ground. Rising to 1.10 m bgl after 20 minutes.
WS14	1.30	30.54	Slight seepage in Made Ground.

MONITORED GROUNDWATER ELEVATIONS

Groundwater was recorded in 12 wells during monitoring. A summary is provided in **Table 9**.

Table 9 – Summary of Groundwater Levels During Monitoring

Exploratory Hole Location	Stratum	Groundwater Level Recorded (m bgl)		Groundwater Level Recorded (m AOD)	
		Min	Max	Min	Max
BH01	Made Ground	2.18	2.27	32.45	32.45
BH02	Lynch Hill Gravel Member	3.61	3.67	31.17	31.23
ВН03	Made Ground	2.78	2.83	30.88	30.93
BH04	Made Ground / Langley Silt Member	0.49	1.32	30.58	31.41
WS01	Made Ground / London Clay Formation	1.89	2.09	32.37	32.57
WS02	Made Ground	DRY	1.03	DRY	34.94
WS04	Made Ground	2.83	2.85	30.99	31.01
WS06	Made Ground	3.64	3.74	31.48	31.62
WS08	Made Ground	3.48	4.95	29.41	30.88
WS09	Made Ground	2.57	2.65	30.89	30.97



Exploratory Hole Location	Stratum	Groundwater Level Recorded (m bgl)		Groundwater Level Recorded (m AOD)	
		Min	Max	Min	Max
WS10	Made Ground	DRY	DRY	DRY	DRY
WS11	Made Ground *Groundwater level may be associated with the Lynch Hill Gravel Member based the location of the strike and the installation details.	2.65	2.74	30.81	30.90
WS12	Made Ground	DRY	DRY	DRY	DRY
WS14	Made Ground	0.71	0.76	31.08	31.13
Grand Union Canal	N/A	-	-	29.30	29.42

During monitoring, the water within WS04 had a strong organic odour and was black in colour and may be representative of landfill leachate. Groundwater recorded in WS02 (on one occasion) and WS14 is not considered to be representative of groundwater elevations at the Site since these exploratory hole locations have shallow response zones (<1.20 m bgl) and the levels within these installations may be due to surface infiltration or perched groundwater. This is supported by the monitoring records which indicate that the water levels at these two locations were significantly different to nearby installations and did not correlate to the estimated flow direction discussed below.

Insufficient groundwater (<0.50 m) was present within WS09 and WS14 for sampling.

During sampling, drawdown of the water level was observed in BH04, WS08. Groundwater in WS06. WS08 also became dry during the first round of sampling and demonstrated a low rate of recharge, thus potentially suggesting that the groundwater within these locations is perched.

HYDRAULIC GRADIENT AND CONTINUITY

Groundwater contour plots for the four monitoring visits are included as Drawings 6, 7, 8 and 9 in **Appendix A**. Based on the monitoring undertaken and contour plots, it appears that groundwater within the Made Ground may flow towards the south. Since only one monitoring well was installed within the Lynch Hill Gravel, it has not been possibly to infer a groundwater flow direction within this stratum. Groundwater elevation data from WS01, BH01, BH03, BH04, WS04, WS06, WS09 and WS11 (all installed within Made Ground) has been used in the production of these drawings. BH04 has been excluded from the contour plot for visit 1 since the groundwater level is considered to have been influenced by the water used during the drilling process. Groundwater data from BH02 has been excluded since the response zone is within the Lynch Hill Gravel and data from WS02, WS08 and WS14 have been excluded since the groundwater is either considered to be perched or due to surface water infiltration.

PROLOGIS PARK WEST LONDON: EXPANSION LAND Project No.: 70055718 | Our Ref No.: 70055718-P2



Hydrographs are included in **Appendix F**. The groundwater level within WS06 and WS08 continued to rise throughout the monitoring visit following sampling, indicating a low rate of recharge. Groundwater within BH04 also took over 24 hours to return to pre-sampling level. Groundwater within BH01, BH02 and WS01 was faster to recharge whilst limited drawdown was noted during sampling of BH03, WS04 and WS11. During the monitoring period, the water level within the canal rose slightly (by about 50 mm), assumed to be due to rainfall. An overall rise in groundwater level was also observed in BH01, BH04 and WS01.

The groundwater level within the canal was typically lower than groundwater levels recorded on-site, which may provide the potential for hydraulic conductivity with the groundwater beneath the Site. However, there is also evidence to suggest that the groundwater may be perched and the cohesive nature of the Made Ground and presence of the sheet pile wall along the canal would limit lateral migration.

It is should be noted that the groundwater present beneath the adjacent Prologis Park: West London site has been demonstrated to be hydraulically disconnected from the Grand Union Canal during previous ground investigations.

Further groundwater level data will be required to fully establish the hydrogeology at the Site.

IN-SITU GEOCHEMISTRY MEASUREMENTS

Geochemical parameters were recorded during low flow purging in nine exploratory hole locations prior to groundwater sampling. The results are included in **Appendix G** and the stabilised readings are summarised in **Table 10**.

Table 10 - Recorded In-situ Geochemistry Measurements

Exploratory Hole	Stratum	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/l)	Specific Conductivity (µS/m)	Redox Potential (mV)
BH01	Made Ground	12.42 to 13.37	7.66 to 7.72	0.38 to 0.88	1193 to 1260	-98.77 to -95.11
BH02	Lynch Hill Gravel Member	12.97 to 13.04	6.74 to 6.84	0.39 to 0.57	2716 to 2767	+41.75 to +56.45
ВН03	Made Ground	11.78 to 13.73	6.79 to 6.80	0.36 to 0.38	1861 to 1906	-47.33 to -42.57
BH04	Made Ground / Langley Silt Member	9.71 to 10.13	7.02 to 7.08	0.54 to 0.95	1293 to 1320	+97.51 to +100
WS01	Made Ground / London Clay Formation	11.39 to 11.79	6.95 to 7.01	0.55 to 2.75	2204 to 2260	-22.99 to -12.17
WS04	Made Ground	11.25 to 12.39	6.85 to 6.89	0.28 to 1.30	3185 to 3336	-109.5 to -103
WS06	Made Ground	13.08 to 13.91	7.55 to 7.56	0.44 to 0.70	3341 to 3638	-28.05 to -18.15

PROLOGIS PARK WEST LONDON: EXPANSION LAND Project No.: 70055718 | Our Ref No.: 70055718-P2



Exploratory Hole	Stratum	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/l)	Specific Conductivity (µS/m)	Redox Potential (mV)
WS08	Made Ground	14.22 to 14.64	6.63 to 6.70	0.63 to 1.17	2001 to 2271	+56.51 to +68.22
WS11	Made Ground	11.11 to 12.67	6.98 to 6.99	0.33 to 0.34	2410 to 2430	-41.66 to -37.05

The measured pH was near neutral across the Site, ranging from 6.63 in WS08 to 7.72 in BH01. Specific conductivity was more variable ranging from 1,193 μ S/m in BH01 to 3,638 μ S/m in WS06. The dissolved oxygen concentration was typically low and redox potential ranged from -109.5 mV in WS04 to 100 mV in BH04: indicative of anaerobic conditions.

3.3. SUMMARY OF FINDINGS

The ground conditions encountered across the Site were broadly consistent with Council records and BGS maps for the area. Block paving underlain by an average thickness of 0.31 m of granular subbase (comprising sand over limestone) was encountered across the Site. The underlying capping layer reported within Council records was not evident during the ground investigation. However, a black geotextile membrane was encountered in the majority of exploratory hole locations between the subbase and underlying Made Ground (infilled material). This Made Ground was identified in all exploratory hole locations, underlain by reworked natural clay in eight locations.

Where the full depth of the Made Ground was proven, the Lynch Hill Gravel Member was encountered in six locations and averaged 0.70 m thick where proven. The Langley Silt was encountered in two locations in the south-east of the Site in accordance with BGS maps and also in two locations in the west; the average thickness was 0.61 m.

During the ground investigation, groundwater was encountered as a seepage or strike within Made Ground in seven exploratory hole locations. Groundwater was also recorded at the top of the London Clay Formation in WS01. During monitoring, groundwater was recorded in 12 locations, of which nine had sufficient water to sample. Based on the monitoring undertaken to date, a southerly groundwater flow direction (towards the Grand Union Canal) has been inferred. However, it is inconclusive as to whether the water recorded within the boreholes on-site is representative of a truly hydraulically continuous groundwater body beneath the Site given the cohesive nature of the Made Ground. There is also evidence to suggest that the groundwater may be perched and the cohesive nature of the Made Ground and presence of the sheet pile wall along the canal would limit lateral migration in a similar way to that present beneath the adjacent Prologis Park: West London site where hydraulically disconnection from the Grand Union Canal was demonstrated.

Limited Lynch Hill Gravel Member was recorded on Site and a monitoring installation was placed within this stratum, which recorded groundwater. Although the majority of the Lynch Hill Gravel Member has been removed from the Site, given it is classified as a Principal Aquifer the risk to this aquifer has been further assessed in Section 4.

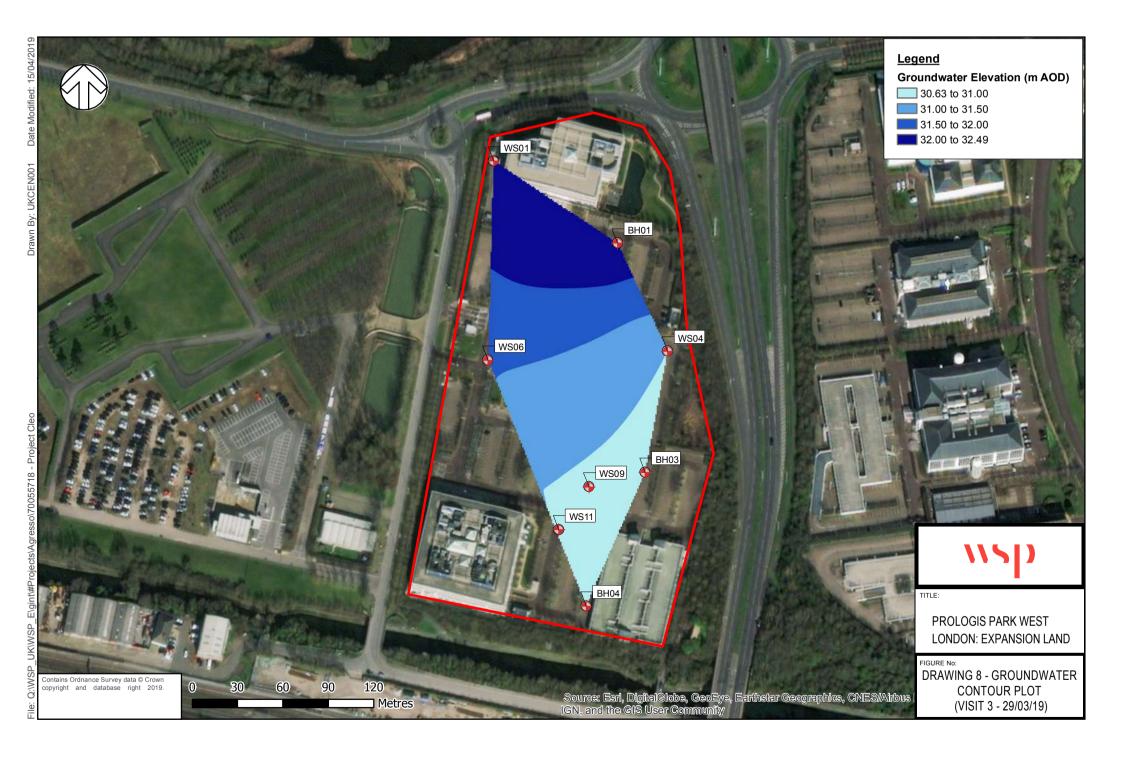
PROLOGIS PARK WEST LONDON: EXPANSION LAND Project No.: 70055718 | Our Ref No.: 70055718-P2

Prologis UK Ltd

WSP April 2019



BH04 excluded due to groundwater elevation interference from water flush used during drilling



Appendix C.4

THAMES WATER ASSET PLANS





WSP Mountbatten House Basing View BASINGSTOKE RG21 4HJ

Search address supplied Glaxo Smithkline Uk Ltd

1-3

Stockley Park Iron Bridge Road

Uxbridge UB11 1BT

Your reference Prologis Park Expansion Land

Our reference ALS/ALS Standard/2019_4102534

Search date 1 November 2019

Keeping you up-to-date

Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: www.thameswater-propertysearches.co.uk Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.



Thames Water Utilities Ltd Property Searches, PO Box 3189, Slough SL1 4WW DX 151280 Slough 13



searches@thameswater.co.uk www.thameswater-propertysearches.co.uk







Search address supplied: Glaxo Smithkline Uk Ltd, 1-3, Stockley Park, Iron Bridge Road, Uxbridge, UB11 1BT

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd Property Searches PO Box 3189 Slough SL1 4WW

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk



Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

With regard to the fresh water supply, this site falls within the boundary of another water company. For more information, please redirect your enquiry to the following address:

Affinity Water Ltd Tamblin Way Hatfield



AL10 9EZ Tel: 0845 7823333

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public
 water mains in the vicinity of the property. It should be possible to estimate the
 likely length and route of any private water supply pipe connecting the property to
 the public water network.

Payment for this Search

A charge will be added to your suppliers account.



Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water) Thames Water Clearwater Court Vastern Road Reading RG1 8DB

Tel: 0800 009 3921

Email: developer.services@thameswater.co.uk

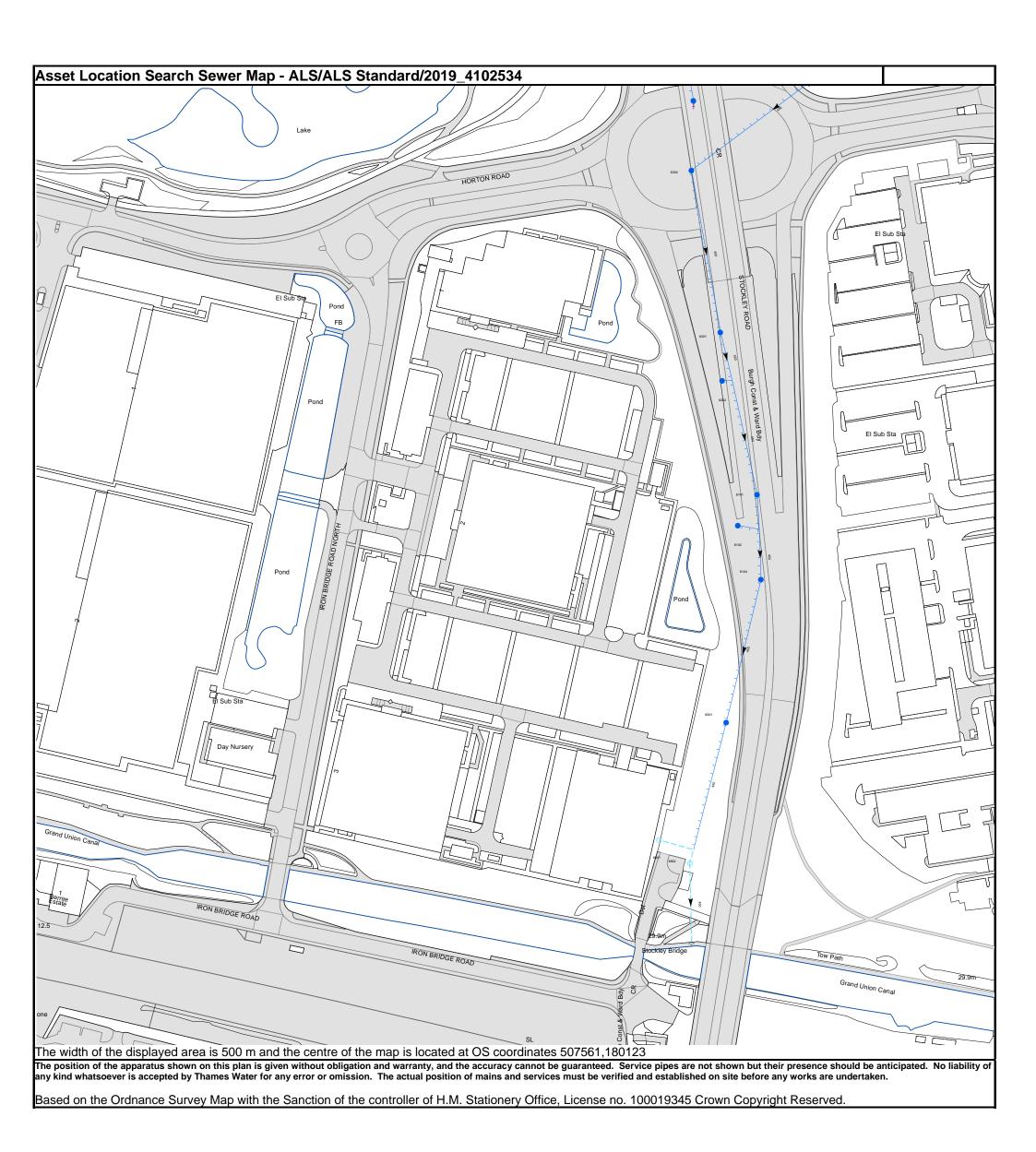
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water) Thames Water Clearwater Court Vastern Road Reading RG1 8DB

Tel: 0800 009 3921

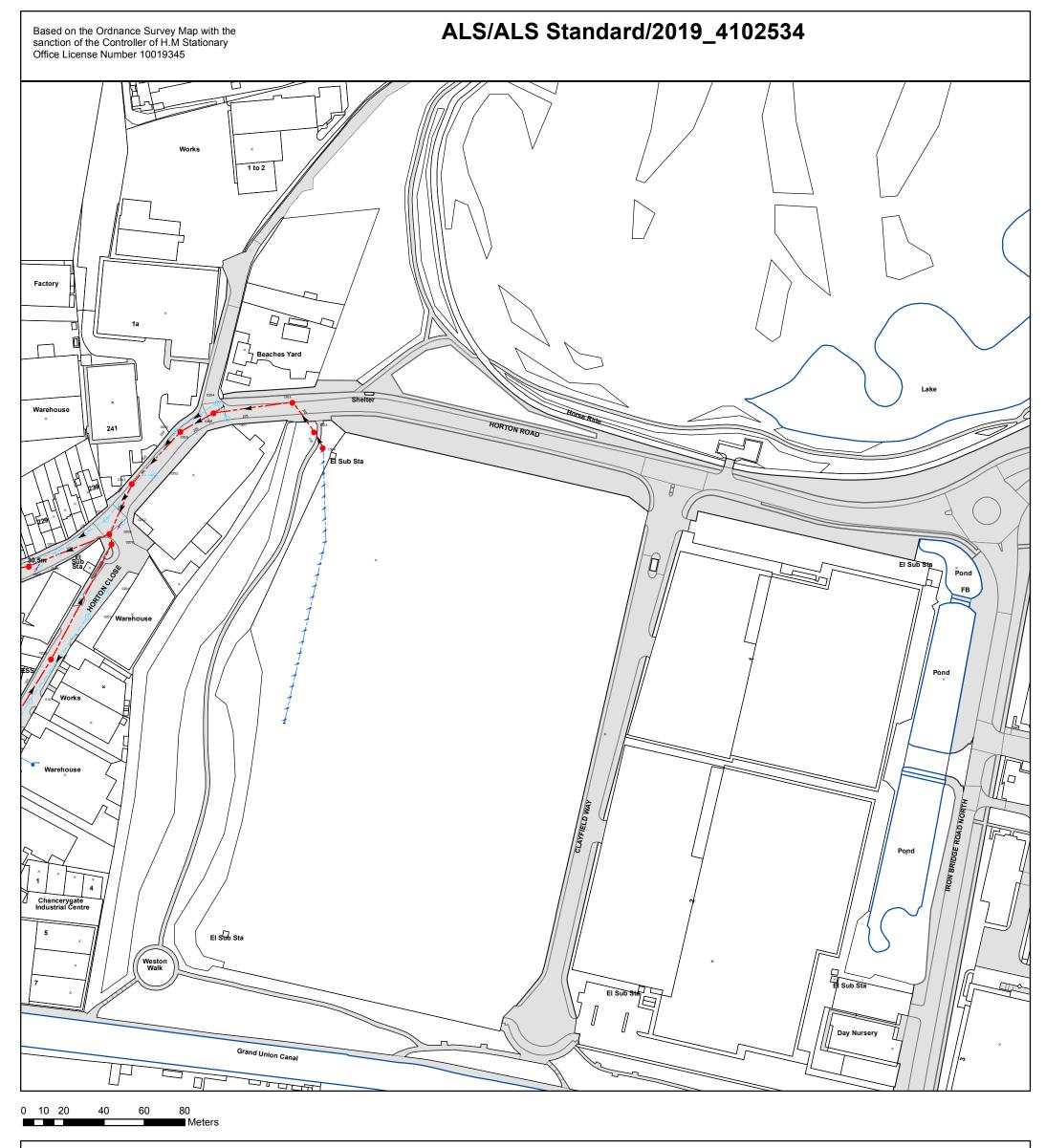
Email: developer.services@thameswater.co.uk



<u>Thames Water Utilities Ltd</u>, Property Searches, PO Box 3189, Slough SL1 4W, DX 151280 Slough 13 **T** 0845 070 9148 **E** <u>searches@thameswater.co.uk</u> **I** <u>www.thameswater-propertysearches.co.uk</u>

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6902	29.83	29.82
6901	n/a	n/a
6001	n/a	n/a
6104	n/a	n/a
6102	n/a	n/a
6101	n/a	n/a
6202	n/a	n/a
6201	n/a	n/a
6302	n/a	n/a
6301	35.4	34.48

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	01/11/2019
Map Centre:	507250,180250
Grid Reference:	TQ0780SW

ALS/ALS Standard/2019_4102534

NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL
0301		30.1
1303	33.08	31.29
0208	31.21	29.51
0305	32.19	30.92
0211	31	29.36
0306	32.48	31.11
0206	30.56	29.24
0207	30.67	29.58
0302	31.72	30.46
1304	34.9	32.28
0209	31.29	30.55

REFERENCE	COVER LEVEL	INVERT LEVEL
0212	31.64	30.19
1305	33.24	32.17
0303	32.13	30.3
0204	30.97	30.27
1301		
0101	30.65	29.68
0202	30.79	29.81
0203	30.99	30.14
011B		
0304		
0205	31.51	29.66

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2019_4102534



The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

 Scale:
 1:7158

 Width:
 2000m

 Printed By:
 G1KANAGA

 Print Date:
 01/11/2019

 Map Centre:
 507561,180123

TQ0780SE

Grid Reference:

Comments:



Public Sewer Types (Operated & Maintained by Thames Water)







Bio-solids (Sludge)

Proposed Thames Water







P Vent Pipe

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.



Dam Chase

Fitting

Meter

Vent Column

Operational Controls

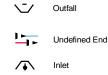
A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.



Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.



- . . .

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Other Symbols

Symbols used on maps which do not fall under other general categories

- ▲ / ▲ Public/Private Pumping Station
- * Change of characteristic indicator (C.O.C.I.)
- Summit

Areas

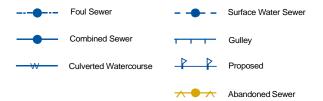
Lines denoting areas of underground surveys, etc.







Other Sewer Types (Not Operated or Maintained by Thames Water)



Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

- 1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
- 2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
- 3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
- 4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
- 5. In case of dispute TWUL's terms and conditions shall apply.
- Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
- 7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
- 8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0845 070 9148 quoting your invoice number starting CBA or ADS / OSS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater. co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to 'Thames Water Utilities Ltd' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Terms and Conditions

Search Code



IMPORTANT CONSUMER PROTECTION INFORMATION

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The Search Code:

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 rely on the information included in property search reports undertaken by subscribers on residential
 and commercial property within the United Kingdom
- · sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- · act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if the Ombudsman finds that you have suffered actual loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme Milford House 43-55 Milford Street Salisbury Wiltshire SP1 2BP Tel: 01722 333306

Fax: 01722 332296 Web site: www.tpos.co.uk Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE



Mountbatten House Basing View Basingstoke, Hampshire RG21 4HJ

wsp.com