Appendix 05-01 – EA Screening

Nature and Heritage Conservation

Screening Report: Bespoke Installation

Reference	**EPR/CP3825SU/P001**
NGR	**TQ 08045 79594**
Buffer (m)	**35**
Date report produced	**20/07/2023**
Number of maps enclosed	**4**

The nature conservation sites identified in the table below must be considered in your application.

Nature and heritage conservation sites	Screening distance (km)	Further information
Special Protection Area (pSPA or SPA) **South West London Waterbodies SPA**	10	Joint Nature Conservation Committee
Ramsar **South West London Waterbodies**	10	Joint Nature Conservation Committee
Local Wildlife Sites (LWS) **London's Canals** **Stockley Business Park Lakes & Meadows** **Bolingbroke Way Sunken Pasture** **Cranford Lane Gravel Workings** **Iron Bridge Road Railsides (formerly The Piggeries)** **Stockley Park Country Park** **Stockley Road Rough** **Cranford Countryside Park and Open Space** **Wall Garden Farm Sand Heaps** **Lake Farm Country Park** **Carp Ponds and Broads Dock**	2	Appropriate Local Record Centre (LRC)

Protected Species	Screening distance (m)	Further Information
European Eel migratory route	up to 500m	Environment Agency. Dial 03708 506 506 for your local Fisheries and Biodiversity team

The relevant Local Records Centre must be contacted for information on the features within local wildlife sites. A small administration charge may also be incurred for this service.

Please note we have screened this application for protected and priority sites, habitats and species for which we have information. It is however your responsibility to comply with all environmental and planning legislation, this information does not imply that no other checks or permissions will be required.

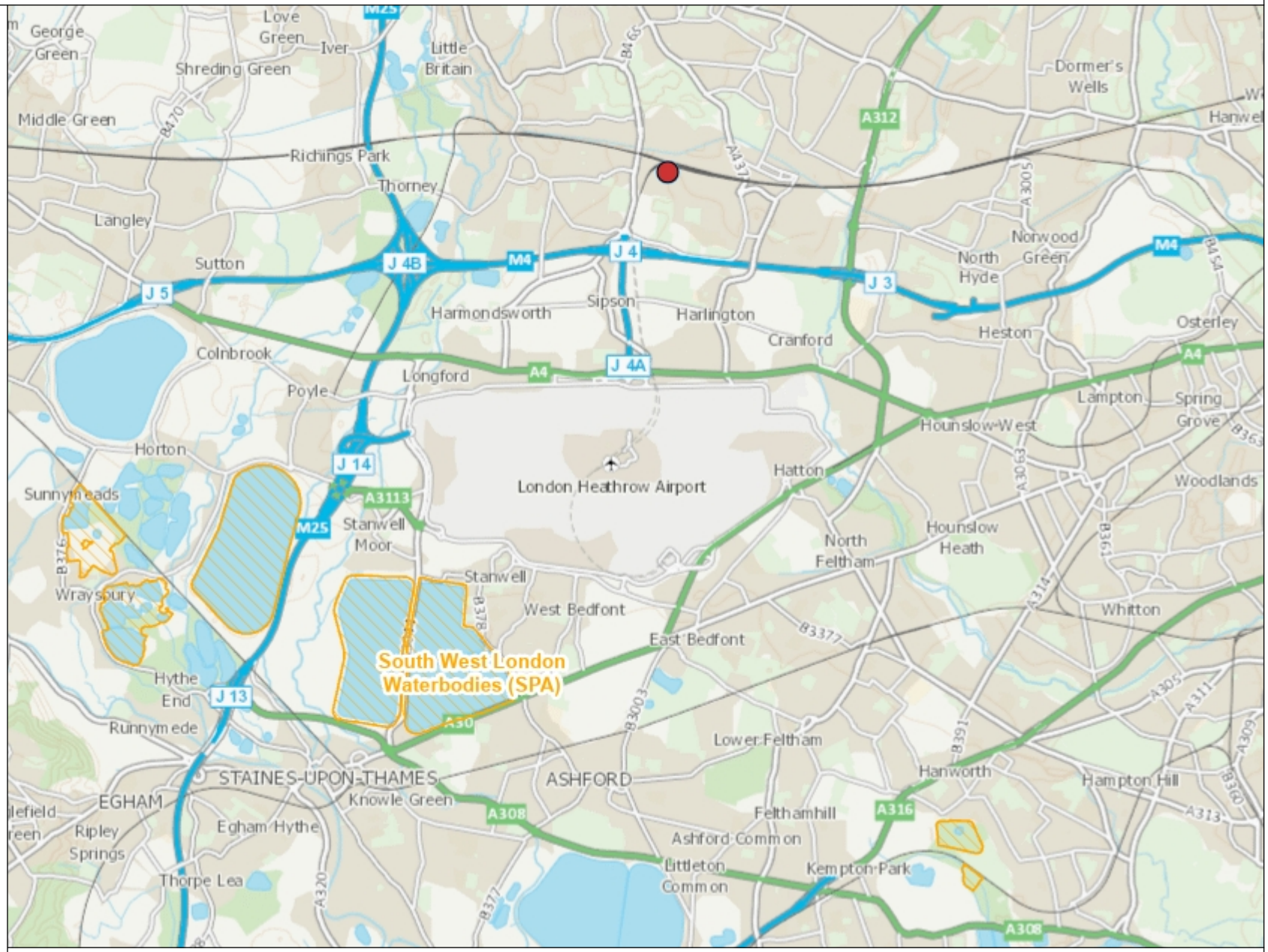
Please note the nature and heritage screening we have conducted as part of this report is subject to change as it is based on data we hold at the time it is generated. We cannot guarantee there will be no changes to our screening data between the date of this report and the submission of the permit application, which could result in the return of an application or requesting further information.

Special Protection Areas - England

Environment Agency

Legend

SPA (England)



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Metres

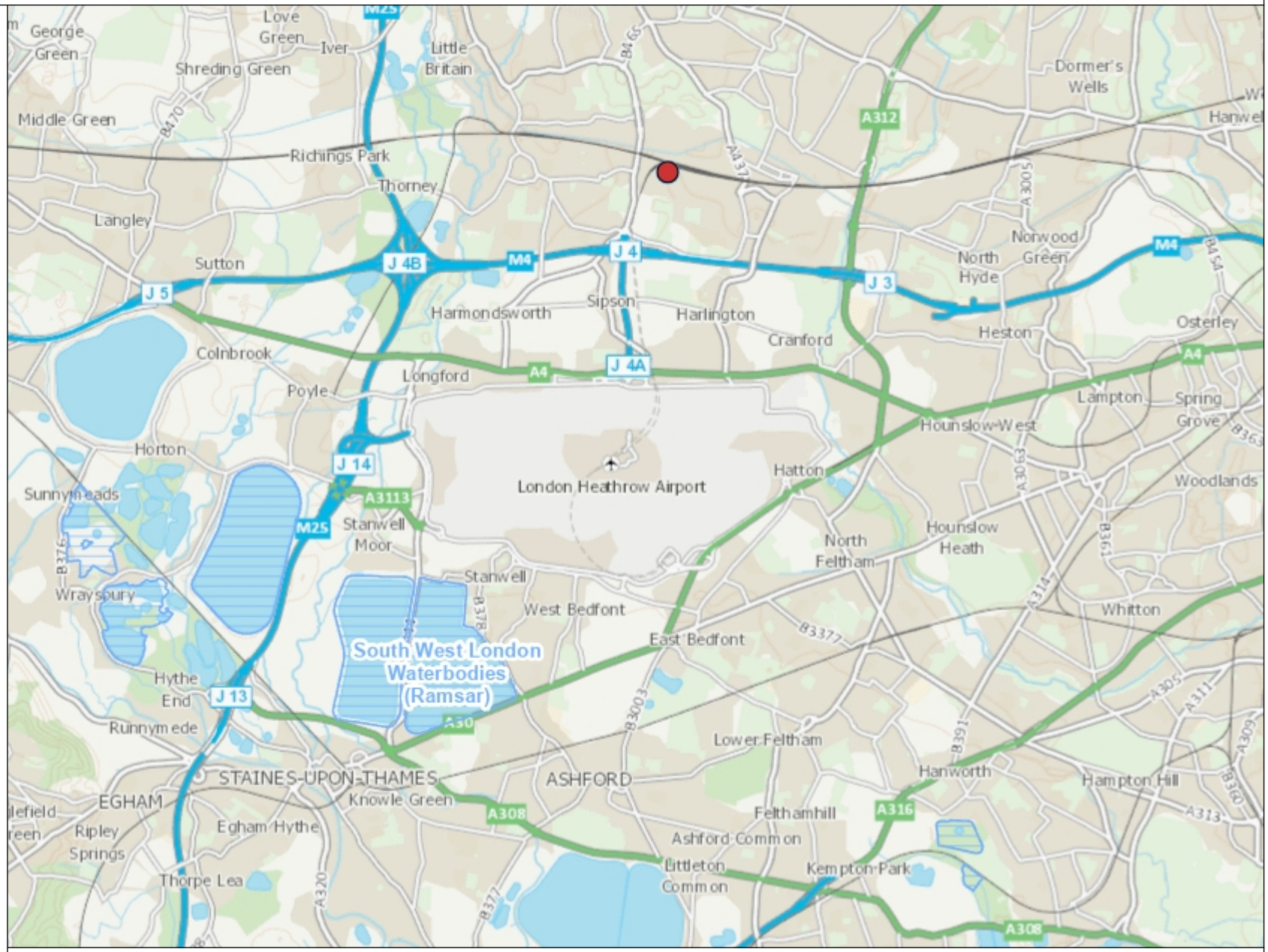
N W E S

Ramsar Sites - England

Environment Agency

Legend

Ramsar (England)



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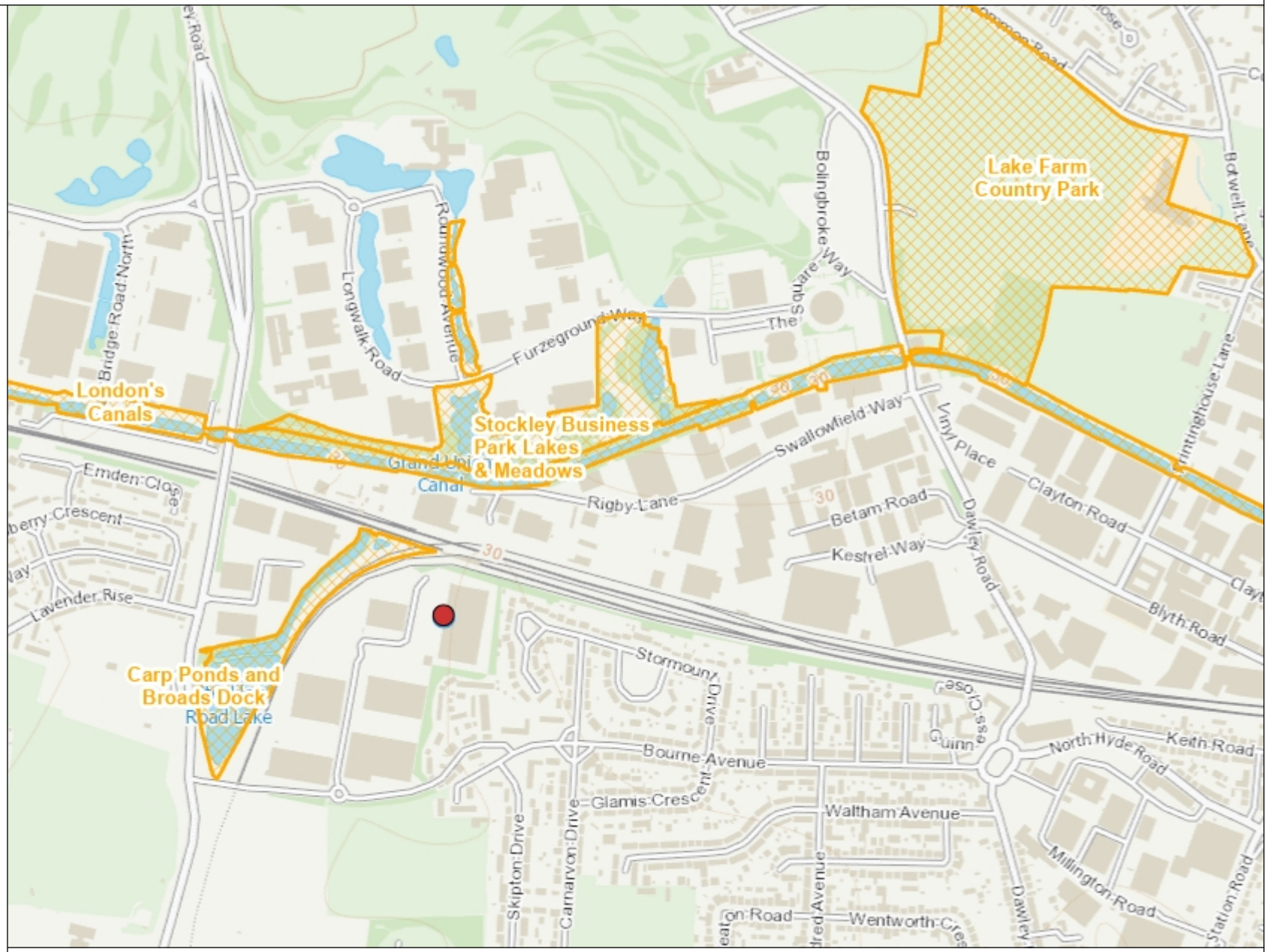
N W E S

Local Wildlife Sites

Environment Agency

Legend

Local Wildlife Sites



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Metres

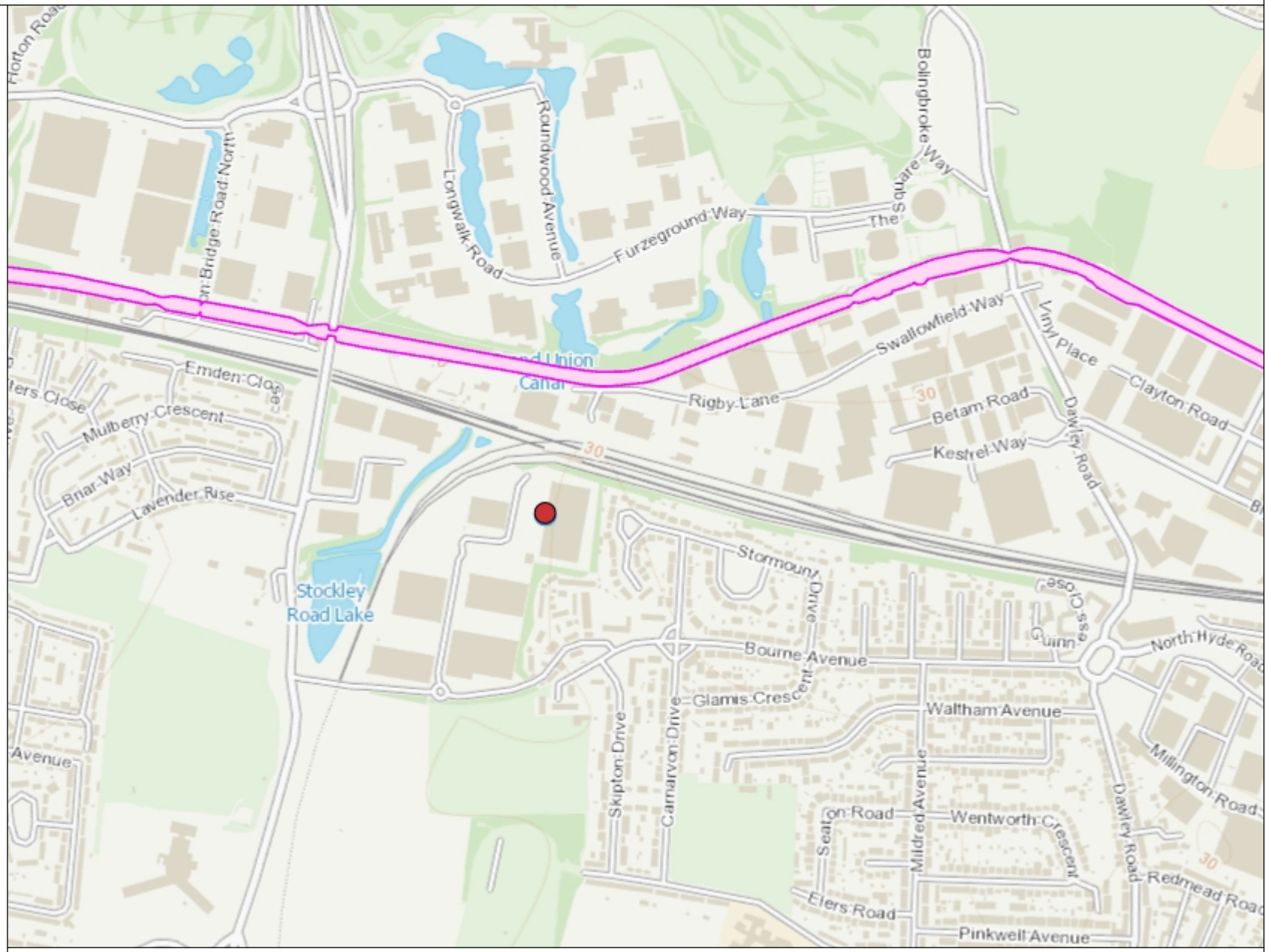
N W E S

Protected Species

Environment Agency

Legend

Fish migratory routes screened for Environmental Permits



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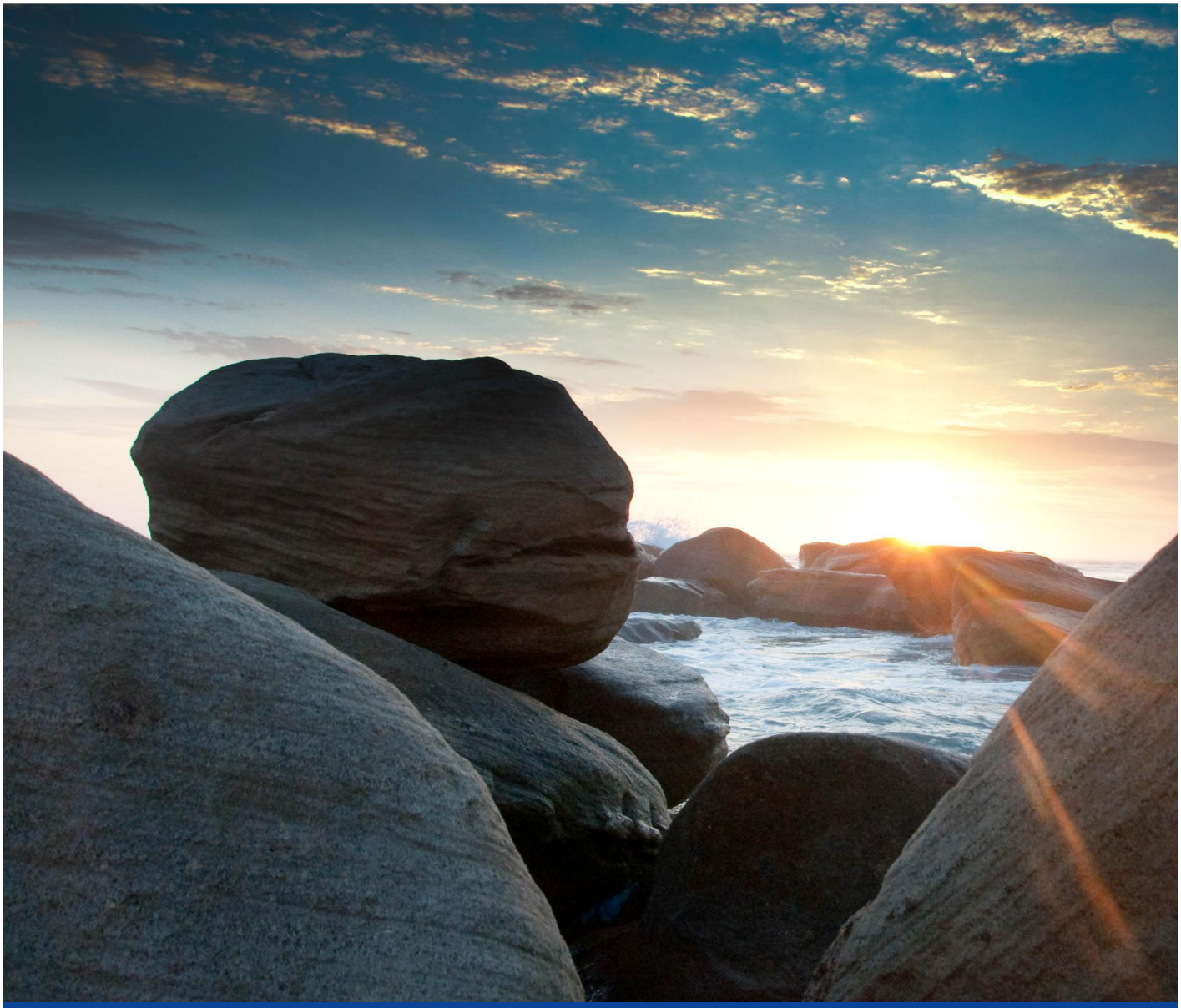
Metres

N W E S

Appendix 05-02 – Flood Risk Assessment



UNITED BY OUR DIFFERENCE

WSP

PROLOGIS PARK, HEATHROW

Flood Risk Assessment

ProLogis UK Ltd.

10/04/2013

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	DRAFT			
Date	10 April 2013			
Prepared by	J Tang			
Signature				
Checked by	G Guma			
Signature				
Authorised by	A Atkinson			
Signature				
Project number	11012721			
Report number				
File reference	2013-04-10 Prologis Park FRA_Final Draft.docx			

Prologis Park, Heathrow

Flood Risk Assessment

10/04/2013

Client

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01383511
WSP House, 70 Chancery Lane, London, WC2A 1AF

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Gerald Guma
Alastair Atkinson

Table of Contents

Table of Appendices

1 Introduction

1.1 Appointment and Brief

1.1.1 WSP UK (WSP) was commissioned by Prologis UK Ltd to undertake a site specific Flood Risk Assessment (FRA) to support an outline planning application for a commercial development at Prologis Park, Heathrow.

1.2 Objective of the Study

1.2.1 The objective of the FRA is to assess the risk of flooding to the proposed development in line with current policy. This report demonstrates that the proposed development is safe from flooding throughout its lifetime and does not increase flood risk elsewhere.

1.2.2 The study assesses flood risk to;

- The site and the proposed development; and
- Any impact on flood risk to other land as a result of the development proposals.

1.2.3 Where required, flood risk mitigation measures have been proposed. The report also provides an outline surface water drainage strategy (see Chapter 5).

1.3 Study Methodology

1.3.1 The appraisal process consisted of a desk study, data research and consultation with regulatory bodies and third parties.

1.3.2 This is an assessment of potential flooding from all possible sources, including fluvial, surface run-off, overland flows, groundwater, sewers and man-made infrastructure. The assessment also identifies and examines the residual flood risk to the proposed development.

1.3.3 Whilst completing the assessment, consideration has been given to the NPPF technical guidance (April 2012). The assessment has been undertaken in accordance with CIRIA C624, 'Development and Flood Risk - Guidance for the Construction Industry' (2004).

1.3.4 As part of the Flood Risk Assessment the following stakeholders have been consulted:

- The Environment Agency;
- Thames Water; and
- London Borough of Hillingdon.

1.4 Limitations

1.4.1 An intrusive site survey has not been undertaken as part of this study.

2 Existing Site

2.1 Site Location

2.1.1 The site is located adjacent to the Stockley Park Industrial area, approximately 2km west of Hayes Town Centre and approximately 0.5km north of Junction 4 of the M4. Heathrow Airport lies approximately 2km south of the site. It is bounded by railway siding to the north and west, residential development to the east and the rest of Prologis Park (commercial) to the south.

2.1.2 The OS grid reference for the site is 508015, 179601 and nearest postcode is UB7 9FN. The site location plans are provided in Appendix A.

2.2 Site Description

2.2.1 The site covers an area of approximately 3.48 Hectares (ha) and is currently cleared for construction pending planning approval. However, until recently the site was occupied by a large commercial warehouse.

2.2.2 Table 2.1 describes the general site characteristics.

Table 2.1 Characteristics of Prologis Park, Heathrow

Area	Approximately 3.48ha
General Topography	The site is predominantly flat.
Existing Surface	Post construction clearance (Greenfield Site)
Current Use	Recently demolished and cleared commercial warehouse
Boundaries	North: Railway line South: Prologis Park (commercial) East: Residential development West: Railway line
Access	Vehicle and pedestrian access: From Perimeter Rd via Prologis Park to the south

2.3 Existing Watercourses

2.3.1 The closest watercourse to the site is the Grand Union Canal which is approximately 180m to the north of the site. Fray's River runs approximately 2.3km to the west of the site. Fray's River is a tributary of the River Colne and the confluence of the rivers is approximately 600m to the south of the site.

2.3.2 The adjacent Carp Pond and Broad Duck SINC at Stockley Road Lake is designated as a Site of Importance for Nature Conversation (SINC) of Metropolitan importance.

2.4 Existing Flood Defences and Other Structures

2.4.1 The Environment Agency has yet to confirm details of any formal flood defences but it is expected that there are no formal defences at the site, as it does not appear that there is a requirement for them.

2.5 Geology and Hydrogeology

2.5.1 Maps on the British Geological Society (BGS) website indicate that the site is underlain by Langley Silts (a sandy clay and silt) over Lynch Hill Gravel (fourth terrace of River Thames). These superficial deposits overly London Clay formation. However, borehole records, from the BGS website, of nearby areas show that there is a gravel layer at a depth of approximately 1.7m with a thickness of around 3m. Refer to the BGS Geology Maps and the Borehole Records provided in Appendix B.

2.5.2 The Environment Agency website indicated that the site does not lie within any ground water Source Protection Zones. Refer to the EA Groundwater SPZ Map provided in Appendix B.

2.6 Historic Flood Records

2.6.1 Table 2.2 below summarises the historic flood records obtained through consultation and liaison with the various bodies contacted as part of the FRA for the proposed development.

Table 2.2: Flood Records Summary

Information Source	Flood Records/Details
The Environment Agency	A response has yet to be received from the Environment Agency.
Thames Water	Thames Water has confirmed that they have no historical records of flooding within the vicinity of the proposed development. Refer to Thames Water correspondence dated 26 March 2013 in Appendix D.
London Borough of Hillingdon	London Borough of Hillingdon has yet to confirm if they have historical records of flooding within the vicinity of the proposed development.

London Borough of Hillingdon Strategic Flood Risk Assessment (SFRA) 2008

2.6.2 Historic flood mapping from London Borough of Hillingdon SFRA show the site to be in Flood Zone 1 and that there are no historic records of groundwater or overland flooding within the vicinity of the site.

2.6.3 The SFRA highlights two artificial waterbodies within the vicinity of the site, the Grand Union Canal to the north and a lake to the west. The SFRA recommends that FRAs consider flood risk from artificial sources within 1 km of the site. Refer to the SFRA extract in Appendix E.

2.7 Flood Mapping

2.7.1 The site is shown to be located entirely in Flood Zone 1 (low probability) on the Environment Agency's Flood Map. Flood Zone 1 is assessed as having less than a 1 in 100 (1%) annual probability of flooding from fluvial sources and is considered to be suitable for all types of land use. Refer to the Environment Agency's Flood Map provided in Appendix B.

3 Proposed Development

3.1 Policy Background

3.1.1 Table 1 in the NPPF Technical Guidance provides a category of the different Flood Zones according to the statistical probability of flooding. According to Table 1 all land uses are appropriate in Flood Zone 1.

London Borough of Hillingdon Pre-Submission Core Strategy (February 2011)

3.1.2 The London Borough of Hillingdon Pre-Submission Core Strategy sets out the vision for development within the borough including the requirements for flood risk for new developments.

3.1.3 The Core Strategy states that development should be avoided in high flood risk areas and SuDS should be used where possible to manage flood risk from surface water.

3.2 Proposed Development and Description

3.2.1 The current development proposals include two large commercial distribution buildings with associated access and parking areas.

3.2.2 Refer to the Overall Site Masterplan (Michael Spark Associates Drawing No. 30587-PL101) in Appendix F.

4 Existing Sources of Flooding

4.1 Existing Sources of flooding

4.1.1 An overview of the existing sources of flooding is presented in Table 4.1.

Table 4.1 Existing Sources of Flooding

Sources	Likelihood Very Likely, Possible, Negligible
Fluvial/Tidal	The flood maps from the Environment Agency website show the site to lie within Flood Zone 1. **Flood Risk – Negligible**
Coastal - Sea	The site is not situated in the vicinity of the sea or coastal water. **Flood Risk – Negligible**
Coastal – Estuarine	See above under Coastal – Sea. (i.e. a negligible risk)
Pluvial/Sheet Runoff	The London Borough of Hillingdon SFRA shows no records of surface water flooding within and in the vicinity of the site. **Flood Risk – Negligible**
Sewer – SWS, FWS, CS	Thames Water has confirmed that they have no records of sewer flooding within the vicinity of the site. **Flood Risk – Negligible**
Groundwater	A response has yet to be received from the Environment Agency regarding groundwater flooding; however, the London Borough of Hillingdon SFRA does not contain any records of previous groundwater flooding within or in the vicinity of the site. Refer to the SFRA extract in Appendix E. **Flood Risk – Negligible**
Dam Breach	The site is not in vicinity of a dam or any river defences **Flood Risk – Negligible**
Canal	The Grand Union Canal runs 180m to the north of the development. Canals are controlled water bodies and generally have a very low risk of flooding. The adjacent Heathrow Express railway embankment also provides an informal flood defence from this residual flood risk. **Flood Risk – Negligible**
Other Sources – Artificial lake	There is an artificial lake (Stockley Road Lake) approximately 170m to the south west of the site. The adjacent railway embankment also provides an informal flood defence to the site from the lake. **Flood Risk – Negligible**

5 Drainage Strategy

5.1 Development Lifespan

5.1.1 Based on a typical lifespan for a commercial development is 60 years, contingency allowances for climate change, set out in Table 5 of the NPPF technical guide, applicable to the site are 20% for the peak rainfall intensity and 20% for the peak river flow.

5.2 Existing Drainage Regime

5.2.1 The site boundary covers an approximate area of 3.48ha, which is currently unoccupied and cleared to make way for the new development construction proposals. Therefore, there are currently no formal surface water drainage systems in place. It is reasonable to assume that surface water runoff on the existing site either infiltrates directly into the ground or create overland runoff away from the site.

5.2.2 Surface Water Runoff from all the main buildings on site, prior to their demolition, drained via a 685mm diameter sewer to the nearby Canal. There was an agreement between British Waterways and the Ministry of Defence (previous owners) to discharge to the Canal.

5.2.3 There is an existing foul rising main located along the area proposed for vehicular access to the new development. This foul rising main had been implemented as part of the overall Prologis Park with the intention for the application site to be developed.

5.2.4 As the application site has been cleared of the previous development, the existing site has been assessed as a Greenfield site. Any future surface water discharged from the proposed development should be limited to the existing Greenfield Runoff Rates. Table 5.1 below indicates the runoff generated by the existing site.

Table 5-1: Existing Greenfield Runoff Rates

Return Period	IOH124 Greenfield Runoff Rates (l/s)
1 Year	5.0
30 Year	13.3
100 Year	18.7
100 Year + Climate Change (30%)	24.3

5.2.5 The Topographical Survey undertaken by GreenHatch Group in March 2010 shows the existing site to be generally quite flat with levels ranging between 32.29mAOD along the northern boundary and 31.22mAOD near the south-eastern boundary of the site.

5.2.6 The Topographical Survey also highlighted several mounds of material currently being stored on the site, which are to be removed prior to the development proposals. Refer to the Topographical Survey provided in Appendix G.

5.2.7 As discussed in Section 2.5 of this report, maps on the British Geological Society website indicate that the site is underlain by London Clay formation. However, borehole records in the vicinity of the site indicate that there is a gravel layer at a depth of approximately 1.7m with a thickness of around

3m. Refer to the Borehole Records provided in Appendix B.

5.2.8 The underlying geology suggests that draining the surface water directly into the ground via infiltration may be possible through the gravel layer stratum. However, the underlying London Clay typically has a very low permeability rate and may restrict vertical groundwater flow.

5.2.9 No intrusive site investigations have been undertaken for the application site, therefore a conservative 10^{-6}m/s permeability value has been assumed for the infiltration coefficient of the underlying geology. A detailed intrusive site investigation should be undertaken during the detailed design stage, to confirm the infiltration rates.

5.3 Drainage Strategy Requirements

5.3.1 The proposed surface water drainage strategy should seek to replicate the site's existing hydrology. Changes in the volume and rate of surface water runoff from the development could increase the risk of flooding upstream and downstream, unless sufficient steps are taken to prevent this happening.

5.3.2 A fundamental principle of sustainable development in terms of minimising the risk of flooding is the reduction of surface water run-off from new developments. The proposed commercial development includes warehousing and offices, and the provision for vehicular car-parking and storage, which will increase the impermeable area within the site.

5.3.3 To provide further reduction of the overall surface water run-off volume, sustainable drainage systems (SuDS) could be considered as they would reduce the amount of rainfall collected at source and where appropriate, improve water quality.

5.3.4 The site's existing hydrology will be replicated as far as practicable by the use of Source Control and SuDS techniques.

5.4 Proposed Surface Water Drainage Strategy

5.4.1 According to the latest development proposals provided by Michael Sparks Associates, the impermeable area of the site will increase significantly compared to that of the existing site. However, with the implementation of Sustainable Drainage Systems (SuDS) as part of the development, it is proposed to attenuate, on site, any increases in surface water runoff.

5.4.2 The proposed development masterplan layout indicates that the development is to be 100% impermeable, which will increase the surface water runoff generated. Using the Modified Rational Method (where Q = 2.78iA) and based on the total impermeable areas in hectares and the rainfall intensities, the runoff rates for the site can be calculated. Table 5.2 below indicates the surface water runoff generated by the proposed development.

Table 5-2: Proposed Development Surface Water Runoff Rates (Uncontrolled)

Return Period	Rainfall Intensity (TRRL Report LR595)	Surface Water Runoff Rates (l/s)	
		Existing Site (Greenfield)	Uncontrolled Post Development
1 Year	50.0	5.0	483.7
30 Year	113.02	13.3	1093.4
100 Year	143.9	18.7	1392.1
100 Year + Climate Change (30%)	187.07	24.3	1809.8

5.4.3 It is proposed to implement infiltrating cellular storage, with a depth of 0.8m, underneath the proposed car parking areas to provide attenuation for the surface water generated by the proposed development. A quick storage volume estimate had been generated using the MicroDrainage software. Based on an infiltration rate of 10^{-6}m/s for the underlying geology, it has been calculated that, for the 1 in 100 year storm event, a storage volume ranging between 1863m^3 and 3901m^3 is required on site for attenuation before infiltrating directly into the ground. Refer to the Drainage Strategy Calculations provided in Appendix H.

5.4.4 Therefore, assessing for the worst case scenario, it has been calculated that an area of 5132.8m^2 is required for cellular storage (based on 0.8m depth and 95% voids) to cater for the increase in impermeable area for the 1 in 100 year plus 30% allowance for climate change. Refer to the Drainage Strategy Calculations in Appendix H.

5.4.5 The latest layout referenced 'Michael Sparks Associates' Drawing No. 30587-PL-101' indicates that there are sufficient car parking areas proposed within the site boundary to implement the infiltrating cellular storage structures. Refer to the Drainage Strategy Drawing No. 2721-D-01 provided in Appendix H.

5.4.6 The drainage strategy for the application site seeks to drain all the surface water generated by the proposed development via infiltration, directly into the underlying geology. Therefore, it is anticipated that the Controlled Post Development Discharge Rates for all storm event scenarios to be zero. This will provide betterment over the existing scenario of which has overland runoff discharging away from the site. Table 5.3 indicates that the proposed controlled development runoff rates for the site.

Table 5-3: Controlled Post Development Runoff Rates

Return Period	Surface Water Runoff Rates (l/s)		
	Existing Site (Greenfield)	Uncontrolled Post Development Runoff	Controlled Post Development Runoff
1 Year	5.0	483.7	0.0
30 Year	13.3	1093.4	0.0
100 Year	18.7	1392.1	0.0
100 Year + Climate Change (30%)	24.3	1809.8	0.0

5.4.7 In accordance with the principle of sustainable development, NPPF and Environment Agency sustainable drainage philosophy, existing runoff rates are calculated using the IOH124 methodology for the site.

5.4.8 Management of extreme event flood risk can be achieved through ensuring the finished flood levels of the proposed buildings are set at least 0.15m above adjacent roads and open spaces in areas where designated overland flood routes are identified.

5.4.9 The proposed development can be undertaken in a sustainable manner without increasing the surface water flood risk either at the site or to any third party land in line with NPPF requirements.

5.5 Foul Drainage Strategy

5.5.1 The development may result in an increase in the volume of foul water discharge from the site. However, Thames Water have stated that they do not expect a significant change to foul sewage flows, so this will not overload the existing foul water sewer system, which will be used to drain the site, or the sewage treatment work Mogden.

6 Conclusions

6.1 Conclusions

6.1.1 WSP UK (WSP) was commissioned by Prologis UK Ltd. to undertake a site specific Flood Risk Assessment (FRA) for a commercial development at Prologis Park, Heathrow.

6.1.2 It is anticipated that the existing Greenfield site, covering approximately 3.48ha, previously drained to the Grand Union Canal. The development proposals seek to provide two large commercial distribution buildings with associated parking areas for loading Lorries.

6.1.3 The permeability of the underlying geology has been assumed to be 10^{-6}m/s, which is a very conservative infiltration rate to determine the worst case scenario. However, a detailed intrusive site investigation should be undertaken to determine accurate infiltration rates during the detailed design stage.

6.1.4 It is proposed that the surface water attenuation volume required on site is provided within 0.8m deep cellular storage structures underneath the car parking areas. These structures will allow surface water to be temporarily stored and then infiltrated directly into the underlying strata without causing any detrimental effects for up to and including the 1 in 100 year storm event plus a 30% allowance for climate change.

6.1.5 At the time of writing, a response was yet to be received from the Environment Agency regarding flood risk at the proposed development; however, the site is shown to be located within Flood Zone 1 on the Environment Agency website. The development is therefore considered to have passed the Sequential Test and is suitable for all types of land use.

6.1.6 Flood risk from overland flows, groundwater flooding, sewer flooding and flooding from reservoirs and canals has been assessed and is considered to be negligible; therefore, flood mitigation is not required.

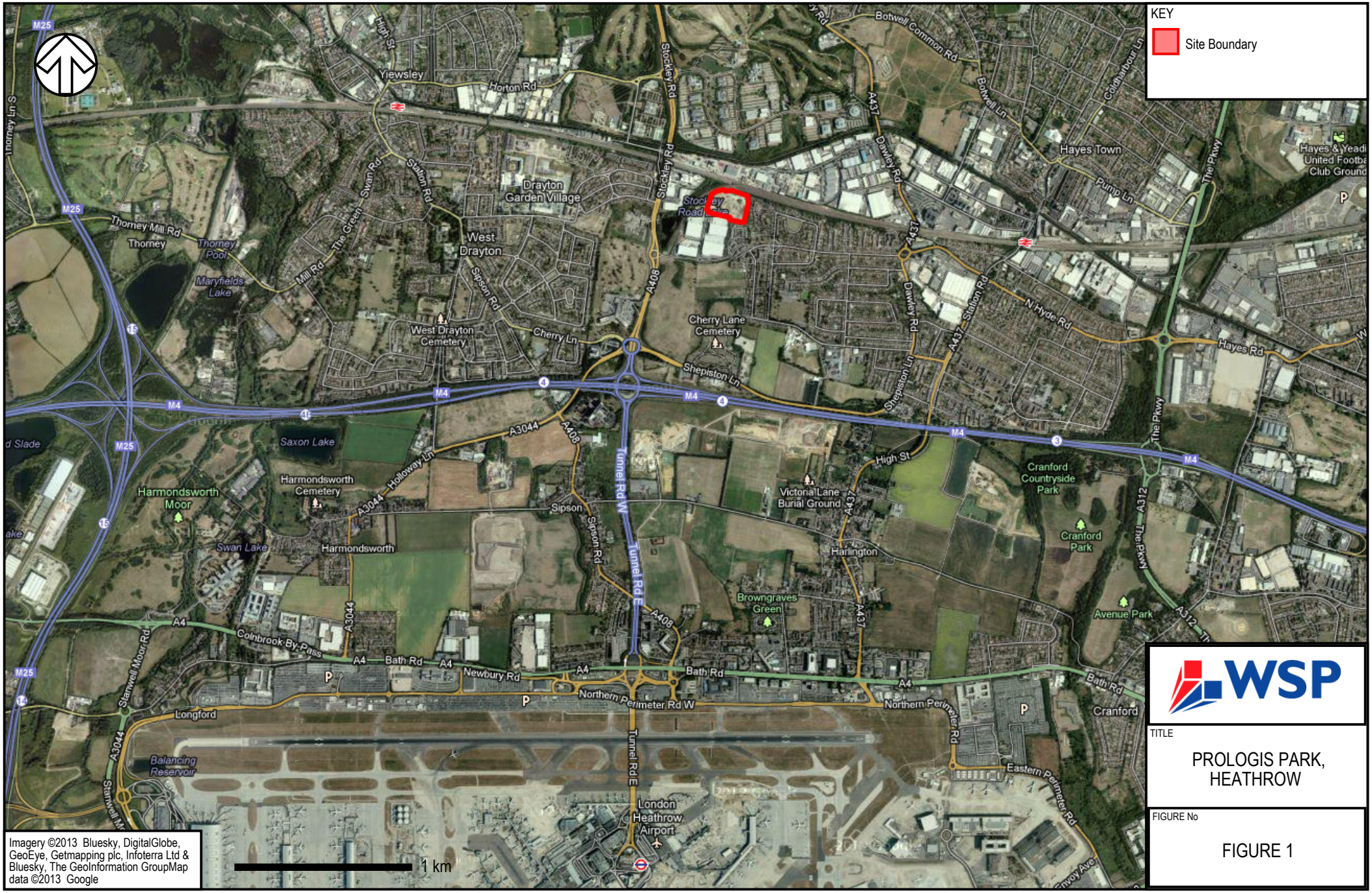
6.1.7 This FRA confirms that the site is located in an area with a low annual probability of flooding and has a low risk of flooding from all sources. Therefore, the site proposals are considered to be robust and in accordance with the requirements set out in NPPF and the associated Technical Guidance.

6.1.8 Safe access and egress will be available to and from the site for events up to and including the 1 in 100 year plus climate change (30%) rainfall events.

6.1.9 The sites satisfies the requirements of SUR1 of the Code for Sustainable Homes relating to volume and discharge because there are no increases in the volume of discharge from the site, even if there is an increase in hardstanding area within the site.

Appendices

Appendix A – Michael Sparks Associates, Drawing No.30587-PL-100 and Figure 1 – Site Location Plans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WSP
TITLE
PROLOGIS PARK, HEATHROW
FIGURE No
FIGURE 1

NOTES:

SUBJECT TO STATUTORY CONSENTS

BASED ON GREENHATCH SURVEY NO. 7159ENT_1

BOUNDARIES BASED ON LAND REGISTRY TITLE NUMBER MX131015

ADOPTED HIGHWAY BOUNDARY BASED ON INFORAMTION RECEIVED FROM LONDON BOROUGH OF HILLINGDON

NORTH

0 25 50 100 m

REV	DATE	COMMENT	DRAW	CHCK
–	18.12.12	FIRST ISSUE	VCN	PW

MICHAEL SPARKS ASSOCIATES
CHARTERED ARCHITECTS
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FAX 020 7736 3896
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PROLOGIS

TITLE
PROLOGIS PARK, HEATHROW

DRAWING
SITE LOCATION PLAN

CLIENT
PROLOGIS UK LTD.

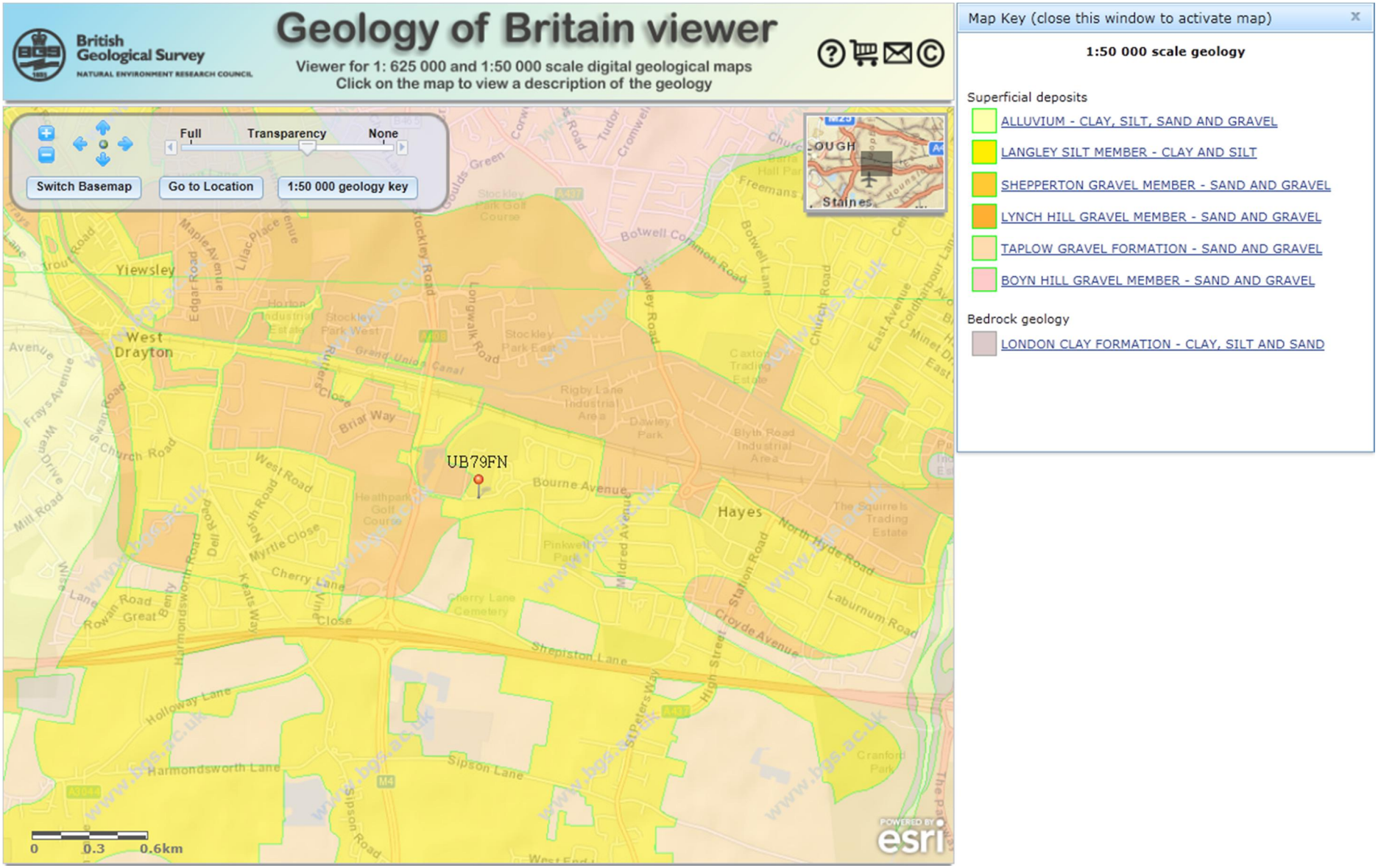
DATE	SCALE	DRAWN
DECEMBER 2012	1:1000 @ A1	PW
	STATUS: FOR PLANNING	CHECKED: PW

DRAWING NUMBER
30587-PL-100

01/100 SITE LOCATION PLAN
1:1000

Appendix B – Figure 3 – BGS Geology Map, Figure 4 & 5 – Environment Agency Groundwater Maps & Figure 6 - Environment Agency Flood Zones

FIGURE 3 – BGS GEOLOGY MAP



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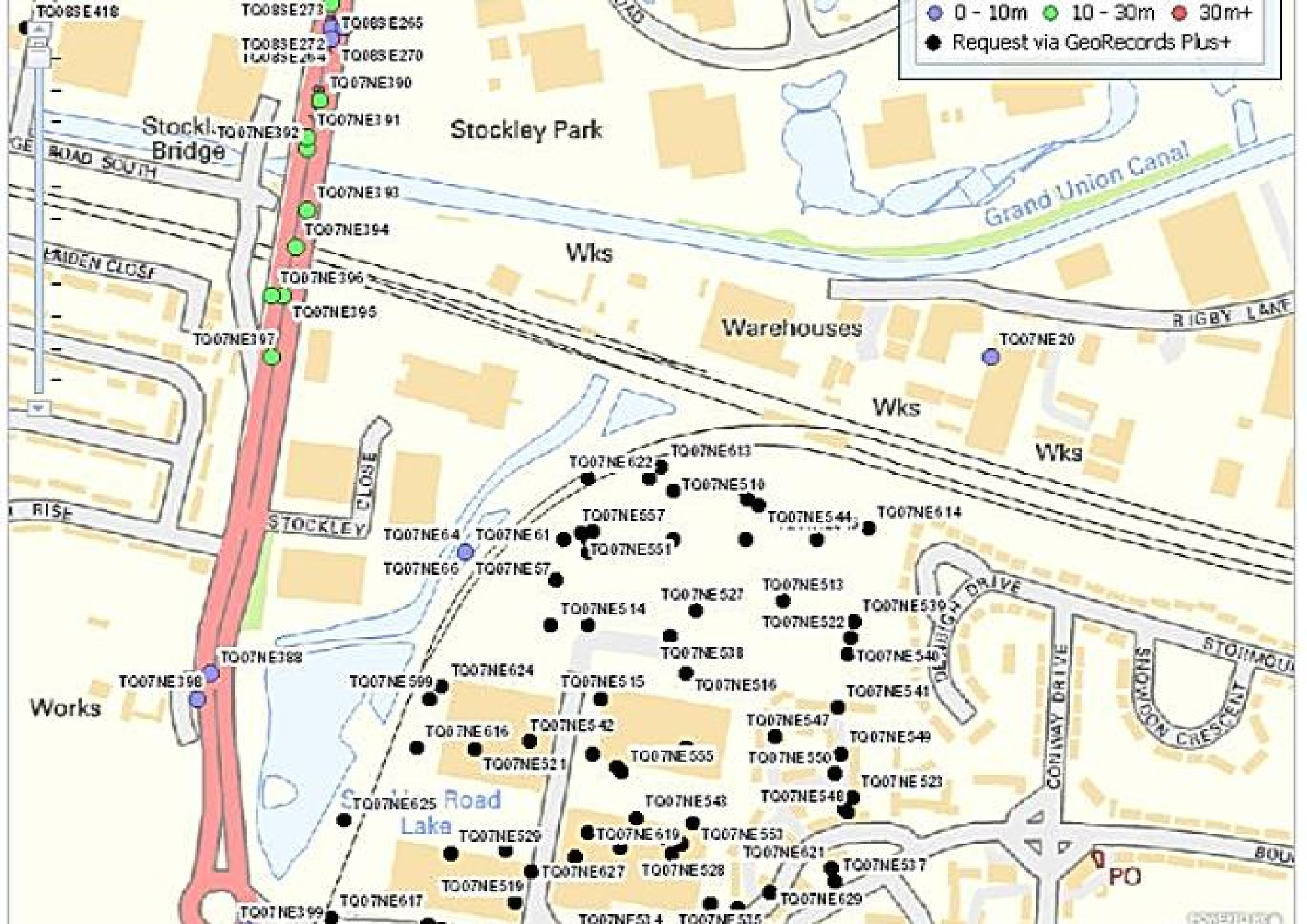
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10 - 30m
30m+
Request via GeoRecords Plus+
Stockley Park
Grand Union Canal
Stockley Bridge
ROAD SOUTH
HAIDEN CLOSE
STOCKLEY CLOSE
RISE
Wks
Warehouses
RIGBY LANE
Works
Road
Lake
CONWAY DRIVE
DELAMERE DRIVE
STOWMOOR
SHERWOOD CRESCENT
PO
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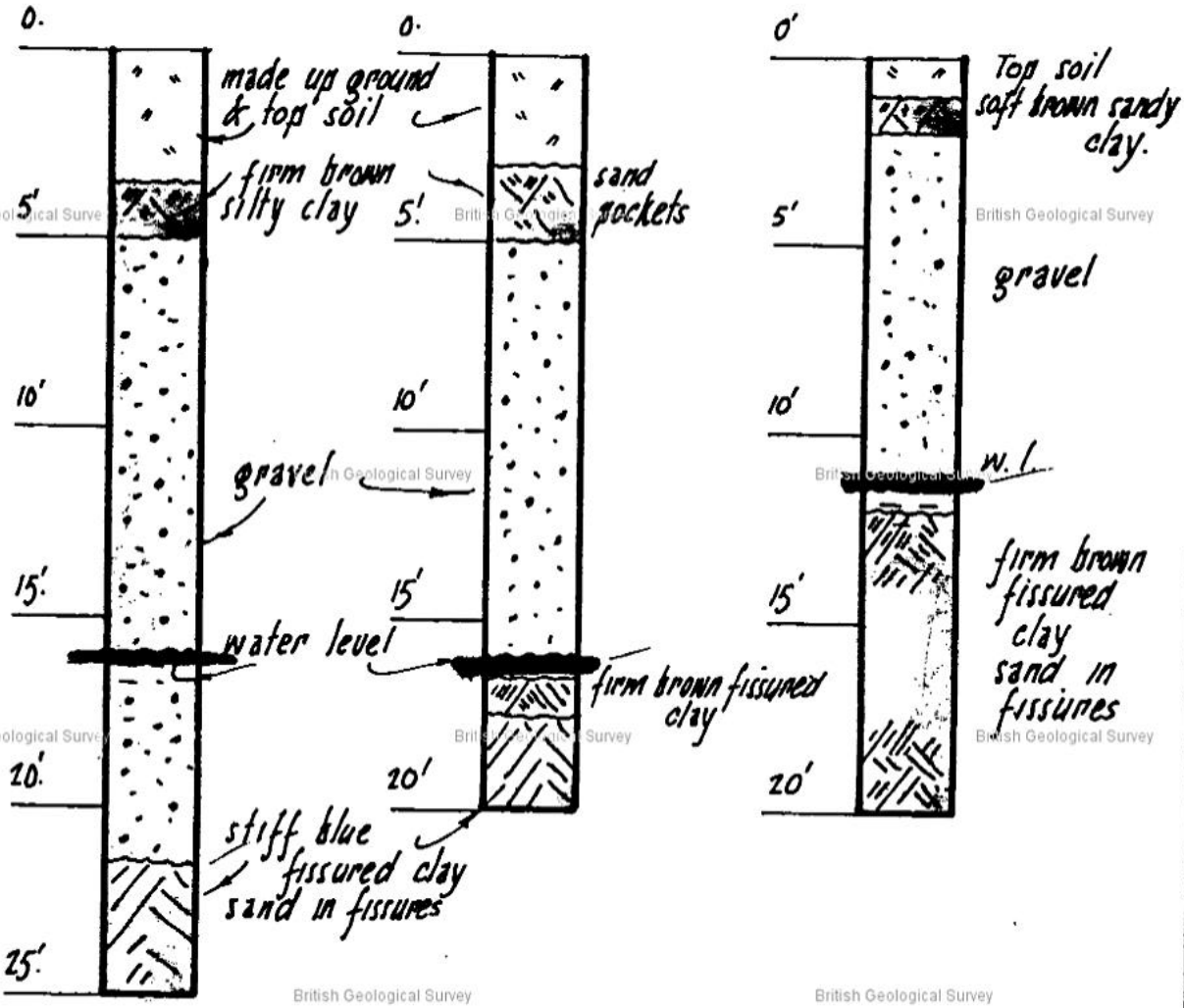


BOREHOLE DATA from report dated June 1960.

SITE : DAWLEY ROAD . HAYES .

Middlesex County Council
ARCHITECT'S DEPARTMENT

H.d. Whitfield Lewis F.R.I.B.A. County Architect

1 Queen Anne's Gate Buildings, Dartmouth Street, Westminster, London SW1 TRAfalgar 7799x 285

(Structural Section)

drawn/checked 7/62 A

first issue

printed

SCALE

job

drawing

sheet size A4
297 x 210 mm

Record of Borehole No. 1

Location: WEST DRAYTON NIDC

Sheet 1 of 1

Client: PROPERTY SERVICES AGENCY

Type of boring: LIGHT CABLE PERCUSSION

TQ07NE55 078 796

Job No. 11311924 Ground level 31.54m A.O.D. Diameter / 150mm Casing / 150mm

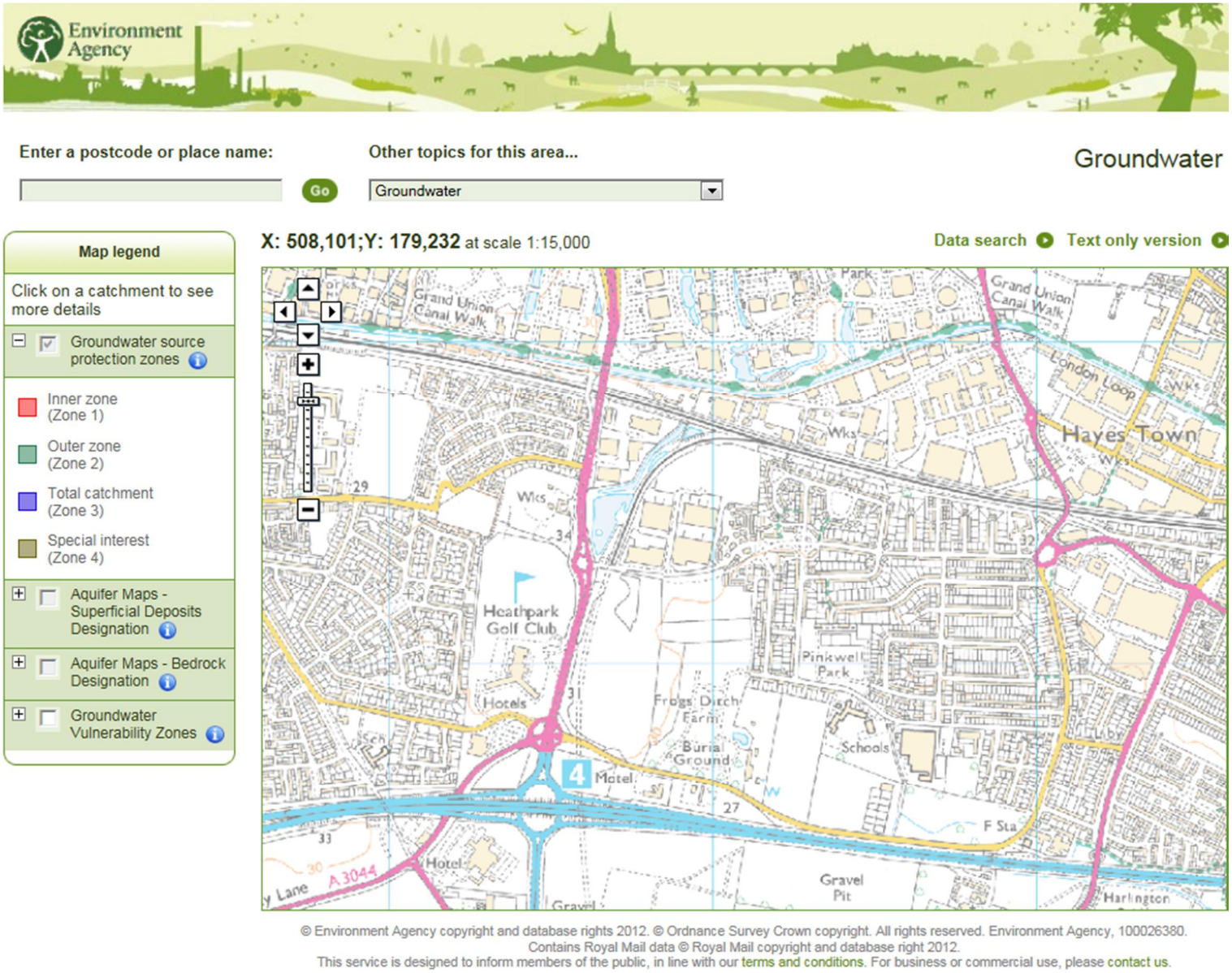
Daily Progress	Ground water levels	Depth of casing	Samples: Depth	Samples: No.	Samples: Type	Scale	Strata: Depth	Strata: Reduced level	Description of strata	Legend
18.5.89	NIL	NIL	0.15-0.40	1	B		G.L.	31.54		
							0.15	31.39	TOPSOIL/MADE GROUND	
			0.50-0.95	2	U		0.40	31.14	MADE GROUND: Dark brown to black silty clayey sand with some metal, clinker and rootlets.	
			1.00	3	D	1			Very dense orange/brown silty clayey to very clayey fine to coarse sub-angular to rounded flint GRAVEL with much sand and frequent pockets of clay.	
		1.00	1.00-1.45	4	D,C(106					
							1.70	29.84		
		2.00	2.00-2.45	5	B,C(40)	2			Medium dense to dense light brown fine to coarse, occasionally cobble-sized, subangular to rounded very sandy GRAVEL.	
		3.00	3.00-3.45	6	B,C(43)	3				
		4.00	4.00-4.45	7	B,C(17)	4				
							4.70	26.84		
		5.00	5.00-5.45	8	U	5	5.00	26.54	Stiff, extremely closely fissured brown silty CLAY.	
			5.50	9					Very stiff extremely closely fissured dark greyish brown silty CLAY with occasional fine silt partings and occasional shell traces.	
			5.50-5.95	10	D,S(22)	6				
		6.50	6.50-6.95							
			7.00	12	D	7				
			7.00-7.45	13	D,S(23)					
		7.50	8.00-8.45	14	U	8				
			8.50	15	D		8.50		... with occasional nodules of moderately weak claystone.	
			8.50-8.95	16	D,S(25)	9				
			9.50-9.95	17	U					
10.00	DRY	7.50	10.00	18	D	10	10.00	21.54	BOREHOLE COMPLETED	

Key
- U.... undisturbed 102mm diameter sample
- D.... disturbed jar sample
- B.... disturbed bulk sample
- W.... water sample
- S( ). standard penetration test
- C( ). cone penetration test
- (33).. number of blows ('N' value)
- ▼.. groundwater encountered

Remarks
Water added from 1.00m to 4.70m to assist drilling.

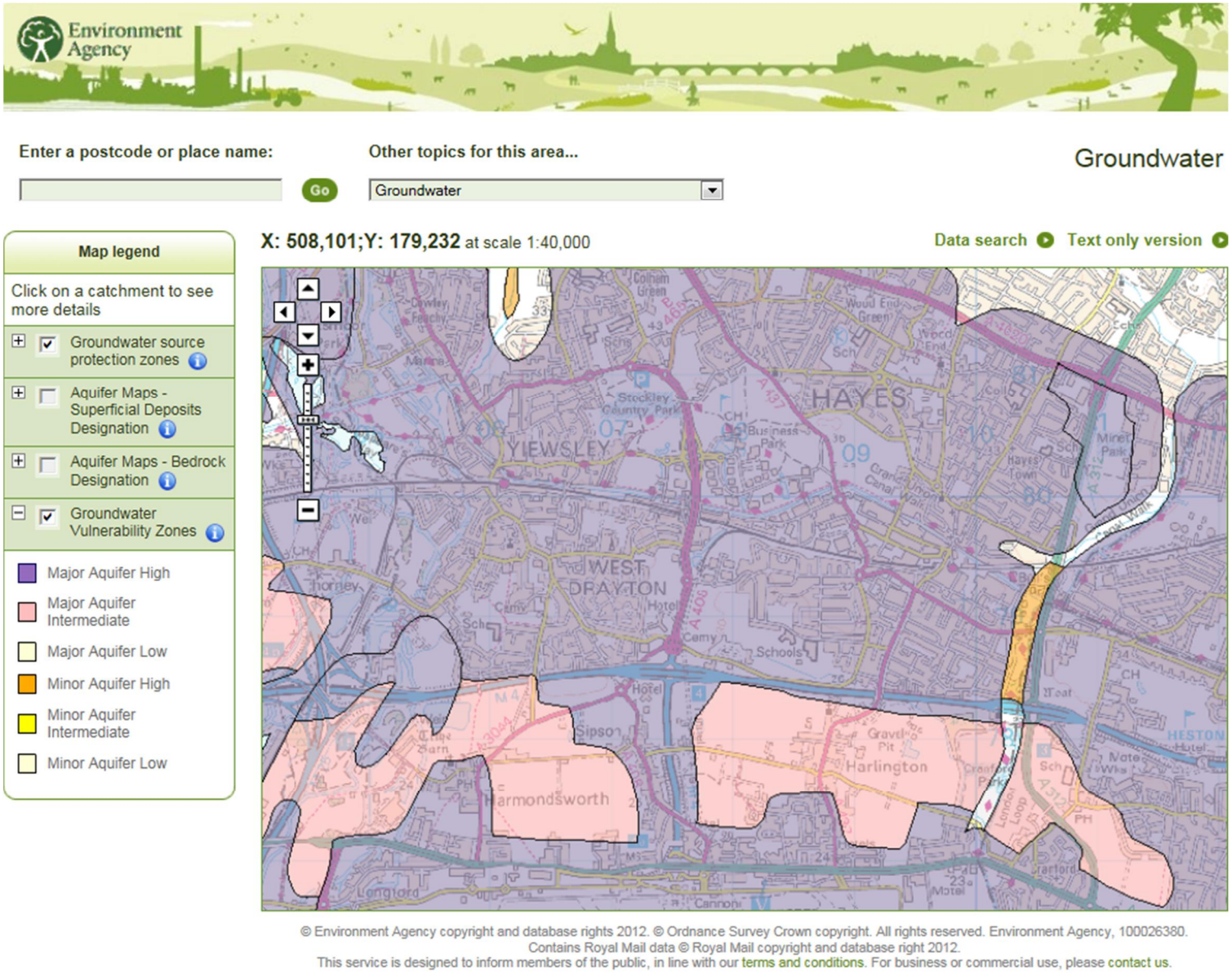
GROUND ENGINEERING

FIGURE 4 – ENVIRONMENT AGENCY'S GROUNDWATER SOURCE PROTECTION ZONE MAP



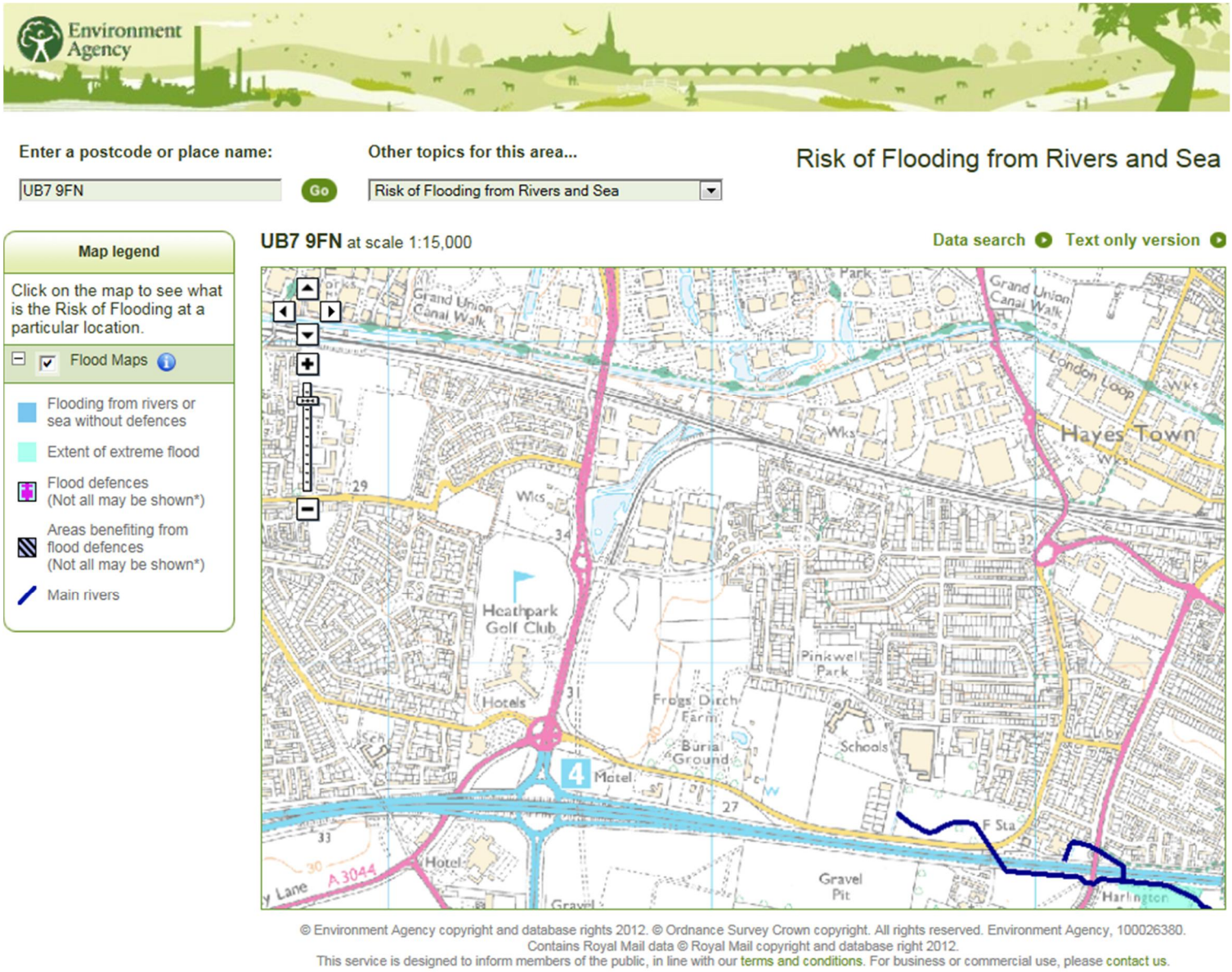
http://maps.environment-agency.gov.uk/wiyby/wiybyController?value=UB7+9FN&lang=_e&ep=map&topic=floodmap&layerGroups=default&scale=9&textonly=off&submit.x=0&submit.y=0#x=508101&y=179232&lg=1,&scale=10

FIGURE 5 – ENVIRONMENT AGENCY'S GROUND VULNERABILITY ZONES



http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=groundwater&layerGroups=default&lang=_e&ep=map&scale=10&x=508101.4895833335&y=179231.75000000017#x=508101&y=179232&lg=1,2,&scale=8

FIGURE 6 – ENVIRONMENT AGENCY'S FLOOD MAP



http://maps.environment-agency.gov.uk/wiyby/wiybyController?value=UB7+9FN&lang=_e&ep=map&topic=floodmap&layerGroups=default&scale=9&textonly=off&submit.x=0&submit.y=0#x=508101&y=179232&lg=1,&scale=10

Appendix C – Environment Agency correspondence

Your ref:
Our ref: GG/paw/11012721

06 March 2013

Environment Agency

Mountbatten House
Basingstoke
RG21 4HJ
UK

Tel: +44 (0)12 5631 8643
Fax: +44 (0)12 5631 8700
www.wspgroup.co.uk

Dear Sirs

Prologis Park, Heathrow
Flood Risk Assessment – Enquiry

We are writing to request flood risk and defence information with respect to proposed development at the above site.

The brownfield site is shown to be located in Flood Zone 1. The OS grid reference for the site is (507978, 179596) and the nearest postcode is UB3 1SW. Please find enclosed a location map for your reference.

We have been instructed by our client to carry out a Flood Risk Assessment for the proposed development at the above site.

With regards to completing the above in compliance with the National Planning Policy Framework (NPPF), WSP would like to request the following information:

1 Does the Environment Agency have any predicted flood levels for the site? Are these levels suitable for use in a formal Flood Risk Assessment?

2 What are the predicted 1 in 20 year, 1 in 100 year, 1 in 200 year, 1 in 100 year climate change and the 1 in 1000 year flood levels for this site? Can the Environment Agency confirm if these levels are suitable for a Flood Risk Assessment?

3 Can the Environment Agency supply a detailed flood map for this area? (We already have access to the Environment Agency web site Flood Maps).

4 Does the Environment Agency have any historical records of flooding in the vicinity of the site? If not, can you confirm that the site has no record of flooding in the past?

5 Are there any significant hydraulic structures in the area that might control the flow?

6 What is the Aquifer classification of this area? Are there any protection zones at or adjacent to the site?

7 Are there any known Ground Water levels on or within the vicinity of the site? Does the Environment Agency have any records of groundwater flooding at or in the vicinity of the site?

8 What would the Environment Agency require interims of the drainage strategy at the site?

9 What freeboard is required, for the site?

10 Any other flood data the Environment Agency considers useful for the above site?

In order to undertake a formal the NPPF Flood Risk Assessment to satisfy the Environment Agency, WSP would like to confirm the following:

1 The site is shown as lying **within Flood Zone 1** according to current Environment Agency Flood Map.

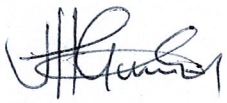
2 The preliminary risk of flooding to the site is fluvial.

3 The site is required to have safe accesses route.

4 The specific freeboard level to all structures is to be 300mm above the 1 in 100 year climate change event.

We trust the above to be satisfactory, however, should you have any queries please do not hesitate to contact myself.

Yours faithfully



Gerald Guma
Senior Engineer

DDI: +44 (0)12 5631 8664

Encs Site location plans

Tang, Joe

From:	NET Enquiries <NETenquiries@environment-agency.gov.uk>
Sent:	18 March 2013 17:38
To:	Guma, Gerald
Subject:	NE34439 BC - Ref 130308/JC05 Prologis Park, Heathrow - Flood Risk Assessment - Enquiry
Attachments:	Standard Notice.pdf

Dear Gerald Guma

Enquiry regarding data for Prologis Park, Heathrow

Thank you for your request for information. I have checked with our Partnerships & Strategic Overview Team (PSO) and there is no relevant modelling data for the Grand Union Canal. We can provide you with the remaining requested data.

The entire canal network was managed by British Waterways until the start of July 2012 when a new organisation called The Canal and River Trust took over ownership. This includes; Grand Union Canal (Main Line and Paddington Arm), the Regent's Canal, the River Lee Navigation, Hertford Union Canal and the Limehouse Cut, including the Docklands water spaces. Therefore, we recommend you contact them with your proposals as they may hold useful data.

Before proceeding with this request, we will require a payment of £50 + VAT (£60). This is a charge for the copyright licence which is set out in our Standard Notice, which explains how you can use the information.

Charging Summary

Copyright Licence Charge = £50 + VAT
Total Charge = £60

You can pay by credit/debit card by calling me at the number below. Please be aware that we can only take payment from the person who is named on the credit/debit card. Once we have received your payment, we will start working on your enquiry. Please make cheques payable to the Environment Agency and send to the address below stating our reference number:

Environment Agency
2 Bishop Square Business Park
St Albans Road West
Hatfield
Hertfordshire
AL10 9EX

The enquiry is currently on Day 8 of 20 and will be placed on hold until we receive payment. If I have not received your payment within 60 days, I will assume that you no longer require the information. If you have any queries, please do not hesitate to contact me.

Yours sincerely

Becki Clark
External Relations Officer
Environment Agency
Direct dial 01707 632302

Direct e-mail NETenquiries@environment-agency.gov.uk

VAT Registration Number: GB 662 4901 34

For more information on our products, please visit the following link:

http://www.environment-agency.gov.uk/research/planning/93498.aspx

---

From: Enquiries, Unit
Sent: 08 March 2013 09:27
To: Gerald.Guma@WSPGroup.com
Subject: FW: Ref 130308/JC05 Prologis Park, Heathrow - Flood Risk Assessment - Enquiry

Dear Gerald

Thank you for your enquiry regarding a flood risk assessment.

For your information, I have passed your query to our local External Relations Team (Planning and Corporate Services) for advice. They will check whether we hold this information and they will be in touch with you shortly. The External Relations team have 20 working days from the date we receive your enquiry to provide a response, and they will get this to you as soon as possible.

Should you wish to contact them in the meantime, their details are below. Please quote your Enquiry Ref 130308/JC05 in your correspondence with us.

External Relations
Planning and Corporate Services
Environment Agency
South East Region, North East Thames Area
Apollo Court
2 Bishops Square Business Park
St Albans Road West
HATFIELD
AL10 9EX

Tel: 03708 506506

We trust that this information will be useful.

Kind regards

Joanne Carney
Customer Service Advisor
Email Enquiries Unit
National Customer Contact Centre
Part of National Operations
Environment Agency
Tel: 03708 506506
Website: www.environment-agency.gov.uk/

Follow us on

We would really like to know what you think of our customer service. Please can you spare five minutes to complete our short survey; your feedback will help us identify where we need to improve.

The survey is completely anonymous.

http://feedback.environmentagency.uk.com/s/HZwQiDVgYzGSx3Z

From: Guma, Gerald [mailto:Gerald.Guma@WSPGroup.com]
Sent: 06 March 2013 16:26
To: Enquiries, Unit
Subject: Ref 130308/JC05 Prologis Park, Heathrow - Flood Risk Assessment - Enquiry

<<130306EA.pdf.pdf>> <<Site Location_1.pdf>> <<30587-PL-100 - SITE LOCATION PLAN.PDF>>

Dear Sirs

Prologis Park, Heathrow

Flood Risk Assessment – Enquiry

We are writing to request flood risk and defence information with respect to proposed development at the above site.

The brownfield site is shown to be located in Flood Zone 1. The OS grid reference for the site is (507978, 179596) and the nearest postcode is UB3 1SW. Please find enclosed a location map for your reference.

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8 What would the Environment Agency require interims of the drainage strategy at the site?

9 What freeboard is required, for the site?

10 Any other flood data the Environment Agency considers useful for the above site?

In order to undertake a formal the NPPF Flood Risk Assessment to satisfy the Environment Agency, WSP would like to confirm the following:

1 The site is shown as lying **within Flood Zone 1** according to current Environment Agency Flood Map.

2 The preliminary risk of flooding to the site is fluvial**.**

3 The site is required to have safe accesses route.

4 The specific freeboard level to all structures is to be 300mm above the 1 in 100 year climate change event.

We trust the above to be satisfactory, however, should you have any queries please do not hesitate to contact myself.

Yours faithfully

Gerald Guma

Senior Engineer

WSP UK Limited

DDI: +44 (0)12 5631 8664

Encs Site location plans

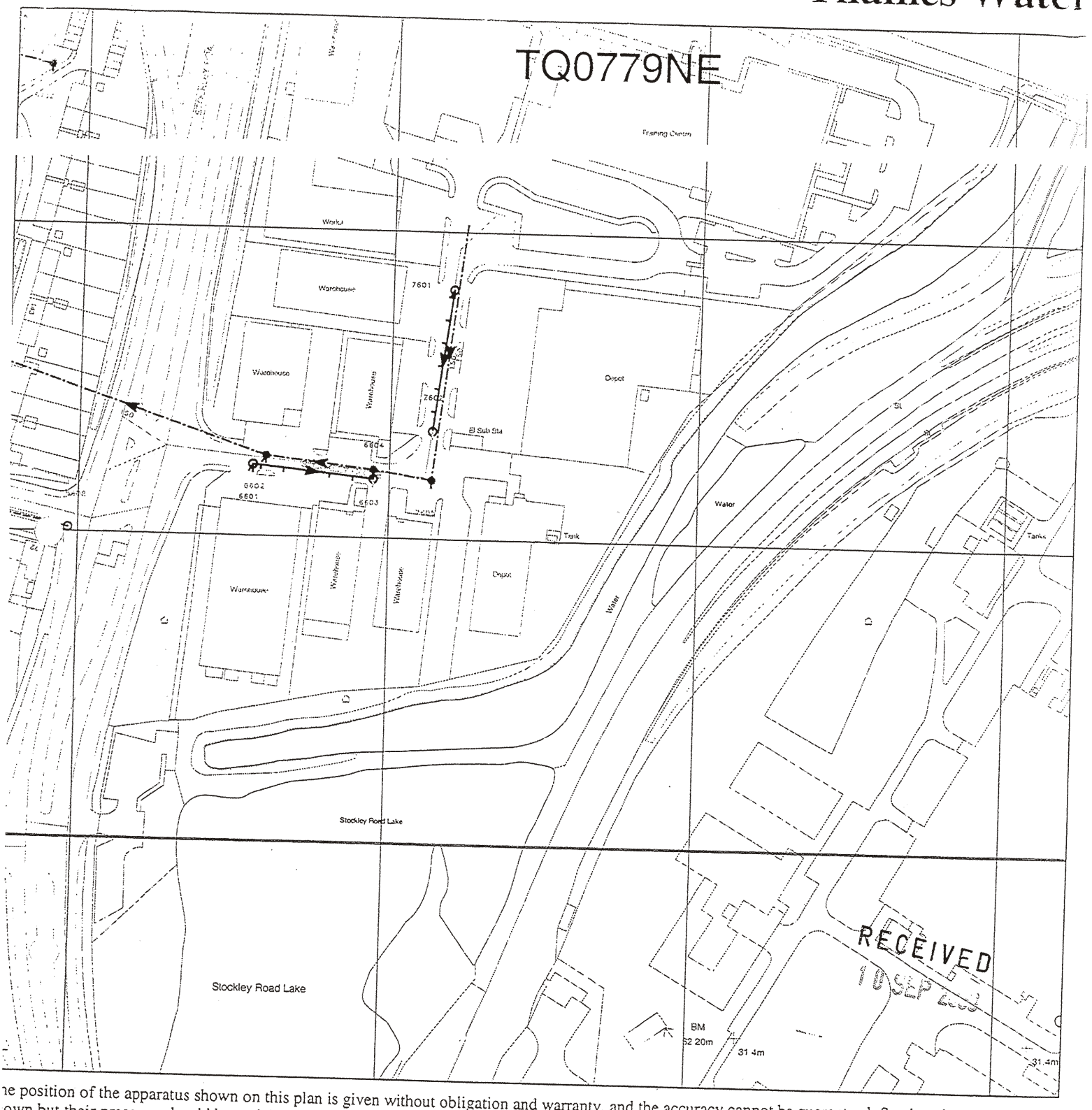
Gerald Guma
Senior Engineer, Property & Development

Mountbatten House, Basing View, Basingstoke RG21 4HJ
Tel: +44(0)1256318664
Fax: +44(0)1256318700
Website: www.wspgroup.co.uk

Appendix D – Thames Water correspondence

Thames Water

TQ0779NE



RECEIVED
10 SEP 2003

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

...0 metre intervals

Thames Water Customer Enquiries Sewer Plan

COMMON SEWER TYPES

- Foul Sewerage
- Surface Water
- Combined Sewerage

OTHER SEWER TYPES

- Trade Effluent
- Vent Pipe
- Abandoned
- Sludge
- Rising Main

...ntre: (507750 , 179595): TQ0779NE. Printed on 2 September 2003 at 15:04:02 by PFOSSEY.

Thames Water

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 known 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.

100 metre intervals

Thames Water Customer Enquiries Sewer Plan

COMMON SEWER TYPES

- Foul Sewerage
- Surface
- Combined Sewerage

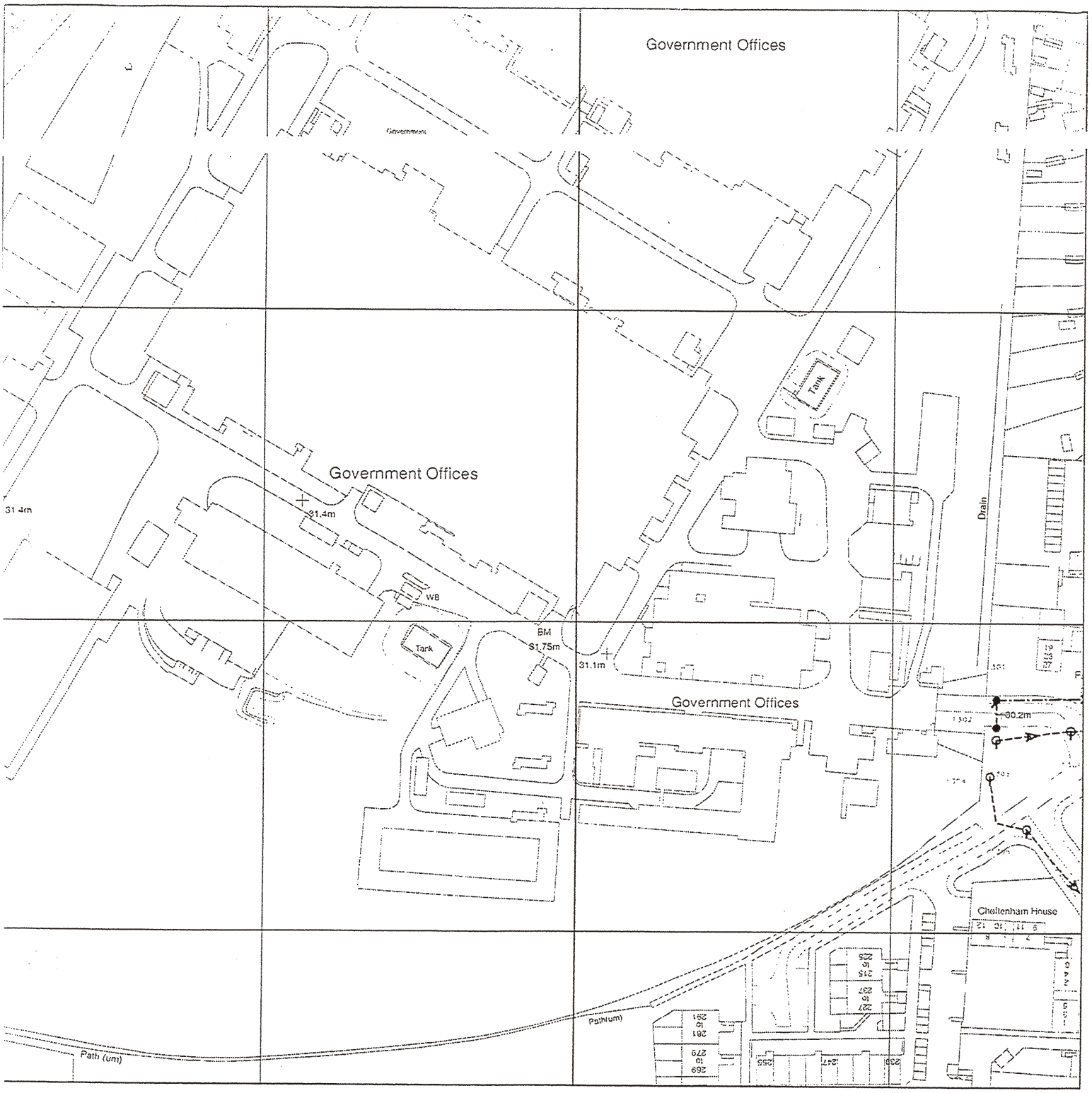
OTHER SEWER TYPES

- Trade Effluent
- Vent Pipe

RECEIVED
10 SEP 2003

Centre: (507989 , 179595): TQ0779NE. Printed on 2 September 2003 at 15:04:11 by PFOSSEY.

Thames Water



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00 metre intervals

Thames Water Customer Enquiries Sewer Plan

COMMON SEWER TYPES

- Foul Sewerage
- Surface
- Combined Sewerage

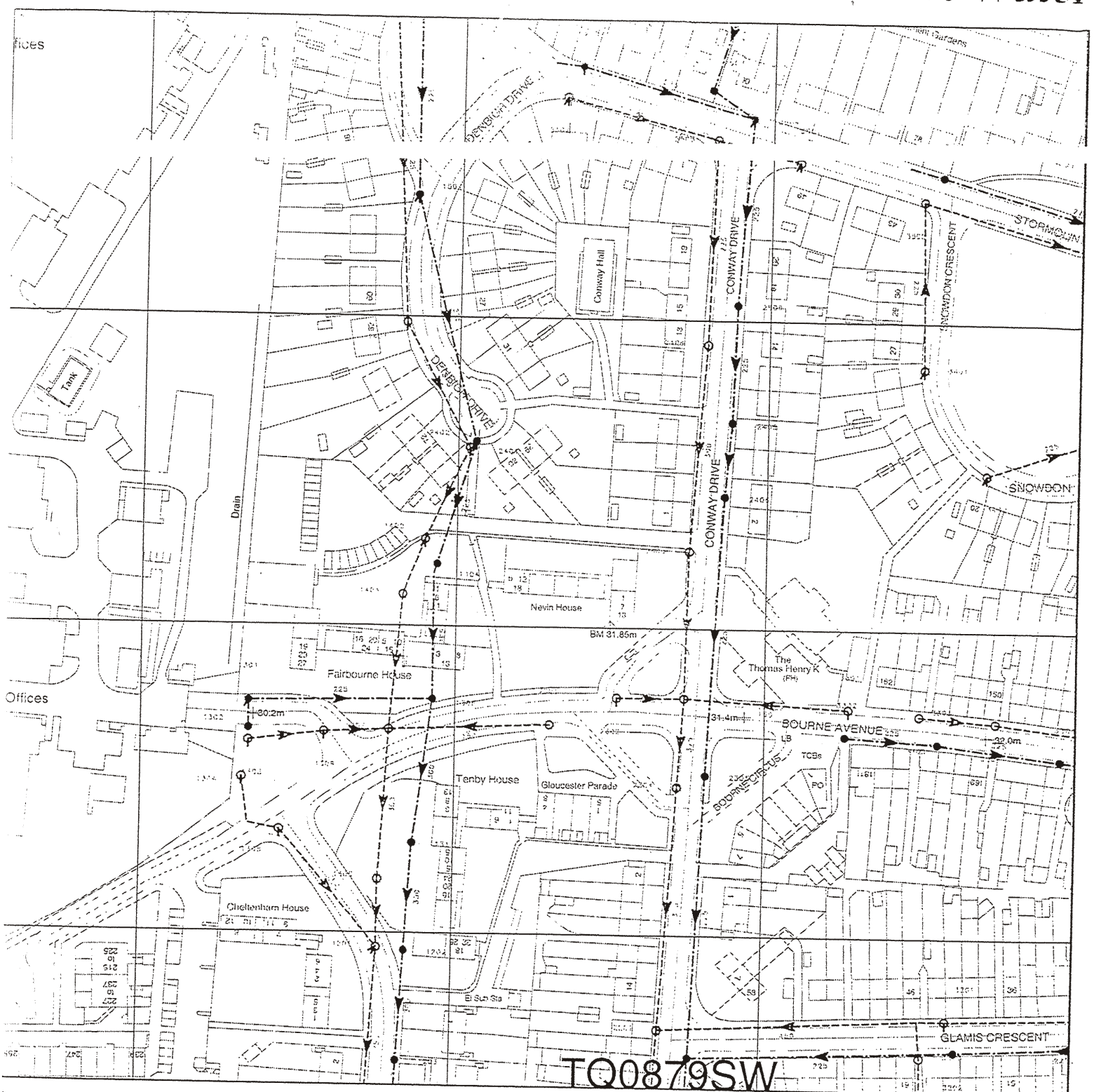
OTHER SEWER TYPES

- Trade Effluent
- Vent Pipe
- Rising Foul

RECEIVED
10 SEP 2003

Centre: (507989 , 179423): TQ0779SE. Printed on 2 September 2003 at 15:04:24 by PFOSSEY.

Thames Water



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 known 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.

00 metre intervals

Thames Water Customer Enquiries Sewer Plan

COMMON SEWER TYPES

- Foul Sewerage
- Surface
- Combined Sewerage

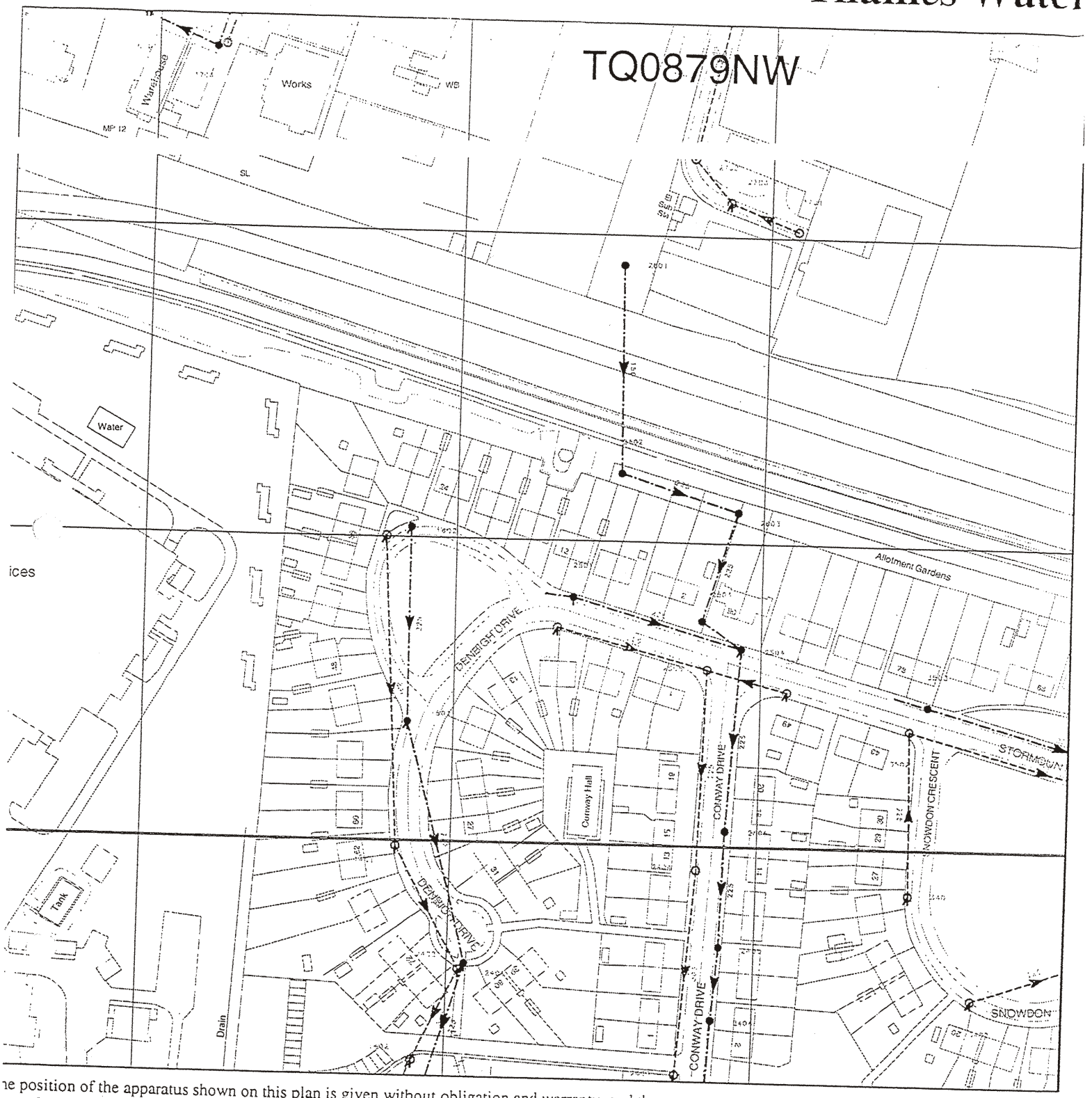
OTHER SEWER TYPES

- Private Effluent
- Vent Pipe
- Pumping Main
- Rising Main

Centre: (508228 , 179423): TQ0879SW. Printed on 2 September 2003 at 15:11:08 by PFOSSEY.

Thames Water

TQ0879NW



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 known 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.

[redacted]

100 metre intervals

Thames Water Customer Enquiries Sewer Plan

COMMON SEWER TYPES

- Foul Sewerage
- Surface Water
- Combined Sewerage

OTHER SEWER TYPES

- Trade Effluent
- Vent Pipe
- Abandoned
- Pumping Main

Centre: (508228 , 179595): TQ0879NW. Printed on 2 September 2003 at 15:10:59 by PFOSSEY.

Sewer Flooding

History Enquiry

Thames Water Property Searches
12
Vastern Road
Reading
RG1 8DB

Search address supplied Prologis Park
Heathrow
UB3 1SW

Your reference N/A

Our reference SFH_SFH_Standard_2013_2437154

Search date **26 March 2013**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

Search address supplied: Prologis Park, Heathrow, UB3 1SW

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

Although Thames Water does not have records of public sewer flooding within the vicinity, please be aware that property owners are not legally obliged to report this flooding to Thames Water. In addition flooding from private sewers, watercourses and highways drains are not the responsibility of Thames Water, and such incidents may not be noted in our records. We therefore strongly advise you to contact the current owners and occupiers of the premises and inquire about sewer flooding.

For your guidance:

- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0845 9200 800 or website www.thameswater.co.uk

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

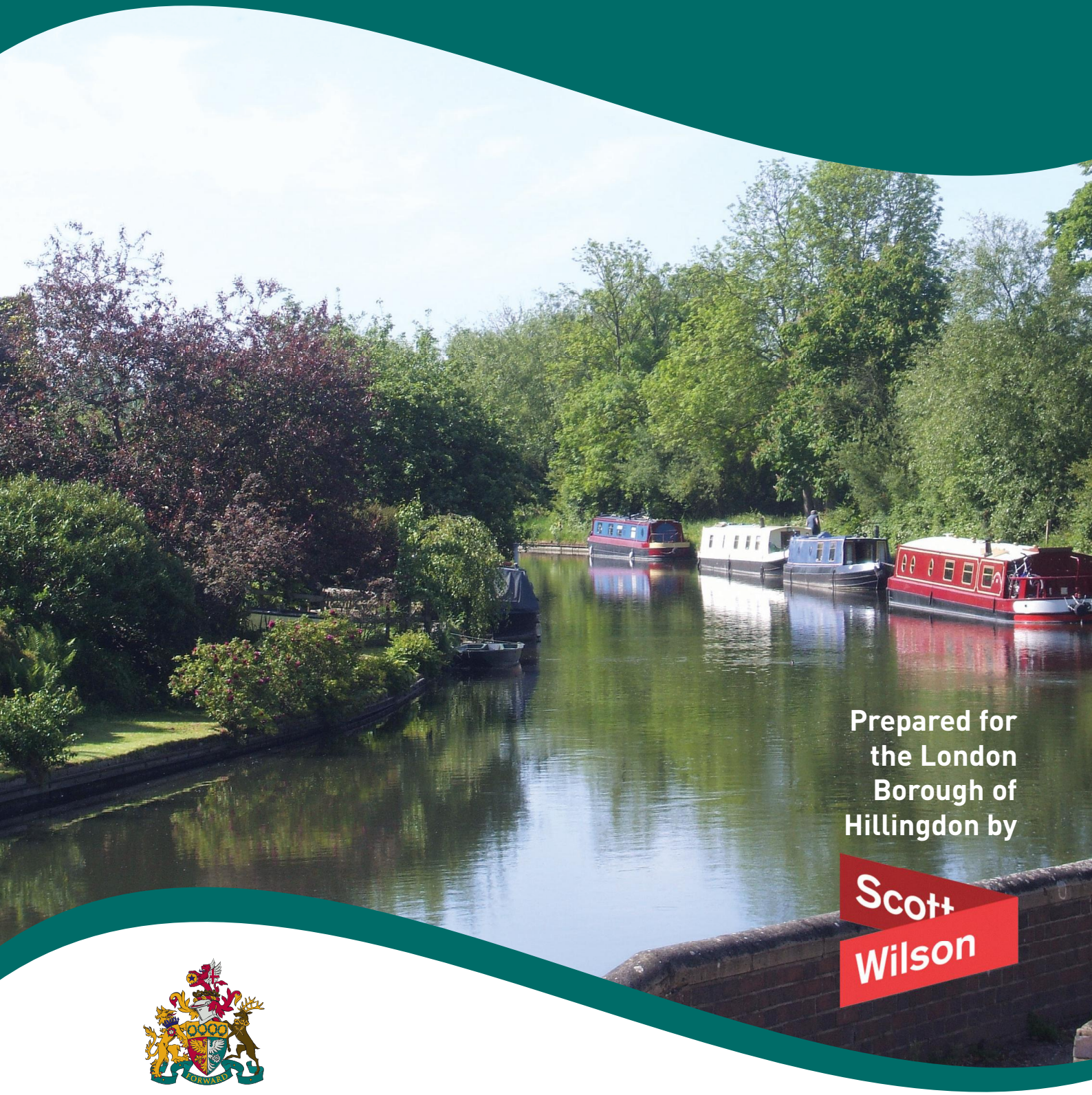
DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Appendix E – London Borough of Hillingdon correspondence and SFRA Extract

Local Development Framework
Technical Background Report
Strategic Flood Risk Assessment 2008



Prepared for the London Borough of Hillingdon by

Scott Wilson

HILLINGDON
LONDON

www.hillingdon.gov.uk

10 Site Specific FRA Guidance

Site specific flood risk assessments are required to assess the flood risk posed to proposed developments and to ensure that where necessary and appropriate, suitable mitigation measures are included in the development.

This section presents the recommendations for site specific flood risk assessments prepared for submission with planning applications in the Hillingdon administrative area.

The site specific flood risk assessment guidance presented in the following sections has been developed based on:

- the recommendations presented in Planning Policy Statement 25 and the consultation draft of the Practice Guide companion to PPS25;
- a review of the policies contained within the existing Unitary Development Plan for the London Borough of Hillingdon; and
- the information gathered through and findings of the Level 1 SFRA process.

10.1 When is a Flood Risk Assessment Required?

When informing developers of the requirements of a flood risk assessment for a development site, consideration should be given to the position of the development relative to flood sources, the vulnerability of the proposed development and its scale.

In the following situations a Flood Risk Assessment should always be provided with a planning application:

1 The development site is located in Flood Zone 2 or 3;

2 The proposed development site area is greater than 1 hectare (even if the site is located in Flood Zone 1). This is to ensure storm water generated by the site is managed in a sustainable manner and does not increase the burden on existing infrastructure and/or flood risk to neighbouring property);

3 The floor space of proposed non-residential development is greater than 1000m2 or the site areas is greater than 1 hectare;

4 The development site is located in an areas known to have experienced flooding problems from any flood source; and,

5 The development is located within 20m of top of bank of a main river watercourse regardless of Flood Zone classification.

To identify when the Environment Agency should be consulted on planning applications please refer to www.pipernetworking.com/floodrisk which presents a matrix detailing the Environment Agency's standing advice on flood risk assessment requirements for different types of development.

10.2 FRA Requirements

Annex E of PPS25 presents the minimum requirements for flood risk assessment. The Practice Guide Companion to PPS25 (consultation document) advocates a staged approach to site specific flood risk assessment with the findings from each stage informing the next iteratively throughout the development process. These documents describe when an FRA is required and advice on what should be contained within a site specific assessment.

10.3 Flood Risk Assessment Guidance Table

The Flood Risk Assessment Guidance Table (Table 10-1) provides guidance to developers and Local Authorities on the requirements of a FRA. In addition guidance can be obtained from www.pipernetworking.com/floodrisk and Annex E of PPS25 with respect to site specific Flood Risk Assessments.

Table 10.1 (end of section 10) provides a framework with which Local Authorities and Developers will be able to assess the requirements of each individual development with regard to flood risk.

10.3.1 Risks of Developing in Flood Risk Areas

Developing in flood risk areas can result in significant risk to a development and site users. Table 10.1 should identify the main flood risks posed to the site. Additional issues to consider include:

i. Failure to consider wider plans prepared by the Environment Agency or other operating authorities may result in a proposed scheme being objected to;

ii. Failure to identify flood risk issues early in a development project could result in failure of a development proposal, requiring redesign of the site to mitigate flood risk;

iii. Failure to adequately assess all flood risk sources and construct a development that is safe over its lifetime could increase the number

of people at risk from flooding and/or increase the risk to existing populations;

iv. Failure to mitigate the risk arising from development may lead to claims against the developer if an adverse effect can be demonstrated (i.e. flooding didn't occur prior to development) by neighbouring properties/residents;

v. Failure to assess residual risk of failure of flood defence infrastructure, or failure of other artificial sources;

vi. Properties may be un-insurable and therefore un-sellable if flood risk management is not adequately provided for the lifetime of the development;

vii. By installing SuDS without arranging for their adoption or maintenance the SuDS will eventually cease to operate as designed and may present a flood risk to the development and/or neighbouring property;

viii. The restoration of river corridors and natural floodplains can significantly enhance the quality of the built environment whilst reducing flood risk. Such an approach can significantly reduce the developable area of sites or lead to fragmented developments, however positive planning and integration throughout the master planning process should resolve these.

Advice from the Environment Agency's National Development Control Policy team on brownfield functional floodplain is that the Environment Agency will consider existing building footprints to be part of the functional floodplain, unless it can be proven that they exclude flood waters. If these buildings do exclude flood waters, then solely the area around these buildings will be deemed functional. When undertaking an FRA this matter should be clarified and ideally pre-agreed with the Environment Agency.

10.3.2 'Safe' Development

The following items should be addressed as part of a Flood Risk Assessment in order to demonstrate that proposed developments are 'safe' in line with PPS25:

- 'Safe' access/egress for 'more vulnerable' and 'highly vulnerable' uses is dry. Dry escape for residential dwellings should be up to the 1 in 100 year event taking into account climate change.

- The Environment Agency have specifically suggested that 'Safe' should preferably be dry for other uses such as educational establishments and 'less vulnerable' land use classifications.
- For ‘More Vulnerable’ and ‘Highly Vulnerable’ finished floor levels should be set 300mm above the 1 in 100 year plus climate change level.
- Where floodplain compensation is undertaken the Environment Agency requires this is on a ‘Level for Level, Volume for Volume Basis’.
- Flood flow routes should be preserved.
- Flood resilient constructions measures should be incorporated into new developments.

Figure 5 demonstrates the location structures and defences using the National Flood Coastal Defence Database (NFCDD), this should be used as a reference point to identify key structures which may become blocked during times of flood and cause increased flood risk as part of a site specific FRA.

10.3.3 Groundwater Flood Risk Areas

In areas at risk of ground water flooding a site specific flood risk assessment should assess the level of risk to the site. Local groundwater monitoring should be identified and where possible analysed to assess ground water levels as part of a Flood Risk Assessment.

10.3.4 Surface Water Flood Risk Areas

In areas at risk of surface water flooding, development should seek to reduce surface water runoff rates as a result of development. Furthermore, the appropriate application of sustainable drainage systems (where possible) to reduce the overall level of flood risk in the area through the outlay and form of the development would be required. Figure 4 (page 97) shows the areas assessed to be at risk of flooding from overland flow and this should be investigated further as part of a site specific FRA.

10.3.5 Artificial Source/Infrastructure Failure Flood Risk Areas

Artificial sources of flooding within a 1km radius of the any site should be considered in order to assess the residual risk of a water body overtopping and potential flow paths. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure and therefore a crude assessment of flood flow routes should be assessed.

If a perched waterbody is in close proximity, where possible a cross section should be taken in relation to the proposed site, showing level of the waterbody and its water level. More specifically areas in proximity to the Ruislip Lido and Colne Lakes system should consider the residual risks further as part of a site specific FRA.

10.3.6 Riverside Development

i. Main River (for Main Rivers in Hillingdon see section 1.1.2)

Under the terms of the Water Resources Act 1991 and the Land Drainage Byelaws 1981, the prior written consent of the Environment Agency is required for any proposed works or structures in, under, over or within 8 meters of the brink of a Main River. Furthermore the Environment Agency would seek an 8 metre wide undeveloped buffer strip alongside main rivers and would also ask to developers to explore opportunities for river restoration as part of the development.

ii. Ordinary watercourses[5]/canals

The Environment Agency requires a 5 metre undeveloped buffer strip alongside such watercourses. This is to allow access for maintenance and encourage conservation and wildlife habitat.

iii. De-culverting

The Environment Agency would seek de-culverting as part of any development next to a culverted river. If de-culverting was not technically feasible the Environment Agency would require a minimum of a 4 metre setback from the culvert for access/maintenance. Any proposals of further culverting or the placing of buildings over a culvert should be strongly discouraged.

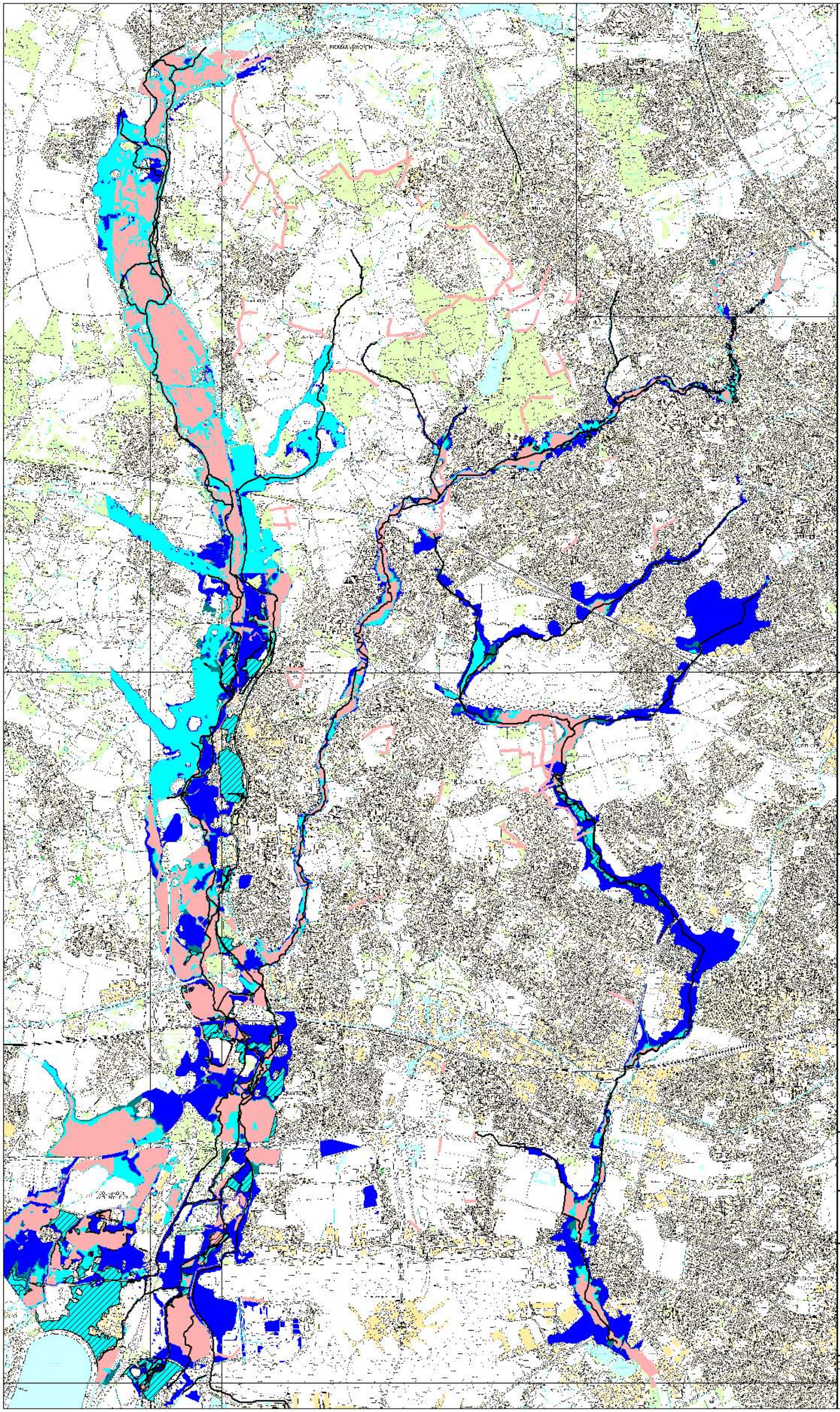
Figure 5 (page 98) of the NFCDD shows existing structures. Figure 5 should be used in conjunction with the large scale flood risk maps (Figures 3- 4) as a reference point to identify any potential structures that could result in increased flood risk within the area and could benefit from de-culverting in future.

iv. Brownfield Functional Floodplain

The following criteria apply to development in the brownfield functional floodplain:

[5] Ordinary watercourses are statutory watercourses that are not classified as main rivers.

- Buildings, unless permeable to floodwaters, are not considered to be part of the functional floodplain. Land/infrastructure around these buildings is considered to be functional.
- The Environment Agency states that the following measures should be considered to reduce risk on these sites:
    - Removal of buildings and restoration of natural floodplain;
    - Change of use to a less vulnerable classification;
    - Reduced building footprints;
    - Preservation of flow routes;
    - Improved conveyance/storage, replacing solid building with building on stilts;
    - Meeting the objectives of the Thames Catchment Flood Management Plan (Summary Document Jan 2007, available at www.environment-agency.gov.uk);
    - Adopting a sequential approach to design of the site using the principles of 'Making Space for Water' (DEFRA 2004 and ongoing, available at http://www.defra.gov.uk/environ/fcd/policy/strategy.htm)



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

- Flood Zone 3b
- Flood Zone 3a
- Flood Zone 3a + Climate Change
- Flood Zone 2
- Areas Benefiting from Defences
- Main River

©

Drawing Status

FINAL

Job Title

London Borough of Hillingdon SFRA

Drawing Title

Fluvial Sources of Flood Risk

Scale at A3

1:50000

Drawn	Approved
MK	JR

Scott Wilson

Drawing Number

Figure 3

RICKMANSWORTH
WATFORD RURAL CP
NORTHWOOD
CHALFONT ST PETER CP
GERRARDS CROSS
GERRARDS CROSS CP
DENHAM CP
RUISLIP
PINNER
FULMER CP
UXBRIDGE
NORTHOLT
HILLINGDON LB
HILLINGDON
WEXHAM CP
IVER CP
HAYES
IVER
YIEWSLEY
SOUTHALL
WEST DRAYTON
COLNBROOK WITH POYLE CP
HORTON CP
Heathrow Airport London
HOUNSLOW LB
HOUNSLOW
WRAYSBURY CP
FELTHAM

FINAL

LONDON BOROUGH OF HILLINGDON SFRA

OTHER SOURCES OF FLOOD RISK

- London Borough of Hillingdon
- Groundwater Flooding
- Artificial Water Bodies
- Area of high relief possibly susceptible to overland flow

FIGURE 4

Scale at A3: 1:10,000

TD | HR

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Scott House
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Hampshire, RG21 4JG
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Appendix F – Masterplan – Michael Sparks Associates, Drawing No. 30587-PL101

01/101 SITE LAYOUT PLAN

1:1000

NOTES:

SUBJECT TO STATUTORY CONSENTS

BASED ON GREENHATCH SURVEY NO. 7159ENT_1

BASED ON OS MAP REPRODUCED BY PERMISSION OF CONTROLLER OF HM STATIONARY OFFICE (c) CROWN COPYRIGHT

BOUNDARIES BASED ON LAND REGISTRY TITLE NUMBER MX131015

ADOPTED HIGHWAY BOUNDARY BASED ON INFORAMTION RECEIVED FROM LONDON BOROUGH OF HILLINGDON

NORTH

0 25 50 100 m

REV	DATE	COMMENT	DRAW	CHCK
–	18.12.12	FIRST ISSUE	VCN	PW

MICHAEL SPARKS ASSOCIATES
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PROLOGIS

TITLE
PROLOGIS PARK, HEATHROW

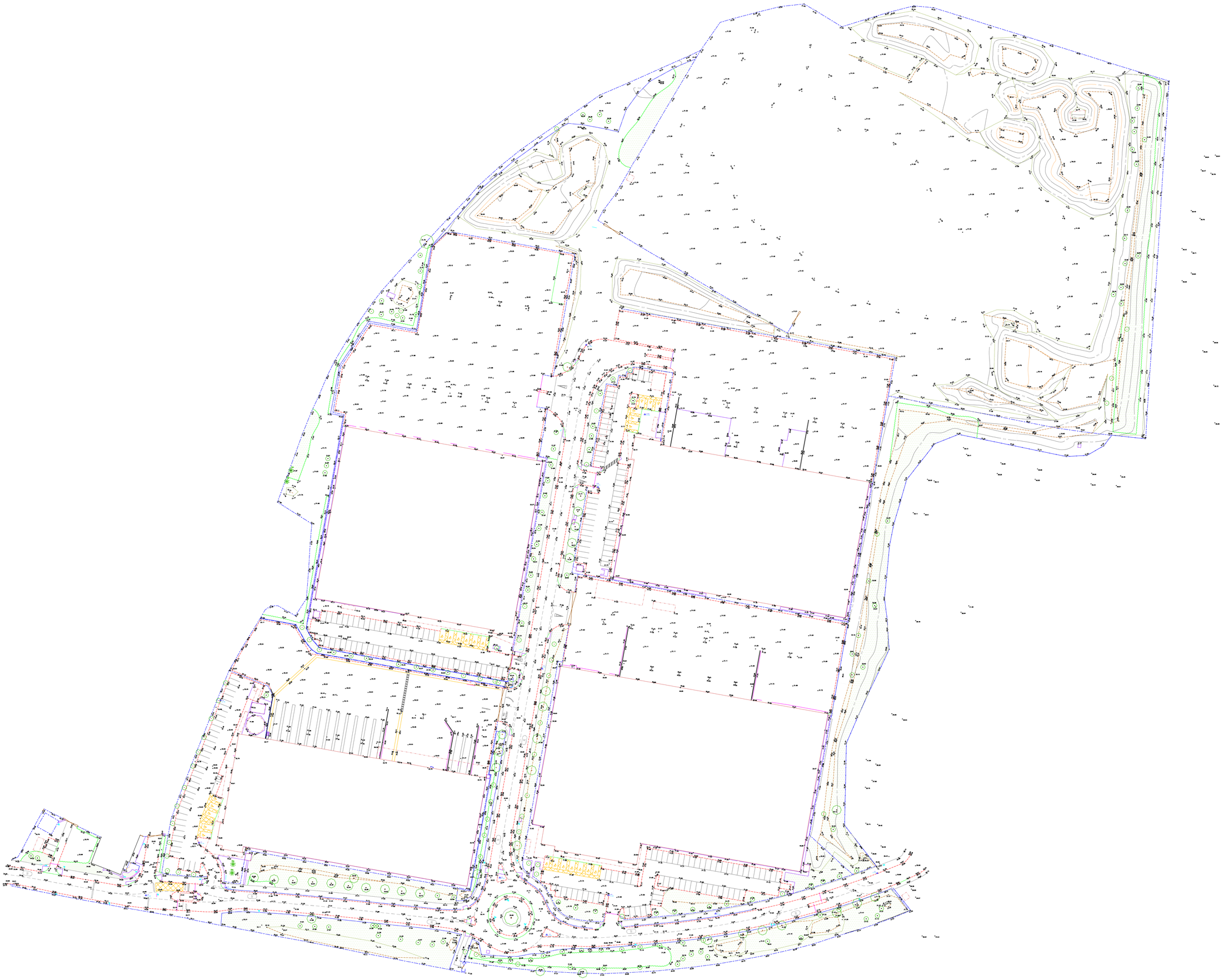
DRAWING
SITE LAYOUT PLAN

CLIENT
PROLOGIS UK LTD.

DATE	SCALE	DRAWN
NOVEMBER 2012	1:1000 @ A1	PW
	STATUS: FOR PLANNING	CHECKED: PW

DRAWING NUMBER
30587-PL101

Appendix G – Topographical Survey – GreenHatch Group Drawing No.14285-OGL



N

Station Information:

Station	Easting (m)	Northing (m)	Level (m)
L1	508021.141	179302.175	31.163
L2	507950.501	179284.560	31.663
L3	507876.741	179275.289	31.335
L3A	507903.769	179292.608	31.654
L4	507856.250	179300.220	32.367
L5	507736.700	179295.877	32.462
L6	507701.671	179292.527	33.847
L7	507874.726	179391.586	32.387
L8	507894.032	179533.075	31.648
L9	507724.829	179315.519	32.770
L9A	507899.071	179470.926	31.574
L10	507734.180	179377.735	32.709
L10A	507919.624	179502.654	31.932

Note:

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

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid (OSGB36) via a Global Position System (GPS) 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 OSTN02 & OSGM02 transformation models.
The survey has been correlated to this point and a further one or more OSGB36 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.

Legend:

	Buildings / walls		
	Earth bm		
	Edge of surface		
	Canopy / Overhang	AC	Air Conditioning Unit
	Line Marking	TT	Tac-Tile Panel
	Centre Line	Elec	Electric
	Barrier	BT	British Telecom
	Hedge	Fh	Fire Hydrant
	C/L Fence + Chainlink Fence	St	Stop tap
	Fanel Fence	Sv	Stop valve
	P/R Fence + Post & Rail	Wp	Width Dia
	Overhead Powerline	Wm	Water Meter
	Chamber	Mkr	Service Marker
	Woodland	Re	Rodding eye
		R/wall	Retaining wall
	Station and Name	Cmp	Cable Marker
		Lp	Lamp Post
100.000	Station Level	Sp	Sign Post
BM 100.00	Benchmark	Ep	Electricity Pole
		Tp	Telegraph Pole
BH 1	Borehole	TL	Traffic light
		Bs	Bus Stop
Tst 1	Trial Hole	Fl	Floodlight
		Fp	Flagpole
	Tree / Bush / Sapling	Pb	Post box
		Lb	Litter Bin
	Area of Underground	Bollt	Bollard
		CPS	Concrete Paving Slabs
	Gate	Fs	Flagstaff
IC	Inspection chamber	WL	Water level
CL	Cover level	H	Height
IL	Invert level	IFL	Internal Floor level
P.Inv ø0.25	Pipe invert (diameter)	THL	Threshold level
Gy	Gully	Re	Rodding Eye
Bg	Back Gully	Dk	Drop kerb
WH	Manhole	Gos	Gas
		Er	Earth rod

Rev	Date	Description	Drawn	Q. Rev

greenhatch group

Topographical Surveys
Site Engineering

Measured Building Surveys
3D Laser Scanning

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DE21 5DR
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CLIENT

Michael Sparks Associates

PROJECT

Prologis Park Hayes

TITLE

Topographical Survey

SCALE	DATE	DRAWN	QUALITY REF.
1: 500	March/April 10	LP	FO550

Level datum	*O.S (GPS Verified)*
Grid orientation	*O.S (GPS Verified)*
Job number	*14285*

Drawing No. **14285_OGL** Rev. **0**

Comments
This plan should only be used for its original purpose. Greenhatch Ltd 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.

Notes:

DO NOT SCALE

Appendix H – Drainage Strategy Drawing No. 2721-D-01-A and WinDes Calculations

WSP Property and Development

CALCULATION LOG SHEET

Project Name	**ProLogis Park, Heathrow**		
Project No	11012721	Office of origin	Basingstoke
Calculation Title	**Outline Preliminary Drainage Strategy Calculations**		
Prepared by	Joe Tang	Date	10/04/2013
Checked by	Gerald Guma	Date	10/04/2013
Approved by	Alastair Atkinson	Date	

Rev	Amendment	By	Date	Checked	Approved
A	Greenfield Runoff Rates	JT	08/04/2013	GG	
A	Modified Rational Calculations	JT	08/04/2013	GG	
A	WinDes Cellular Storage Calcs	JT	09/04/2013	GG	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	3.480	Urban	0.000
SAAR (mm)	655	Region Number	Region 6

Results l/s

QBAR Rural	5.9
QBAR Urban	5.9
Q100 years	18.7
Q1 year	5.0
Q30 years	13.3
Q100 years	18.7

Proposed Surface Water Runoff Rates – Modified Rational Method

$$Q = 2.78iA$$

Where by:

Q = Discharge Rate/Flow (l/s)
i = Rainfall Intensity (mm/hr)
A = Impermeable Area (hectares)

Rainfall Intensities for various Return Periods
(TRRL Report LR 595 '*Transport Road and Research laboratory*')
i_1 = 50 mm/hr
i_{30} = 113.02 mm/hr
i_{100} = 143.9 mm/hr

Therefore:
Q_1 = 2.78 × 50 × 3.48 = 483.72 l/s

Q_{30} = 2.78 × 113.02 × 3.48 = 1093.4 l/s

Q_{100} = 2.78 × 143.9 × 3.48 = 1392.1 l/s

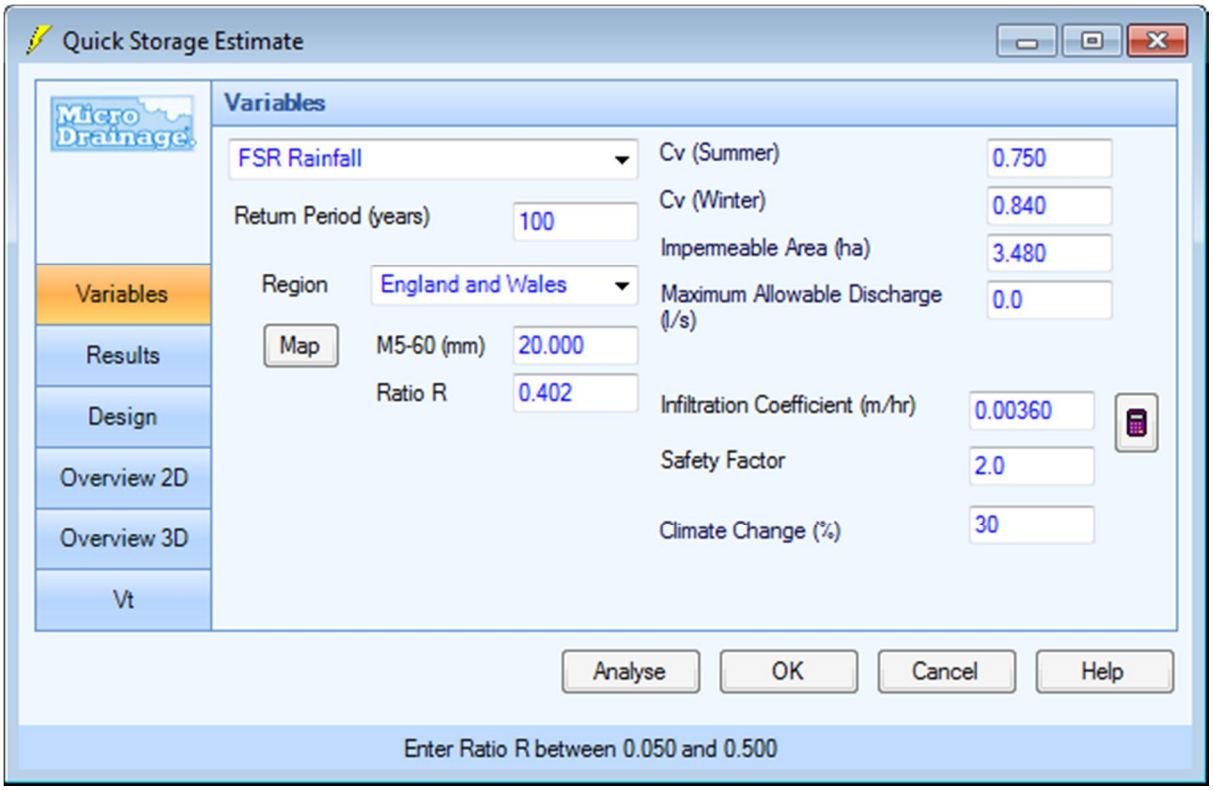
Q_{100+30} = 2.78 × 143.9 × 3.48 × 30% = 1809.7 l/s

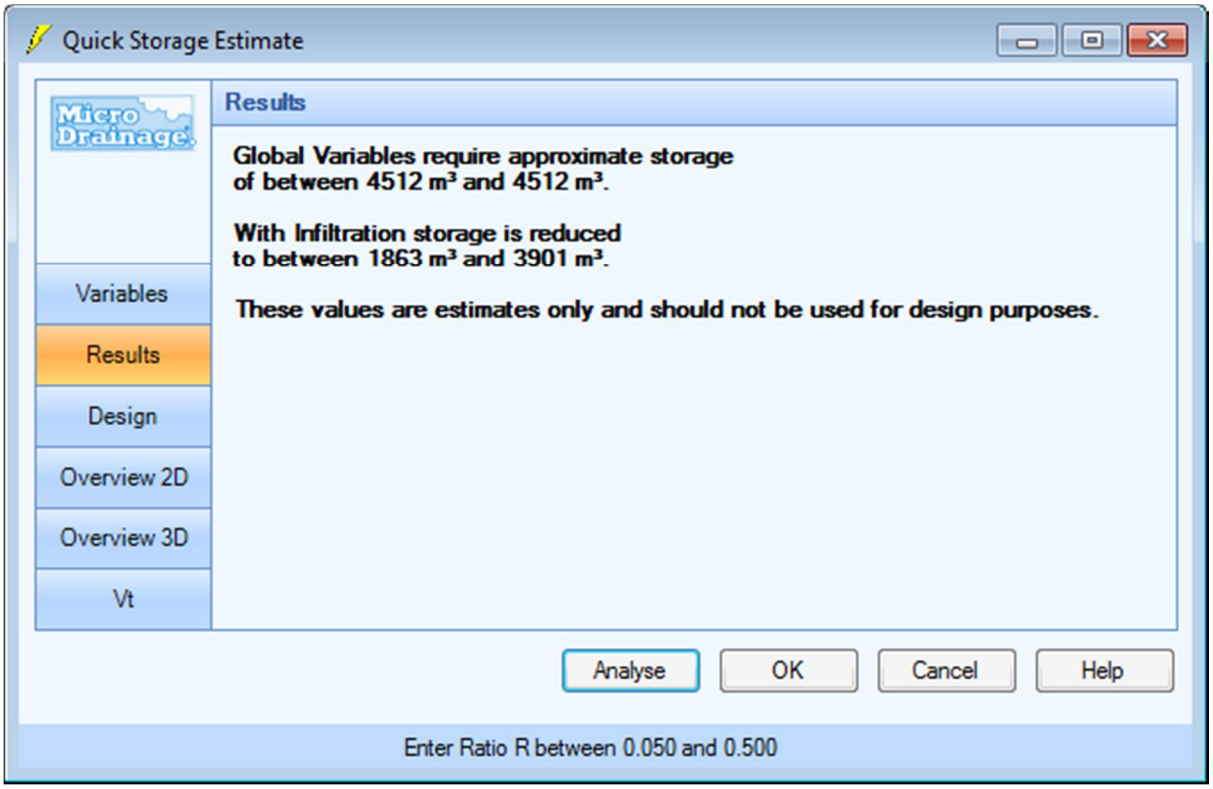
Summary:

The surface water runoff calculations have been based on the proposed development impermeable areas, which indicate that there would be a significant increase in surface water generated by the site, when comparing against the existing Greenfield situation. However, it is foreseen to drain the proposed development via infiltration directly into the ground meaning there will be no outfalls required for the site reducing the discharge rates to 0 l/s.

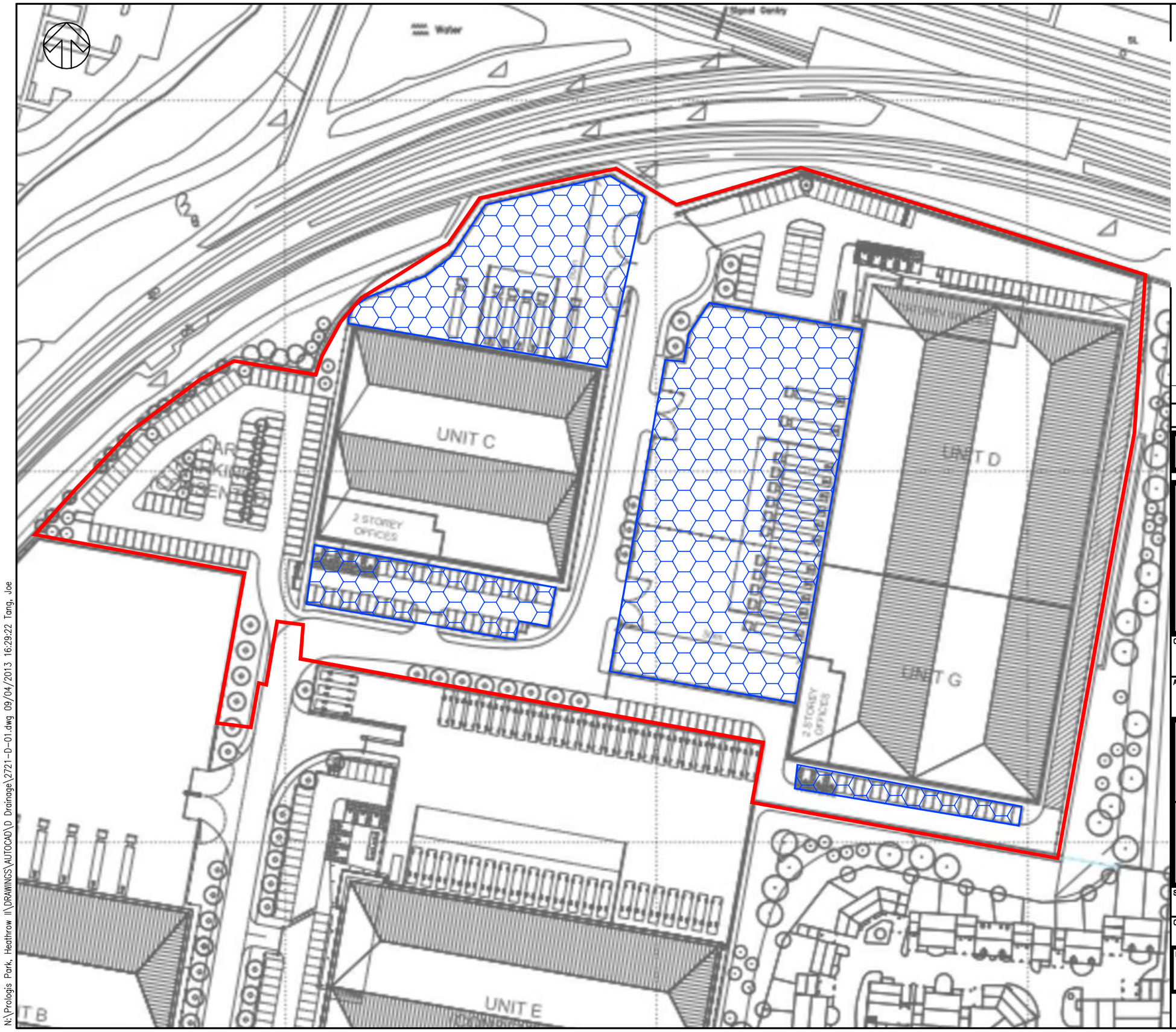
Quick Storage Estimates – Infiltration SuDS

Application Site Location: OS Grid Ref (508002, 179580)
Proposed Impermeable Area: 3.48ha
Assumed Infiltration Rate: $1x10^{-6}$m/s (=0.0036m/hr)





Maximum Storage Volume Required for an Infiltrating System is = 3901m^3



DO NOT SCALE

KEY

SITE BOUNDARY (approx. 3.48ha)

PROPOSED INFILTRATING CELLULAR STORAGE (Total Area = 0.89ha)

REV	DATE	BY	DESCRIPTION	CHK	APD
A	10/04/2013	JT	FIRST ISSUE	GG	ALA

DRAWING STATUS:
FOR INFORMATION ONLY

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CLIENT:
PROLOGIS UK LTD.

ARCHITECT:
MICHAEL SPARKS ASSOCIATES

PROJECT:
PROLOGIS PARK
HEATHROW

TITLE:
PROPOSED PRELIMINARY OUTLINE
DRAINAGE STRATEGY

SCALE @ A3:	CHECKED:	APPROVED:
N.T.S.	GG	ALA
CAD FILE:	DESIGN-DRAWN:	DATE:
2721-D-01	JT	April 2013

PROJECT No:	DRAWING No:	REV:
11012721	2721-D-01	A

N:\Prologis Park, Heathrow II\DRAWINGS\AUTOCAD\D Drainage\2721-D-01.dwg 09/04/2013 16:29:22 Tang, Joe

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