

Appendix C

Topographical Survey



KEY:	British Telecom
cb	Control Box
cl	Cover Level
ctv	Cable Television
dk	Drop Kerb
el	Electric
ep	Electricity Pole
fh	Fire Hydrant
gv	Gas Stop Valve
ht	Height
ic	Inspection Cover
il	Invert Level
lp	Lane Post
mr	Marker
o/h	Overhead
pb	Post Box
pcp	Stream Crossing
ps	Post Sign
rp	Name Plate
sv	Stop Valve
tb	Telephone Box
tl	Traffic Light
tt	Top of Tree
th	Threshold
tw	Top of Wall
utl	Unable to Lift
vp	Vent Pipe
wm	Water Meter
wsv	Water Stop Valve

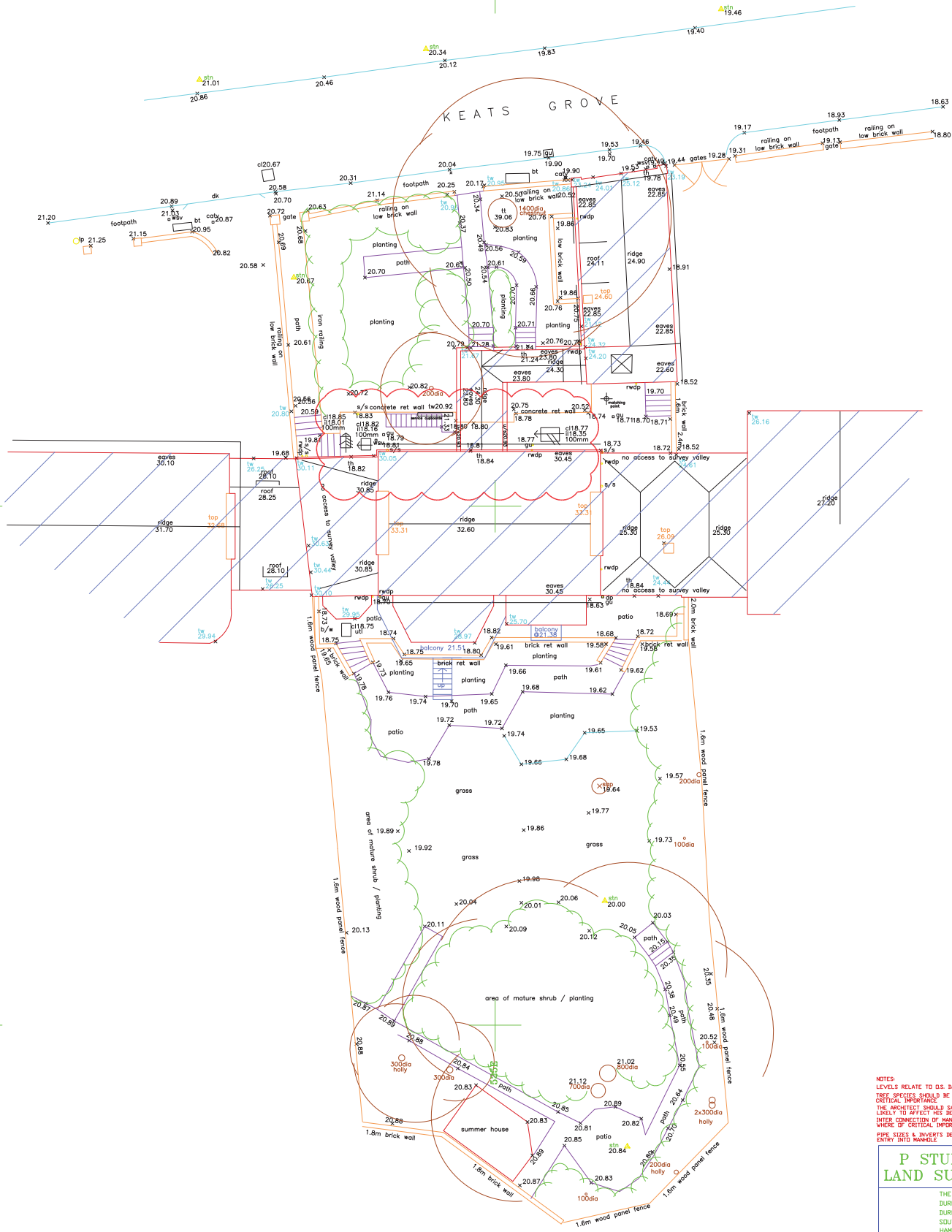
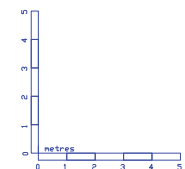
150N

125N

100N

300S

300S



NOTES:
 LEVELS RELATE TO D.S. DATUM
 TREE SPECIES SHOULD BE VERIFIED WHERE OF CRITICAL IMPORTANCE
 THE ARCHITECT SHOULD SATISFY HIMSELF THAT ALL TREES LIKELY TO AFFECT HIS DESIGN HAVE BEEN SHOWN
 INTER CONNECTION OF MANHOLES SHOULD BE VERIFIED WHERE OF CRITICAL IMPORTANCE USING CLOSING
 PIPE SIZES & INVERTS DETERMINED WITHOUT ENTRY INTO MANHOLE

P STUBBINGTON LAND SURVEYS LTD

THE MEAD
 BURLEY BROOK ROAD
 BURLEY
 SOUTHAMPTON
 HAMPSHIRE
 SO32 2AR
 TEL: 023 8056 1876
 MOBILE: 07793 348165
 EMAIL: PAUL.STUBBINGTON@BTINTERNET.COM

CONTRACT:	4 KEATS GROVE HAMPSTEAD
TITLE:	EXISTING SURVEY
SCALE:	1: 100 @A1
DRAWING NO.	4468/01
DATE:	MAY 2014
SURVEYOR:	PS

Appendix D

Environment Agency Flood Maps & Data



BETA This is a new service – your [feedback \(https://www.gov.uk/long-term-flood-risk/feedback\)](https://www.gov.uk/long-term-flood-risk/feedback) will help us to improve it.

4
KEATS GROVE
LONDON
NW3 2RT

Detailed flood risk information for this area



The flood risk from rivers or the sea is very low

What this means

Very low risk means that each year this area has a chance of flooding of less than 0.1%. This takes into account the effect of any flood defences in the area. These defences reduce, but do not completely stop the chance of flooding as they can be overtopped, or fail.

How to use this information

You can use this information to [see which areas are more likely to flood first, deepest, or most often. \(https://www.gov.uk/long-term-flood-risk/map?easting=527019&northing=185664&address=5051985&map=RiversOrSea\)](https://www.gov.uk/long-term-flood-risk/map?easting=527019&northing=185664&address=5051985&map=RiversOrSea)

Planning a development

This information is not suitable for use in land-use planning. If you're planning a development, you must use the [Risk of Flooding for Land-Use Planning \(Rivers and Sea\) for England \(http://apps.environment-agency.gov.uk/wiyby/151263.aspx\)](http://apps.environment-agency.gov.uk/wiyby/151263.aspx) or [Development Advisory Map for Wales. \(http://data.wales.gov.uk/apps/floodmapping/\)](http://data.wales.gov.uk/apps/floodmapping/) This is information based on flooding without defences.



The flood risk from surface water is very low

What this means

Very low risk means that each year this area has a chance of flooding of less than 0.1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast.

How to use this information

You can use this information to [see the approximate areas that would flood, and which parts would be shallower or deeper.](https://www.gov.uk/long-term-flood-risk/map?easting=527019&northing=185664&address=5051985&map=SurfaceWater) (<https://www.gov.uk/long-term-flood-risk/map?easting=527019&northing=185664&address=5051985&map=SurfaceWater>)

This information is suitable for identifying which parts of streets or parcels of land are at risk, or have the most risk. It's suitable for identifying the extent, depth and approximate velocity of flooding. It's very likely to be reliable for local areas of land and identifying individual properties at risk (though not whether the individual properties will flood internally).

Additional information

Lead Local Flood Authority

Camden

[View the flood risk information for another location](https://www.gov.uk/long-term-flood-risk/) (<https://www.gov.uk/long-term-flood-risk/>)

[Back to flood risk summary](https://www.gov.uk/long-term-flood-risk/risk?address=5051985) (<https://www.gov.uk/long-term-flood-risk/risk?address=5051985>)

24 October 2016



[Are there any current flood warnings here?](https://flood-warning-information.service.gov.uk/warnings?location=NW3%20RT)

([https://flood-warning-information.service.gov.uk/warnings?location=NW3 2RT](https://flood-warning-information.service.gov.uk/warnings?location=NW3%20RT))



[National flood information service](https://flood-warning-information.service.gov.uk)

(<https://flood-warning-information.service.gov.uk>)

Your [feedback](https://www.gov.uk/long-term-flood-risk/feedback) (<https://www.gov.uk/long-term-flood-risk/feedback>) will help us improve this service

ne:

[Other topics for this area...](#)

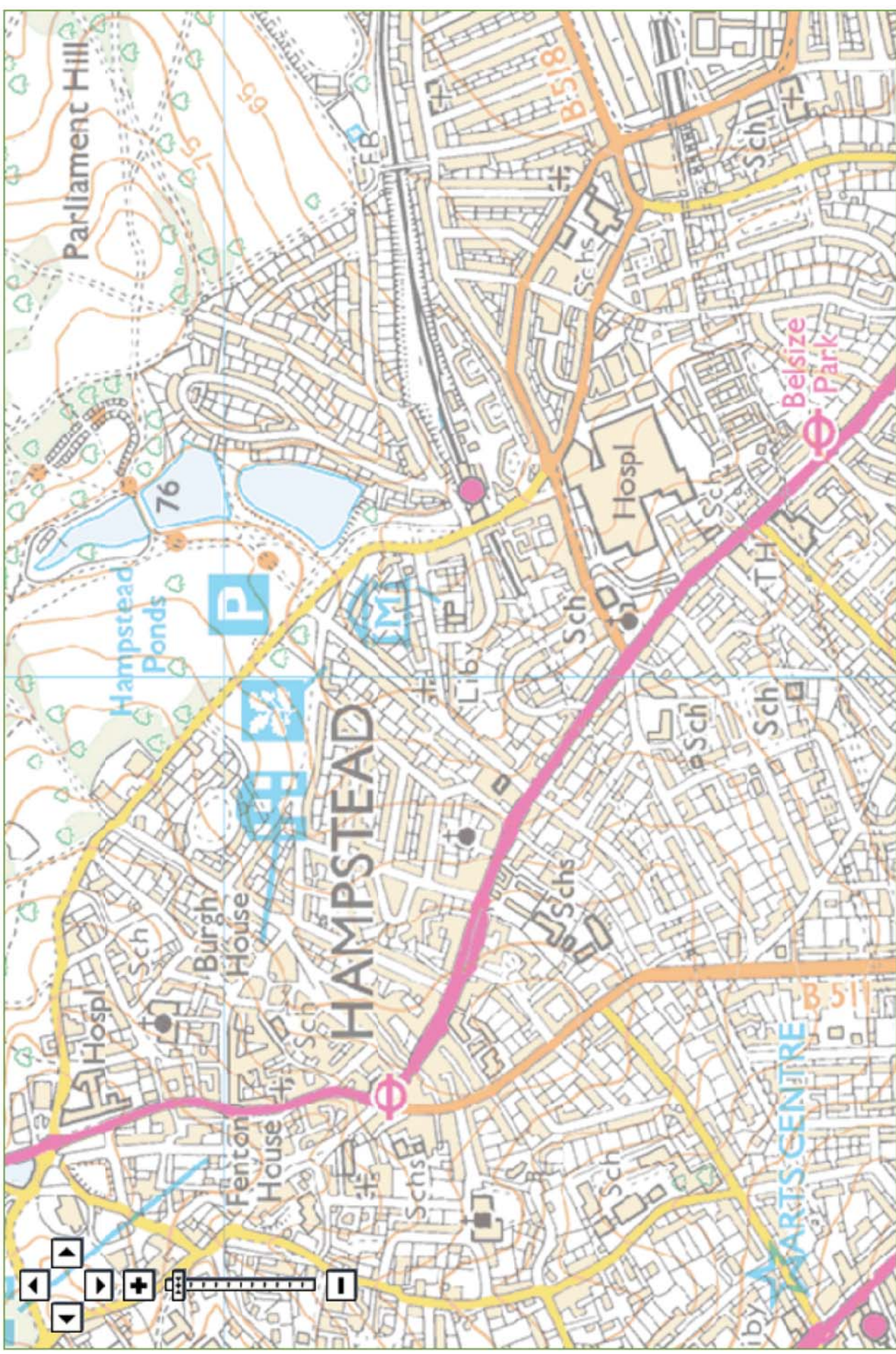
Flood Map for Planning (Rivers and Sea)



[Flood Map for Planning \(Rivers and Sea\)](#) ▼

NW3 2RT at scale 1:10,000

[Other maps](#) [Data search](#) [Text only version](#)



Flood risk from rivers or the sea



Extent of flooding from rivers or the sea

Flood risk from surface water



Extent of flooding

Flood risk from reservoirs



Extent of flooding

Flood risk



High



Medium



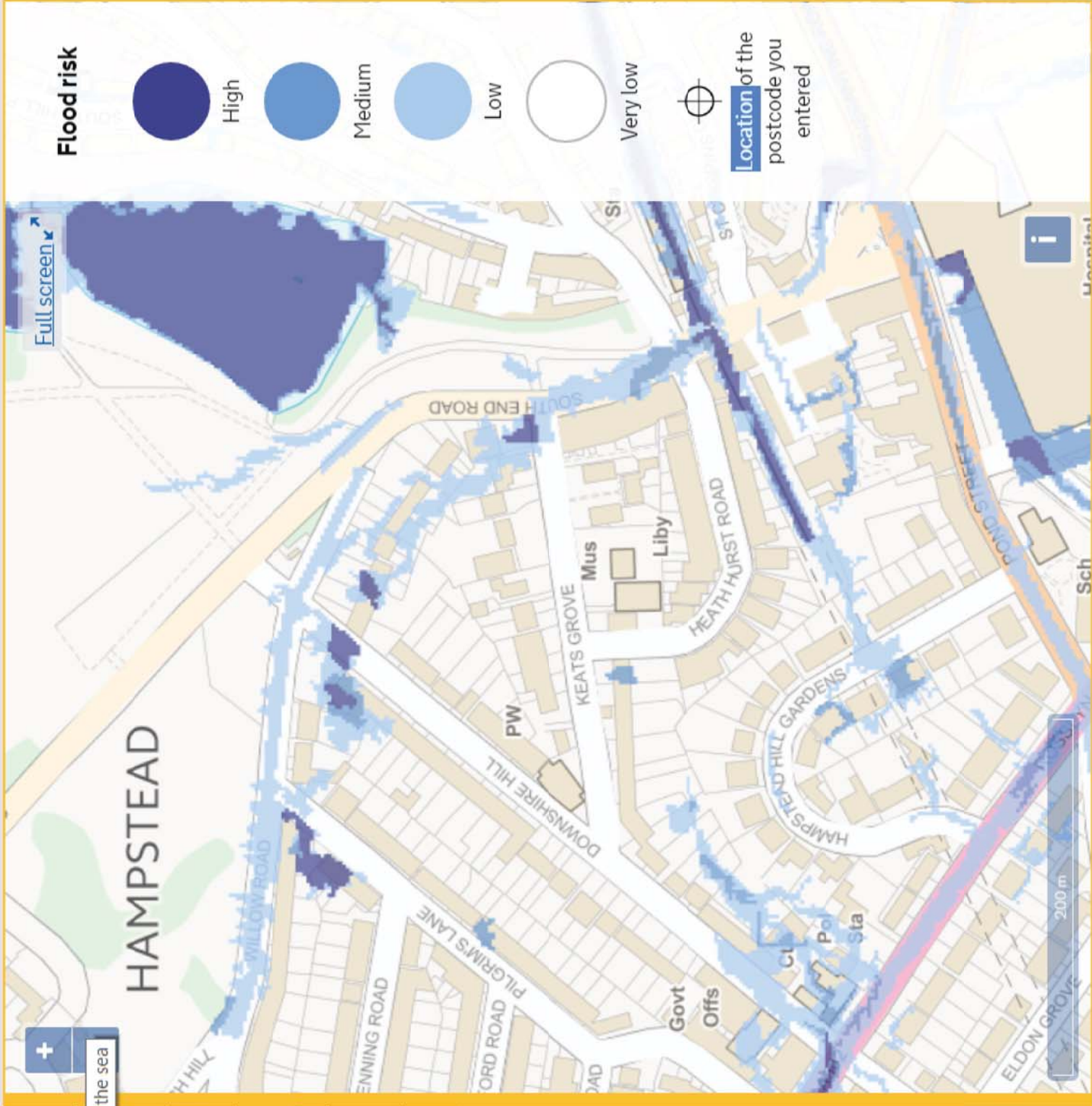
Low



Very low



Location of the postcode you entered



Flood risk from rivers or the sea



Extent of flooding



Flood risk from surface water



Extent of flooding



Flood risk from reservoirs



Extent of flooding



Flood risk



Maximum extent of flooding



Location of the postcode you entered

Full screen



200 m



Hospital

Sch

ROSSLYN HILL

ELDON GROVE

1502

Pol Sta

Ct

Govt Offs

HAMPSTEAD

WILLOW ROAD

WINING ROAD

PILGRIMS LANE

DOWNSHIRE HILL

PW

KEATS GROVE

Mus

Liby

HEATH HURST ROAD

HAMPSTEAD HILL GARDENS

POND STREET

SOUTH END ROAD

Sta

ST CR

FLEET

Appendix E

Extracts from Ground Investigation Report

Hand shear vane (HSV) and pocket penetrometer tests were also undertaken throughout the depth of the London Clay Formation. The results of the HSV tests ranged from 74 kN/m² to 98 kN/m². Full results are provided on the exploratory hole logs and summarised on the Undrained Shear Strength -vs- Depth plots presented in Appendix B.

Atterberg limit tests were undertaken on five samples of the London Clay Formation and indicated the clay to be of high to very high plasticity and hence of medium to high volume change potential. Full results of these tests are provided in Appendix C.

Root identification was undertaken on a root sample obtained from the London Clay Formation. The root identification identified that the root, which was described as being in a poor condition, could be either of the following tree species:

- Acer (Sycamore Maple)
- Carpinus (Hornbeam)

The root encountered within the sample was identified to be very decayed (dead) using the iodine test for starch. The results of this testing are provided in Appendix C.

4.3.3. Groundwater

Groundwater was not encountered in the exploratory holes during formation, however it was encountered during subsequent monitoring on 5th October 2016. Table 2, provides a summary of the groundwater data and includes strike depths during formation and standing water level depths (SWL) during monitoring on 5th October 2016.

Table 2: Summary of Groundwater Levels

Exploratory Hole	Strike Depth during Formation on 12/09/16 (m bgl)	SWL during Monitoring on 05/10/16 (m bgl)	SWL during Monitoring on 05/10/16 (m AOD)
WLS1	Dry	5.65	15.11
WLS2		Dry	Dry
TH1		1.68	17.12

The results did not infer a continuous groundwater body beneath the site and are considered likely to be associated with seepages from within the made ground or the London Clay Formation.

Project Name: 4 Keats Grove

Dates
 12/09/2016

Project no.
 51659

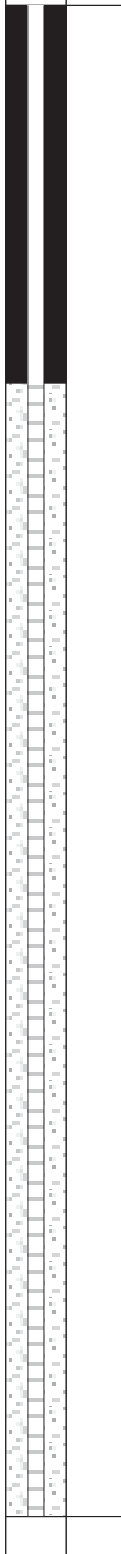
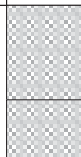



 Hole Type
WLS
Location: Hampstead, Greater London, NW3 2RT

Co-ordinates:

 Scale
1:20
Client: Mr Marcus Piggott

Ground Level (m, aOD)
 20.76

 Logged By
JW

Well	Water Strike	Samples & In-situ Tests					Level (m)	Depth (m)	Legend	Stratum Description	Scale
		Casing	SWL	Depth	Type	Results					
						20.51	0.25		Dark brown, slightly gravelly, slightly clayey, silty, fine SAND with frequent roots. Gravel of sub-angular, fine to coarse flint and brick fragments. MADE GROUND	1 2 3	
				0.50	D1						Stiff, brown/light brown mottled, slightly sandy CLAY with occasional roots with rare iron staining. Gravel of sub-angular, fine to coarse flint and fragments of brick, coal dust and concrete. MADE GROUND <i>...friable between 0.60m and 1.10m.</i>
		1.00		1.00	C	N=17					
				1.00	D2	(3,4/4,5,4,4)					
				1.50	D3						
		1.00		2.00	C	N=16					
				2.00	D4	(3,3/3,4,5,4)					
				2.50	PP	130					
				2.50	D5		19.06	1.70			Very stiff, brown/reddish brown mottled, slightly gravelly, sandy CLAY with rare iron staining. Gravel of sub-angular flint and fragments of brick and coal dust. MADE GROUND
				3.00	C	N=21					
			3.00	D6	(3,3/4,5,6,6)						
			3.30	PP	98					Stiff, slightly fissured, brown/grey mottled, silty CLAY with rare orange/brown silt partings. LONDON CLAY FORMATION <i>...becoming firm to stiff from 3.30m.</i>	
			3.50	D7							
			3.80	PP	82						
		1.00	4.00	C		16.76	4.00				


Groundwater: Groundwater not encountered during drilling.

Groundwater Key
Sample Type Key
Test Type Key
 Groundwater Strike

D Disturbed
B Bulk

IVN Hand vane
S/C SPT / CPT

Remarks: Groundwater standing at 5.65m bgl (15.11m AOD) on 05/10/16.

 Standing water level

U Undisturbed
ES Environmental

PP Pocket penetrometer
PID PID Reading

Project Name: 4 Keats Grove

Dates
 12/09/2016

Project no.
 51659

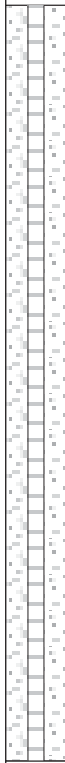

 Hole Type
WLS
Location: Hampstead, Greater London, NW3 2RT



Co-ordinates:

 Scale
1:20
Client: Mr Marcus Piggott

Ground Level (m, aOD)
 20.76

 Logged By
JW

Well	Water Strike	Samples & In-situ Tests					Level (m)	Depth (m)	Legend	Stratum Description	Scale
		Casing	SWL	Depth	Type	Results					
		1.00		4.00	D8	N=12 (2,2/2,3,3,4)	14.76	6.00		Firm to stiff, slightly fissured, brown/grey mottled, silty CLAY with rare orange/brown silt partings. LONDON CLAY FORMATION <i>...with rare selenite crystals (fine gravel-sized) from 4.00m.</i> <hr/> <i>...becoming stiffer from 4.50m.</i>	5
				4.30	PP	78					
				4.50	D9						
				4.80	PP	110					
				5.00	C	N=12					
				5.00	D10	(2,2/2,3,3,4)					
				5.50	PP	80					
				5.50	D11						
				5.90	PP	115					
				6.00	C	N=20					
				6.00	D12	(3,3/4,5,5,6)					

Groundwater: Groundwater not encountered during drilling.	Groundwater Key		Sample Type Key		Test Type Key	
		Groundwater Strike	D	Disturbed	IVN	Hand vane
Remarks: Groundwater standing at 5.65m bgl (15.11m AOD) on 05/10/16.		Standing water level	B	Bulk	S/C	SPT / CPT
			U	Undisturbed	PP	Pocket penetrometer
			ES	Environmental	PID	PID Reading

Project Name: 4 Keats Grove

Dates
 12/09/2016

Project no.
 51659

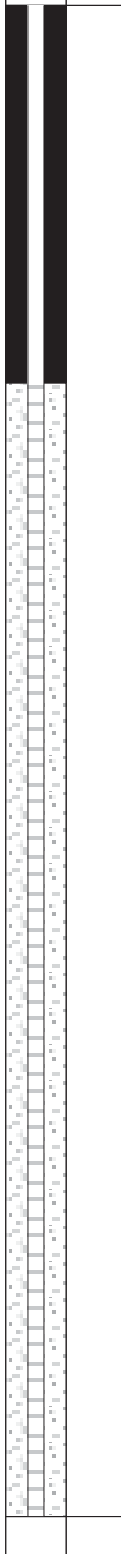
 Hole Type
WLS
Location: Hampstead, Greater London, NW3 2RT



Co-ordinates:

 Scale
1:20
Client: Mr Marcus Piggott

Ground Level (m, aOD)
 20.76

 Logged By
JW

Well	Water Strike	Samples & In-situ Tests					Level (m)	Depth (m)	Legend	Stratum Description	Scale	
		Casing	SWL	Depth	Type	Results						
		1.00		0.30			20.46	0.30	MADE GROUND	1		
				0.50	D1						Very stiff, very friable, dark brown/brown mottled, slightly gravelly, slightly sandy CLAY with rare roots. Gravel of sub-angular to sub-rounded, fine to coarse flint and fragments of brick, concrete and coal dust.	
				1.00	C	N=20						
				1.00	D2	(4,4/5,5,5,5)						
				1.50	D3							
				1.90	PP	250			18.96		1.80	Very stiff, light brown/grey mottled, slightly gravelly, slightly sandy, silty CLAY with rare roots and rare iron staining. Gravel of sub-angular to sub-rounded, fine to coarse flint and rare fragments of coal dust and brick.
				2.00	C	N=10						
				2.00	D4	(1,2/2,2,3,3)			18.61		2.15	MADE GROUND
				2.20	PP	177						Very stiff, fissured, light brown/orange brown/grey mottled, silty CLAY with rare roots and rare orange/brown silt partings.
				2.50	D5							LONDON CLAY FORMATION
2.75	PP	72					<u>...firm to stiff from 2.75m.</u>					
3.00	C	N=14										
3.00	D6	(2,2/3,3,4,4)						<u>...with occasional selenite crystals (fine gravel-sized) from 3.30m.</u>				
3.30	PP	97										
3.50	D7											
3.80	PP	98										
4.00	C				16.76	4.00						

Groundwater: Groundwater not encountered during drilling.	Groundwater Key		Sample Type Key		Test Type Key	
		Groundwater Strike	D	Disturbed	IVN	Hand vane
Remarks: No groundwater during monitoring on 05/10/16.		Standing water level	B	Bulk	S/C	SPT / CPT
			U	Undisturbed	PP	Pocket penetrometer
			ES	Environmental	PID	PID Reading

Project Name: 4 Keats Grove

Dates
 12/09/2016

Project no.
 51659

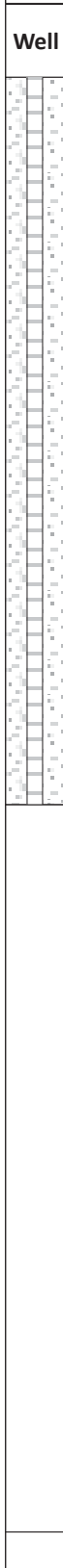

 Hole Type
WLS
Location: Hampstead, Greater London, NW3 2RT

Co-ordinates:



 Scale
1:20
Client: Mr Marcus Piggott

Ground Level (m, aOD)
 20.76

 Logged By
JW

Well	Water Strike	Samples & In-situ Tests					Level (m)	Depth (m)	Legend	Stratum Description	Scale
		Casing	SWL	Depth	Type	Results					
		1.00		4.00	D8	N=13 (2,3/3,3,3,4)	14.76	6.00		Firm to stiff, fissured, light brown/orange brown/grey mottled, silty CLAY with rare roots and rare orange/brown silt partings. LONDON CLAY FORMATION	5
				4.30	PP	82					
				4.50	D9						
				4.70	PP	128					
				5.00	C	N=16					
				5.00	D10	(2,3/3,4,4,5)					
				5.40	PP	98					
				5.50	D11						
				5.70	PP	142					
				6.00	C	N=20					
				6.00	D12	(3,3/4,5,5,6)					

...becoming stiff from 4.50m.

Groundwater: Groundwater not encountered during drilling.	Groundwater Key		Sample Type Key		Test Type Key	
		Groundwater Strike	D	Disturbed	IVN	Hand vane
Remarks: No groundwater during monitoring on 05/10/16.		Standing water level	B	Bulk	S/C	SPT / CPT
			U	Undisturbed	PP	Pocket penetrometer
			ES	Environmental	PID	PID Reading

Well	Description	Legend	Depth (mm)	Water Level	Description		Tests			
					Type	Depth (mm)	Type	Depth (mm)		
	85 60 CONC/RUBBLE 120 190 310 510 REDUNDANT CLAY PIPE 3100	York stone slabs (MADE GROUND). Sand/cement bed (MADE GROUND). Lean mix Sand cement/concrete (MADE GROUND). Concrete (MADE GROUND). Lean mix Sand cement/concrete (MADE GROUND). Brown gravelly SAND. Gravel of sub-angular fine to coarse brick and tile fragments (MADE GROUND). Brown silty gravelly SAND. Gravel of sub-angular, fine to coarse brick and tile fragments (MADE GROUND). Firm brown/orange brown/grey mottled silty CLAY, (LONDON CLAY FORMATION).	0 30 65 105 220 260 400 850 1500 1800 3100 END			D1 D2 D3 D4 D5 D6	510 1000 1500 2000 2500 3000	SV=74 SV=78 SV=96 SV=92 SV=98	1000 1500 2000 2500 3000	
	...becoming firm to stiff with depth.									
	Root observed and becoming brown/grey mottled with depth.									
	Sample test key: D - Disturbed sample. SV - Shear vane test.		Remarks No groundwater encountered during excavation. Ground level at 18.80 AOD. Standing water level at 1.68m BGL, (17.12m AOD) on 05/10/2016.							

Project 4 KEATS GROVE, HAMPSTEAD LONDON, NW3 2RT		Title TH1		 847 The Crescent, Colchester Business Park, Essex, CO4 9VQ Tel: 01206 228800 Suite 409, 1 Allie Street, London E1 9DE Tel: 020 7448 9910 York House, 3 Station Court, Great Shelford, Cambs CB22 5NE Tel: 01223 314794 6 The Old Church, St. Matthews Road, Norwich, Norfolk NR1 1SP Tel: 01603 230240 The Wheelhouse, Bonds Mill, Stonehouse, Gloucestershire GL10 3RF Tel: 01172 020070 Email Address: mail@rj.uk.com Website: http://www.rj.uk.com							
This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.		Client MR MARCUS PIGGOTT									
Scale AS SHOWN @ A4		Drawn RDL		Date OCTOBER 2016		Logged By J. WARNER		Checked		Approved	
				Borehole/Trial Hole Log No. <h1>51659/G/TH1</h1>		Drawing Status <input checked="" type="checkbox"/> INFORMATION		<input type="checkbox"/> APPROVAL		<input type="checkbox"/> COSTING	
				<input type="checkbox"/> TENDER		<input type="checkbox"/> CONSTRUCTION		<input type="checkbox"/> AS CONSTRUCTED			

Appendix F

Extracts from North London Strategic Flood Risk Assessment

flooding are low but this assessment is based on limited information from Thames Water.

Groundwater flooding was found to be a relatively low risk.

10.3 Summary for Camden

Camden has no fluvial watercourses within its borough boundaries. The Regents Canal does flow through the borough but the locations of raised canal banks that could pose a flood risk are yet to be identified as attempts to obtain information from British Waterways have been unsuccessful. The Canal could also be considered as a reservoir as in places embankments have been constructed to create the watercourse.

Surface water flooding has a well document and recent history. The 2002 Camden floods highlighted the vulnerability of particular areas (shown in map 22).

The two small reservoirs in Hampstead Heath are part of a series of ponds owned by the City of London Corporation. These reservoirs lie within the River Fleet catchment. The flood management plans and supporting inundation mapping is anticipated to be a legal requirement from spring 2009.

GARDIT operate an on going abstraction scheme across London to maintain the level of the groundwater table which is assisted by the impermeable geology.

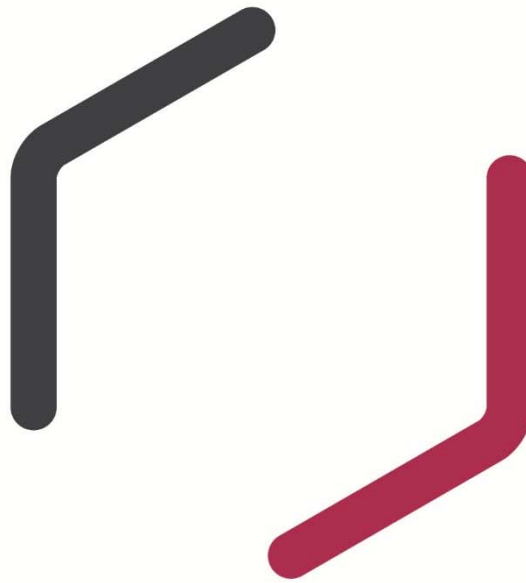
10.4 Conclusions for Camden

The LB of Camden has a particularly high risk of flooding from sewer and surface water flooding, while fluvial flood risk remains low due to the lack of watercourses. At present the Canal presents an unknown risk to the borough. A more detailed assessment of the flood risk posed by the Canal to the surrounding properties is required in close partnership with British Waterways.

Surface water flooding zones are in need of further investigation within Camden due to the high level of risk and historic precedent. A more detailed assessment of sewer flooding would also be desirable but this would require the cooperation of Thames Water in releasing the necessary data for a review and analysis to be undertaken. Where sewer and surface water flooding may occur the consequences are unlikely to restrict development providing that mitigation for surface water flooding is applied using the precautionary approach.

Groundwater flooding was found to be a relatively low risk.

The two small reservoirs on Hampstead Heath are considered to present a low risk to Camden. It is anticipated that the Flood Management Plans and associated inundation mapping will provide a more accurate appraisal and assessment of flood risk presented by the reservoir.



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