SUDS REPORT FOR 142 THE FAIRWAY, LONDON, N14 4NN

DOCUMENT NUMBER.: C2743-R1-REV-A

PREPARED BY

Nimbus
ENGINEERING CONSULTANTS

Contents

APPENDICES

1. INTRODUCTION

1.1 Appointment

Nimbus Engineering have been appointed by Hector Estates Ltd to provide an outline solution on the management of Surface Water run-off and to ensure that there is no risk of flooding caused by the construction of a two-storey dwelling at 142 The Fairway, London, N14 4NN.

1.2 Objectives

This report will provide information on a suitable Sustainable Urban Drainage System (SuDS) in order to reduce the surface water run off leaving the site and show that the proposed development will not increase Flood Risk at the site or elsewhere.

1.3 Limitations

The general limitations of this report are:

- A number of data and information sources have been used to prepare this report. Whilst Nimbus Engineering believes them to be trustworthy, Nimbus

Engineering is unable to guarantee the accuracy of data and information that has been provided by others;

- This report has been prepared using the best data and information that was available at the time of writing. There is the potential for further information or data to become available, leading to changes in the conclusions drawn by this report, for which Nimbus Engineering cannot be held responsible.

2. GEOLOGY OF THE AREA

According to, the British Geological Survey, the superficial deposits at the site are of the Dollis Hill Gravel Member, as shown in Figure 1, below. The bedrock in the area is a member of the London Clay Formation, as shown in Figure 2, overleaf.

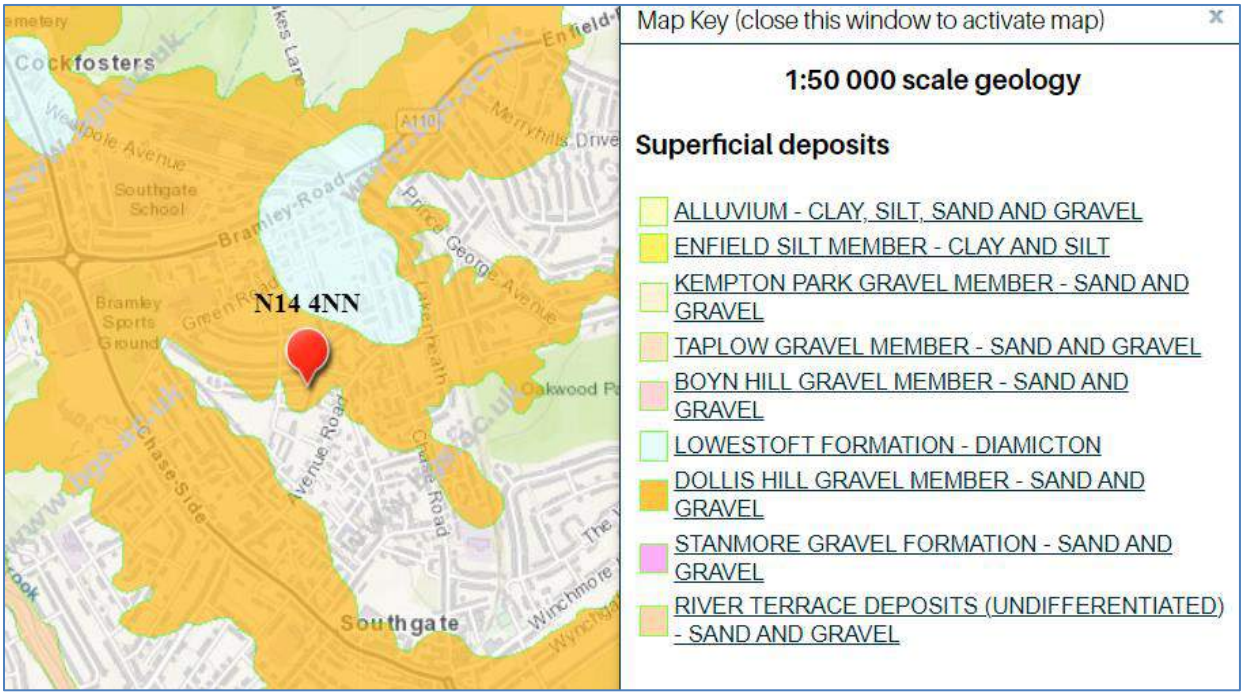

Figure 1- Superficial deposits at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2022]. Base mapping is provided by ESRI)).

Figure 2- Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2022]. Base mapping is provided by ESRI)).

The London Borough of Enfield have requested that historic boreholes within the vicinity of the site are consulted in order to ascertain the suitability of infiltration, the location of the boreholes is shown on the plan overleaf, and the results can be found in Appendix A.

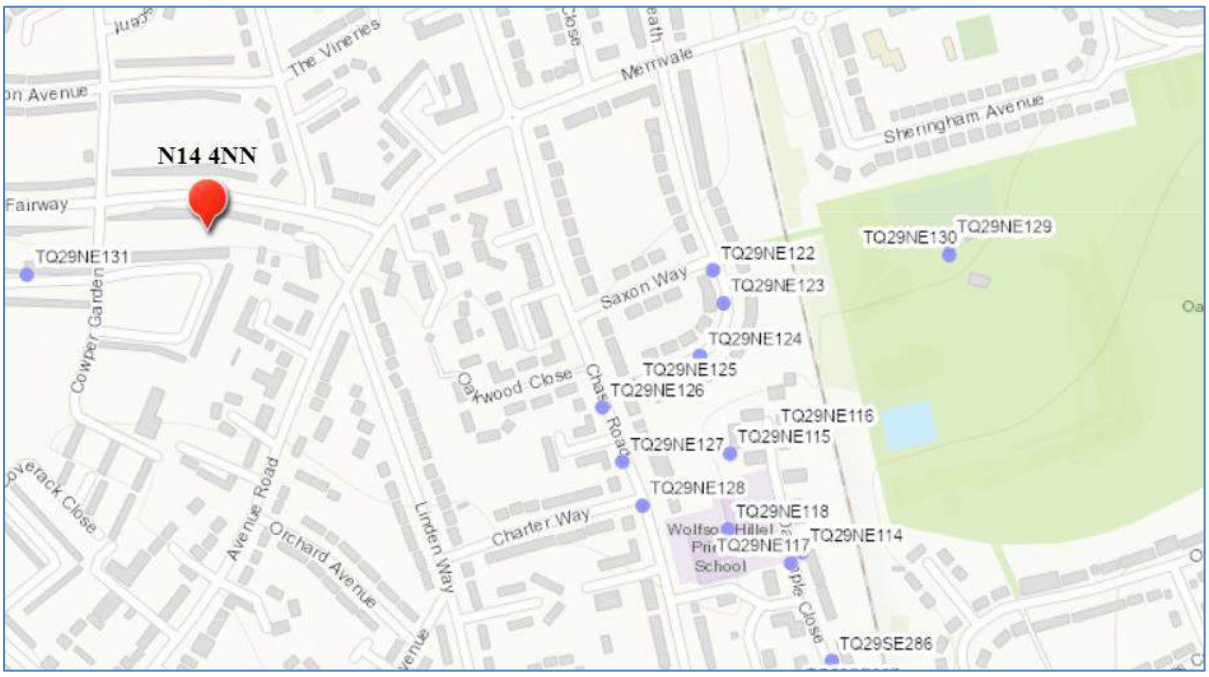

Figure 3- Historic Boreholes at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2022]. Base mapping is provided by ESRI)).

The highlighted historic boreholes show that the soil deposits within the surrounding area of the new development consist predominantly of clay. Due to the ground conditions within the area it was deemed that full infiltration is not feasible.

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS

Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from urban sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels and dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water run-off containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the natural landscape of an area which as well as slowing down the rate of runoff provides a number of environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality. As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through fine soils and the roots of specially selected plants. Pollutants washed off the hard landscaping by rainfall will be safely removed before the water reaches the natural receiving water course.

- A sympathetic approach to the environmental setting by providing opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers to work in order to determine a feasible solution.

The SuDS management train is shown below, and this has been followed when proposing the proposed Sustainable Urban Drainage Systems for this site.

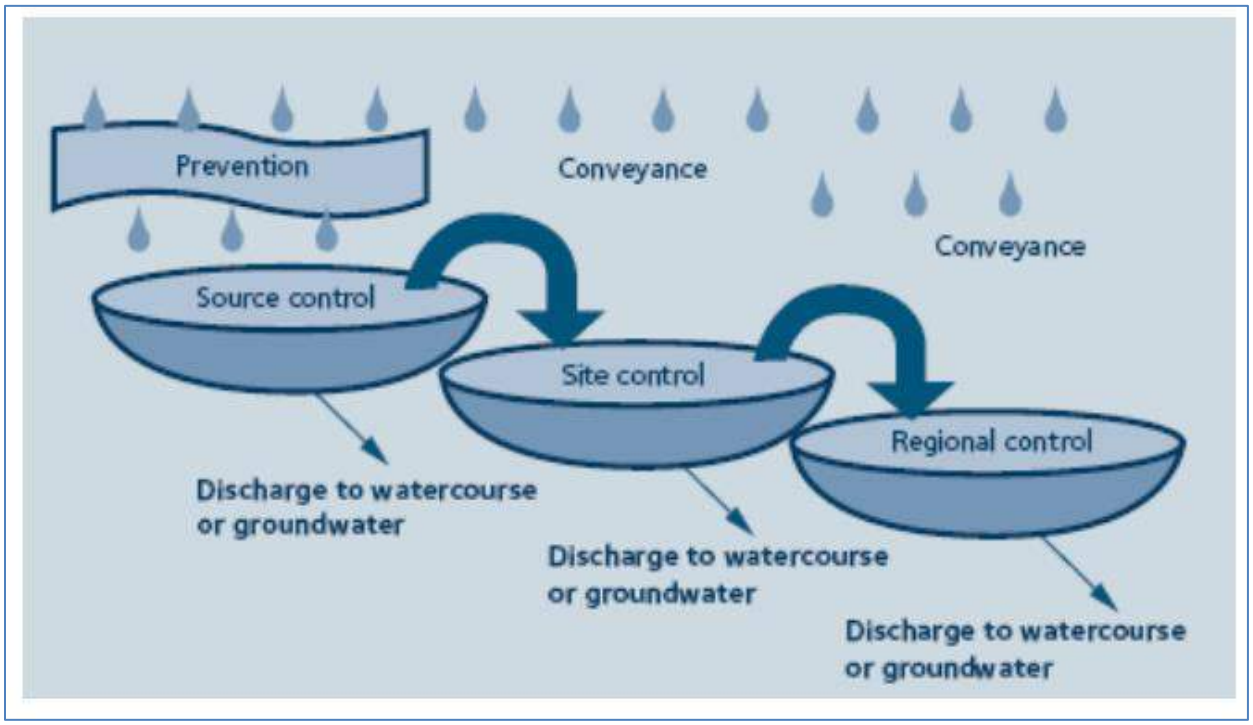

Figure 4 – SuDS Management Train

4. SuDS PROPOSALS FOR DEVELOPMENT

In accordance with the CIRIA SuDS Manual C753 and Policy SI 13 of the London Plan, the SuDS hierarchy has been considered in relation to the site-specific constraints and its surroundings. Table 1 below outlines the hierarchical approach considered for the development at 142 The Fairway.

Sustainable Drainage Proposal	Description	Constraints/Comments	Appropriate
Rainwater Use as a Resource	Use of rainwater runoff for reuse, e.g. Rainwater harvesting tanks, Blue Roofs for irrigation	One rainwater harvesting tank proposed at the rear of the property, to allow for rainwater reuse.	Yes
Rainwater Full Infiltration to Ground (Source Control)	Infiltration devices and/or soakaways. Surface water runoff stored on site and gradually percolating into receiving ground	Due to bedrock geology consisting of London Clay formation, and the nearby surface water sewer to site, full infiltration was deemed as a non-appropriate option.	No
Rainwater Partial Infiltration to Ground (Source Control)	Installation of permeable/porous surfacing	Permeable Paving, underlain with a hyhdrocarbon removing geotextile, is proposed on all hardstanding areas throughout the site to allow for partial infiltration in low intensity storm events.	Yes
Rainwater attenuation in green infrastructure features for gradual release	The onsite storage of all surface water runoff which can then be gradually conveyed to a nearby watercourse, sewer or infiltration into the ground. Forms of green infrastructure features: Green Roofs, Raingardens, Ponds, Swales, Detention	Filter drains were installed at the site boundary and at the doorway of the dwelling to provide a level of treatment for surface water runoff. 16m^2 of green roof was proposed for the flat roof, to provide a level of treatment for the roof runoff. The roof runoff from the front of the property will	Yes

	basins, Infiltration Trenches, filters drains and Raingarden Planters	pass through the proposed raingarden planter, to provide a level of treatment, and also to slow down the peak flow from the site.	
Rainwater discharge direct to a watercourse	All surface water runoff on site discharged at a restricted rate to a nearby watercourse	Consultation of EA Maps and survey information shows no nearby watercourses to site	No
Controlled rainwater discharge to a surface water sewer or drain	All surface water runoff on site discharged at a restricted rate to a nearby surface water sewer or drain, all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	Due to the existing Thames Water surface water sewer onsite and infiltration not being feasible. All surface water runoff will be stored in below ground sub-base granular storage, sized for a 1 in 100 Year Storm Event + 40% CC with a restricted discharge rate 0.3 l/s.	Yes
Controlled rainwater discharge to a combined sewer	All surface water runoff on site discharged at a restricted rate to a nearby combined sewer all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	N/A.	No

Table 1: SuDS Control Measures for Development

5. PROPOSED SOLUTION

The total area of the site is 225m^2, and the existing impermeable areas at the site are 0m^2. Following the development proposals, the impermeable areas will have increased to 88.4m² as shown on drawing C2743-01 in Appendix B.

Due to the bedrock geology consisting of London Clay and the existing Thames Water surface water sewer onsite, infiltration was deemed not suitable.

A hydraulic model was built using Infodrainage to ensure a feasible solution was proposed, to simulate rainfall events for a 1 in 100 year storm event, with a 40% allowance for climate change with a restricted flow discharging at 0.3 l/s. The results of the hydraulic model can be found in Appendix C.

In order to ensure that the SuDS management train has been considered fully, all hardstanding areas will be formed of permeable surfacing underlain by a hydrocarbon removing geotextile membrane at the car parking areas, in order to deal with as much of the surface water run off at source, with the surface water runoff from all sloped areas away from the dwellings to be caught by filter drains, this will provide a level of treatment from the surface water runoff produced by all proposed trafficked hardstanding and walkways.

The surface water runoff from the site will then be conveyed into a large area of sub-base storage in the rear gardens of the dwellings, with a restricted discharge rate of 0.3 l/s . The total storage required within the sub-base storage was 1.872m³.

This restricted surface water runoff will be conveyed by gravity into the existing Thames Water manhole as shown on drawing C2743-02 in Appendix B, and as shown on the Thames Water Asset Plans in Appendix D.

We believe the Sustainable Urban Drainage System hierarchy has been considered fully, with as much of the surface water runoff to be treated at source, attenuated, and restricted to 0.300 l/s, in line with the London Borough of Enfield's requirements. The proposed SuDS layout and details are shown on drawing numbers C2743-02, C2743-03 and C2743-04 in Appendix B. All surface water runoff calculations can be found in Appendix C.

6.TIMESCALE AND MAINTENANCE OF WORKS

All drainage works will be completed prior to first occupation and there will be no adoption of any of the drainage works within the site, a management company will be formed, which will be responsible in overseeing the long-term maintenance of all the communal drains.

- Gullies should be cleaned every 3 months in order to ensure that there are no blockages.

- The catch pit chamber to the permeable paving sub-base and flow control chamber should be checked and emptied every 3 months, especially after a heavy rain storm, this to ensure that the system does not get clogged up with silt or blocked.

- Regular jet-washing of permeable surfacing can be used to keep joints and voids clear, this should be carried out every 3 to 6 months.

The following table outlines the maintenance requirements for the permeable paving:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 2: Operation and maintenance requirements for pervious pavements.

The following table outlines the maintenance requirements for filter drains:

Maintenance schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six Monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998 2010)	As required
	At location with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Table 3: Operation and maintenance requirement for filter drains

The following table outlines the maintenance requirements for the flow control chambers:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 4: Operation and maintenance requirement for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no entry or removal of parts to be undertaken by landowner.

If upstream network of flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts

The following table outlines the maintenance requirements for rainwater harvesting tanks:

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 5: Operation and maintenance requirement for rainwater harvesting systems

The following table outlines the maintenance requirements for green/sedum roofs:

Maintenance schedule	Required action	Typical Frequency
Regular Inspections	Inspect all components including soil substrate vegetation, drains irrigation systems (if applicable), membranes and roof structure for proper operation integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one) replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required

	Mow grasses, prune shrubs and manage other planting (if appropriate) as required- clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial Actions	If erosion channels are evident, these should e stabilised with extra soil substrate similar to the original material and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Table 6: Operation and maintenance requirement for green / sedum roofs

The following table outlines the maintenance requirements for the raingarden planters:

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Pipe inlets to the raingarden planters should be checked every month and especially after an extreme rainstorm to ensure that there are no blockages.	Monthly
	Periodic inspections & removal of debris or other items that represent blockage risks particularly in vicinity of the inlet to the raingarden planters	Monthly
	Weeding, cutting of plants and removal of any dead plants to ensure that the system works effectively	Every three months
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockages by sediment, algae or other matter: remove and replace surface infiltration medium as necessary.	Annually
Remedial actions	Repair inlets, outlets, overflows	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that the are in good condition and operating as designed	Annually

Table 7: Operation and maintenance requirement for raingarden planters

7. CONCLUSIONS

The purpose of this report and associated calculations and drawings, is to present a SuDS solution to satisfy Enfield Council that the proposed development will not increase surface water flows, and hence increase flood risk at the site elsewhere.

All components of the SuDS management train have been considered and utilised where possible and this proposed development will greatly reduce the surface water run off leaving the site, and therefore reduce flood risk at the site and elsewhere.

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APPENDIX A – HISTORIC BOREHOLES

BOREHOLE SECTION SHEET

BOREHOLE N°. 4

LOCATION Lakenheath Road, Chase Road, Enfield WATER LEVEL STRUCK –

DATE 18.1.88 WATER LEVEL STANDING –

DESCRIPTION OF STRATA	SECTION	DEPTH From	DEPTH To	THICKNESS	SAMPLE No.	TYPE	SAMPLE DEPTH (metres)
Tarmac over hardcore (concrete road 6")		GL –	1.0	1.0			
					1	B	0.7
Stiff brown fissured clay with streaks of blue and grey.		1.0 –	6.4	NP			
					2	U4	1.5 – 1.9
					3	D	1.9
					4	U4	3.0 – 3.4
					5	D	3.4
					6	U4	4.5 – 4.9
					7	D	4.9
					8	U4	6.0 – 6.4
					9	D	6.4
		NP					
		TOTALS		6.4M			

SCALE 1 : 50

LEVEL O.D.

BH DIAMETER 200mm

RIGS Shell & Auger

WEATHER Dry

REMARKS:- Only lead casing used.

B - BULK SAMPLE

U - UNDISTURBED SAMPLE

D - DISTURBED SAMPLE

W - WATER SAMPLE

(125)

BOREHOLE SECTION SHEET

BOREHOLE N°. 1

LOCATION 33 COWPER GARDENS, ENFIELD.

WATER LEVEL STRUCK None

DATE DECEMBER, 1983

WATER LEVEL STANDING None on completion

DESCRIPTION OF STRATA	SECTION	DEPTH From	DEPTH To	THICKNESS	SAMPLE No.	TYPE	SAMPLE DEPTH (metres)
Topsoil		GL	- 0.25	0.25			
Soft to firm brown silty CLAY with roots		0.25	- 0.70	0.45			
Stiff brown silty fissured CLAY with roots (rather dry)		0.70	- 2.00	1.30	1	U	0.70 - 1.15
					2	D	1.20
Firm to stiff becoming stiff brown with grey silty fissured CLAY becoming darker brown with depth		2.00	- 8.00	6.00	3	D	2.00
					4	U	2.50 - 2.95
					5	D	3.00
					6	D	4.00
					7	U	5.00 - 5.45
					8	D	5.50
					9	D	6.00
					10	D	7.00
Stiff grey silty fissured CLAY		8.00	- 9.00	1.00 NP	11	U	8.00 - 8.45
					12	D	8.50
					13	D	9.00
		TOTALS		9.00m			

SCALE Not to scale

LEVEL O.D. -

BH DIAMETER 200mm

RIGS Shell and Claycutter

WEATHER Fair

REMARKS:- Clay rather dry between 0.70 - 2.00m

B - BULK SAMPLE

U - UNDISTURBED SAMPLE

D - DISTURBED SAMPLE

W - WATER SAMPLE

BOREHOLE SECTION SHEET

BOREHOLE N°. 4

LOCATION Lakenheath Road, Chase Road, Enfield WATER LEVEL STRUCK –

DATE 18.1.88 WATER LEVEL STANDING –

DESCRIPTION OF STRATA	SECTION	DEPTH From	DEPTH To	THICKNESS	SAMPLE No.	TYPE	SAMPLE DEPTH (metres)
Tarmac over hardcore (concrete road 6")		GL –	1.0	1.0			
					1	B	0.7
Stiff brown fissured clay with streaks of blue and grey.		1.0 –	6.4	NP			
					2	U4	1.5 – 1.9
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					4	U4	3.0 – 3.4
					5	D	3.4
					6	U4	4.5 – 4.9
					7	D	4.9
					8	U4	6.0 – 6.4
					9	D	6.4
		NP					
	TOTALS			6.4M			

SCALE 1 : 50

LEVEL O.D.

BH DIAMETER 200mm

RIGS Shell & Auger

WEATHER Dry

REMARKS:- Only lead casing used.

B - BULK SAMPLE

U - UNDISTURBED SAMPLE

D - DISTURBED SAMPLE

W - WATER SAMPLE

NP - STRATA NOT PENETRATED

BLANEY & KILROY LIMITED

125

BOREHOLE SECTION SHEET

BOREHOLE N°. 1

LOCATION 33 COWPER GARDENS, ENFIELD.

WATER LEVEL STRUCK None

DATE DECEMBER, 1983

WATER LEVEL STANDING None on completion

DESCRIPTION OF STRATA	SECTION	DEPTH From	DEPTH To	THICKNESS	SAMPLE No.	TYPE	SAMPLE DEPTH (metres)
Topsoil		GL	- 0.25	0.25			
Soft to firm brown silty CLAY with roots		0.25	- 0.70	0.45			
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					5	D	3.00
					6	D	4.00
					7	U	5.00 - 5.45
					8	D	5.50
					9	D	6.00
					10	D	7.00
Stiff grey silty fissured CLAY		8.00	- 9.00	1.00 NP	11	U	8.00 - 8.45
					12	D	8.50
					13	D	9.00
	TOTALS		9.00m				

SCALE Not to scale

LEVEL O.D. -

BH DIAMETER 200mm

RIGS Shell and Claycutter

WEATHER Fair

REMARKS:- Clay rather dry between 0.70 - 2.00m

B - BULK SAMPLE

U - UNDISTURBED SAMPLE

D - DISTURBED SAMPLE

W - WATER SAMPLE

NP - STRATA NOT PENETRATED

APPENDIX B – DRAWINGS

KEY

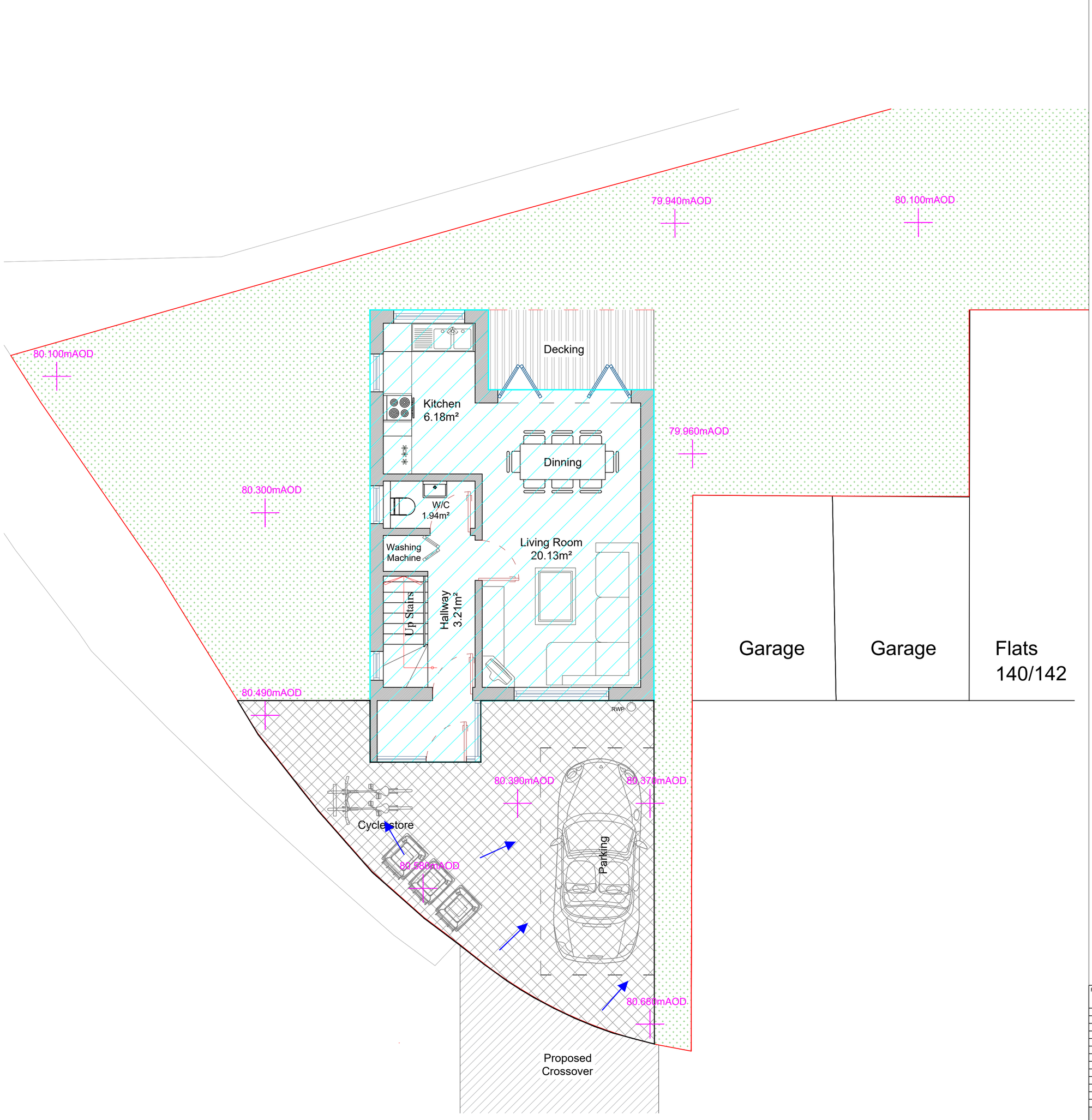
ROOF AREAS

HARDSTANDING AREAS

EXCEEDANCE ROUTE

SITE AREA

POST-DEV IMPERMEABLE SURFACE	AREA (m^2)
ROOF AREA 1	46.70
HARDSTANDING 1	41.70



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PROJECT:

142 THE FAIRWAY, LONDON, N14 4NN

TITLE:

POST-DEVELOPMENT IMPERMEABLE AREAS & EXCEEDANCE ROUTE PLAN

CLIENT:

HECTOR ESTATES LTD.

Nimbus ENGINEERING CONSULTANTS

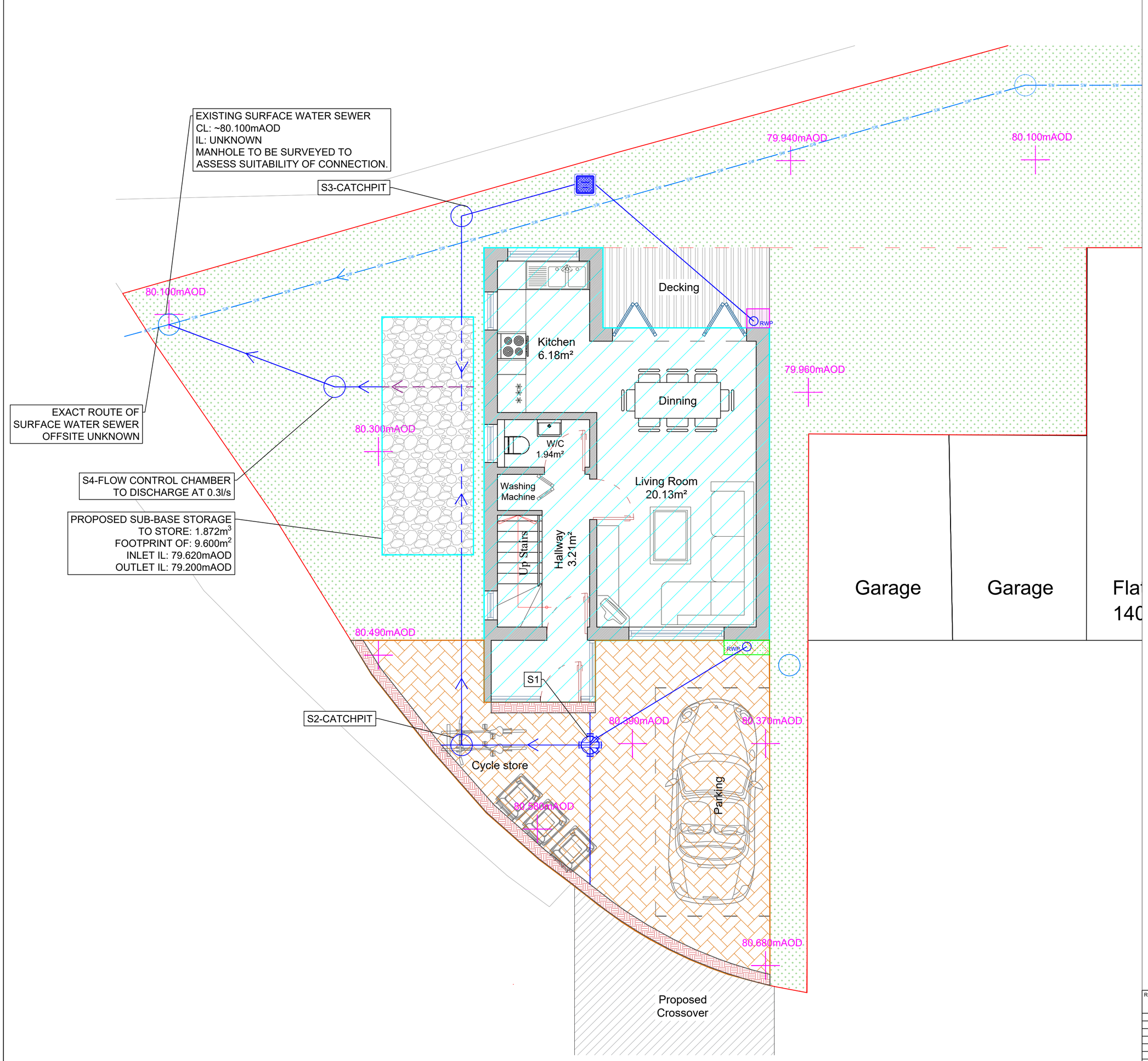
www.nimbusengineering.co.uk

info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	28-04-22	S.L	28-04-22
DRN BY: F.G	SCALE: 1:50	DRAWING NUMBER: C2743-01	REV: A
DATE: 28-04-22	SIZE: A1		

KEY

- ROOF AREAS
- POROUS SURFACING
- 200mm(w) FILTER TRENCH
- RAINWATER HARVESTING TANK
- PROPOSED SURFACE WATER UPVC PIPES
- PROPOSED SURFACE WATER INSPECTION CHAMBERS
- RODDING EYE
- HALF BARREL PERFORATED SURFACE WATER UPVC PIPES IN LOWER HALF
- HALF PERFORATED SURFACE WATER UPVC PIPES IN UPPER HALF
- EXISTING SURFACE WATER UPVC PIPES
- SITE AREA
- EXISTING GROUND LEVELS (PROVIDED BY DEFRA DATA)



SCHEDULE OF ALL SEWER MANHOLE CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

SURFACE WATER

NAME	TYPE	DIAMETER (m)	COVER LEVEL (mAOD)	INVERT LEVEL (mAOD)	DEPTH (m)
S1	Manhole	0.450	80.390	79.690	0.700
S2-CATCHPIT	Manhole	0.450	80.550	79.660	0.890
S3-CATCHPIT	Manhole	0.450	80.150	79.650	0.500
S4-FLOW CONTROL CHAMBER		0.450	80.300	79.190	1.110
S5	Manhole	0.450	80.100	79.145	0.955

PIPEWORK SCHEDULE

PIPEWORK IDENTIFIER	MATERIAL	DIAMETER (mm)	GRADIENT (1:x)	LENGTH (C/C) (m)
SURFACE WATER SEWERS				
S1-S3 CATCHPIT	uPVC	100	1:86	1.720
S2-S3 CATCHPIT	uPVC	100	1:106	2.120
S3 CATCHPIT-TANK INLET	uPVC	100	1:25	0.500
TANK OUTLET - S4 FLOW CONTROL CHAMBER	uPVC	100	1:101	1.000
S4 FLOW CONTROL CHAMBER - S5	uPVC	100	1:132	13.185
S5 - C1	uPVC	100	1:80	1.250

1:50
1m 0 1m 2m 3m 4m 5m

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	28-04-22	FG	For Information	SL	SL

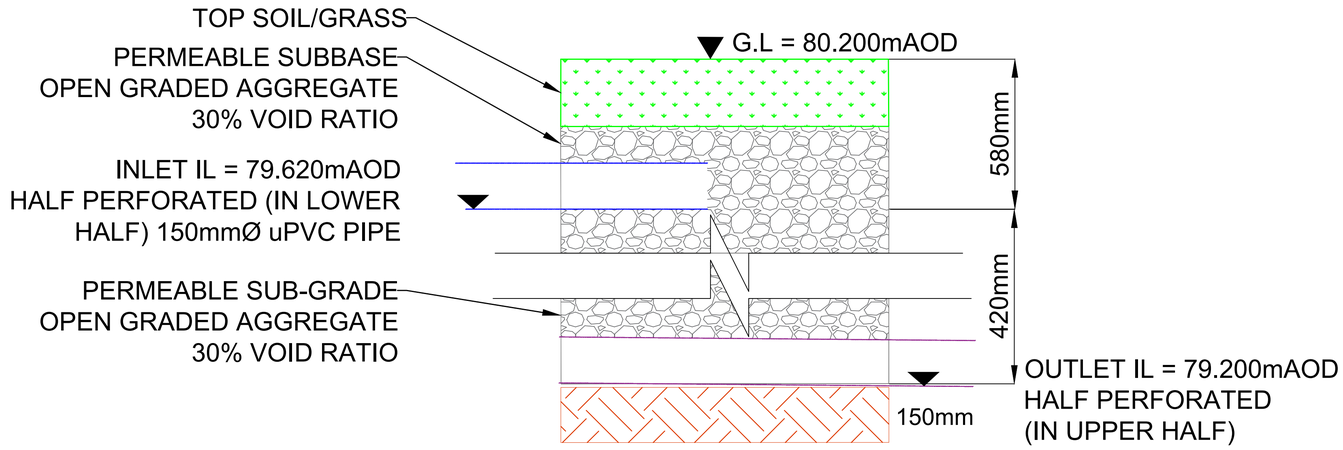
PROJECT:
142 THE FAIRWAY, LONDON, N14 4NN

TITLE:
SURFACE WATER & SuDS LAYOUT PLAN

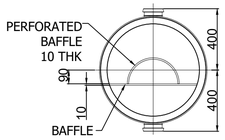
CLIENT:
HECTOR ESTATES LTD.

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	28-04-22	S.L	28-04-22
DRN BY: F.G	SCALE: 1:50	DRAWING NUMBER: C2743-02	REV: A
DATE: 28-04-22	SIZE: A1		

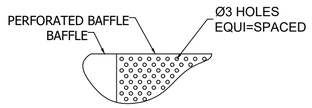


SUB-BASE STORAGE CROSS-SECTION
N.T.S

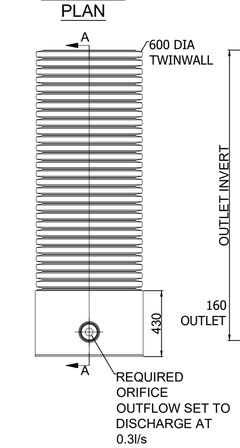


ORIFICE FLOW
CONTROL
PLAN

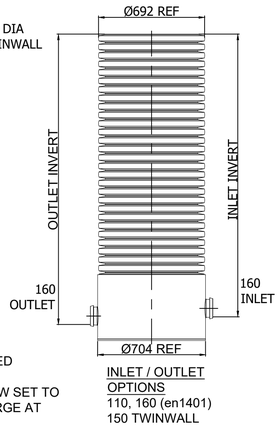
SCALE
1:20



PART DETAIL OF
INTERNAL BAFFLES

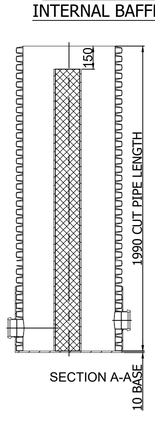


ORIFICE FLOW
CONTROL
ELEVATION

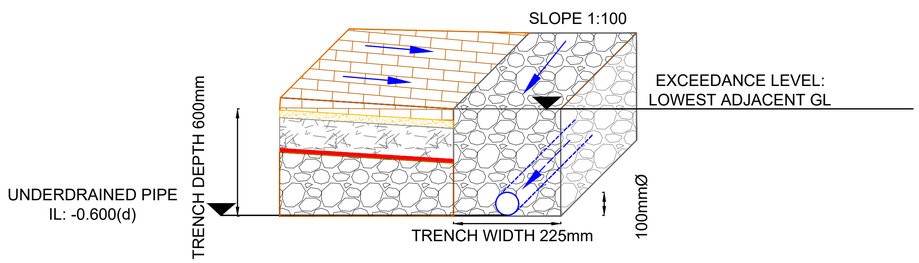


INLET / OUTLET
OPTIONS
110, 160 (en1401)
150 TWINWALL

ORIFICE FLOW
CONTROL
ELEVATION



ORIFICE FLOW
CONTROL
SECTION A-A



FILTER DRAIN CROSS SECTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	29-04-22	FG	For Information	SL	SL

CHECKED BY: S.L	DATE: 29-04-22	APPROVED BY: S.L	DATE: 29-04-22
DRN BY: F.G	SCALE: AS STATED	DRAWING NUMBER: C2743-03	REV: A
DATE: 29-04-22	SIZE: A1		

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CLIENT: HECTOR ESTATES LTD.

PROJECT: 142 THE FAIRWAY, LONDON, N14 4NN

TITLE: SURFACE WATER & SuDS DRAINAGE DETAILS

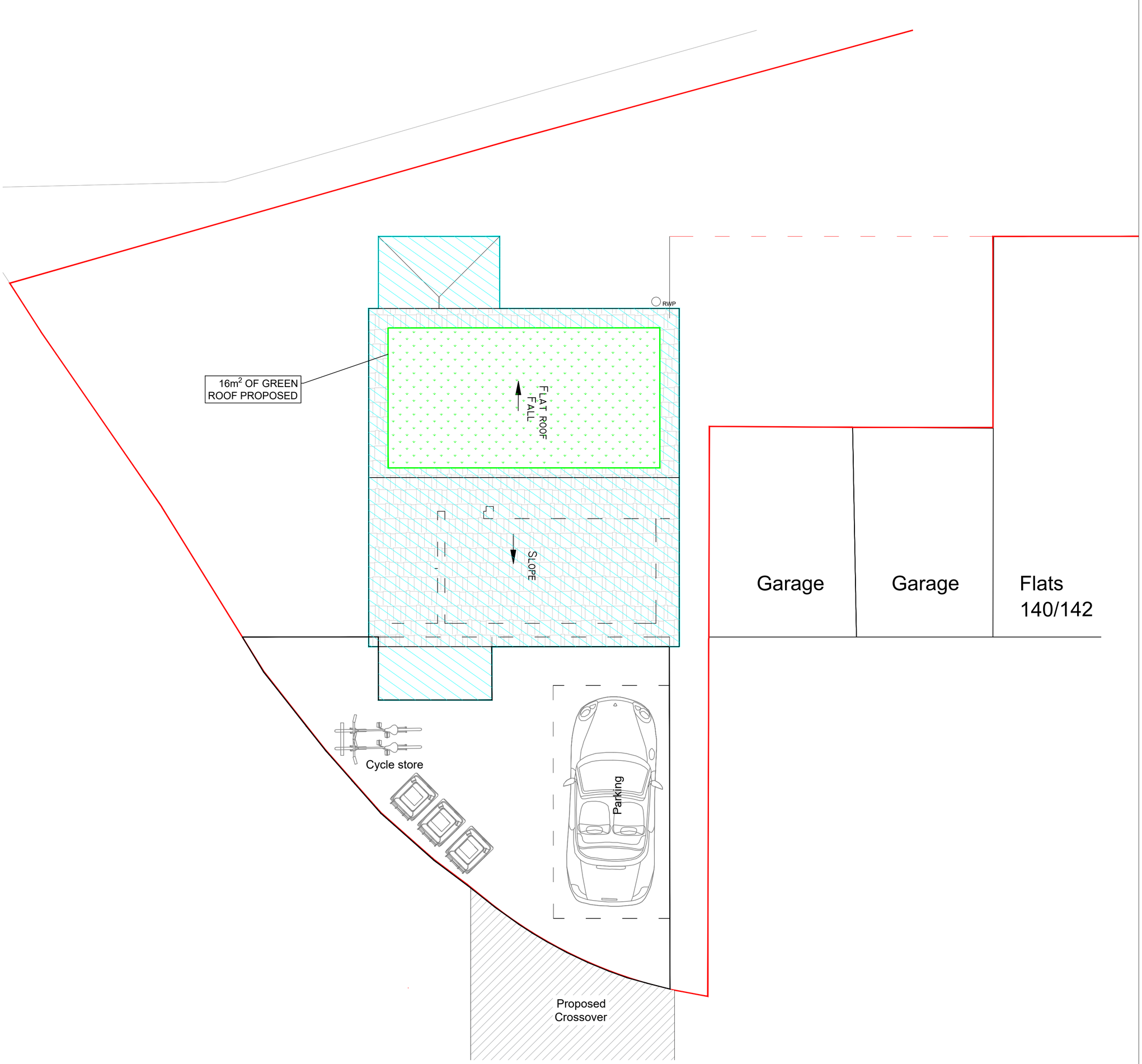
KEY

GREEN/SEDUM ROOF

SITE BOUNDARY

NOTES:

1. BAUDER - XF301 - SEDUM BLANKET GREEN ROOF TO BE INSTALLED - OR SIMILARLY APPROVED PRODUCT.
2. DWG TO BE READ IN CONJUNCTION WITH BAUDER XF301 SEDUM BLANKET GREEN ROOF - TECHNICAL SYSTEM SUMMARY GUIDANCE.
3. FOR DETAILS OF GREEN ROOF INSTALLATION AND MAKE-UP REFER TO BAUDER DWG: *"D0901-00W_1-2Deg_200-Ext-XF301-SM_001" - "EXTENSIVE GREEN ROOF SYSTEM XF301 SEDUM BLANKET 1°-2° SLOPE"*



1:50

1m 0 1m 2m 3m 4m 5m

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	28-04-22	FG	For Information	SL	SL

PROJECT:

142 THE FAIRWAY, LONDON, N14 4NN

TITLE:

ROOF LEVEL SuDS LAYOUT PLAN

CLIENT:

HECTOR ESTATES LTD.

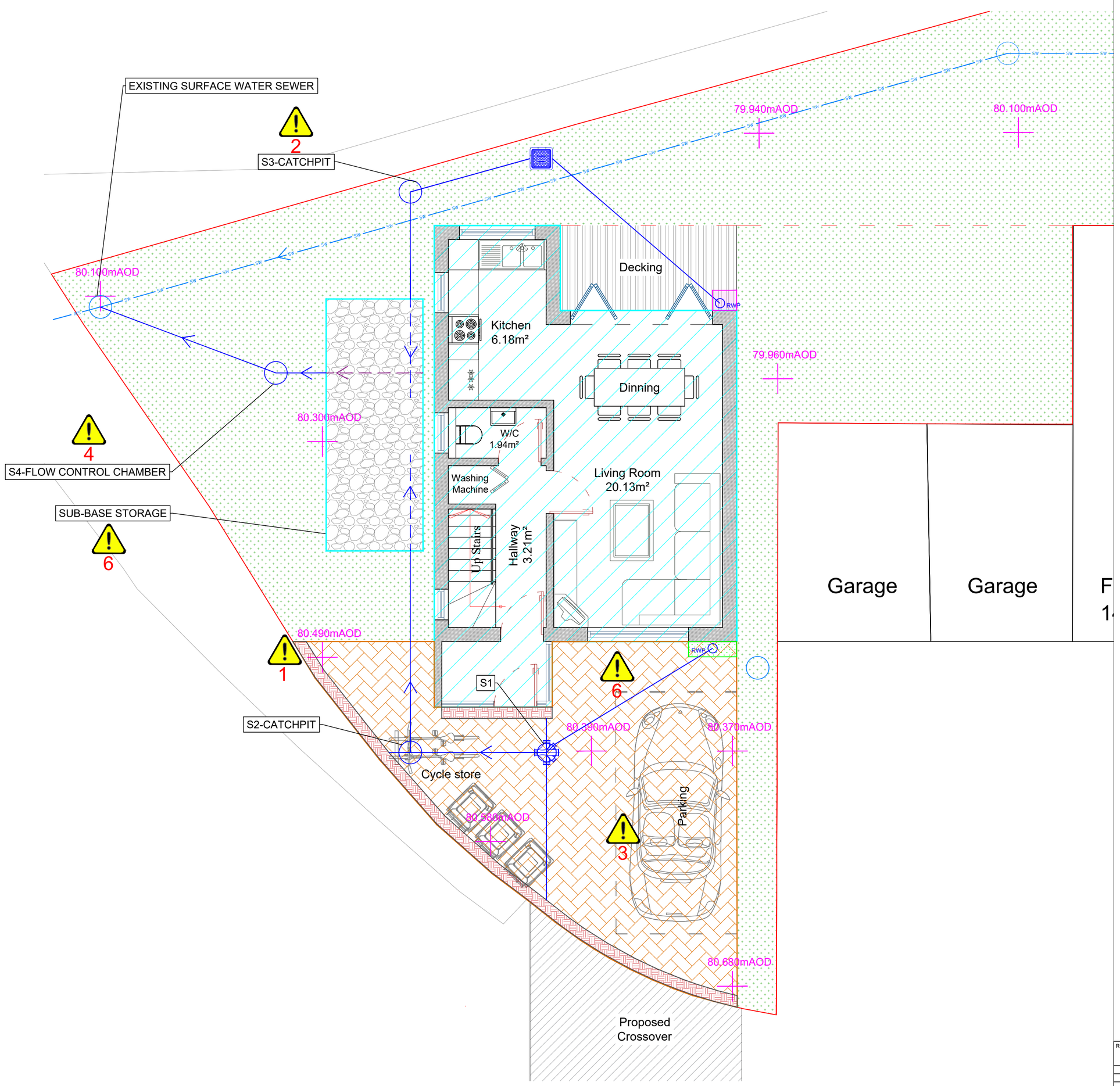
Nimbus ENGINEERING CONSULTANTS

www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	28-04-22	S.L	28-04-22
DRN BY: F.G	SCALE: 1:50	DRAWING NUMBER: C2743-04	REV: A
DATE: 28-04-22	SIZE: A1		

KEY

- ROOF AREAS
- POROUS SURFACING
- 200mm(w) FILTER TRENCH
- RAINWATER HARVESTING TANK
- PROPOSED SURFACE WATER UPVC PIPES
- PROPOSED SURFACE WATER INSPECTION CHAMBERS
- RODDING EYE
- HALF BARREL PERFORATED SURFACE WATER UPVC PIPES IN LOWER HALF
- HALF PERFORATED SURFACE WATER UPVC PIPES IN UPPER HALF
- EXISTING SURFACE WATER UPVC PIPES
- SITE AREA
- xx.xxxAOD — EXISTING GROUND LEVELS (PROVIDED BY DEFRA DATA)



MAINTENANCE REQUIREMENTS FOR ALL DRAINAGE FEATURES WITHIN DEVELOPMENT	
IDENTIFIER	MAINTENANCE REQUIREMENTS & REMEDIAL ACTIONS
1. FILTER DRAINS	FILTER DRAINS ARE TO BE INSPECTED AND ANY DEBRIS/ LITTER REMOVED EVERY MONTH OR AFTER A HEAVY RAINFALL EVENT TO ENSURE THERE ARE NO BLOCKAGES.
2. CATCHPITS	CATCHPIT CHAMBERS CONNECTING TO THE SWALES AND SUB-BASE STORAGE ARE TO BE INSPECTED AND EMPTIED EVERY 3 MONTHS, ESPECIALLY AFTER A HEAVY RAINFALL EVENT TO ENSURE THE SYSTEM DOES NOT CLOG UP WITH SILT OR BECOME BLOCKED.
3. PERMEABLE PAVING	REGULAR JET-WASHING OF PERMEABLE BLOCK PAVING TO KEEP JOINTS AND VOIDS CLEAR, THIS SHOULD BE CARRIED OUT EVERY 6 MONTHS
4. FLOW CONTROL CHAMBER	THE FLOW CONTROL CHAMBER FROM THE SUB-BASE STORAGE IS TO BE INSPECTED EVERY 3 MONTHS, ESPECIALLY AFTER A HEAVY RAINFALL EVENT. IF UPSTREAM NETWORK IS MAINTAINED CORRECTLY NO PARTS SHOULD HAVE TO BE REMOVED OR REPLACED WITHIN FLOW CONTROL CHAMBER.
5. DRAINAGE RUNS	ANY DEFORMED OR DAMAGED PIPEWORK IS TO BE IDENTIFIED BY A DRAINAGE/CCTV SURVEY AND IS TO BE REPLACED.
6. SUB-BASE STORAGE	SUB-BASE STORAGE MAINTENANCE SHOULD BE MINIMAL IF CORRECT INSTALLATION METHODS ARE FOLLOWED AND UPSTREAM NETWORK IS CORRECTLY MAINTAINED.

1:50

1m 0 1m 2m 3m 4m 5m

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	29-04-22	FG	For Information	SL	SL

PROJECT:
142 THE FAIRWAY, LONDON, N14 4NN

TITLE:
MANAGEMENT AND MAINTENANCE PLAN

CLIENT:
HECTOR ESTATES LTD.

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	28-04-22	S.L	28-04-22
DRN BY: F.G	SCALE: 1:50	DRAWING NUMBER: C2743-05	REV: A
DATE: 28-04-22	SIZE: A1		

APPENDIX C – INFODRAINAGE HYDRAULIC MODELLING REPORT

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	S1		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (1)	Simple Junction		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (2)	S1		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (3)	S1		Time of Concentration	0.003	100	0	100	0.003
Green Roof	Simple Junction		Green Roof	0.001		0		0.001
TOTAL		**0.0**		**0.008**				**0.008**

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	28/04/2022		
	Designed by:	Checked by:	Approved By:
	FG	SL	SL
Report Title: Rainfall Analysis Criteria	Kemp House: 152 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England and Wales
M5-60 (mm)	21.0
Ratio R	0.442
Summer	☐
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

S1

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter	80.390	79.690	79.746	0.056	4.4	0.009	0.000	4.3	2.054	OK
FSR: 100 years: +40 %: 30 mins: Winter	80.390	79.690	79.778	0.088	2.9	0.014	0.000	2.9	2.602	OK
FSR: 100 years: +40 %: 60 mins: Winter	80.390	79.690	79.826	0.136	2.1	0.022	0.000	2.1	3.225	OK
FSR: 100 years: +40 %: 120 mins: Winter	80.390	79.690	79.837	0.147	1.3	0.023	0.000	1.3	3.846	OK
FSR: 100 years: +40 %: 180 mins: Winter	80.390	79.690	79.825	0.135	1.0	0.021	0.000	1.0	4.176	OK
FSR: 100 years: +40 %: 240 mins: Winter	80.390	79.690	79.805	0.115	0.8	0.018	0.000	0.8	4.428	OK
FSR: 100 years: +40 %: 360 mins: Winter	80.390	79.690	79.765	0.075	0.6	0.012	0.000	0.6	4.782	OK
FSR: 100 years: +40 %: 480 mins: Winter	80.390	79.690	79.724	0.034	0.4	0.005	0.000	0.4	5.004	OK
FSR: 100 years: +40 %: 600 mins: Winter	80.390	79.690	79.705	0.015	0.4	0.002	0.000	0.4	5.304	OK

142 The Fairway, London, N14 4NN: 142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Date: 28/04/2022		
	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

S2-CATCHPIT

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter	80.550	79.660	79.715	0.055	4.3	0.009	0.000	4.3	2.008	OK
FSR: 100 years: +40 %: 30 mins: Winter	80.550	79.660	79.778	0.118	2.9	0.019	0.000	2.9	2.511	OK
FSR: 100 years: +40 %: 60 mins: Winter	80.550	79.660	79.826	0.166	2.1	0.026	0.000	2.1	3.157	Surcharged
FSR: 100 years: +40 %: 120 mins: Winter	80.550	79.660	79.837	0.177	1.3	0.028	0.000	1.3	3.844	Surcharged
FSR: 100 years: +40 %: 180 mins: Winter	80.550	79.660	79.825	0.165	1.0	0.026	0.000	1.0	4.175	Surcharged
FSR: 100 years: +40 %: 240 mins: Winter	80.550	79.660	79.805	0.145	0.8	0.023	0.000	0.8	4.426	OK
FSR: 100 years: +40 %: 360 mins: Winter	80.550	79.660	79.765	0.105	0.6	0.017	0.000	0.6	4.781	OK
FSR: 100 years: +40 %: 480 mins: Winter	80.550	79.660	79.723	0.063	0.4	0.010	0.000	0.4	5.003	OK
FSR: 100 years: +40 %: 600 mins: Winter	80.550	79.660	79.691	0.031	0.4	0.005	0.000	0.4	5.303	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Simple Junction

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter		0.000	79.711	0.026	0.8			0.7	0.456	OK
FSR: 100 years: +40 %: 30 mins: Winter		0.000	79.778	0.093	0.6			0.6	0.641	OK
FSR: 100 years: +40 %: 60 mins: Winter		0.000	79.826	0.141	0.5			0.5	0.854	OK
FSR: 100 years: +40 %: 120 mins: Winter		0.000	79.837	0.152	0.3			0.3	1.065	Surcharged
FSR: 100 years: +40 %: 180 mins: Winter		0.000	79.825	0.140	0.2			0.3	1.179	OK
FSR: 100 years: +40 %: 240 mins: Winter		0.000	79.805	0.120	0.2			0.2	1.230	OK
FSR: 100 years: +40 %: 360 mins: Winter		0.000	79.765	0.080	0.2			0.2	1.335	OK
FSR: 100 years: +40 %: 480 mins: Winter		0.000	79.723	0.038	0.1			0.1	1.395	OK
FSR: 100 years: +40 %: 600 mins: Winter		0.000	79.693	0.008	0.1			0.1	1.476	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

S3-CATCHPIT

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter	80.150	79.650	79.711	0.061	0.7	0.010	0.000	0.7	0.405	OK
FSR: 100 years: +40 %: 30 mins: Winter	80.150	79.650	79.778	0.128	0.6	0.020	0.000	0.6	0.569	OK
FSR: 100 years: +40 %: 60 mins: Winter	80.150	79.650	79.826	0.176	0.5	0.028	0.000	0.4	0.808	Surcharged
FSR: 100 years: +40 %: 120 mins: Winter	80.150	79.650	79.837	0.187	0.4	0.030	0.000	0.3	1.079	Surcharged
FSR: 100 years: +40 %: 180 mins: Winter	80.150	79.650	79.825	0.175	0.3	0.028	0.000	0.2	1.183	Surcharged
FSR: 100 years: +40 %: 240 mins: Winter	80.150	79.650	79.805	0.155	0.2	0.025	0.000	0.2	1.230	Surcharged
FSR: 100 years: +40 %: 360 mins: Winter	80.150	79.650	79.765	0.115	0.2	0.018	0.000	0.2	1.334	OK
FSR: 100 years: +40 %: 480 mins: Winter	80.150	79.650	79.723	0.073	0.1	0.012	0.000	0.1	1.394	OK
FSR: 100 years: +40 %: 600 mins: Winter	80.150	79.650	79.691	0.041	0.1	0.006	0.000	0.1	1.475	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

S4-FLOW CONTROL CHAMBER

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter	80.300	79.190	79.711	0.521	1.6	0.083	0.000	0.3	0.378	Surcharged
FSR: 100 years: +40 %: 30 mins: Winter	80.300	79.190	79.778	0.588	1.2	0.093	0.000	0.3	0.858	Surcharged
FSR: 100 years: +40 %: 60 mins: Winter	80.300	79.190	79.826	0.636	0.9	0.101	0.000	0.3	1.821	Surcharged
FSR: 100 years: +40 %: 120 mins: Winter	80.300	79.190	79.836	0.646	0.6	0.103	0.000	0.3	3.582	Surcharged
FSR: 100 years: +40 %: 180 mins: Winter	80.300	79.190	79.825	0.635	0.5	0.101	0.000	0.3	4.881	Surcharged
FSR: 100 years: +40 %: 240 mins: Winter	80.300	79.190	79.805	0.615	0.5	0.098	0.000	0.3	5.620	Surcharged
FSR: 100 years: +40 %: 360 mins: Winter	80.300	79.190	79.765	0.575	0.4	0.091	0.000	0.3	6.112	Surcharged
FSR: 100 years: +40 %: 480 mins: Winter	80.300	79.190	79.723	0.533	0.4	0.085	0.000	0.3	6.394	Surcharged
FSR: 100 years: +40 %: 600 mins: Winter	80.300	79.190	79.691	0.501	0.3	0.080	0.000	0.3	6.776	Surcharged

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

EX. SW MH

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +40 %: 15 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	0.360	OK
FSR: 100 years: +40 %: 30 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	0.840	OK
FSR: 100 years: +40 %: 60 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	1.803	OK
FSR: 100 years: +40 %: 120 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	3.566	OK
FSR: 100 years: +40 %: 180 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	4.868	OK
FSR: 100 years: +40 %: 240 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	5.613	OK
FSR: 100 years: +40 %: 360 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	6.110	OK
FSR: 100 years: +40 %: 480 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	6.393	OK
FSR: 100 years: +40 %: 600 mins: Winter	80.100	79.145	79.159	0.014	0.3	0.000	0.000	0.3	6.774	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	28/04/2022		
	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

SUB-BASE STORAGE

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FSR: 100 years: +40 %: 15 mins: Winter	79.711	79.711	0.511	0.511	5.0	1.472	0.000	0.000	1.6	0.978	8	21	OK
FSR: 100 years: +40 %: 30 mins: Winter	79.778	79.778	0.578	0.578	3.5	1.664	0.000	0.000	1.2	1.529	16	11	OK
FSR: 100 years: +40 %: 60 mins: Winter	79.826	79.826	0.626	0.626	2.4	1.804	0.000	0.000	0.9	2.472	17	4	OK
FSR: 100 years: +40 %: 120 mins: Winter	79.836	79.836	0.636	0.636	1.6	1.833	0.000	0.000	0.6	3.988	27	2	OK
FSR: 100 years: +40 %: 180 mins: Winter	79.825	79.825	0.625	0.625	1.2	1.799	0.000	0.000	0.5	5.031	34	4	OK
FSR: 100 years: +40 %: 240 mins: Winter	79.805	79.805	0.605	0.605	1.0	1.742	0.000	0.000	0.5	5.639	38	7	OK
FSR: 100 years: +40 %: 360 mins: Winter	79.765	79.765	0.565	0.565	0.7	1.628	0.000	0.000	0.4	6.113	39	13	OK
FSR: 100 years: +40 %: 480 mins: Winter	79.723	79.723	0.523	0.523	0.6	1.507	0.000	0.000	0.4	6.396	40	19	OK
FSR: 100 years: +40 %: 600 mins: Winter	79.691	79.691	0.491	0.491	0.5	1.414	0.000	0.000	0.3	6.777	41	24	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	S1		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (1)	Simple Junction		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (2)	S1		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (3)	S1		Time of Concentration	0.003	100	0	100	0.003
Green Roof	Simple Junction		Green Roof	0.001		0		0.001
TOTAL		**0.0**		**0.008**				**0.008**

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	28/04/2022		
	Designed by:	Checked by:	Approved By:
	FG	SL	SL
Report Title: Rainfall Analysis Criteria	Kemp House: 152 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England and Wales
M5-60 (mm)	21.0
Ratio R	0.442
Summer	☐
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Critical Storm

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 100 years: +40 %: 120 mins: Winter	80.390	79.690	79.837	0.147	1.3	0.023	0.000	1.3	3.846	OK
S2-CATCHPIT	FSR: 100 years: +40 %: 120 mins: Winter	80.550	79.660	79.837	0.177	1.3	0.028	0.000	1.3	3.844	Surcharged
Simple Junction	FSR: 100 years: +40 %: 120 mins: Winter		0.000	79.837	0.152	0.3			0.3	1.065	Surcharged
S3-CATCHPIT	FSR: 100 years: +40 %: 120 mins: Winter	80.150	79.650	79.837	0.187	0.4	0.030	0.000	0.3	1.079	Surcharged
S4-FLOW CONTROL CHAMBER	FSR: 100 years: +40 %: 120 mins: Winter	80.300	79.190	79.836	0.646	0.6	0.103	0.000	0.3	3.582	Surcharged
EX. SW MH	FSR: 100 years: +40 %: 120 mins: Winter	80.100	79.145	79.160	0.015	0.3	0.000	0.000	0.3	3.566	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 100 Year Storm Event + 40% CC - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Critical Storm

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
SUB-BASE STORAGE	FSR: 100 years: +40 %: 120 mins: Winter	79.836	79.836	0.636	0.636	1.6	1.833	0.000	0.000	0.6	3.988	27	2	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 30 Year Storm Event - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	S1		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (1)	Simple Junction		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (2)	S1		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (3)	S1		Time of Concentration	0.003	100	0	100	0.003
Green Roof	Simple Junction		Green Roof	0.001		0		0.001
TOTAL		**0.0**		**0.008**				**0.008**

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 30 Year Storm Event - FSR Data 0.3l/s Discharge Rate	28/04/2022		
	Designed by:	Checked by:	Approved By:
	FG	SL	SL
Report Title: Rainfall Analysis Criteria	Kemp House: 152 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England and Wales
M5-60 (mm)	21.0
Ratio R	0.442
Summer	☐
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 30 Year Storm Event - FSR Data 0.3l/s Discharge Rate	28/04/2022 Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Critical Storm

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 30 years: +0 %: 15 mins: Winter	80.390	79.690	79.730	0.040	2.4	0.006	0.000	2.4	1.120	OK
S2-CATCHPIT	FSR: 30 years: +0 %: 15 mins: Winter	80.550	79.660	79.699	0.039	2.4	0.006	0.000	2.3	1.118	OK
Simple Junction	FSR: 30 years: +0 %: 15 mins: Winter		0.000	79.699	0.014	0.3			0.3	0.226	OK
S3-CATCHPIT	FSR: 30 years: +0 %: 30 mins: Winter	80.150	79.650	79.663	0.013	0.3	0.002	0.000	0.3	0.355	OK
S4-FLOW CONTROL CHAMBER	FSR: 30 years: +0 %: 60 mins: Winter	80.300	79.190	79.586	0.396	0.5	0.063	0.000	0.3	1.334	Surcharged
EX. SW MH	FSR: 30 years: +0 %: 60 mins: Winter	80.100	79.145	79.159	0.014	0.3	0.000	0.000	0.3	1.319	OK

142 The Fairway, London, N14 4NN:	Date:		
142 The Fairway, London, N14 4NN 1 in 30 Year Storm Event - FSR Data 0.3l/s Discharge Rate	Designed by: FG	Checked by: SL	Approved By: SL
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 152 City Road London EC1V 2NX		

Critical Storm

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
SUB-BASE STORAGE	FSR: 30 years: +0 %: 60 mins: Winter	79.586	79.586	0.386	0.386	1.4	1.111	0.000	0.000	0.5	1.600	22	41	OK

APPENDIX D – WATER AUTHORITY ASSET PLANS

Asset location search

Property Searches

Nimbus Engineering Consultants LTD
Michealson Square
Office 8Livingston
LIVINGSTON
EH54 7DP

Search address supplied 142
The Fairway
London
N14 4NN

Your reference c2743

Our reference ALS/ALS Standard/2022_4632706

Search date 26 April 2022

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

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

0800 009 4540

Asset location search

Property Searches

Search address supplied: 142, The Fairway, London, N14 4NN

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 0800 009 4540, 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.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

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

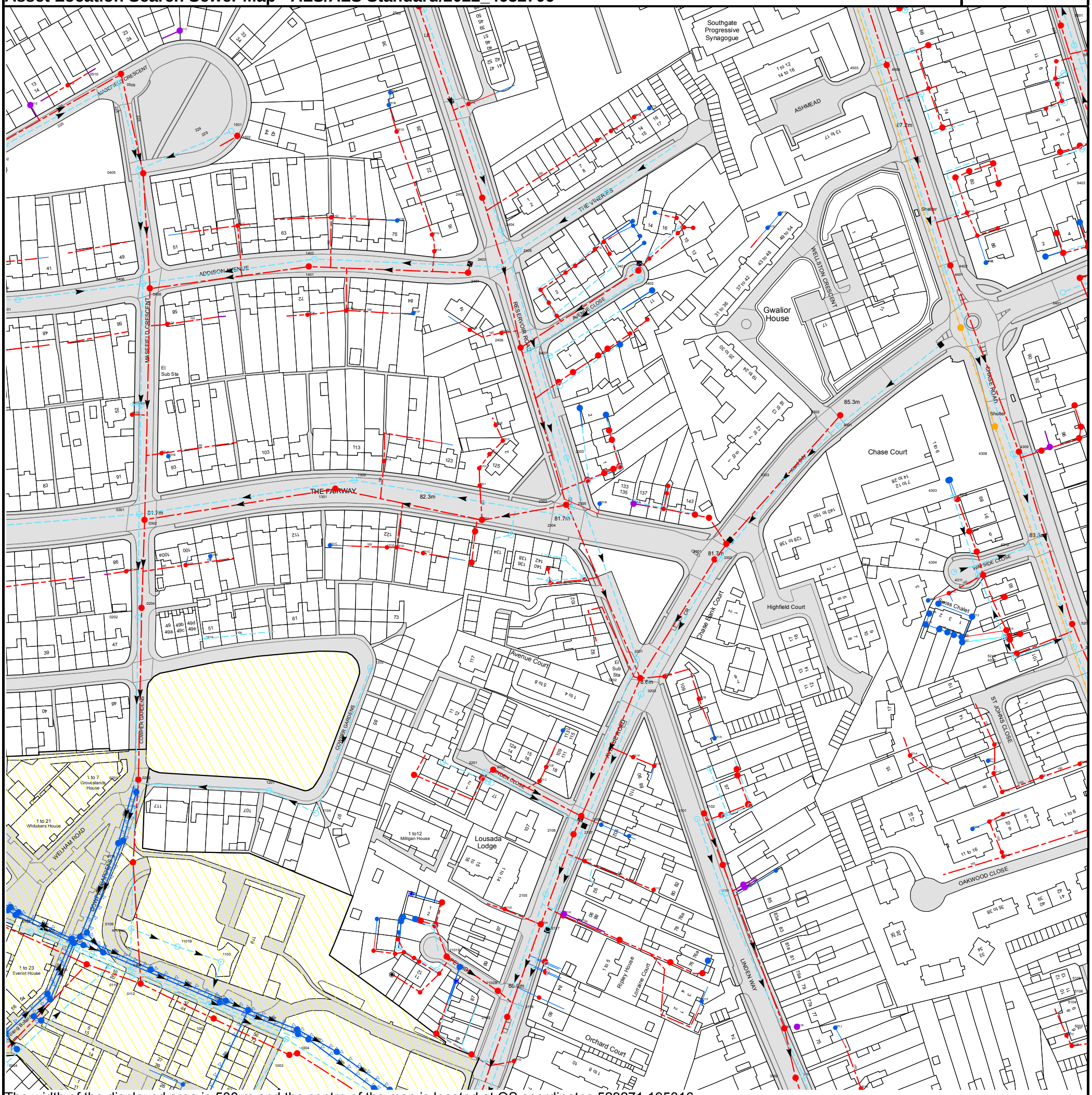
Clean Water queries

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

Asset Location Search Sewer Map - ALS/ALS Standard/2022_4632706



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 529271,195316

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.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
401K	n/a	n/a
5501	85.6	83.75
341E	n/a	n/a
341D	n/a	n/a
4503	87.22	84.14
4504	87.21	n/a
45CI	n/a	n/a
4506	n/a	n/a
45BC	n/a	n/a
4505	n/a	n/a
45EE	n/a	n/a
44BD	n/a	n/a
441D	n/a	n/a
44BF	n/a	n/a
44BG	n/a	n/a
44BI	n/a	n/a
44AI	n/a	n/a
45CD	n/a	n/a
55EF	n/a	n/a
55EG	n/a	n/a
54AG	n/a	n/a
551A	n/a	n/a
55EJ	n/a	n/a
54CH	n/a	n/a
55EE	n/a	n/a
55FA	n/a	n/a
55EI	n/a	n/a
5502	85.65	83.34
54BB	n/a	n/a
55EB	n/a	n/a
54CJ	n/a	n/a
55BB	n/a	n/a
55BE	n/a	n/a
4311	n/a	n/a
4304	n/a	n/a
43BC	n/a	n/a
4312	n/a	n/a
43BB	n/a	n/a
4305	n/a	n/a
4303	n/a	n/a
43CA	n/a	n/a
43CC	n/a	n/a
4308	n/a	n/a
4309	n/a	n/a
43BG	n/a	n/a
53AF	n/a	n/a
53AE	n/a	n/a
53AD	n/a	n/a
53AC	n/a	n/a
54CC	n/a	n/a
5401	85.57	83.33
5402	85.67	83.66
4401	n/a	n/a
4402	n/a	n/a
441B	n/a	n/a
441C	n/a	n/a
44AH	n/a	n/a
54AH	n/a	n/a
54AI	n/a	n/a
44BJ	n/a	n/a
5205	81.86	78.69
4207	n/a	n/a
4212	n/a	n/a
4206	n/a	n/a
4205	n/a	n/a
42CB	n/a	n/a
4208	n/a	n/a
42CC	n/a	n/a
4209	n/a	n/a
4210	n/a	n/a
4215	n/a	n/a
4211	n/a	n/a
5204	82.3	81.91
4213	n/a	n/a
4216	n/a	n/a
4214	n/a	n/a
421B	n/a	n/a
42BH	n/a	n/a
421C	n/a	n/a
42BG	n/a	n/a
411D	n/a	n/a
411A	n/a	n/a
411C	n/a	n/a
411B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
421H	n/a	n/a
521A	n/a	n/a
421G	n/a	n/a
521B	n/a	n/a
421I	n/a	n/a
421A	n/a	n/a
421F	n/a	n/a
4201	n/a	n/a
5210	n/a	n/a
301E	n/a	n/a
401J	n/a	n/a
501C	n/a	n/a
501B	n/a	n/a
2117	n/a	n/a
2104	n/a	n/a
21GD	n/a	n/a
211H	n/a	n/a
211D	n/a	n/a
2105	n/a	n/a
3103	n/a	n/a
311G	n/a	n/a
311C	n/a	n/a
311B	n/a	n/a
311E	n/a	.6
3104	n/a	n/a
211F	n/a	n/a
311H	n/a	n/a
2107	n/a	n/a
2106	n/a	n/a
211G	n/a	n/a
3101	n/a	n/a
31BE	n/a	n/a
2108	n/a	n/a
31BC	n/a	n/a
31CC	n/a	n/a
3102	n/a	n/a
31BD	n/a	n/a
31BB	n/a	n/a
31BA	n/a	n/a
2205	n/a	n/a
1003	n/a	n/a
1004	n/a	n/a
1002	n/a	n/a
n/a	n/a	n/a
1001	n/a	n/a
n/a	n/a	n/a
1102	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
0112	n/a	n/a
0110	n/a	n/a
n/a	n/a	n/a
0108	n/a	n/a
0107	n/a	n/a
1103	n/a	n/a
11AG	n/a	n/a
1101B	n/a	n/a
0109	n/a	n/a
11AF	n/a	n/a
0111	72.2	n/a
n/a	n/a	n/a
n/a	n/a	n/a
1104	n/a	n/a
n/a	n/a	n/a
1201	n/a	n/a
0201	n/a	n/a
0004	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
0102	n/a	n/a
n/a	n/a	n/a
0103	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
0104	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
0105	n/a	n/a
n/a	n/a	n/a
0106	n/a	n/a
n/a	n/a	n/a
20BF	n/a	n/a
21FC	n/a	n/a
21FA	n/a	n/a
21GB	n/a	n/a
21EJ	n/a	n/a
21EI	n/a	n/a
2101B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
21EG	n/a	n/a
21EH	n/a	n/a
21GA	n/a	n/a
21FE	n/a	n/a
21FD	n/a	n/a
21FH	n/a	n/a
21EC	n/a	n/a
21FJ	n/a	n/a
21EF	n/a	n/a
21EE	n/a	n/a
21FF	n/a	n/a
21EB	n/a	n/a
211A	n/a	n/a
211C	n/a	n/a
211B	n/a	n/a
31CI	n/a	n/a
31CH	n/a	n/a
311F	n/a	n/a
31CF	n/a	n/a
31CD	n/a	n/a
3001	n/a	n/a
3002	n/a	n/a
3003	n/a	n/a
21CE	n/a	n/a
20BH	n/a	n/a
2102B	n/a	n/a
2103	n/a	n/a
201D	n/a	n/a
2116	n/a	n/a
211E	n/a	n/a
101H	n/a	n/a
24CH	n/a	n/a
24BC	n/a	n/a
2408	n/a	n/a
24CG	n/a	n/a
24CF	n/a	n/a
251B	n/a	n/a
34BE	n/a	n/a
34BD	n/a	n/a
34BA	n/a	n/a
341B	n/a	n/a
351B	n/a	n/a
34CG	n/a	n/a
3401	n/a	n/a
341C	n/a	n/a
3402	n/a	n/a
34BB	n/a	n/a
34AJ	n/a	n/a
34CB	n/a	n/a
351A	n/a	n/a
34CF	n/a	n/a
34BG	n/a	n/a
341A	n/a	n/a
34BI	n/a	n/a
34CA	n/a	n/a
34CE	n/a	n/a
34BJ	n/a	n/a
34CD	n/a	n/a
33BH	n/a	n/a
33CB	n/a	n/a
33BG	n/a	n/a
33CA	n/a	n/a
2305	n/a	n/a
2302	n/a	n/a
231B	n/a	n/a
331A	n/a	n/a
331B	n/a	n/a
33BF	n/a	n/a
33BE	n/a	n/a
3303	n/a	n/a
23DF	n/a	n/a
23DB	n/a	n/a
23DA	n/a	n/a
33BC	n/a	n/a
33BD	n/a	n/a
33BB	n/a	n/a
2303	n/a	n/a
231G	n/a	n/a
231F	n/a	n/a
23CJ	n/a	n/a
23CI	n/a	n/a
4301	n/a	n/a
231E	n/a	n/a
4302	n/a	n/a
23DD	n/a	n/a
2208	n/a	n/a
221C	n/a	n/a
2204	n/a	n/a
32AH	n/a	n/a
2201	n/a	n/a
2202	n/a	n/a
32AG	n/a	n/a
32AJ	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
221B	n/a	n/a
321E	n/a	n/a
321F	n/a	n/a
321A	n/a	n/a
221A	n/a	n/a
321B	n/a	n/a
3203	n/a	n/a
3202	n/a	n/a
321C	n/a	n/a
3201	n/a	n/a
22AD	n/a	n/a
23ED	n/a	n/a
23EA	n/a	n/a
23EE	n/a	n/a
231J	n/a	n/a
3301	n/a	n/a
3302	n/a	n/a
23EG	n/a	n/a
331C	n/a	n/a
23CA	n/a	n/a
33BI	n/a	n/a
2304	n/a	n/a
2502	89.11	n/a
2503	n/a	n/a
45DD	n/a	n/a
45EC	n/a	n/a
45DE	n/a	n/a
23DH	n/a	n/a
23CF	n/a	n/a
23CD	n/a	n/a
23CC	n/a	n/a
24CI	n/a	n/a
2407	n/a	n/a
2406	n/a	n/a
241C	n/a	n/a
241D	n/a	n/a
24BH	n/a	n/a
24CD	n/a	n/a
241F	n/a	n/a
24BG	n/a	n/a
24BF	n/a	n/a
24CC	n/a	n/a
2401	n/a	n/a
24BE	n/a	n/a
2403	n/a	n/a
24BD	n/a	n/a
241A	n/a	n/a
2405	n/a	n/a
241E	n/a	n/a
241G	n/a	n/a
2404	n/a	n/a
241B	n/a	n/a
2402	n/a	n/a
251C	n/a	n/a
251D	n/a	n/a
251E	n/a	n/a
031C	n/a	n/a
031D	n/a	n/a
0202	n/a	n/a
0203	n/a	n/a
0301	n/a	n/a
0204	n/a	n/a
0302	n/a	n/a
031A	n/a	n/a
031B	n/a	n/a
131D	n/a	n/a
121A	n/a	n/a
131B	n/a	n/a
131C	n/a	n/a
1301	n/a	n/a
1302	n/a	n/a
1202	n/a	n/a
131A	n/a	n/a
131E	n/a	n/a
231D	n/a	n/a
2206	n/a	n/a
231C	n/a	n/a
2203	n/a	n/a
23BG	n/a	n/a
23BH	n/a	n/a
231H	n/a	n/a
231I	n/a	n/a
2301	n/a	n/a

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.

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

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.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

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

- Ancillary
- Drop Pipe
- Control Valve
- 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.

- Inlet
- Outfall
- Undefined End

Other Symbols

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

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement
- Conduit Bridge
- Subway
- Tunnel

Ducts may contain high voltage cables. Please check with Thames Water.

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) 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 indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. 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, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2022_4632706

The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 529271, 195316.

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.

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- **Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

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.
6. 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 **0800 009 4540** 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**

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