SUDS REPORT FOR LAND ADJACENT TO 2F BEACON CLOSE, UXBRIDGE, UB8 1PX

DOCUMENT NUMBER.: C3155-R1-REV-A

PREPARED BY

Nimbus
ENGINEERING CONSULTANTS

Contents

1. INTRODUCTION

1.1 Appointment

Nimbus Engineering Consultants Ltd have been appointed to provide a solution on the management of Surface Water runoff and to ensure that there is no risk of flooding caused by the proposed construction of a new dwelling.

London Borough of Hillingdon have imposed the following planning condition, relating to surface water:

"3. No development above ground level shall take place until a scheme for the provision of sustainable water management and water efficiency shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall:

i. Provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;

ii. Include a timetable for its implementation; and

iii. Provide a management and maintenance plan for the lifetime of the development The scheme shall also demonstrate the use of methods to minimise the use of potable water through water collection, reuse and recycling and will:

iv. Provide details of water collection facilities to capture excess rainwater;

v. *Provide details of how rain and grey water will be recycled and reused in the development;*

vi. *Provide details of how the dwelling will achieve a water efficiency standard of no more than 110 litres per person per day maximum water consumption (to include a fixed factor of water for outdoor use of 5 litres per person per day in accordance with the optional requirement defined within Approved Document G of the Building Regulations).*

Thereafter the development shall be implemented and retained/maintained in accordance with these details for as long as the development remains in existence

REASON To ensure the development does not increase the risk of flooding in accordance with Policies DMEI 9 and DMEI 10 of the Hillingdon Local Plan Part 2 (2020) and Policies SI2 and SI 13 of the London Plan (2021)"

1.2 Objectives

This report will address the concerns raised by the Borough and provide details 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 (BGS), the superficial deposits at the site are unknown, as shown in Figure 1 below. The bedrock in the area is of the London Clay Formation consisting of clay and silt, as shown in Figure 2, below.

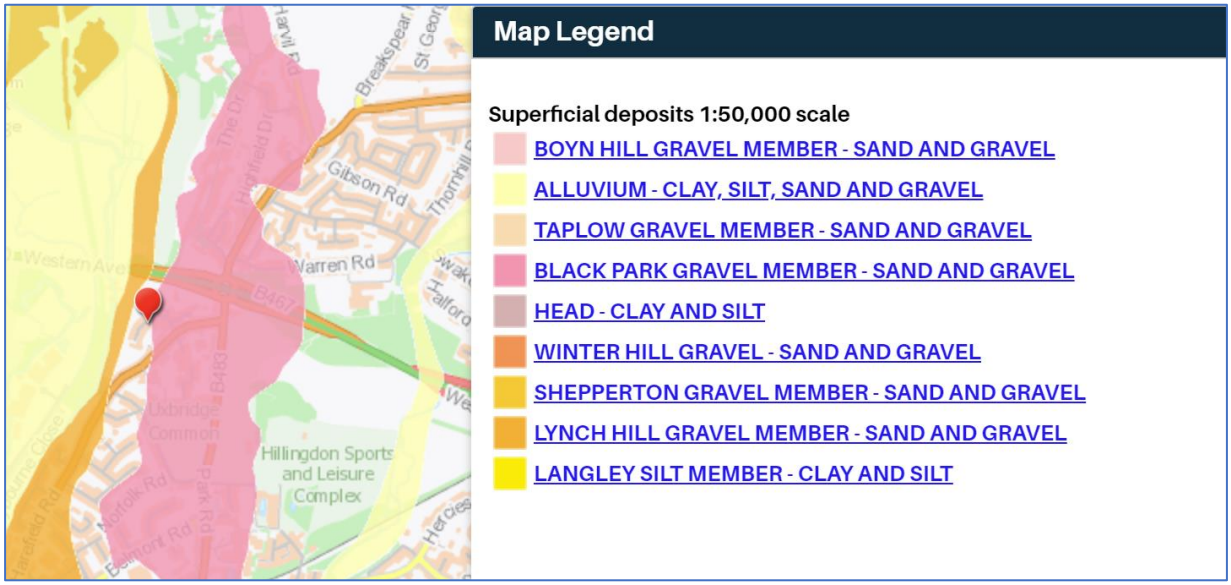


Figure 1- Superficial deposits at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2024]. Base mapping is provided by ESRI)).

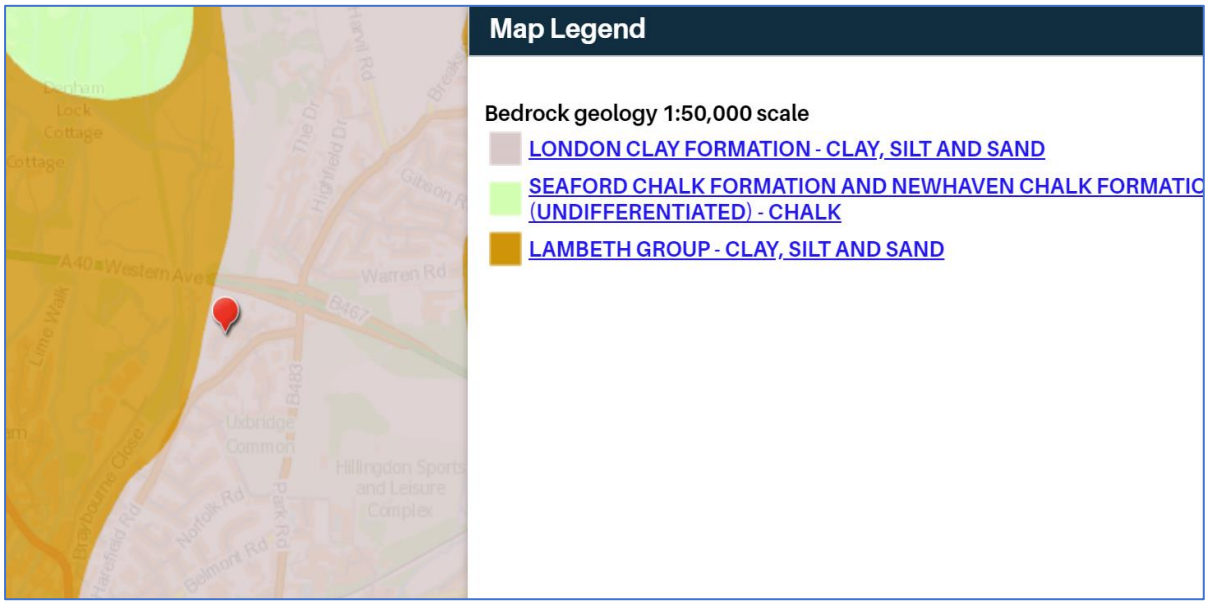


Figure 2- Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2024]. Base mapping is provided by ESRI))

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 runoff containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures deigned 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.

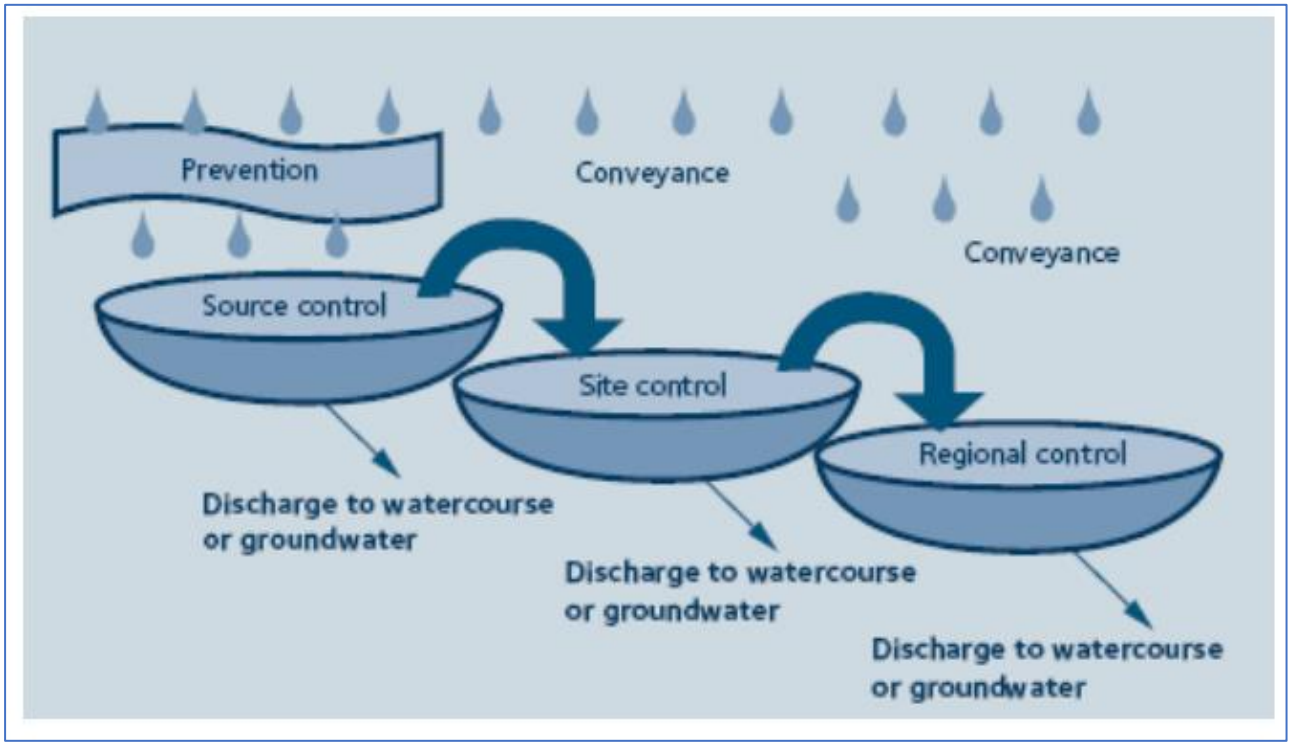


Figure 3 – SuDS Management Train

4. SuDS PROPOSALS FOR DEVELOPMENT

In accordance with the CIRIA SuDS Manual C753, 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 Land Adjacent to 2F Beacon Close, Uxbridge, UB8 1PX.

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 wall mounted rainwater harvesting tank will be provided	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 the superficial geology being unsuitable for infiltration this has been discounted as an option	No
Rainwater Partial Infiltration to Ground (Source Control)	Installation of permeable/porous surfacing	All new proposed hardstanding areas will be formed of porous surfacing	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 basins, Infiltration Trenches and raingarden planters	Due to roof being pitched, green or sedum roofs are not feasible, however raingarden planters have been provided	No
Rainwater discharge direct to a watercourse	All surface water runoff on site discharged at a restricted rate to a nearby watercourse	N/A	N/A

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	The surface water run off will be attenuated and then discharged to the existing surface water sewer at the site at a restricted rate	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	N/A

Table 1: SuDS Control Measures for Development

5. PROPOSED SOLUTION

NPPF states that any proposed SuDS solution is to be proportionate to the nature and scale of the development.

In order to ensure that the SuDS management train has been considered fully, we have proposed one wall mounted rainwater harvesting tank.

Furthermore, all of the new 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 runoff at source, with the surface water runoff from all sloped area to be caught by slot drains.

The remaining surface water runoff from the site will be conveyed into a below-ground attenuation tank with restricted surface water being conveyed via gravity to an existing surface water manhole adjacent to site at a rate of 0.3 l/s. The proposed SuDS solution is shown on drawing number C3155-03, in Appendix A.

To ensure a feasible solution was proposed a hydraulic model was built using Infodrainage, to simulate rainfall events for a 1 in 100 year storm event, with a 45% allowance for climate change. The results of the hydraulic model can be found in Appendix B.

We believe the above solution is proportionate to the nature and scale of the development.

6. TIMESCALE AND MAINTENANCE OF WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, the homeowners will be responsible to oversee the long-term maintenance of the drains. The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide. A management and maintenance plan drawing has also been included in Appendix A.

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months

- The catchpit to the soakaway should be checked and emptied regularly or after a high storm event for the accumulation of debris/silt in order to ensure that there are no blockages

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 2: Operation and maintenance requirement for RWH systems.

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 glyphosate 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 3: Operation and maintenance requirements for pervious pavements.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	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
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/ rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Table 4: Operation and maintenance requirements for attenuation storage tanks.

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 5: Operation and maintenance requirements for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no access to chambers or removal of parts to be undertaken by homeowners

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

7. WATER EFFICIENCY CALCULATIONS

The planning condition states:

i. Provide details of how the dwelling will achieve a water efficiency standard of no more than 110 litres per person per day maximum water consumption (to include a fixed factor of water for outdoor use of 5 litres per person per day in accordance with the optional requirement defined within Approved Document G of the Building Regulations).

Therefore we have provided water efficiency calculations in Appendix D, which show that the total water consumption from this dwelling will be 109.l litres per person per day.

8. CONCLUSIONS

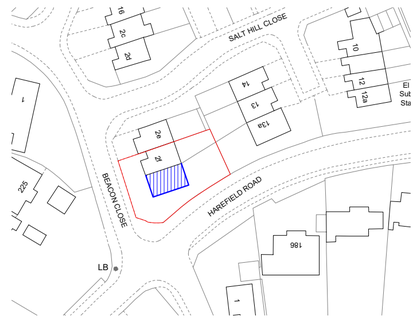
The purpose of this report and associated drawings, is to satisfy the planning condition imposed by the local planning authority relating to surface water flows arising due to the development at this site.

As requested, SuDS have been incorporated into this design, in the form of:

1. One wall mounted rainwater harvesting tanks
2. Porous surfacing on all proposed hardstanding areas
3. Attenuation tank with restricted discharge into adjacent surface water sewer

Water efficiency calculations have also been carried out which show the total water consumption from this dwelling will be 109.1 litres per person per dwelling per day, therefore this part of the condition can also be discharged.

APPENDIX A – DRAWINGS



Location Plan (1:1250)

New 1.8m fence

60.48

Bike store

450mm high brick retaining wall to support bank up to boundary

60.37

Grass / Planting

Take down the extg wall and reinstate garden

New 1.8m fence

Patio

58.23

61.46

Extg planting to remain

Lounge

Dining

2f

Family

New dwelling

Form new wc

Wc

Kitchen

Convert garage into study

Study

3710

Raise roof over garage/study

2254

2870

Convert extg door to window

59.84

59.82

3604

Kitchen

3015

St

Path

Grass / Planting

450 high brick retaining wall to support bank up to boundary

Rear

Canopy to match 2f

Wc

ramp

Bin Store

Acco drain

Path

New 1.8m brick wall

Extg planting to remain

61.31

61.17

80.19

Parking space

Grass / Planting

60.26

60.38

60.71

60.81

60.66

New crossover

59.85

60.09

60.56

60.63

BEACON CLOSE

Site Plan (1:50)

0 1 2 3 4 5 6 7

SCALE BAR 1:50

PRELIMINARY

Site Plan

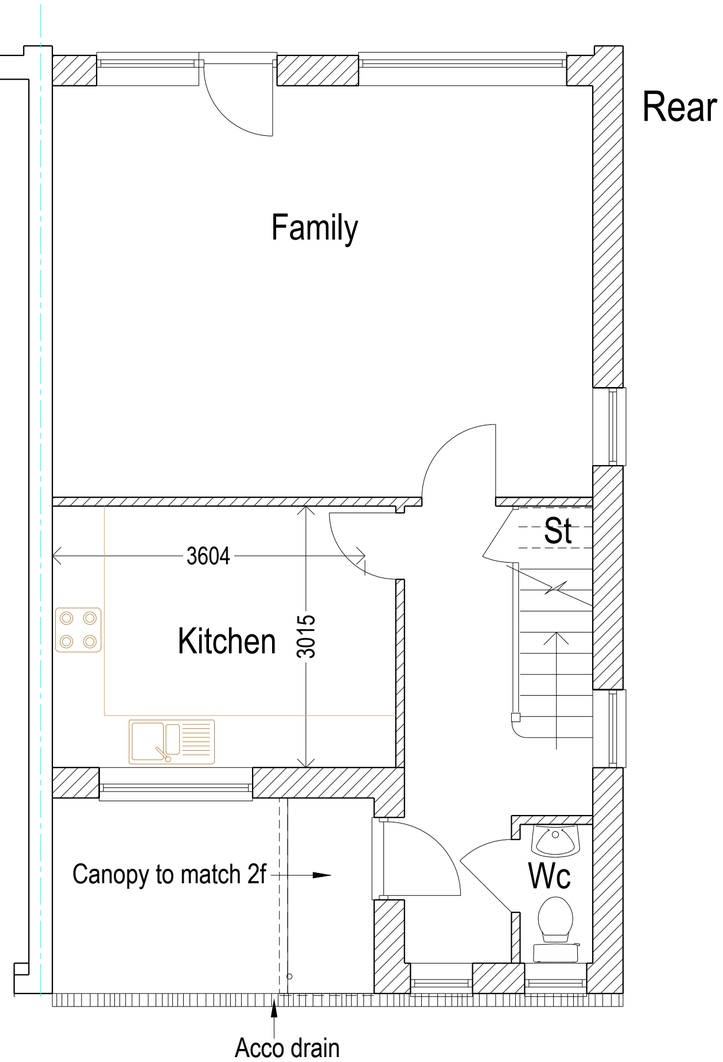
New dwelling and alterations to existing
2f Beacons Close, Uxbridge, UB8 1PX
For Kearns Developments Ltd

HDA ARCHITECTURE
8 LIME GROVE, BUGBROOKE
NORTHAMPTON
NN7 3QZ
TEL : 01604 622226
29 PEGASUS COURT
194 HORN LANE, ACTON
LONDON W3 6PT
TEL : 020 3892 4798

SCALE	DATE	DRN/CHD
1:50 (A1)	6/23	IB

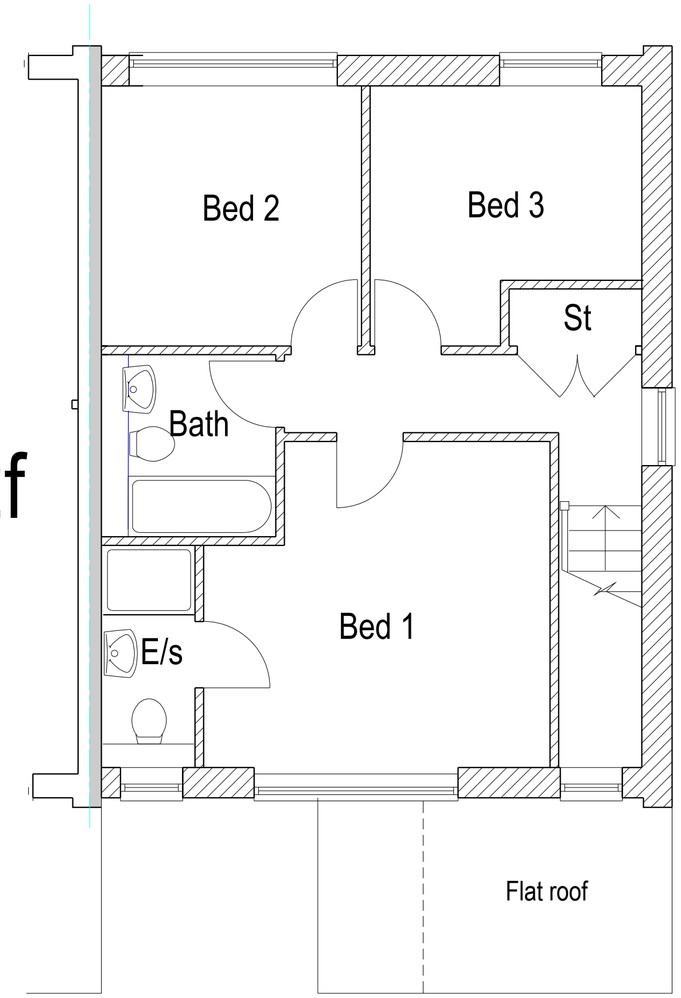
DRG NO 23013/10 P1

2f



Ground

2f



First

0 1 2 3 4 5 6 7

SCALE BAR 1:50

PRELIMINARY

Plans

New dwelling and alterations to existing
2f Beacons Close, Uxbridge, UB8 1PX
For Kearns Developments Ltd

HDA ARCHITECTURE
8 LIME GROVE, BUGBROOKE
NORTHAMPTON
NN7 3QZ
TEL : 01604 622226
29 PEGASUS COURT
194 HORN LANE, ACTON
LONDON W3 6PT
TEL : 020 3892 4798

SCALE	DATE	DRN/CHD
1:50 (A2)	6/23	IB

DRG NO 23013/11 P1

Side

Rear

Front

0 1 2 3 4 5 6 7

SCALE BAR 1:50

PRELIMINARY

Elevations

New dwelling and alterations to existing
2f Beacons Close, Uxbridge, UB8 1PX
For Kearns Developments Ltd

HDA ARCHITECTURE
8 LIME GROVE, BUGBROOKE
NORTHAMPTON
NN7 3QZ
TEL : 01604 622226
29 PEGASUS COURT
194 HORN LANE, ACTON
LONDON W3 9PT
TEL : 020 3892 4798

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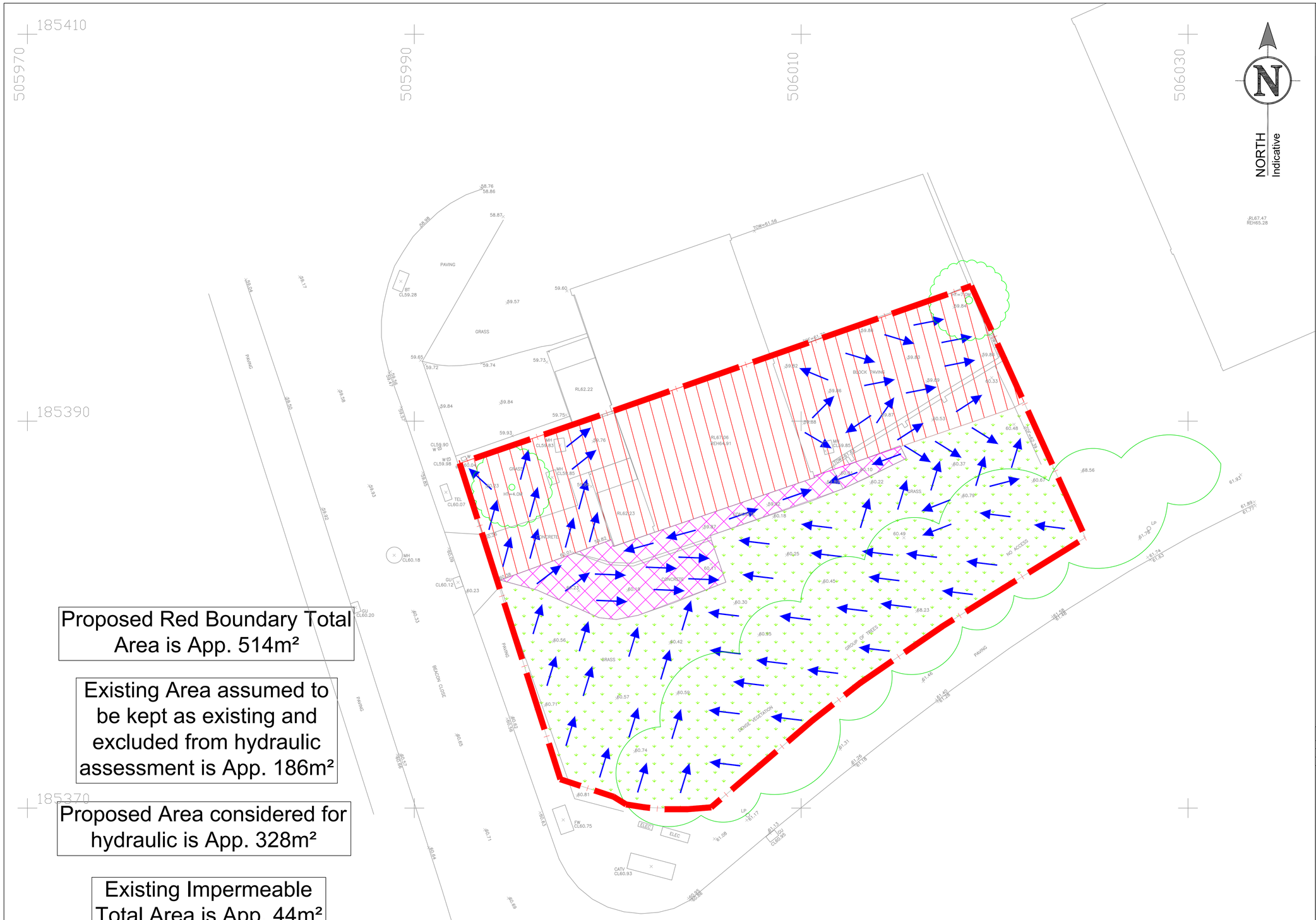
DRG NO
23013/12 P1



Proposed Red Boundary Total Area is App. 514m²

Existing Area assumed to be kept as existing and excluded from hydraulic assessment is App. 186m²

Proposed Area considered for hydraulic is App. 328m²

Existing Impermeable Total Area is App. 44m²

Existing Soft Total Area is App. 284m²

Existing Impermeable area represent app. 13% from total considered area.

IMPORTANT
FOR DETAILS ABOUT POST DEVELOPMENT IMPERMEABLE AREAS PLEASE SEE DRAWING C3155-02

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Existing Soft Areas as per topographical survey. Soft areas include grass, shrubs and trees but for ease of reference is shown as same hatch.
- Existing site that is considered to be kept as existing therefore it is excluded from the hydraulic assessment.
- Existing impermeable areas as per topographical survey. Impermeable area is made from the existing concrete pavement.
- Proposed Site Boundary.
- 60.37 Existing AOD pre-development spot levels as per topographical survey.
- Existing Exceedance SW routes as per information from topographical survey.

NOTES:

1. DRAWING WILL NEED TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS FROM ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER AND M&E.
2. EXISTING GROUND LEVELS ARE BASED ON TOPOGRAPHICAL SURVEY UNDERTAKEN BY TOPSURVEY ON 22 MAY 2023. FOR CONTROL POINTS AND CONTROL STATIONS PLEASE REFER TO THAT DRAWING. THEIR DRAWING REFERENCE 2023_67.
3. EXISTING ROUTES FOR UNDERGROUND UTILITIES ARE CURRENTLY UNKNOWN.

NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

PROJECT:
C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

TITLE:
Existing Pre-Development Impermeable Areas.

CLIENT:
Kearns Development Ltd

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

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY: M.H	SCALE: 1:100	DRAWING NUMBER: C3155-01	REV: A
DATE: 05-12-23	SIZE: A1		

Proposed Red Boundary Total Area is App. 514m²

Existing Area assumed to be kept as existing and excluded from hydraulic assessment is App. 186m²

Proposed Area considered for hydraulic is App. 328m²

Proposed Impermeable Total Area is App. 122m²

Existing and Proposed Soft Total Area is App. 206m²

Proposed Impermeable area represent app. 37% from total considered area.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Soft Areas as per Landscape drawing. Soft areas include grass, shrubs and trees but for ease of reference is shown as same hatch.
- Existing site that is considered to be kept as existing therefore it is excluded from the hydraulic assessment.
- Proposed Impermeable Area from roof and pavements of proposed structures. Shape of structures as per proposed site layout.
- Proposed Site Boundary.
- Proposed Channel Drains as per Surface Water Strategy Layout.
- Proposed assumed overland flow routes that are based on the levels information from the topographical survey. To be confirmed once the detailed external levels design is undertaken.
- 60.25 × Existing levels as per topographical survey.

NOTES:

1. DRAWING WILL NEED TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS FROM ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER AND M&E.
2. ROOT PROTECTION AREA WAS NOT PROVIDED AND ONCE THAT INFORMATION IS MADE AVAILABLE DESIGNED WILL NEED TO BE REVIEWED.

EXISTING AND PROPOSED LEVELS ARE BASED ON TOPOGRAPHICAL SURVEY UNDERTAKEN BY TOPSURVEY ON 22 MAY 2023. FOR CONTROL POINTS AND CONTROL STATIONS PLEASE REFER TO THAT DRAWING. THEIR DRAWING REFERENCE 2023_67.

3. PROPOSED FLOW ARROWS TO BE CONFIRMED ONCE A DETAILED EXTERNAL LEVELS DESIGN IS PROVIDED.
4. EXISTING ROUTES FOR UNDERGROUND UTILITIES ARE CURRENTLY UNKNOWN.

NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

PROJECT:
C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

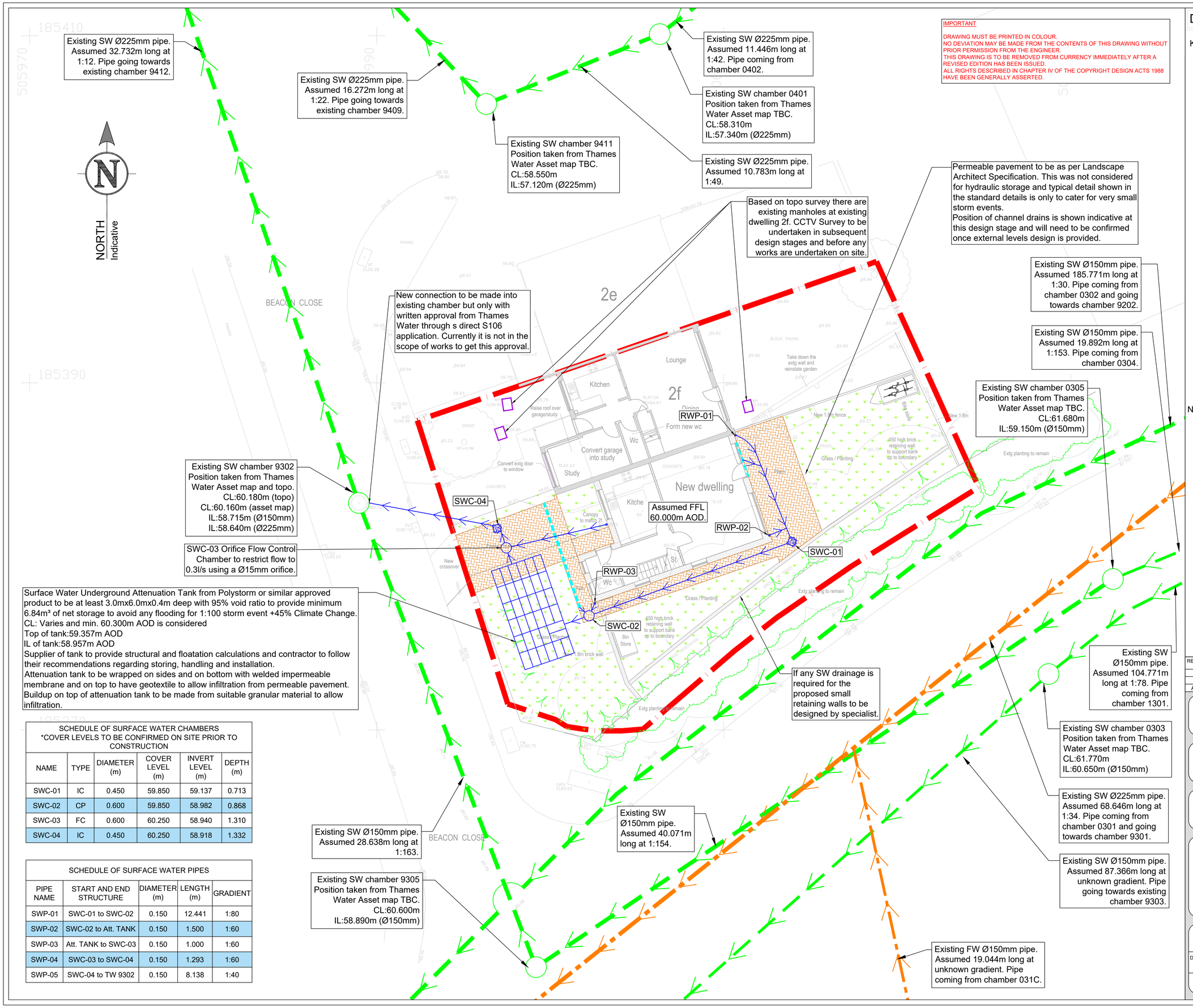
TITLE:
Proposed Post-Development Impermeable Areas.

CLIENT:
Kearns Development Ltd

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

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY: M.H	SCALE: 1:100	DRAWING NUMBER: C3155-02	REV: A
DATE: 05-12-23	SIZE: A1		

IMPORTANT
FOR DETAILS ABOUT PRE DEVELOPMENT IMPERMEABLE AREAS PLEASE SEE DRAWING C3155-01



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DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Surface Water Pipes.
- Existing Thames Water SW public sewer.
- Existing Thames Water FW public sewer.
- Existing Assumed Drainage chambers found on site during topo survey. TBC with a CCTV Survey.
- Channel drain position shown indicative. Threshold drains to be detailed by architect.
- Proposed Site Boundary.
- Proposed RWP (blue) shown indicative. Locations TBC by Architect or M&E.
- Proposed SW inspection/catchpit chamber.
- Existing SW (green) and FW chambers as per Thames Water asset map.
- Proposed Permeable Pavement as per Landscape Architect specification. permeable pavement not considered for hydraulic storage. Permeable pavement only suitable for very small storm events.
- Proposed geocellular underground attenuation tank to be Polystorm or similar approved product. Supplier to provide structural calc and guidance for installation.

NOTES:

1. DRAWING WILL NEED TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS FROM ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER AND M&E.
2. ROOT PROTECTION AREAS CURRENTLY NOT PROVIDED. IF THAT INFORMATION IS MADE AVAILABLE DESIGN WILL NEED TO BE CHECKED.
3. EXISTING AND PROPOSED LEVELS ARE BASED ON TOPOGRAPHICAL SURVEY AND WILL NEED TO BE CONFIRMED.
4. FINISHED FLOOR LEVELS TO BE CONFIRMED BY ARCHITECT DURING SUBSEQUENT DESIGN STAGES.
5. THE RESTRICTED FLOW RATE OF 0.3l/s IS BASED ON MINIMUM CONSIDERED FLOW IN ORDER TO AVOID CONSTANT BLOCKAGES.
6. CATCH-PITS TO HAVE 300mm SUMP FROM VALUE SHOWN IN TABLE.
7. CONTRACTOR IS RESPONSIBLE FOR COORDINATION THIS DRAINAGE DESIGN WITH OTHER UTILITIES AND CHECK FOR CLASHES. ANY UNAVOIDABLE CLASHES TO BE REPORTED TO DRAINAGE DESIGN ENGINEER.
8. ALL SURFACE WATER PIPES TO BE Ø150mm LAID AT A GRADIENT BETWEEN 1:10 AND 1:100 UNLESS OTHERWISE NOTED.
9. COVERS FOR CHAMBERS TO BE B125 IN GARDEN AREAS AND C250 IN ACCESS DRIVE. IN ROAD OR WHERE EMERGENCY VEHICLES ARE TO ACCESS THE AREA D400 COVERS TO BE USED.
10. CURRENTLY RWP ARE SHOWN INDICATIVE AND ARCHITECT WILL NEED TO CONFIRM/SUPPLY THEM IN DETAILED DESIGN STAGE.
11. CONNECTION TO BE MADE TO EXISTING SW THAMES WATER SEWER ONLY ONCE WRITTEN APPROVAL IS RECEIVED FROM THEM.

NOT FOR CONSTRUCTION

SCHEDULE OF SURFACE WATER CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

NAME	TYPE	DIAMETER (m)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)
SWC-01	IC	0.450	59.850	59.137	0.713
SWC-02	CP	0.600	59.850	58.982	0.868
SWC-03	FC	0.600	60.250	58.940	1.310
SWC-04	IC	0.450	60.250	58.918	1.332

SCHEDULE OF SURFACE WATER PIPES

PIPE NAME	START AND END STRUCTURE	DIAMETER (m)	LENGTH (m)	GRADIENT
SWP-01	SWC-01 to SWC-02	0.150	12.441	1:80
SWP-02	SWC-02 to Att. TANK	0.150	1.500	1:60
SWP-03	Att. TANK to SWC-03	0.150	1.000	1:60
SWP-04	SWC-03 to SWC-04	0.150	1.293	1:60
SWP-05	SWC-04 to TW 9302	0.150	8.138	1:40

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

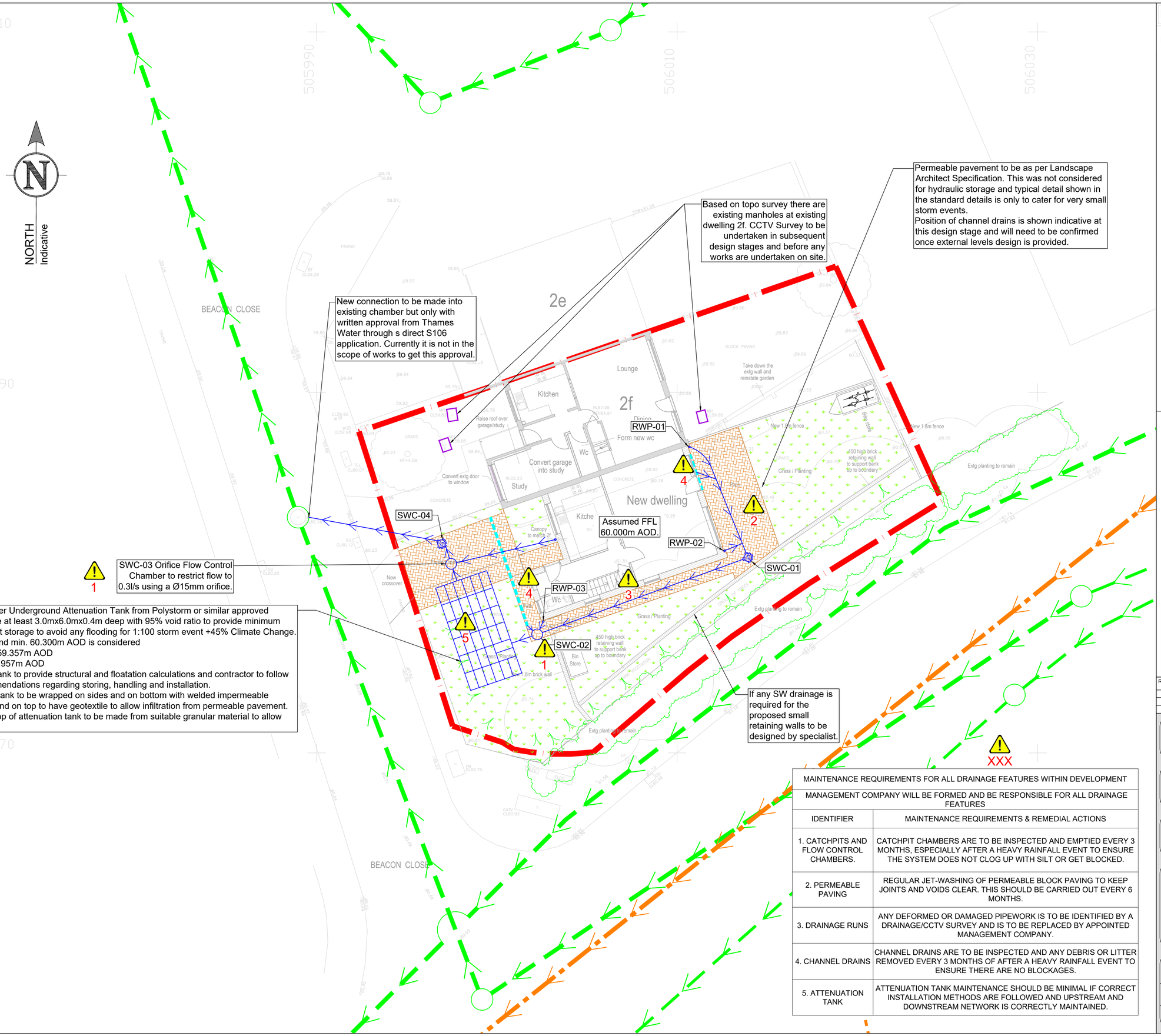
PROJECT:
C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

TITLE:
Proposed Surface Water Strategy Layout.

CLIENT:
Kearns Development Ltd

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

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY: M.H	SCALE: 1:100	DRAWING NUMBER: C3155-03	REV: A
DATE: 05-12-23	SIZE: A1		



MAINTENANCE REQUIREMENTS FOR ALL DRAINAGE FEATURES WITHIN DEVELOPMENT	
MANAGEMENT COMPANY WILL BE FORMED AND BE RESPONSIBLE FOR ALL DRAINAGE FEATURES	
IDENTIFIER	MAINTENANCE REQUIREMENTS & REMEDIAL ACTIONS
1. CATCHPITS AND FLOW CONTROL CHAMBERS.	CATCHPIT CHAMBERS 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 GET BLOCKED.
2. PERMEABLE PAVING	REGULAR JET-WASHING OF PERMEABLE BLOCK PAVING TO KEEP JOINTS AND VOIDS CLEAR. THIS SHOULD BE CARRIED OUT EVERY 6 MONTHS.
3. DRAINAGE RUNS	ANY DEFORMED OR DAMAGED PIPEWORK IS TO BE IDENTIFIED BY A DRAINAGE/CCTV SURVEY AND IS TO BE REPLACED BY APPOINTED MANAGEMENT COMPANY.
4. CHANNEL DRAINS	CHANNEL DRAINS ARE TO BE INSPECTED AND ANY DEBRIS OR LITTER REMOVED EVERY 3 MONTHS OF AFTER A HEAVY RAINFALL EVENT TO ENSURE THERE ARE NO BLOCKAGES.
5. ATTENUATION TANK	ATTENUATION TANK MAINTENANCE SHOULD BE MINIMAL IF CORRECT INSTALLATION METHODS ARE FOLLOWED AND UPSTREAM AND DOWNSTREAM NETWORK IS CORRECTLY MAINTAINED.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Surface Water Pipes.
- Existing Thames Water SW public sewer.
- Existing Thames Water FW public sewer.
- Existing Assumed Drainage chambers found on site during topo survey. TBC with a CCTV Survey.
- Channel drain position shown indicative. Threshold drains to be detailed by architect.
- Proposed Site Boundary.
- Proposed RWP (blue) shown indicative. Locations TBC by Architect or M&E.
- Proposed SW inspection/catchpit chamber.
- Existing SW (green) and FW chambers as per Thames Water asset map.
- Proposed Permeable Pavement as per Landscape Architect specification. permeable pavement not considered for hydraulic storage. Permeable pavement only suitable for very small storm events.
- Proposed geocellular underground attenuation tank to be Polystorm or similar approved product. Supplier to provide structural calc and guidance for installation.

NOT FOR CONSTRUCTION

IMPORTANT

DRAWING MUST BE PRINTED IN COLOUR.
NO DEVIATION MAY BE MADE FROM THE CONTENTS OF THIS DRAWING WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
THIS DRAWING IS TO BE REMOVED FROM CURRENCY IMMEDIATELY AFTER A REVISED EDITION HAS BEEN ISSUED.

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

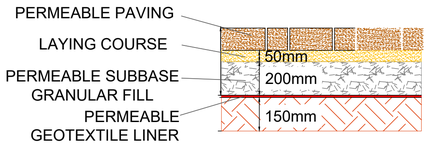
PROJECT:
C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

TITLE:
Proposed Surface Water Maintenance and Management Plan.

CLIENT:
Kearns Development Ltd

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

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY: M.H	SCALE: 1:100	DRAWING NUMBER: C3155-04	REV: A
DATE: 05-12-23	SIZE: A1		



PERMEABLE PAVING INDICATIVE CROSS-SECTION (WITHOUT STORAGE)

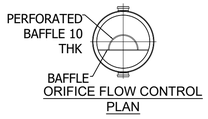
(DEPTH OF SUBBASE TO BE DESIGNED BY OTHERS BASED ON CBR VALUE AND VEHICULAR LOADING)

NOT TO SCALE

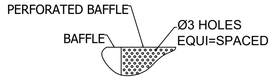
TRENCH BEDDING AND FILL MATERIALS

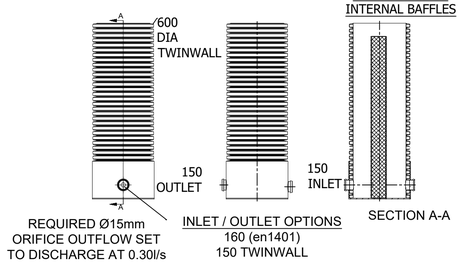
GRANULAR BEDDING TYPE A

TYPE	USE FOR NOMINAL PIPE (DIA.)	% PASSING BY MASS BS 410 SIEVE SIZES (mm)						
		63	37.5	20	14	10	5	2.36
A40	>1350	100	85-100	0-25	–	0-5	–	–
A20	600-1350	–	100	85-100	–	0-25	0-5	–
A14	300-525	–	–	100	85-100	0-50	0-10	–
A10	<300	–	–	–	100	85-100	0-25	0-5



ORIFICE FLOW CONTROL PLAN



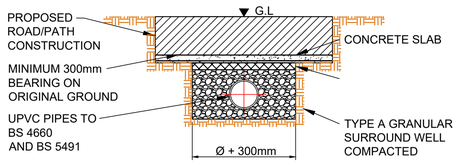


INLET / OUTLET OPTIONS
160 (en1401)
150 TWINWALL

ORIFICE FLOW CONTROL ELEVATION
NOT TO SCALE

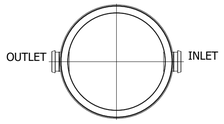
ORIFICE FLOW CONTROL ELEVATION
NOT TO SCALE

ORIFICE FLOW CONTROL SECTION A-A
NOT TO SCALE

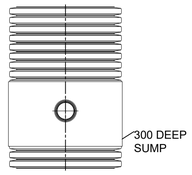


PROTECTION FOR PIPES LAID AT SHALLOW DEPTHS (UPVC PIPES)

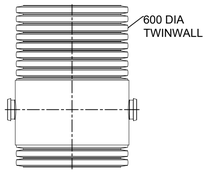
NOT TO SCALE



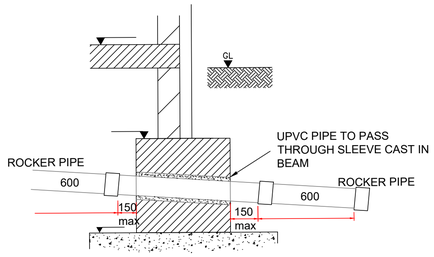
CATCHPIT CHAMBER PLAN
NOT TO SCALE



CATCHPIT CHAMBER ELEVATION
NOT TO SCALE

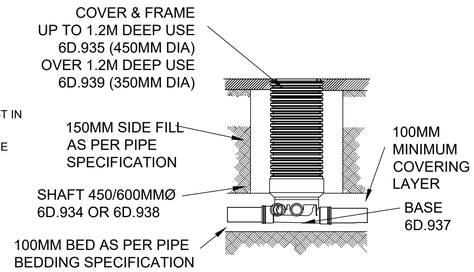


CATCHPIT CHAMBER ELEVATION
NOT TO SCALE



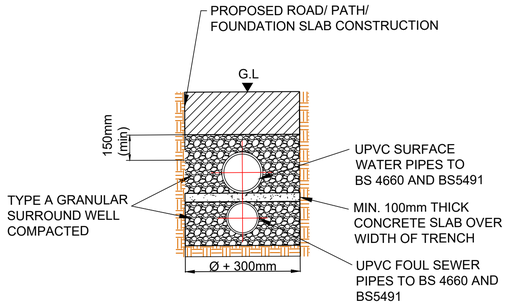
DETAIL OF DRAIN PASSING THROUGH GROUND BEAM OR OTHER STRUCTURE

NOT TO SCALE



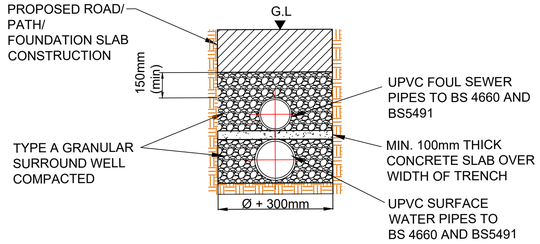
TYPICAL INSPECTION CHAMBER DETAIL (WITHIN PRIVATE LAND)

NOT TO SCALE



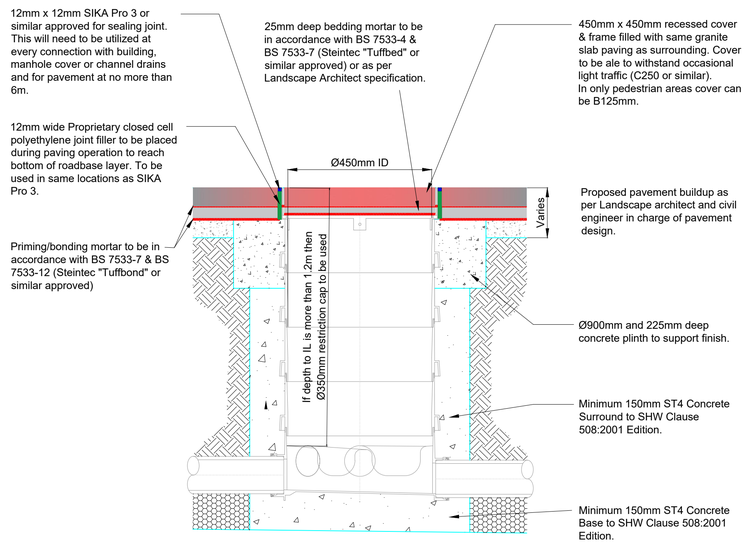
PROTECTION FOR SURFACE WATER SEWER CROSSINGS ABOVE FOUL SEWERS (UPVC PIPES)

NOT TO SCALE



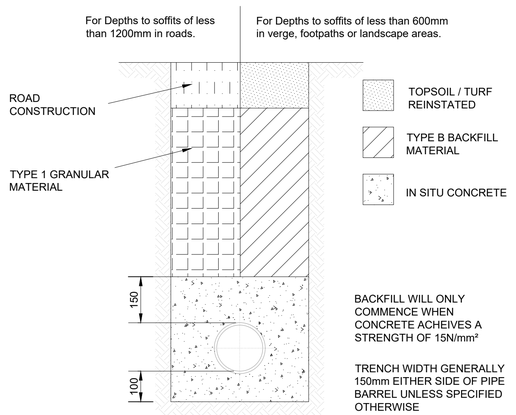
PROTECTION FOR FOUL SEWER CROSSINGS ABOVE SURFACE WATER SEWERS (UPVC PIPES)

NOT TO SCALE



Ø450mm SURFACE AND FOUL WATER INSPECTION CHAMBER TYPICAL INSTALLATION DETAIL

NOT TO SCALE

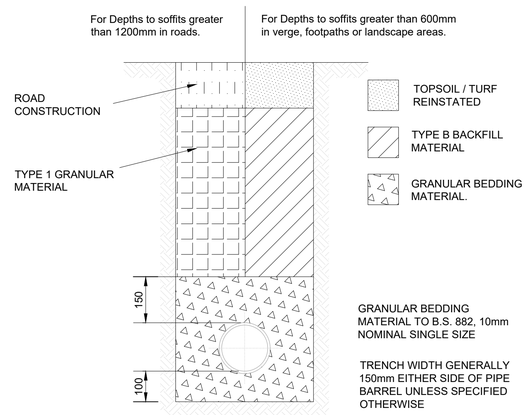


CONCRETE BED AND SURROUND TO BE GEN3 SULPHATE RESISTING WITH FLEXIBLE JOINTS 18mm THICK, AT ALTERNATE PIPE JOINTS.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS Z BEDDING FOR DRAINAGE PIPES
NOT TO SCALE



GRANULAR BACKFILL MATERIAL DTp TYPE 1. DTp CLAUSES 803 OR 804 RESPECTIVELY OR SUITABLE APPROVED EQUIVALENT COMPACTED IN LAYERS OF 150mm.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS S BEDDING FOR DRAINAGE PIPES
NOT TO SCALE

NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

PROJECT:

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

TITLE:

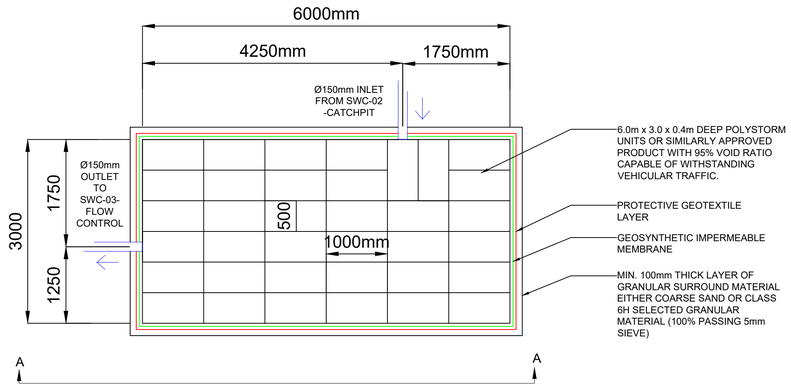
Standard Drainage Details - Sheet 01 from 02.

CLIENT:

Kearns Development Ltd

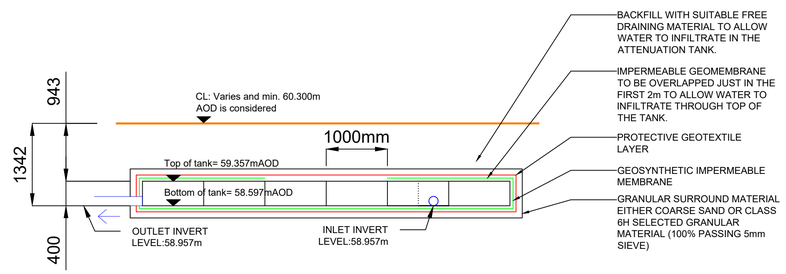
Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY:	SCALE:	DRAWING NUMBER:	REV:
M.H	N/A	C3155-05	A
DATE:	SIZE:		
05-12-23	A1		



ATTENUATION TANK - PLAN VIEW

SCALE 1:50

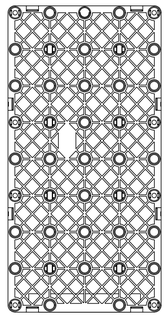


ATTENUATION TANK - SECTION A-A

SCALE 1:50

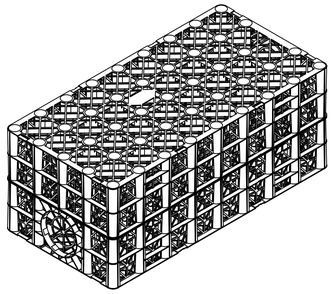
POLYSTORM CELLS

Product Code: PSM1, PSM1A & PSM2



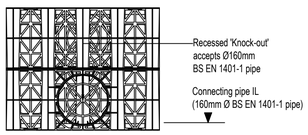
PLAN VIEW

NOT TO SCALE



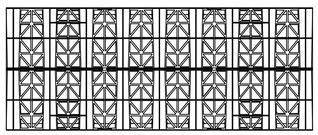
ISOMETRIC VIEW

NOT TO SCALE



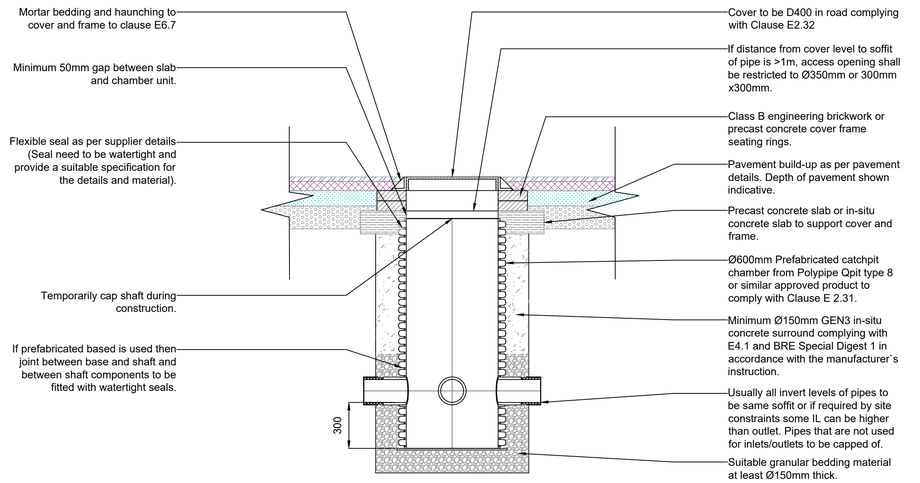
END ELEVATION

NOT TO SCALE



SIDE ELEVATION

NOT TO SCALE



TYPICAL DETAIL FOR INSPECTION CATCHPIT CHAMBER IN ROAD

(ALL REFERENCES TO CLAUSES ARE FROM SEWERAGE SECTOR GUIDANCE - FORMER SFA)

SCALE 1:20

NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	05-12-23	M.H	For Information.	SL	SL

PROJECT:

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX

TITLE:

Standard Drainage Details - Sheet 02 from 02.

CLIENT:

Kearns Development Ltd

Nimbus ENGINEERING CONSULTANTS
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CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	05-12-23	S.L	05-12-23
DRN BY: M.H	SCALE: N/A	DRAWING NUMBER: C3155-06	REV: A
DATE: 05-12-23	SIZE: A1		

APPENDIX B – HYDRAULIC MODELLING RESULTS

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	60.300
Depth (m)	0.400
Base Level (m)	58.957
Number of Crates Long	6
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	7.783

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 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	SWC-01		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (1)	SWC-02		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.012**				**0.013**

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	04/12/2023 Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: Rainfall Analysis Criteria	Kemp House:: 124 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.405
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

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

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: UK and Ireland Rural Runoff Calculator	Kemp House:: 124 City Road London EC1V 2NX		

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.033
SAAR (mm)	691.0
Soil	0.3
Region	Region 6
Urban	0.13
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.2	0.1	0.2	0.2

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Depth

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
SWC-01	FSR: 100 years: +45 %: 180 mins: Winter	59.850	59.137	59.429	0.292	1.2	0.046	0.000	1.1	5.169	Surcharged
SWC-02	FSR: 100 years: +45 %: 180 mins: Winter	59.850	58.982	59.429	0.447	2.3	0.126	0.000	2.2	10.107	Surcharged
SWC-03 (FC)	FSR: 100 years: +45 %: 180 mins: Winter	60.250	58.940	59.429	0.489	0.4	0.138	0.000	0.3	5.149	Surcharged
SWC-04	FSR: 100 years: +45 %: 180 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	5.136	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Avg. Depth

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)	Percentage Available (%)	Status
Attenuation Tank	FSR: 100 years: +45 %: 180 mins: Winter	59.429	59.429	0.472	0.472	2.2	6.915	0.000	0.000	0.4	5.485	11.156	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	60.300
Depth (m)	0.400
Base Level (m)	58.957
Number of Crates Long	6
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	7.783

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 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	SWC-01		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (1)	SWC-02		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.012**				**0.013**

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: Rainfall Analysis Criteria	Kemp House:: 124 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.405
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

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

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Title: UK and Ireland Rural Runoff Calculator	Kemp House:: 124 City Road London EC1V 2NX			

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.033
SAAR (mm)	691.0
Soil	0.3
Region	Region 6
Urban	0.13
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.2	0.1	0.2	0.2

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Summary Results for SWC-01: Rank By: Max. Depth

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: +45 %: 15 mins: Summer	59.850	59.137	59.194	0.057	5.6	0.009	0.000	5.5	2.379	OK
FSR: 100 years: +45 %: 15 mins: Winter	59.850	59.137	59.194	0.057	5.3	0.009	0.000	5.2	2.376	OK
FSR: 100 years: +45 %: 30 mins: Summer	59.850	59.137	59.259	0.122	3.7	0.019	0.000	3.6	3.066	OK
FSR: 100 years: +45 %: 30 mins: Winter	59.850	59.137	59.259	0.122	3.5	0.019	0.000	3.4	3.066	OK
FSR: 100 years: +45 %: 60 mins: Summer	59.850	59.137	59.317	0.180	3.2	0.029	0.000	3.1	3.820	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	59.850	59.137	59.317	0.180	2.6	0.029	0.000	2.5	3.819	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	59.850	59.137	59.371	0.234	2.3	0.037	0.000	2.3	4.645	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	59.850	59.137	59.379	0.242	1.6	0.039	0.000	1.6	4.651	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	59.850	59.137	59.414	0.277	1.8	0.044	0.000	1.6	5.169	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	59.850	59.137	59.429	0.292	1.2	0.046	0.000	1.1	5.169	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	59.850	59.137	59.411	0.274	1.4	0.044	0.000	1.3	5.557	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	59.850	59.137	59.420	0.283	1.0	0.045	0.000	0.9	5.564	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	59.850	59.137	59.384	0.247	1.1	0.039	0.000	1.0	6.107	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	59.850	59.137	59.384	0.247	0.7	0.039	0.000	0.6	6.137	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	59.850	59.137	59.356	0.219	0.9	0.035	0.000	0.8	6.486	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	59.850	59.137	59.352	0.215	0.6	0.034	0.000	0.5	6.492	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	59.850	59.137	59.346	0.209	0.7	0.033	0.000	0.7	6.786	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	59.850	59.137	59.338	0.201	0.5	0.032	0.000	0.4	6.780	Surcharged

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Summary Results for SWC-02: Rank By: Max. Depth

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: +45 %: 15 mins: Summer	59.850	58.982	59.194	0.212	11.1	0.060	0.000	10.5	4.537	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	59.850	58.982	59.194	0.212	10.4	0.060	0.000	9.9	4.534	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	59.850	58.982	59.259	0.277	7.2	0.078	0.000	6.9	5.912	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	59.850	58.982	59.259	0.277	6.8	0.078	0.000	6.5	5.912	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	59.850	58.982	59.317	0.335	6.3	0.095	0.000	5.9	7.401	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	59.850	58.982	59.317	0.335	5.1	0.095	0.000	4.8	7.407	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	59.850	58.982	59.371	0.389	4.5	0.110	0.000	4.2	9.047	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	59.850	58.982	59.379	0.397	3.3	0.112	0.000	3.1	9.052	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	59.850	58.982	59.414	0.432	3.4	0.122	0.000	3.2	10.101	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	59.850	58.982	59.429	0.447	2.3	0.126	0.000	2.2	10.107	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	59.850	58.982	59.411	0.429	2.7	0.121	0.000	2.6	10.878	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	59.850	58.982	59.420	0.438	1.9	0.124	0.000	1.8	10.878	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	59.850	58.982	59.384	0.402	2.0	0.114	0.000	1.9	11.999	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	59.850	58.982	59.384	0.402	1.3	0.114	0.000	1.3	12.016	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	59.850	58.982	59.356	0.374	1.7	0.106	0.000	1.6	12.852	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	59.850	58.982	59.352	0.370	1.1	0.105	0.000	1.0	12.846	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	59.850	58.982	59.346	0.364	1.4	0.103	0.000	1.3	13.486	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	59.850	58.982	59.338	0.356	0.9	0.101	0.000	0.9	13.468	Surcharged

Summary Results for SWC-03 (FC): Rank By: Max. Depth

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: +45 %: 15 mins: Summer	60.250	58.940	59.194	0.254	0.8	0.072	0.000	0.2	0.304	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	60.250	58.940	59.194	0.254	0.8	0.072	0.000	0.2	0.305	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	60.250	58.940	59.259	0.319	0.6	0.090	0.000	0.3	0.721	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	60.250	58.940	59.259	0.319	0.6	0.090	0.000	0.3	0.722	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	60.250	58.940	59.317	0.377	0.6	0.107	0.000	0.3	1.609	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	60.250	58.940	59.317	0.377	0.5	0.107	0.000	0.3	1.609	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	60.250	58.940	59.371	0.431	0.5	0.122	0.000	0.3	3.402	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	60.250	58.940	59.379	0.439	0.4	0.124	0.000	0.3	3.404	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	60.250	58.940	59.414	0.474	0.4	0.134	0.000	0.3	5.144	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	60.250	58.940	59.429	0.489	0.4	0.138	0.000	0.3	5.149	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	60.250	58.940	59.411	0.471	0.4	0.133	0.000	0.3	6.739	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	60.250	58.940	59.420	0.480	0.4	0.136	0.000	0.3	6.742	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	60.250	58.940	59.384	0.444	0.4	0.126	0.000	0.3	9.468	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	60.250	58.940	59.384	0.444	0.3	0.126	0.000	0.3	9.477	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	60.250	58.940	59.356	0.416	0.3	0.118	0.000	0.3	11.648	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	60.250	58.940	59.352	0.412	0.3	0.117	0.000	0.3	11.647	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	60.250	58.940	59.346	0.406	0.3	0.115	0.000	0.3	13.211	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	60.250	58.940	59.338	0.398	0.3	0.113	0.000	0.3	13.199	Surcharged

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Summary Results for SWC-04: Rank By: Max. Depth

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: +45 %: 15 mins: Summer	60.250	58.918	58.928	0.010	0.2	0.000	0.000	0.2	0.291	OK
FSR: 100 years: +45 %: 15 mins: Winter	60.250	58.918	58.928	0.010	0.2	0.000	0.000	0.2	0.292	OK
FSR: 100 years: +45 %: 30 mins: Summer	60.250	58.918	58.929	0.011	0.3	0.000	0.000	0.3	0.708	OK
FSR: 100 years: +45 %: 30 mins: Winter	60.250	58.918	58.929	0.011	0.3	0.000	0.000	0.3	0.709	OK
FSR: 100 years: +45 %: 60 mins: Summer	60.250	58.918	58.929	0.011	0.3	0.000	0.000	0.3	1.595	OK
FSR: 100 years: +45 %: 60 mins: Winter	60.250	58.918	58.929	0.011	0.3	0.000	0.000	0.3	1.595	OK
FSR: 100 years: +45 %: 120 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	3.388	OK
FSR: 100 years: +45 %: 120 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	3.390	OK
FSR: 100 years: +45 %: 180 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	5.131	OK
FSR: 100 years: +45 %: 180 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	5.136	OK
FSR: 100 years: +45 %: 240 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	6.726	OK
FSR: 100 years: +45 %: 240 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	6.729	OK
FSR: 100 years: +45 %: 360 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	9.456	OK
FSR: 100 years: +45 %: 360 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	9.466	OK
FSR: 100 years: +45 %: 480 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	11.638	OK
FSR: 100 years: +45 %: 480 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	11.637	OK
FSR: 100 years: +45 %: 600 mins: Summer	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	13.204	OK
FSR: 100 years: +45 %: 600 mins: Winter	60.250	58.918	58.930	0.012	0.3	0.000	0.000	0.3	13.192	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Summary Results for Attenuation Tank: Rank By: Max. Avg. Depth

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)	Percentage Available (%)	Status
FSR: 100 years: +45 %: 15 mins: Summer	59.194	59.194	0.237	0.237	10.5	4.060	0.000	0.000	0.8	0.593	47.837	OK
FSR: 100 years: +45 %: 15 mins: Winter	59.194	59.194	0.237	0.237	9.9	4.056	0.000	0.000	0.8	0.594	47.890	OK
FSR: 100 years: +45 %: 30 mins: Summer	59.259	59.259	0.302	0.302	6.9	5.161	0.000	0.000	0.6	1.072	33.687	OK
FSR: 100 years: +45 %: 30 mins: Winter	59.259	59.259	0.302	0.302	6.5	5.160	0.000	0.000	0.6	1.072	33.696	OK
FSR: 100 years: +45 %: 60 mins: Summer	59.317	59.317	0.360	0.360	5.9	6.158	0.000	0.000	0.6	1.998	20.872	OK
FSR: 100 years: +45 %: 60 mins: Winter	59.317	59.317	0.360	0.360	4.8	6.163	0.000	0.000	0.5	1.999	20.817	OK
FSR: 100 years: +45 %: 120 mins: Summer	59.371	59.371	0.414	0.414	4.2	6.860	0.000	0.000	0.5	3.782	11.864	OK
FSR: 100 years: +45 %: 120 mins: Winter	59.379	59.379	0.422	0.422	3.1	6.868	0.000	0.000	0.4	3.783	11.760	OK
FSR: 100 years: +45 %: 180 mins: Summer	59.414	59.414	0.457	0.457	3.2	6.901	0.000	0.000	0.4	5.480	11.336	OK
FSR: 100 years: +45 %: 180 mins: Winter	59.429	59.429	0.472	0.472	2.2	6.915	0.000	0.000	0.4	5.485	11.156	OK
FSR: 100 years: +45 %: 240 mins: Summer	59.411	59.411	0.454	0.454	2.6	6.897	0.000	0.000	0.4	7.022	11.379	OK
FSR: 100 years: +45 %: 240 mins: Winter	59.420	59.420	0.463	0.463	1.8	6.906	0.000	0.000	0.4	7.025	11.267	OK
FSR: 100 years: +45 %: 360 mins: Summer	59.384	59.384	0.427	0.427	1.9	6.872	0.000	0.000	0.4	9.648	11.701	OK
FSR: 100 years: +45 %: 360 mins: Winter	59.384	59.384	0.427	0.427	1.3	6.872	0.000	0.000	0.3	9.658	11.708	OK

FSR: 100 years: +45 %: 480 mins: Summer	59.356	59.356	0.399	0.399	1.6	6.820	0.000	0.000	0.3	11.743	12.377	OK
FSR: 100 years: +45 %: 480 mins: Winter	59.352	59.352	0.395	0.395	1.0	6.753	0.000	0.000	0.3	11.742	13.234	OK
FSR: 100 years: +45 %: 600 mins: Summer	59.346	59.346	0.389	0.389	1.3	6.644	0.000	0.000	0.3	13.247	14.639	OK
FSR: 100 years: +45 %: 600 mins: Winter	59.338	59.338	0.381	0.381	0.9	6.513	0.000	0.000	0.3	13.235	16.317	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 0.3l/s	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	60.300
Depth (m)	0.400
Base Level (m)	58.957
Number of Crates Long	6
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	7.783

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 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	SWC-01		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (1)	SWC-02		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.012**				**0.013**

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: Rainfall Analysis Criteria	Kemp House:: 124 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.405
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	40.000

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

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling	04/12/2023		
1:30 Years Storm Event + 40% Climate Change	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 0.3l/s	M.H	S.L	S.L
Report Title:	Kemp House::		
UK and Ireland Rural Runoff Calculator	124 City Road London EC1V 2NX		

Nimbus ENGINEERING CONSULTANTS

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.033
SAAR (mm)	691.0
Soil	0.3
Region	Region 6
Urban	0.13
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.2	0.1	0.2	0.2

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Depth

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
SWC-01	FSR: 30 years: +40 %: 180 mins: Winter	59.850	59.137	59.255	0.118	0.9	0.019	0.000	0.9	3.879	OK
SWC-02	FSR: 30 years: +40 %: 180 mins: Winter	59.850	58.982	59.255	0.273	1.8	0.077	0.000	1.7	7.541	Surcharged
SWC-03 (FC)	FSR: 30 years: +40 %: 180 mins: Winter	60.250	58.940	59.255	0.315	0.3	0.089	0.000	0.3	4.300	Surcharged
SWC-04	FSR: 30 years: +40 %: 180 mins: Winter	60.250	58.918	58.929	0.011	0.3	0.000	0.000	0.3	4.288	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX			

Critical Storm Per Item: Rank By: Max. Avg. Depth

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)	Percentage Available (%)	Status
Attenuation Tank	FSR: 30 years: +40 %: 180 mins: Winter	59.255	59.255	0.298	0.298	1.7	5.099	0.000	0.000	0.3	4.526	34.489	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX:	Date:		
Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	60.300
Depth (m)	0.400
Base Level (m)	58.957
Number of Crates Long	6
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m^3)	7.783

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 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	SWC-01		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (1)	SWC-02		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.012**				**0.013**

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: Rainfall Analysis Criteria	Kemp House:: 124 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.405
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0.000

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

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Title: UK and Ireland Rural Runoff Calculator	Kemp House:: 124 City Road London EC1V 2NX			

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.033
SAAR (mm)	691.0
Soil	0.3
Region	Region 6
Urban	0.13
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.2	0.1	0.2	0.2

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Depth

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
SWC-01	FSR: 30 years: +0 %: 15 mins: Summer	59.850	59.137	59.176	0.039	3.0	0.006	0.000	2.9	1.286	OK
SWC-02	FSR: 30 years: +0 %: 180 mins: Winter	59.850	58.982	59.163	0.181	1.3	0.051	0.000	1.2	5.425	Surcharged
SWC-03 (FC)	FSR: 30 years: +0 %: 180 mins: Winter	60.250	58.940	59.163	0.223	0.2	0.063	0.000	0.2	3.538	Surcharged
SWC-04	FSR: 30 years: +0 %: 180 mins: Winter	60.250	58.918	58.928	0.010	0.2	0.000	0.000	0.2	3.527	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX			

Critical Storm Per Item: Rank By: Max. Avg. Depth

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)	Percentage Available (%)	Status
Attenuation Tank	FSR: 30 years: +0 %: 180 mins: Winter	59.163	59.163	0.206	0.206	1.2	3.515	0.000	0.000	0.2	3.677	54.832	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	60.300
Depth (m)	0.400
Base Level (m)	58.957
Number of Crates Long	6
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	7.783

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 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	SWC-01		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (1)	SWC-02		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.012**				**0.013**

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Title: Rainfall Analysis Criteria	Kemp House:: 124 City Road London EC1V 2NX		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.405
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000

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

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Title: UK and Ireland Rural Runoff Calculator	Kemp House:: 124 City Road London EC1V 2NX			

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.033
SAAR (mm)	691.0
Soil	0.3
Region	Region 6
Urban	0.13
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.2	0.1	0.2	0.2

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Depth

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
SWC-01	FSR: 1 years: +0 %: 15 mins: Summer	59.850	59.137	59.162	0.025	1.2	0.004	0.000	1.2	0.526	OK
SWC-02	FSR: 1 years: +0 %: 180 mins: Winter	59.850	58.982	59.036	0.054	0.6	0.015	0.000	0.6	2.410	OK
SWC-03 (FC)	FSR: 1 years: +0 %: 180 mins: Winter	60.250	58.940	59.036	0.096	0.1	0.027	0.000	0.1	2.117	OK
SWC-04	FSR: 1 years: +0 %: 180 mins: Winter	60.250	58.918	58.926	0.008	0.1	0.000	0.000	0.1	2.109	OK

C3155 - Land Adj to 2F Beacon Close, Uxbridge, UB8 1PX: Proposed New Dwelling 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 0.3l/s	Date: 04/12/2023		
	Designed by: M.H	Checked by: S.L	Approved By: S.L
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Avg. Depth

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)	Percentage Available (%)	Status
Attenuation Tank	FSR: 1 years: +0 %: 180 mins: Winter	59.036	59.036	0.079	0.079	0.6	1.352	0.000	0.000	0.1	2.154	82.628	OK

APPENDIX C – WATER AUTHORITY ASSET PLANS

Asset location search

Property Searches

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

Search address supplied 2f
Beacon Close
Uxbridge
UB8 1PX

Your reference C3155

Our reference ALS/ALS Standard/2023_4917826

Search date 28 November 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk

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

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

0800 009 4540

Asset location search

Property Searches

Search address supplied: 2f, Beacon Close, Uxbridge, UB8 1PX

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

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

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

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0345 3572401

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

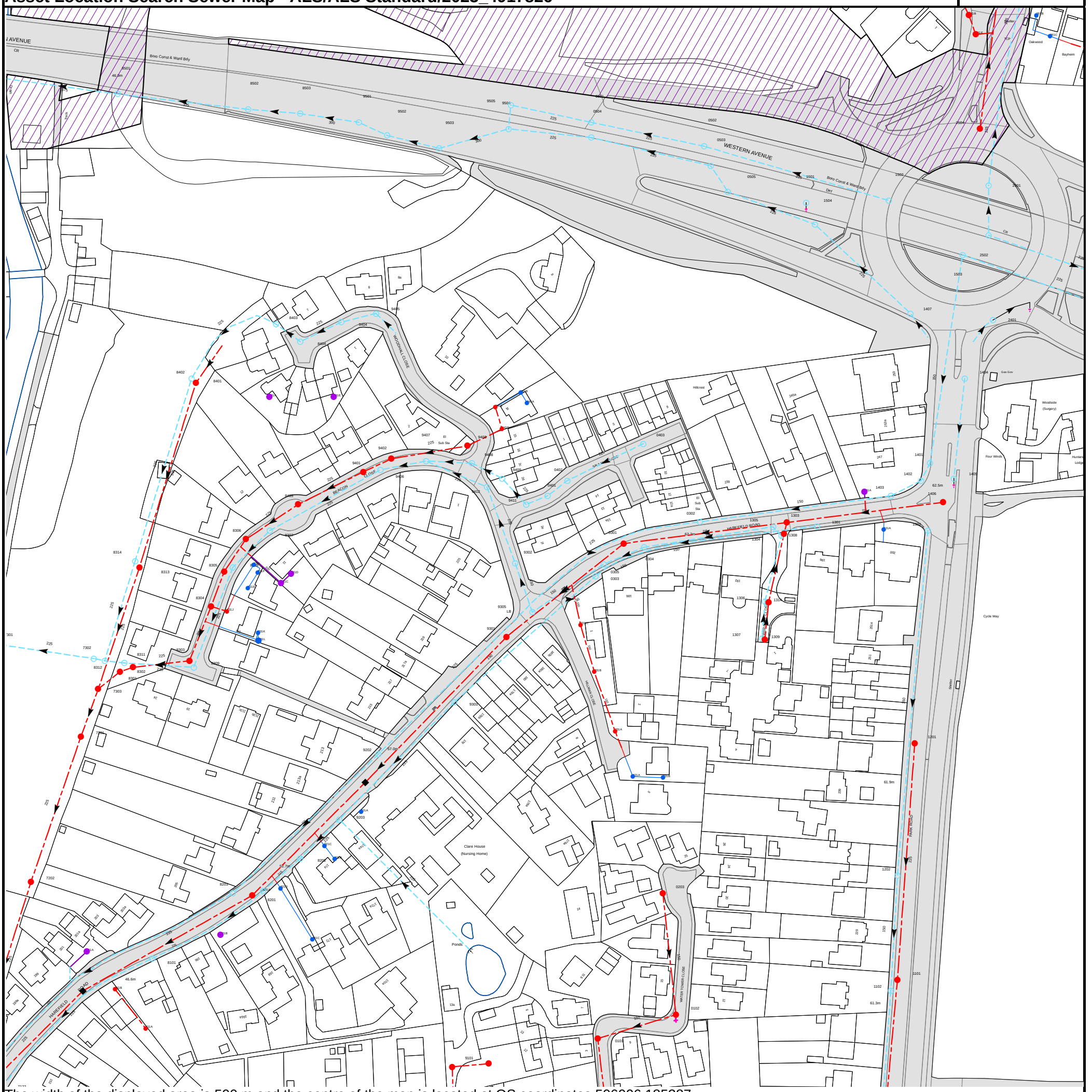
Clean Water queries

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/2023_4917826



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 506006,185387

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.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

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
131A	n/a	n/a
1502	n/a	n/a
0505	n/a	n/a
2501	n/a	n/a
0503	n/a	n/a
0502	n/a	n/a
2504	61.81	59.99
261C	n/a	n/a
261E	n/a	n/a
261B	n/a	n/a
161B	n/a	n/a
9409	58.28	56.38
9401	53.69	51.69
9406	54.35	52.46
9408	57.4	55.56
9407	56.54	54.65
9402	54.65	52.37
9403	57.07	54.1
941D	n/a	n/a
941C	n/a	n/a
941A	n/a	n/a
941E	n/a	n/a
841A	n/a	n/a
941B	n/a	n/a
8401	46.21	45.01
8402	46.39	45.15
8404	50.38	48.46
8403	49.64	48.09
9404	52.88	50.46
9405	55.16	53.36
9503	n/a	n/a
0504	n/a	n/a
9502	n/a	n/a
9504	n/a	n/a
0501	n/a	n/a
9501	n/a	n/a
8503	n/a	n/a
8502	n/a	n/a
9505	n/a	n/a
8501	n/a	n/a
1309	n/a	n/a
1307	n/a	n/a
1314	n/a	n/a
1306	n/a	n/a
0304	62	59.28
0301	61.91	58.23
1304	62.24	59.74
1308	n/a	n/a
1302	62.51	61.57
1305	62.3	59.68
1301	62.65	61.99
1303	n/a	n/a
0302	62.51	61.45
1406	62.4	59.64
1403	62.66	61.87
141A	n/a	n/a
1402	n/a	n/a
1405	n/a	n/a
1401	62.37	60.96
0403	60.58	59.49
1404	62.31	61.83
2401	62.34	61
1407	62.22	58.63
1503	n/a	n/a
2502	n/a	n/a
1504	n/a	n/a
1501	n/a	n/a
8312	42.01	40.51
8311	43.84	42.51
8314	43.77	42.53
8313	43.74	42.43
8303	47.04	43.95
8304	47.99	46.28
8305	48.51	46.83
831J	n/a	n/a
8308	48.83	47.13
8306	49.9	47.83
831E	n/a	n/a
831I	n/a	n/a
831F	n/a	n/a
831K	n/a	n/a
831L	n/a	n/a
8307	50.39	48.79
831C	n/a	n/a
831D	n/a	n/a
8405	51.6	49.12
9412	57.91	55.96
9301	59.82	57.23
9302	60.16	58.64
9411	58.55	57.12
9305	60.6	58.89

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0401	58.31	57.34
0402	58.56	57.61
031C	n/a	n/a
0303	61.77	60.65
0305	61.68	59.15
8202	n/a	n/a
821C	n/a	n/a
921C	n/a	n/a
921B	n/a	n/a
9203	n/a	n/a
921A	n/a	n/a
9202	56.24	55.33
9101	57.95	56.48
9303	n/a	n/a
9102	n/a	n/a
031B	n/a	n/a
0101	n/a	n/a
031A	n/a	n/a
021A	n/a	n/a
0203	n/a	n/a
021B	n/a	n/a
0102	n/a	n/a
1102	n/a	n/a
1101	n/a	n/a
1202	61.76	60.69
1201	62.01	59.89
811A	n/a	n/a
811B	n/a	n/a
8101	58.34	57
821B	n/a	n/a
8201	51.74	49.83
8203	n/a	n/a
821A	n/a	n/a
821D	n/a	n/a
7303	41.5	40.53
8301	43.21	41.01
8309	47.15	45.68
8302	44.16	42.19
711A	n/a	n/a
7202	n/a	n/a
7201	n/a	n/a
7302	41.35	38.85

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

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

- Conduit Bridge
- Subway
- Tunnel

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.

Payment 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 within 14 days of the 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. 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'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. 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 still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

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 0300 034 2222 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**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	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

APPENDIX D – WATER EFFICIENCY CALCULATIONS

Installation Type	Unit of Measure	Capacity/Flow rate (1)	Use Factor (2)	Fixed use (litres/person/day) (3)	Litres/person/day = [(1)x(2)] + (3) (4)
WC (single flush)	Flush Volume (litres)		4.42	0.00	0
WC (dual flush)	Full flush Volume (litres)	6	1.46	0.00	8.76
	Part flush Volume (litres)	3	2.96	0.00	8.88
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	4.00	1.58	1.58	7.90
Bath (where shower also present)	Capacity to overflow(litres)	175.00	0.11	0.00	19.25
Shower (where bath also present)	Flow Rate(litres / minute)	8.00	4.37	0.00	34.96
Bath Only	Capacity to overflow(litres)		0.50	0.00	0
Shower Only	Flow Rate (litres/minute)		5.60	0.00	0
Kitchen/Utility room sink taps	Flow rate (litres/minute)	6.00	0.44	10.36	13.00
Washing Machine	(Litres/kg dry load)	8.17	2.1	0.00	17.16
Dishwasher	(Litres/place setting)	1.25	3.6	0.00	4.50
Waste disposal unit	(Litres/use)	☐ Present	3.08	0.00	0
Water Softener	(Litres/person/day)		1.00	0.00	0
	(5)	Total Calculated use (litres/person/day) =SUM(column 4)			114.41
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			0
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			104.11
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			109.1

Installation Type	Make/Model (mandatory)	Litres/Person/Day
WC (dual flush)	TBC	17.64
Taps	TBC	11.06
Baths (shower(s) present)	TBC	20.35
Showers (bath(s) present)	TBC	43.70
Kitchen Taps	TBC	13.88
Washing Machines		17.16
Dishwasher		4.5
Property Type	New dwelling	
Housing Development	Beacons Close	

Terms and Conditions
System Requirements