32 MANOR ROAD
HAYES
HILLINGDON
UB3 2DG

Residential Development

Drainage Strategy

Project No. 453

May 2025

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ZBSA
Drainage Strategy Report

Quality Control

Issue	Date	Prepared	Checked	Approved	Comments
P1	07.05.25	Rafi Zaidi	Sam Beckett	Rafi Zaidi	Issued to assist Planning Application

This report is based on the information that's been gathered or provided to ZBSA through a range of searches and consultations carried out as part of the Drainage Strategy Report. In some cases, where formal records weren't available, we've had to rely on anecdotal information.

We believe the conclusions in this report are accurate based on what we know right now. That said, if new information comes to light, those conclusions may need to be updated.

The work we've done here is grounded in our current professional knowledge, and in line with the latest UK standards, codes, technologies, and legislation available at the time of writing. Of course, these things can change, and if they do, some parts of this report might no longer apply or may need reviewing.

Finally, some of the information we've used comes from maps and documents created by others. While we've used these in good faith, we can't guarantee their accuracy or be held responsible for any errors they might contain.

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Contents

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Introduction

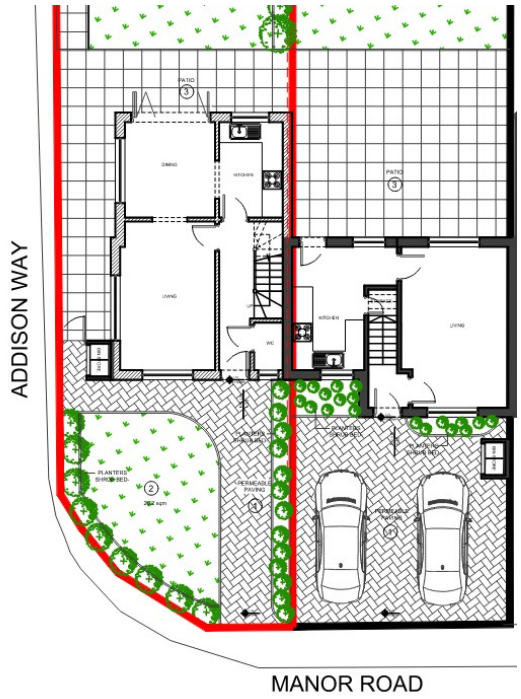
ZBSA Building Services Consultants has been appointed by the Client and instructed to provide a Drainage Strategy Report to assist with a planning application at 32 Manor Road, Hayes, Hillingdon, UB3 2DG.

The proposed development is for the construction of two-Storey semi-dwelling with provision of cycle parking, refuse storage and amenity space.

The proposed works would occur over an area of approximately 240 m2 (0.023 ha), currently occupied by outbuilding and nearby hardstanding and vegetation.

Site Location

Propose dwelling



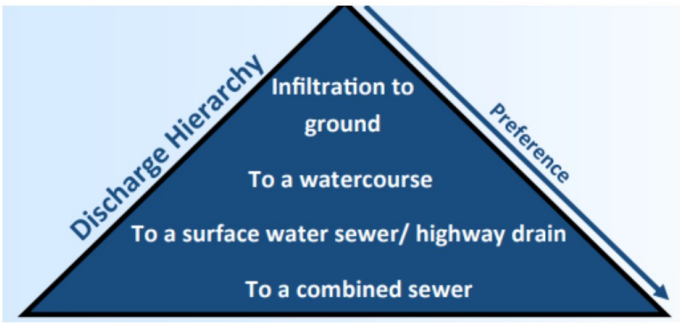
Sustainable Urban Design (SUDS)

What are SuDS?

SuDS aim to regulate water quantity, water quality, amenity and biodiversity. This is known as the "four pillars of SuDS". SuDS are a new way of managing surface water in a natural and controlled manner. They slow runoff and provide storage of surface water which mimics pre-development conditions, and minimise the risk of flooding compared to traditional underground piped systems which often provide no improvements to water quality, biodiversity or amenity.

SuDS can discharge to groundwater via infiltration, to a watercourse, surface water sewers or combined sewers.

In accordance with SUDS hierarchy when considering surface water drainage then consideration to each of the below discharge options should be considered in Sequence.



Examples of SUDS

Detention Basins/ Infiltration Basins
Normally dry outside of storm events. They are designed to store runoff and reduce the volume of surface water.

Attenuation Ponds
As well as storing water from storm events they support native vegetation and provide habitat and amenity places for local wildlife and communities.

Permeable Paving
Pavement made of permeable material that allows water to infiltrate into the ground or be discharged into sewers without overland flow while removing pollutants.

Swales
Shallow, open channels designed to convey, treat and store surface water runoff from rainfall events.

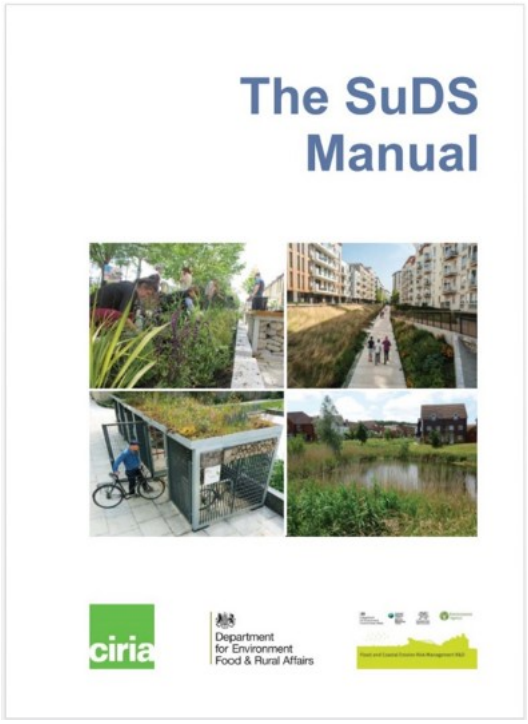
Green Roofs
Multi-layered system that can store water which can be reused for non-potable uses. They also insulate buildings, reduce energy and water costs and have biodiversity benefits.

Soakaways
Excavations that are backfilled with permeable material that allow to water to attenuate and infiltrate into the ground.

The London Plan

A Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1 store rainwater for later use
2 use infiltration techniques, such as porous surfaces in non-clay areas
3 attenuate rainwater in ponds or open water features for gradual release
4 attenuate rainwater by storing in tanks or sealed water features for gradual release
5 discharge rainwater direct to a watercourse
6 discharge rainwater to a surface water sewer/drain
7 discharge rainwater to the combined sewer.
Drainage should be designed and implemented in ways that deliver other policy objectives of this Plan, including water use efficiency and quality, biodiversity, amenity and recreation.



SUDS Management & Maintenance Plan

There are three categories of maintenance activities referred to in this report:

• **Regular maintenance** (including inspections and monitoring).
Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.

• **Occasional maintenance**
Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example). 3 Welbeck Colliery, Nottinghamshire SUDS Management & Maintenance Plan

• **Remedial maintenance**
Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

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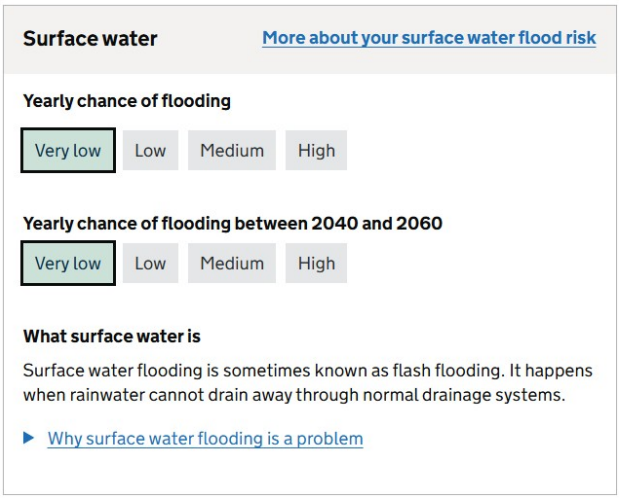
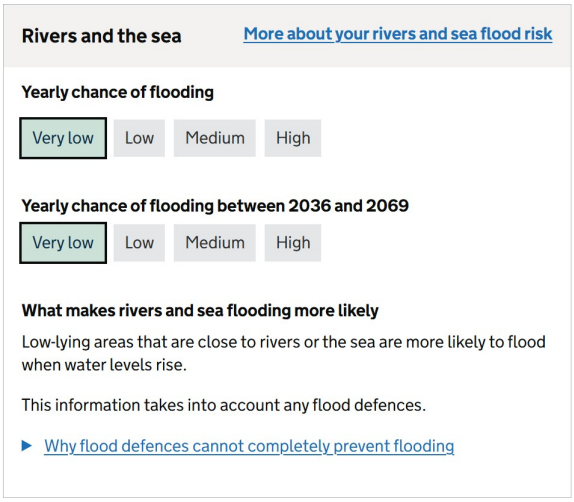
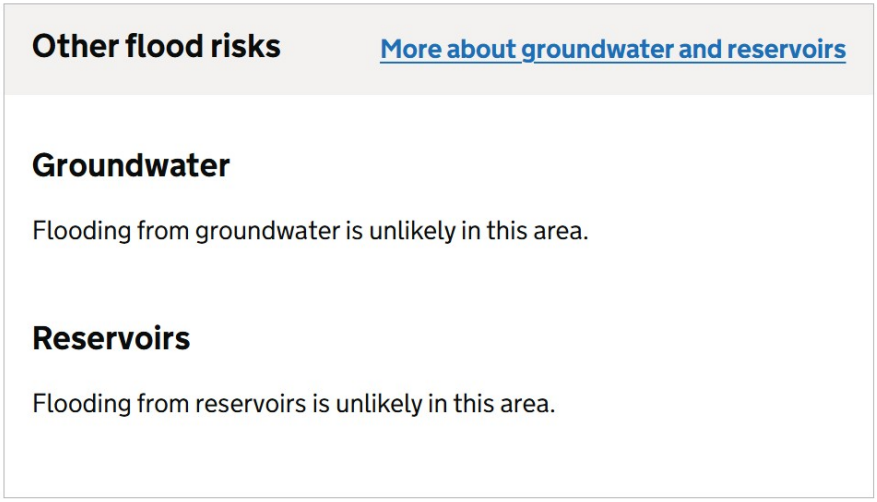
Flood Risk Assessment

The Environment Agency (EA) mapping for Flood Risk, shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Flood zone 1 is described as land having a less than 1 in 1,000 annual probability of river or sea flooding. The EA Long Term Flood risk online service shows that the area of the proposed works is at a 'Very Low' risk of surface water flooding, indicating that it would not experience any significant flooding during a 1 in 1000 year storm event.







Existing and Proposed Surface and Foul Drainage Strategy Urban Design (SUDS)

Foul Water Drainage Strategy
The existing property at 32 Manor Road, hayes, UB3 2DG has existing drainage connection to the public sewer.

The proposal foul drainage from the new dwelling shall discharge directly into the public swer via existing connections located on site.

Surface Water Drainage Strategy

In accordance with London Plan SUDS guidelines, developments are required to use SUDS to reduce both the volume and runoff rates to the drainage system.

Results from The British Geological Survey website states that the site is located on London clay, which do not have a great permeability factor, therefore it is expected that soaks will not work on this site. (see Appendix B for The British Geological Survey results).

Due to the fact that there are no watercourse in the surrounding area we would not be able to discharge into a watercourse to meet SUDS hierarchy.

Therefore, it is proposed to connect into the public sewer via existing connections located on site.

ZBSA recommends the use of permeable paving as indicated in the architect's drawings. This natural drainage minimises the risk of puddling, waterlogging, and flooding in areas with permeable paving.

By reducing runoff, permeable pavements alleviate the pressure on traditional drainage systems, which can become overwhelmed during heavy rainfall.

In addition to reducing the runoff from the rain that falls on them, permeable pavements can help filter out pollutants that contribute to water pollution.

In addition to permeable paving ZBSA recommend that a water butt of 210L capacity with means of overflow to be installed.

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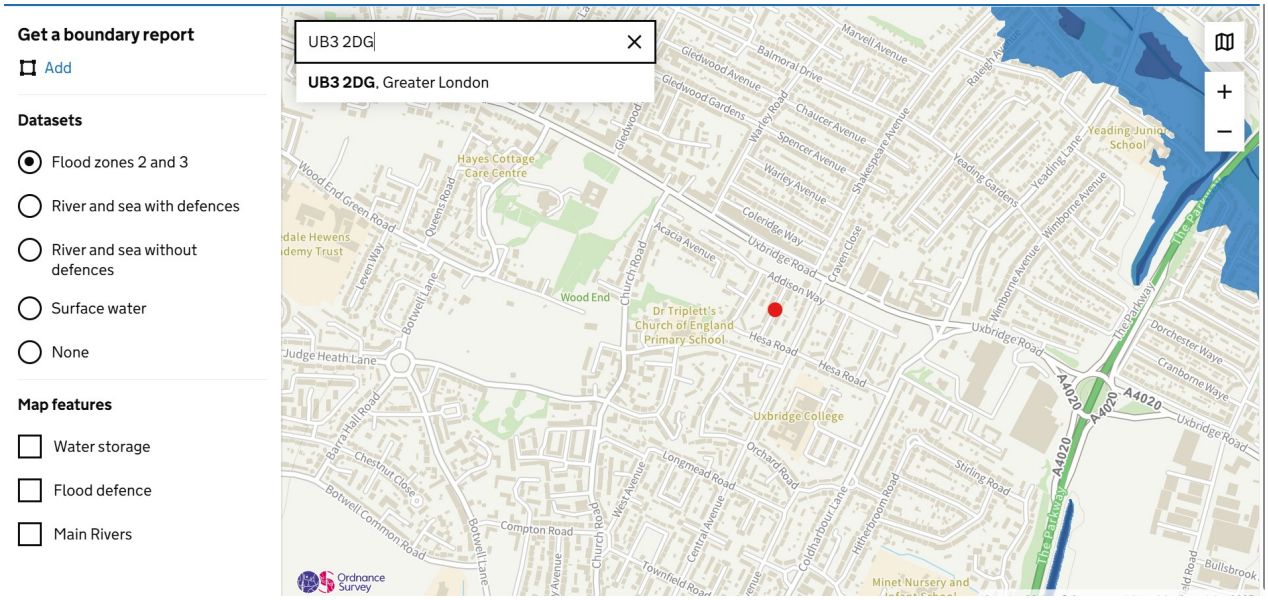
Appendix A - Flood Risk Assessment Map



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Appendix B – The British Geological Survey results

Appendix C – Greenfield Runoff Rate Estimates

Surface water storage volume design tool

www.uksuds.com | Surface water storage volume design tool (https://www.uksuds.com/)

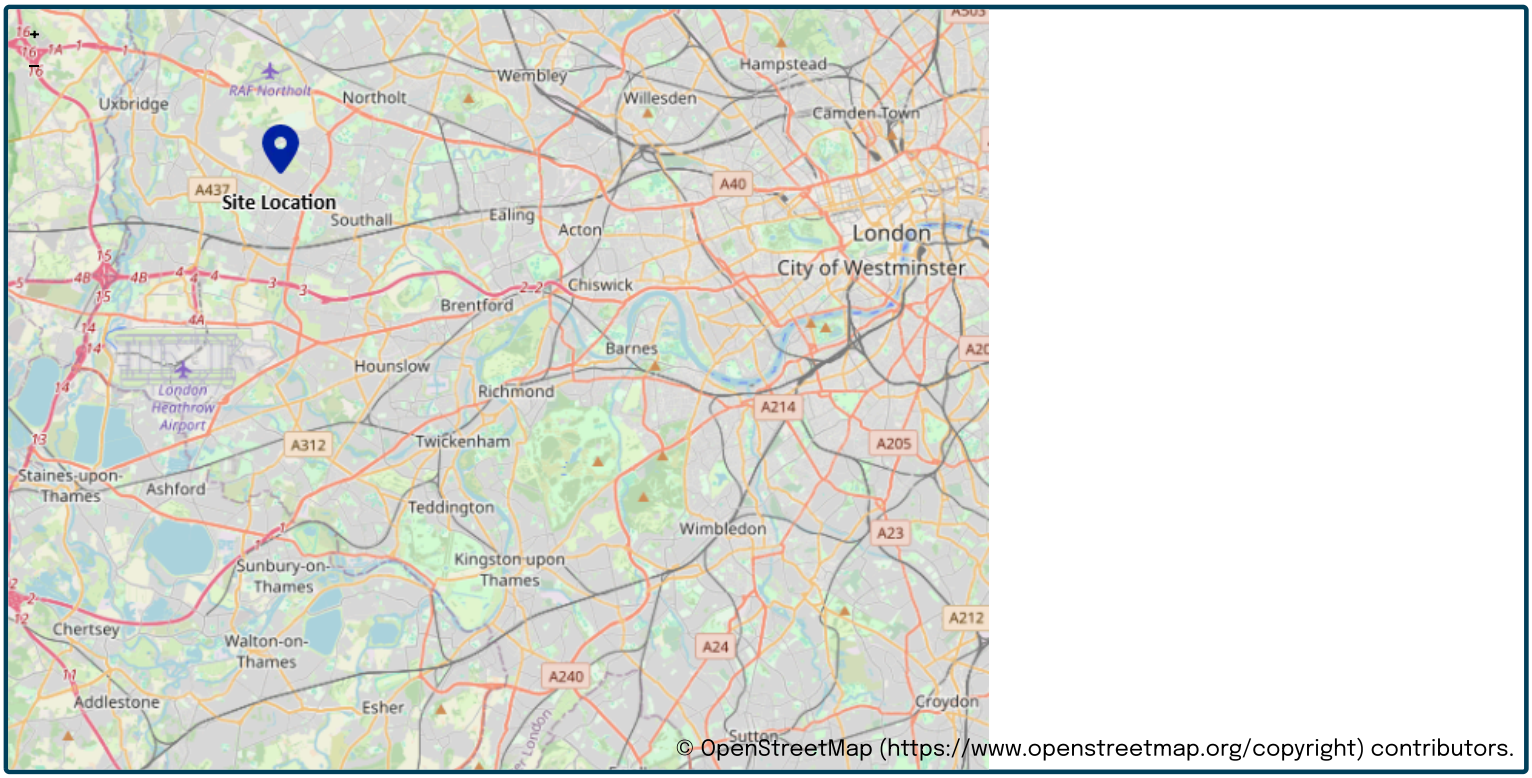
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

Project details

Date	26/04/2025
Calculated by	Rafi Zaidi
Reference	32 Manor Road Hayes UB3 2DG
Model version	2.0.0

Location

Site name	
Site location	



Site easting	510184
Site northing	181123

Site areas

Total site area (ha)	0.024	ha

Roof area

Total roof area (ha)	0.004	ha
Contributing roof area (ha)		ha
Non-contributing roof area (ha)	0.004	ha

Paved area

Total paved area (ha)	0.003	ha
Contributing paved area (ha)		ha
Non-contributing paved area (ha)	0.003	ha

Grass / vegetated area

Total grass / vegetated area (ha)	0.017	ha
Contributing grass / vegetated area (ha)	0.017	ha
Non-contributing grass / vegetated area (ha)	0	ha

Total area

Total contributing area (ha)	0.017	ha

Contributing areas with urban creep allowance

Urban creep allowance factor	+0% (no creep)

Storage design parameters

Storage base shape	Circular	
Storage design depth (mm)	2000	mm
Storage side slope (1 in x)	Vertical sided	
Storage voids ratio (%)	100% (all voids)	
Storage volume design return period (years)	1:200 years	

Please select a return period in the rainfall file.

Discharge flow rate from the site

Method

Type of site	Greenfield
Specify the method	IH124

IH124

	My value		Map/default value
SAAR (mm)	619 mm		619
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
Total area for greenfield runoff calculation (ha)	0.024 ha		0.024
QBar (l/s)	0.1 l/s		
Hydrological region	6		6
Return period (years)	1:100 years		
Growth curve factor	3.19		
Flow rate (IH124) (l/s)	0.32 l/s		

Final discharge rate

Runoff calculation method	IH124
Design flow rate (l/s)	0.32 l/s

Blockage risk

Specify the method	Flow rate
Minimum discharge flow rate to prevent blockage	1l/s

	My value		Calculated value
Design orifice diameter (mm)	100 mm		18
Flow rate of orifice (l/s)	29.2 l/s		

Rainfall and runoff

Rainfall input type	Generic rainfall CSV file

Invalid rainfall file.

- There should be at least 5 storm durations in the file.
- The file contain at least 5 unique rainfall depth values.

Climate change allowance factor	120%
Specify the runoff method from grass / vegetated areas	Fixed percentage - based on rainfall event depth and SPR

	My value	Map value
How should SPR be derived?	WRAP soil type	

WRAP soil type	4		4
SPR	0.47		

Model results

The model has not yet been run.

Disclaimer

This report was produced using the surface water storage volume design tool (2.0.0) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate surface water storage volumes for the whole site based on a limiting discharge rate from the site. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (https://fehweb.ceh.ac.uk/Home/Terms (https://fehweb.ceh.ac.uk/Home/Terms)).

Appendix D – Surface Water Butts Details

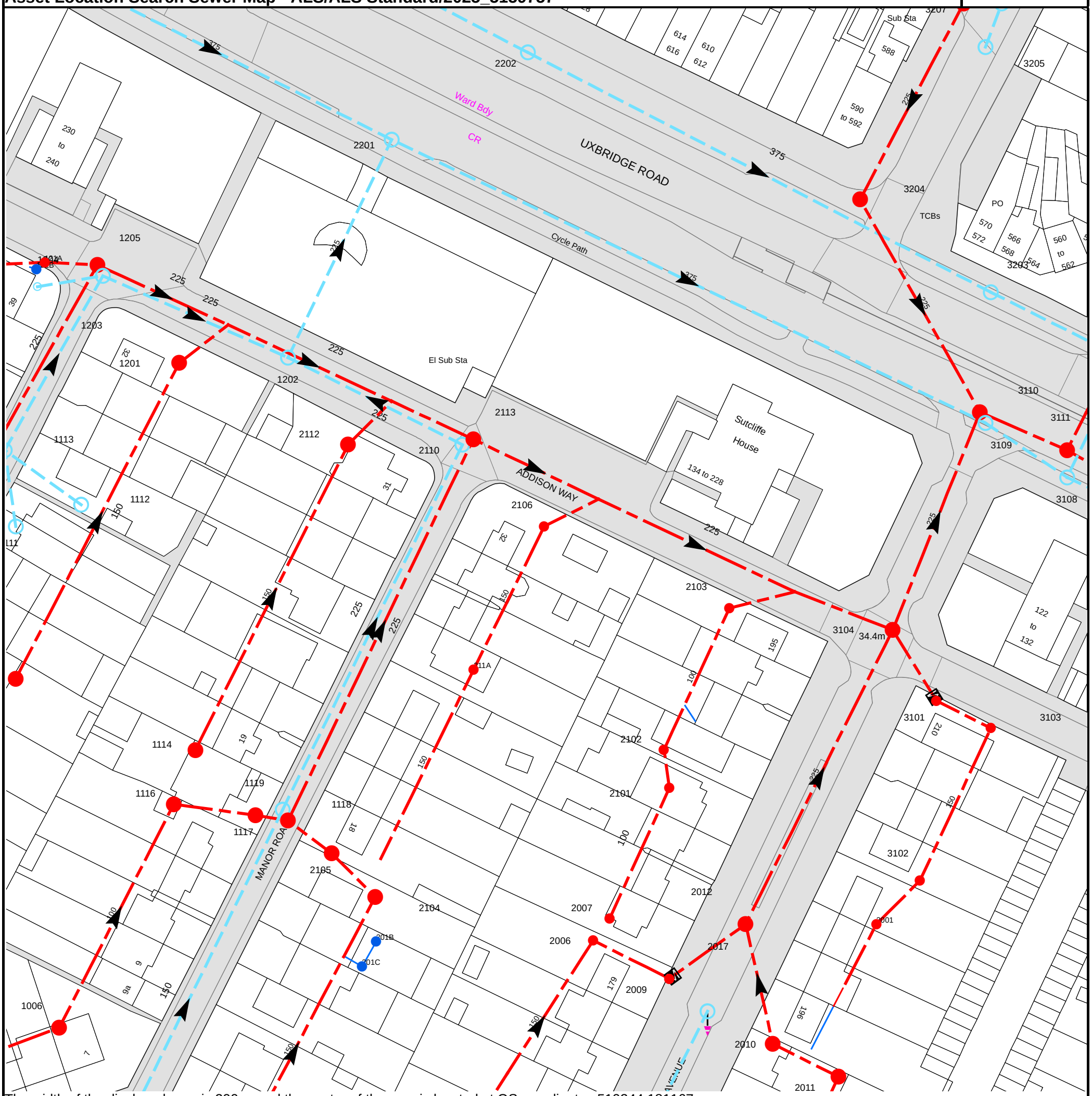
Surface water butts, also known as water butts, are containers used to collect and store rainwater, typically from rooftops, for later use, such as watering plants. They are often connected to drainpipes and can hold significant amounts of water, like 200 liters, which can reduce reliance on tap water for gardening.

Water butts help conserve water by capturing rainwater that would otherwise flow into drains and sewers. They provide a readily available source of water for gardening and other outdoor uses, reducing the need to tap into municipal water supplies

v

Appendix E – Thames Water Asset Search

Asset Location Search Sewer Map - ALS/ALS Standard/2025_5159757



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 510244,181167

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
121B	n/a	n/a
1204	n/a	n/a
121A	n/a	n/a
1205	36.23	33.57
1203	35.98	34.03
201C	n/a	n/a
201B	n/a	n/a
2012	34.8	32.97
2010	n/a	n/a
3111	n/a	n/a
3207	33.65	32.31
3206	33.71	32.52
1111	n/a	n/a
2106	n/a	n/a
1112	n/a	n/a
1113	36.08	34.44
2110	35.22	33.9
2112	n/a	n/a
2113	35.23	32.98
1201	n/a	n/a
1202	35.54	33.73
2201	n/a	n/a
2202	n/a	n/a
2011	n/a	n/a
3001	n/a	n/a
3102	n/a	n/a
3103	n/a	n/a
3101	n/a	n/a
3104	34.49	32.59
2103	n/a	n/a
3108	n/a	n/a
3109	34.34	32.81
3110	34.27	32.08
3203	34.09	31.9
3204	34.42	32.25
3205	33.79	32.86
1109	n/a	n/a
1006	n/a	n/a
1116	n/a	n/a
1114	n/a	n/a
1117	n/a	n/a
1119	n/a	n/a
1118	n/a	n/a
2105	n/a	n/a
2104	n/a	n/a
211A	n/a	n/a
2006	n/a	n/a
2007	n/a	n/a
2102	n/a	n/a
2009	n/a	n/a
2101	n/a	n/a
2017	n/a	n/a

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:

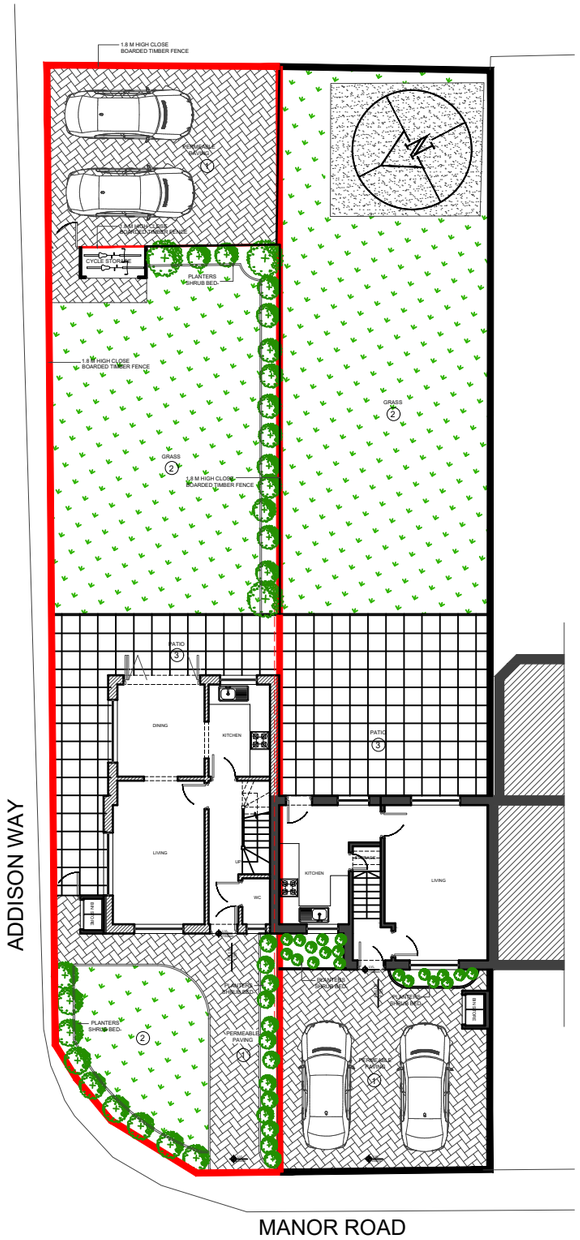
1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been 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.

Appendix F – Proposed Site Landscaping

NOTES

- Dimensions are not to be scaled from this drawing by contractors. The contractor is requested to check all dimensions before the work started.
- Report any discrepancies to the client or architect before undertaking the work described in the drawings.
- Dimensions are approximate site dimensions and are to be verified by the contractor on site before any fabrication/site works i.e foundations etc occur
- Contractor is responsible for all temporary propping to existing structure



01 - SITE PLAN Scale 0 1 2m 3 4 5m

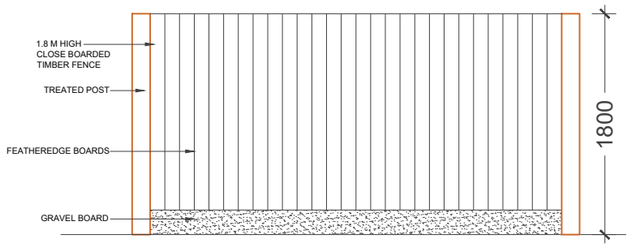
.\White-COMPOSITE DOOR.jpg

FRONT DOOR

FINISH : DOUBLE GLAZED COMPOSITE
LOCATION : TO FRONT WALL

ELECTRIC CAR CHARGER REFERENCE IMAGE

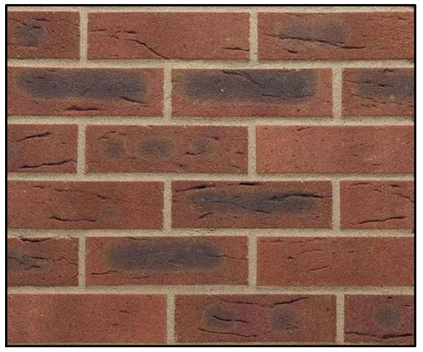
TIMBER FENCE REFERENCE IMAGE



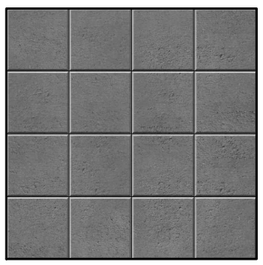
1.8M HIGH CLOSEBOARD TIMBER FENCE

GRASS (2)

HERRING BONE GREY PAVING (1)



FACING BRICKWORK



Stack Bond square paving at patio (3)

BIN STORAGE REFERENCE IMAGE

CYCLE STORAGE REFERENCE IMAGE

WINDOWS

FINISH : uPVC
LOCATION : To external wall

REVISIONS			
NO.	DESCRIPTION	DATE	BY

FULL PLANNING APPLICATION

DE ARCHITECTURAL CONSULT.LTD
M: 07824773079,7869580774
E: design.endeavour@gmail.com

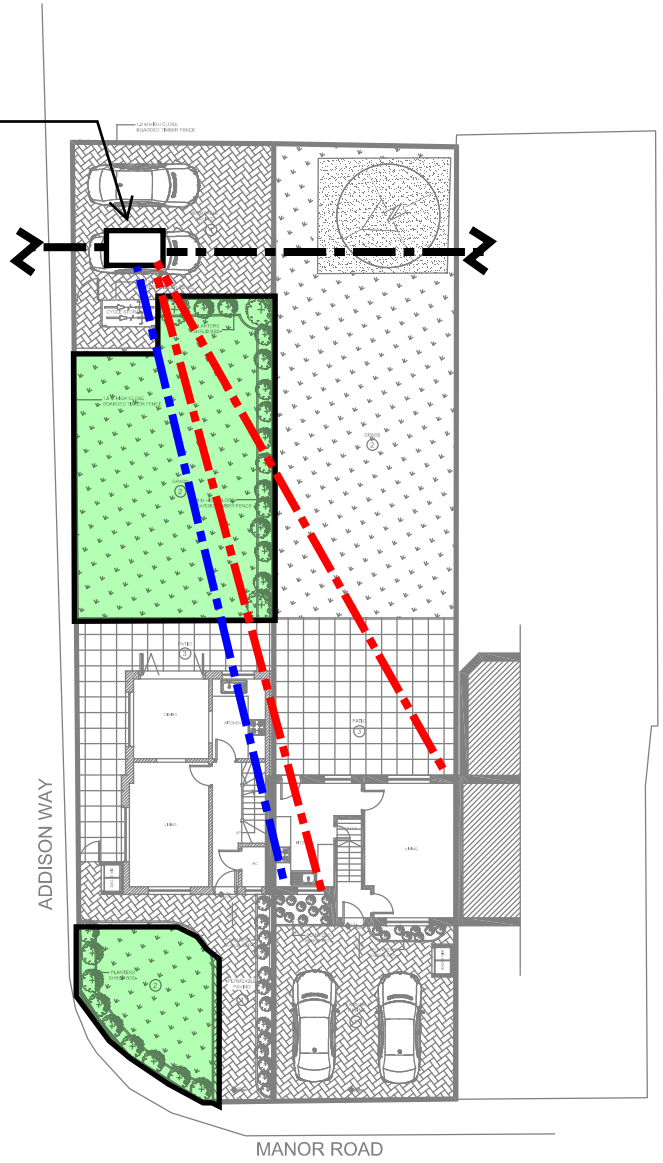
Project: LAND ADJACENT TO 32 MANOR ROAD HAYES
UB3 2DG

Title: PROPOSED SITE PLAN

Scale	Drawn	Approved	Date
1:200@A3	TA		APR 25
Job No.	Drawing No.		Rev.
DAC-352/25	PF-24BC-03		-

Appendix G – Existing and Proposed Layout

Existing combined manhole to remain



KEY

- Existing Combined Water Sewer
- Surface Water Sewer
- Foul Water Sewer
- Natural Grass

Existing

Cover and inverts of existing sewers should be checked on site prior to construction

Rev	Date	CAD	Chkd	Description
A	05.05.25	SP	RZ	ISSUED FOR COMMENTS

Project
94 Wellington Road TW4 7AA

Client

Architect
DE ARCHITECTURAL CONSULT.LTD
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Drawing
GROUND FLOOR, DRAINAGE STRATEGY DRAWING

Scale	Size	Engineer	Date
1:100	A1	RZ	MAY'25

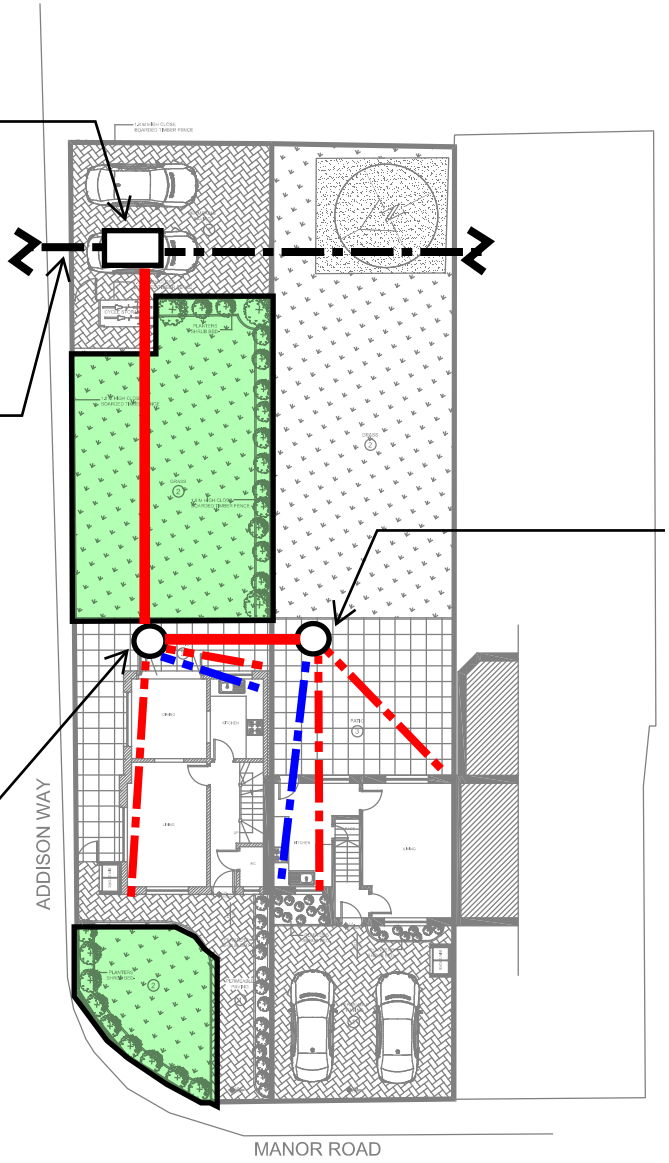
Drawing No.	Rev
4053/M/1000	A

Existing combined manhole to remain

150Ø Combined surface and foul water drain to connect into main sewer.

New combined chamber

New combined chamber



KEY

- Existing Combined Water Sewer
- Surface Water Sewer
- Foul Water Sewer
- Natural Grass

Existing

Cover and inverts of existing sewers should be checked on site prior to construction

Rev	Date	CAD	Chkd	Description
A	05.05.25	SP	RZ	ISSUED FOR COMMENTS

Project
94 Wellington Road TW4 7AA

Client

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Drawing No. 4053/M/1000

Rev A