



# Abingdon Road, Clifton Hampden

## Surface Water Management Strategy

On behalf of **Thomas Homes Ltd**



Project Ref: 332110526 | Rev: - | Date: July 2022

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## Document Control Sheet

**Project Name:** Clifton Hampden  
**Project Ref:** 332110526  
**Report Title:** Surface Water Management Strategy  
**Doc Ref:** 332110526-2001-R001  
**Date:** July 2022

	Name	Position	Signature	Date
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<b>For and on behalf of Stantec UK Limited</b>				

Revision	Date	Description	Prepared	Reviewed	Approved
-	July 2022	First Issue	PB	JS	SH

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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# 1 Introduction

## 1.1 Appointment

- 1.1.1 Stantec UK Ltd (Stantec) have been commissioned by Thomas Homes Ltd to prepare a surface water management strategy and design for the proposed residential development located to the north and south of Abingdon Road, Clifton Hampden, Oxfordshire.
- 1.1.2 The purpose of this report is to identify and describe the existing site drainage, with consideration to ground conditions, geology and ground water across the site and propose a sustainable surface water drainage strategy (SWDS) for the proposed development.

## 1.2 Site Proposals

- 1.2.1 The Site is currently greenfield land, used primarily for agricultural purposes. The northern section of the site also contains the existing Village Hall and allotments. This is hereafter referred to as the Site.
- 1.2.2 The Site is to be developed to provide 17 residential units, a new surgery and a re-developed village hall. Amenity space and landscaping will also be provided.

## 1.3 Reference Documents

- 1.3.1 This surface water drainage strategy has been designed and prepared with reference to documents and information sources provided and/or published by the following bodies:
- a) CIRIA C753 – The SUDs Manual and SUDs Hierarchy;
  - b) National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG);
  - c) Oxfordshire County Council, the Lead Local Flood Authority (LLFA) - Local Standards and Guidance for Surface Water Drainage on Major Development in Oxfordshire (November 2018);
  - d) Environment Agency (EA) Standing Advice;
  - e) Thames Water;
  - f) Code for Adoption where applicable;
  - g) Relevant Building Regulations where applicable; and
  - h) Best practice.

## 2 Site Context

### 2.1 Site Description and Location

- 2.1.1 The Site is located on the north-western edge of the village of Clifton Hampden and is split into two parts, situated to the north and south of A415 Abingdon Road. The northern parcel is at National Grid Reference 454560E 195650N, with a postcode of OX14 3EG. The southern parcel is at National Grid Reference 454480E 195510N, with an approximate postcode of OX14 3DE. A site location plan is shown in Appendix A.
- 2.1.2 The total area of the Site is approximately 4.45ha. The northern section occupies an area of 3.05ha, and the southern section having an area of 1.4ha.
- 2.1.3 The Site is predominantly greenfield, the northern section is arable land with a mixture of active and abandoned allotments. A small portion of the northern section is occupied by the existing Village Hall. The southern section of the Site is currently used as a paddock.
- 2.1.4 Following the proposed development approximately 0.52ha of the northern section and 0.21ha of the southern section will become impermeable.

### 2.2 Flood Risk

- 2.2.1 The nearest watercourse to the Site is the River Thames; located approximately 150m to the south-east. Ditches that drain to the River Thames are located immediately north of the northern section and approximately 120m southwest of the southern section.
- 2.2.2 The Site is located entirely within Flood Zone 1, representing areas with a low probability of flooding from nearby watercourses. An extract of the *Long Term Flood Risk Map for England* (gov.uk) shows the Site in relation to adjacent Flood Zones 2 and 3, presented in Figure 2.1.

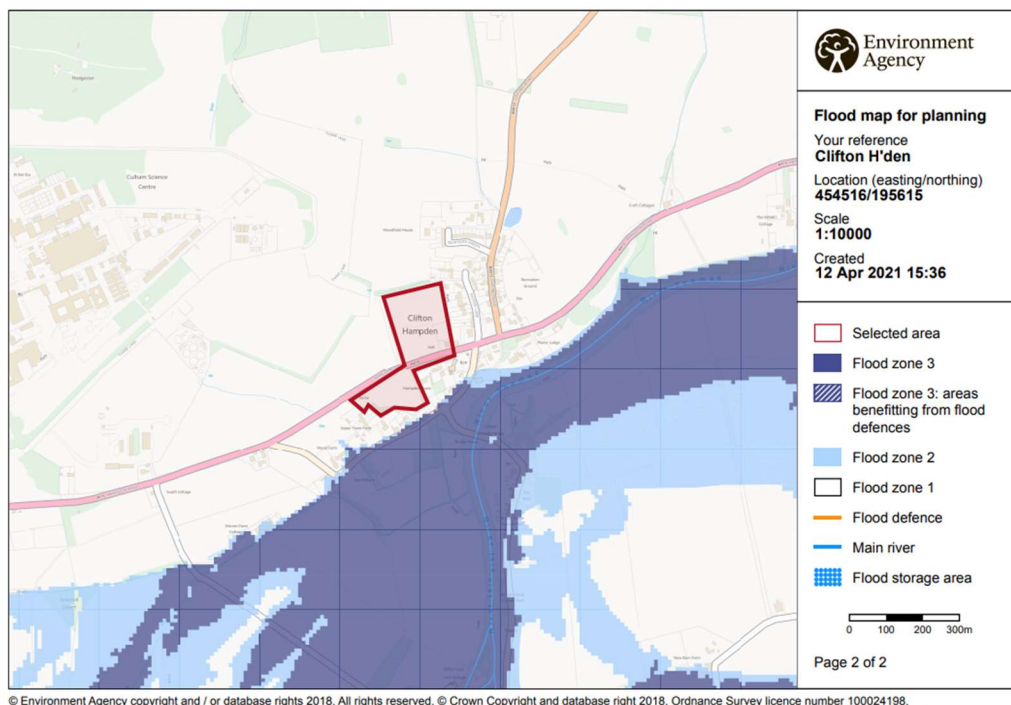


Figure 2.1: Site Locations and Flood Zones (gov.uk flood map)

- 2.2.3 The *Long Term Flood Risk Map for England* (gov.uk) shows the Site to be at negligible to no risk of flooding from rivers, the sea or reservoirs. The mapping tool also shows very low risk of surface water flooding across the entire site area. The flood risk map is based on mathematical modelling, considering surfaces, topology and existing land uses. No significant flooding occurs from the proposed surface water drainage strategy, so the risk of surface water flooding will continue to be negligible across the Site.

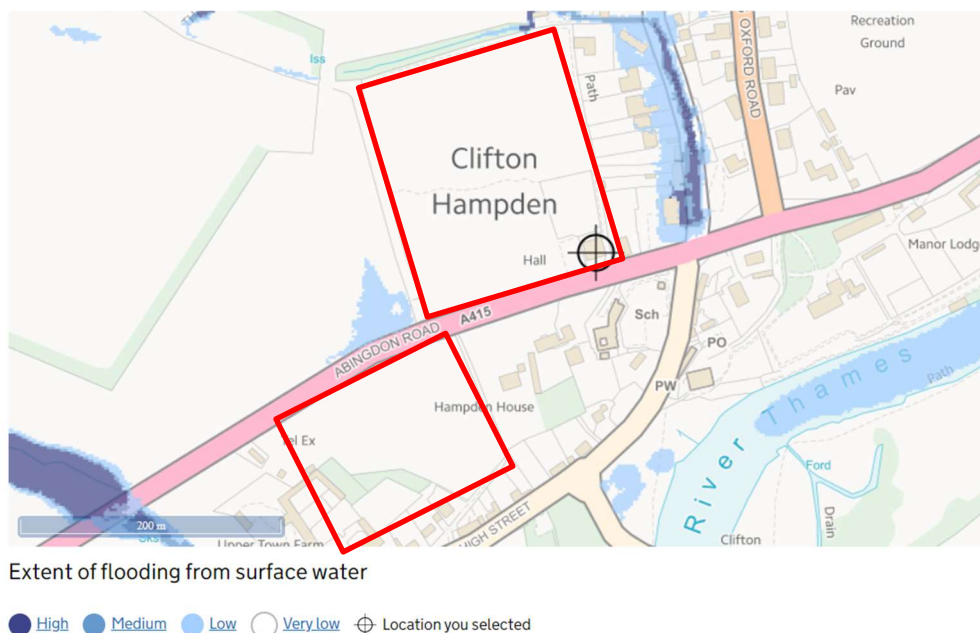


Figure 2.2: Extract of the Long Term Flood Risk Map for England (gov.uk), site outlines in red.

## 2.3 Site Topography

- 2.3.1 The northern section of the Site falls from a high point of 56.55mAOD located in the middle of the western boundary. The Site slopes towards the north-eastern and south-eastern corners, with low points around 54.00mAOD in both corners.
- 2.3.2 The southern section falls from the northern boundary along Abingdon Road to the southern boundary (56.30mAOD to 53.25mAOD). The southern boundary slopes steeply down to the properties along High Street.

## 2.4 Geology and Hydrology

- 2.4.1 The geological record data from the British Geological Society (BGS) show the Site lies on a boundary of differing geological deposits.
- 2.4.2 The northern section of the Site, including the village hall and allotments, is formed of superficial deposits of sand and gravel to the south and west. No superficial deposits were recorded to the north and east. This overlies a bedrock formation of the Lower Greensand sandstone group.
- 2.4.3 The southern section of the Site, currently used as a paddock, has superficial deposits of sand and gravel to the north and east. No superficial deposits were recorded to the south and west. The Site is founded on bedrock deposits of the Gault formation (clay and mudstone) to the south and west, and the Lower Greensand formation (sand and sandstone) to the north and east.
- 2.4.4 See Figure 2.3 for British Geological Society mapping.



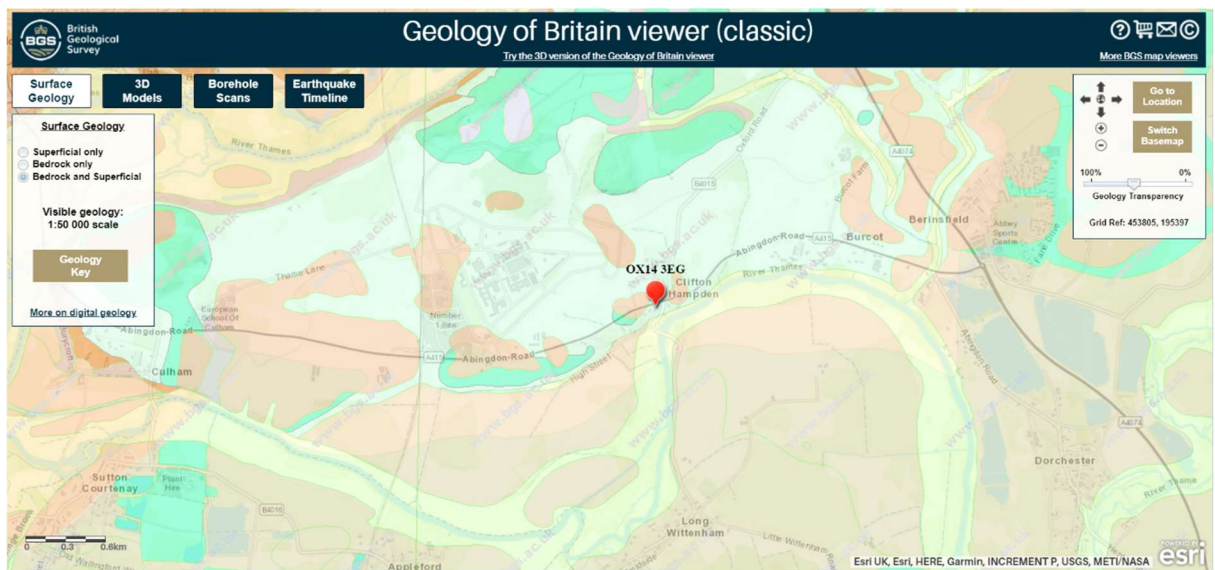


Figure 2.3: BGS Surface Geology Mapping

2.4.5 Ground Investigation Services (Southern) Ltd have performed an intrusive site investigation, including 6no. boreholes and 8no. trial pits. Infiltration tests were conducted within the eight trial pits, and the results are shown in Table 2.1, below.

Trial Pit	Location on Site	Infiltration Rate (m/s)
SA1	Northern section, north-east corner	$1.76 \times 10^{-6}$
SA2	Northern section, north	$1.78 \times 10^{-6}$
SA3	Northern section, east	$1.30 \times 10^{-6}$
SA4	Northern section, south	$1.11 \times 10^{-5}$
SA5	Southern section, west	-*
SA6	Southern section	$1.07 \times 10^{-6}$
SA7	Southern section, south-east corner	$3.34 \times 10^{-6}$
SA8	Southern section, centre	-*

Table 2.1: Infiltration Test Results.

\*No significant change in levels within SA5 and SA8 were recorded during the test period, so no infiltration rate was calculable.

2.4.6 Groundwater monitoring carried out by Ground Investigation Services (Southern) Ltd recorded striking groundwater in the northern section at levels ranging from 0.70m to 1.57m below ground level, rising to between 0.24m and 0.62m during subsequent monitoring periods.

2.4.7 For the southern section, groundwater was not present during the first round of monitoring, with no groundwater strikes occurring up to the 3m maximum borehole depth. During subsequent monitoring periods, groundwater began to develop at depths between 1.21m and 1.81m below ground level.

2.4.8 Groundwater monitoring across the Site showed shallow groundwater levels, with seasonal fluctuation causing shallower groundwater levels during winter months.

## 2.5 Existing Drainage Regime

2.5.1 The Site is predominantly greenfield, with some areas of brownfield land. The northern section comprises a grassed field with sparse allotment plots. The current village hall, an electrical substation and a small car park are located to the south-east. The southern section is a grassed field with stable buildings located to the west.

2.5.2 Thames Water asset records have been obtained which indicate the presence of an existing adopted foul water rising main crossing the southern section of the Site. Thames Water asset records are included in Appendix B.

2.5.3 An existing manhole has been identified in the south-east corner of the southern section. Further investigation will need to be carried out to determine type, pipe levels and pipe diameters.

2.5.4 Soft landscaping is assumed to drain via infiltration. The discharge routes of the foul and surface water for the existing village hall are unknown. If the village hall drains to Thames Water surface water sewers it is assumed this will be via an unrestricted outfall. The ancillary car park for the village hall is assumed to utilise over-the-edge drainage, as no gullies or other primary drainage has been identified on the topographical survey.

2.5.5 A drainage / utilities survey may be necessary to confirm the points above.

2.5.6 Greenfield discharge rates for the site were calculated using Microdrainage to determine the existing surface water run-off rates from the undeveloped site. These can be seen in Table 2.2 below and the calculations provided within Appendix C.

Return Period (Years)	Greenfield Run-off Rate	
	Per Hectare (l/s/ha)	Site Area (4.45ha) (l/s)
1 in 1	1.3	5.8
QBAR	1.5	6.7
1 in 30	3.4	15.1
1 in 100	4.9	21.8

Table 2.2: Greenfield Rates for the Sites.

## 3 Surface Water Drainage

### 3.1 Treatment of Existing Drainage

- 3.1.1 Where possible, existing drainage should be reused; however, the layout of the existing drainage on-site is not suitable to receive connections from the new site development. No evidence of SuDS features, surface water flow controls or attenuation storage have been found on-site.
- 3.1.2 Further investigation is recommended to identify any remaining on-site drainage that is to be abandoned and removed prior to construction. Drainage to be removed will require checking for live connections. Any existing private drainage should only have served the existing village hall, on the northern section of the Site.

### 3.2 Climate Change Allowances

- 3.2.1 In February 2016 the Environment Agency released 'Flood risk assessments: climate change allowances'<sup>1</sup> guidance to support the NPPF. Within this guidance it states that the appropriate allowances for increases in peak rainfall intensity for the proposed development, over the next 100 years, are the central and upper end allowances for increases in peak rainfall intensity of 20% and 40% respectively.
- 3.2.2 This SWMS has undertaken calculations to inform the design of flood mitigation measures based on a 40% increase in peak rainfall intensity (the upper end allowance).

### 3.3 Proposed Surface Water Drainage

- 3.3.1 Due to the unsuitability of the existing network, a new surface water drainage network is proposed for the development. Following the SuDS hierarchy as outlined in the Planning Policy Guidance<sup>2</sup>, see Figure 3.1 below, the preferable outfall option is an infiltration system.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

Figure 3.1: Extract of Planning Policy Guidance on Flood Risk and Coastal Change.

- 3.3.2 Due to the high water-table, especially in the wetter winter months, soakaways are not a suitable solution for the discharge of surface water run-off from this site. Additionally, the Site slopes steeply down to High Street at the southern boundary, creating the potential for seepage lines to occur above neighbouring properties if infiltration features were used in the southern portion of the Site.

<sup>1</sup> Environment Agency, Flood risk assessments: climate change allowances (February 2016) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

<sup>2</sup> Planning Policy and Guidance, Flood Risk and Coastal Change (March 2014) (<https://www.gov.uk/guidance/flood-risk-and-coastal-change>)

- 3.3.3 Therefore, the second option of the SuDS hierarchy will be used, and the surface water drainage system will outfall at the greenfield rate to an existing watercourse approximately 120m to the south-west of the Site. The watercourse drains to the River Thames to the south of the Site. Access to this watercourse has been agreed across the intervening third party land (Appendix H).
- 3.3.4 The majority of the hard landscaping will utilise a porous subbase to provide attenuation storage for surface water runoff. Industry standard software Microdrainage has been used to ensure the subbase will have sufficient capacity to store the runoff associated with storm events up to and including the 1 in 100 year (1% AEP) +40% event. The northern section of the Site requires a 400mm depth of subbase and the southern section 300mm.
- 3.3.5 Microdrainage calculation results are included in Appendix F.
- 3.3.6 Surface water will be conveyed via a piped system which will utilise perforated pipes to collect the water from the porous subbase before discharging to the existing water course at the greenfield rate (QBar).
- 3.3.7 The discharge rate will be restricted by a 40mm orifice plate within a chamber located upstream of the outfall within the Site boundary. The discharge rates will be restricted to QBar across all design storm events as presented within Table 3.1 below.

Return Period (Years)	Greenfield Run-off Rate (l/s)	Proposed Discharge Rate (l/s)
1 in 1	5.8	5.6
QBar	<b>6.7</b>	-
1 in 30	15.1	6.2
1 in 100	21.8	6.2
1 in 100 + 40% CC	-	6.3

Table 3.1 Existing and Proposed Discharge Rates

- 3.3.8 The proposed drainage strategy is presented on drawings 332110526-2001-001 and 332110526-2001-002 included in Appendix D.
- 3.3.9 Standard details for the drainage elements implemented within this scheme are included in Appendix E.

### 3.4 Flood Exceedance

- 3.4.1 Flood Exceedance flows are shown on drawings 332110526-2001-004 and 332110526-2001-005 (Appendix G), illustrating that any potential surface water flooding will be directed away from the building's entrances and habitable spaces.

### 3.5 Contamination and Treatment

- 3.5.1 Guidance on contamination hazard levels, and suitable treatment, is given in the SuDS Manual 2015, CIRIA C753. The two sources of pollution the surface water network of this site may experience are rainfall-borne contaminants, and those associated with the residential car

parking. In accordance with Table 26.2, these are classified as resulting in *very low* and *low* pollution hazard levels respectively.

- 3.5.2 CIRIA C753 outlines treatment indices in Table 26.3 (CIRIA C753), to quantify the treatment potential of differing SuDS systems as compared to the pollution hazard level of Table 26.2 (CIRIA C753). This table identifies that porous paving systems provide suitable treatment for water polluted with both rainfall borne contaminants and those associated with residential car parking.

## 4 Foul Water Drainage

### 4.1 Existing Foul Water System

- 4.1.1 The existing foul water network is assumed to serve the existing village hall only. An existing manhole and 2 no. foul gullies are located adjacent to the eastern elevation of the hall. This is assumed to be a combined sewer, discharging to the Thames Water foul network in Abingdon Road.
- 4.1.2 The existing foul water network will be abandoned following confirmation on-site.
- 4.1.3 Thames Water asset records are shown in Appendix B.
- 4.1.4 A drainage / utilities survey may be necessary to confirm the points above.

### 4.2 Proposed Foul Water System

- 4.2.1 The northern section of the Site will contain a gravity network serving all buildings, connecting to a proposed adopted sewer within the High Street. This sewer will discharge into the existing Thames Water network approximately 130m from the Site, into the 150mm diameter pipe between manhole references 7602 and 7501.
- 4.2.2 The southern section of the site contains a gravity network serving all buildings. Due to the level differences between both sections, a packaged foul water pumping station is proposed to serve the southern section. The discharge from the pumping station is proposed to connect into the gravity foul network of the northern section, via a new rising main.
- 4.2.3 The concept foul water strategy is presented on the proposed Drainage Layout drawings 332110526-2001-001 and 332110526-2001-002 (Appendix D).

## 5 Summary

- 5.1.1 Planning permission is sought for a site north-west of Clifton Hampden village, straddling Abingdon Road. The proposals will provide 17 residential units, alongside a new health surgery and improvements to the existing village hall.
- 5.1.2 Both portions of the site are predominantly greenfield. The northern section is arable land with a mixture of active and abandoned allotments. A small portion of the northern section is occupied by the existing Village Hall. The southern section of the Site is currently used as a paddock.
- 5.1.3 The existing village hall is currently served by a small foul water network that is assumed to discharge via gravity to an offsite Thames Water sewer. An existing Thames Water foul rising main is shown to cross the southern section of the site. There is no known existing surface water drainage, hardstanding is assumed to utilise over-the-edge drainage and infiltrate into the ground. Any connections to Thames Water sewers are assumed to discharge at an unrestricted rate.
- 5.1.4 The surface water drainage strategy for the scheme has been designed in accordance with Lead Local Flood Authority guidance. The strategy incorporates SuDS features to provide attenuation and treatment to surface water, which discharges at greenfield rate to an existing watercourse. The presented drainage strategy demonstrates that the site proposals can be drained in a sustainable manner without increasing the risk of flooding to neighbouring properties for events up to and including the 1 in 100 year (plus 40% climate change) rainfall event.
- 5.1.5 Flood exceedance flows show that any potential surface water flooding will be directed away from building entrances and habitable spaces.
- 5.1.6 This surface and foul water drainage strategy has been prepared to demonstrate that the proposed development can meet national and local requirements.

# Appendix A Site Location Plan





Client / Project  
Thomas Homes Ltd.  
**SITES at CLIFTON HAMPDEN**

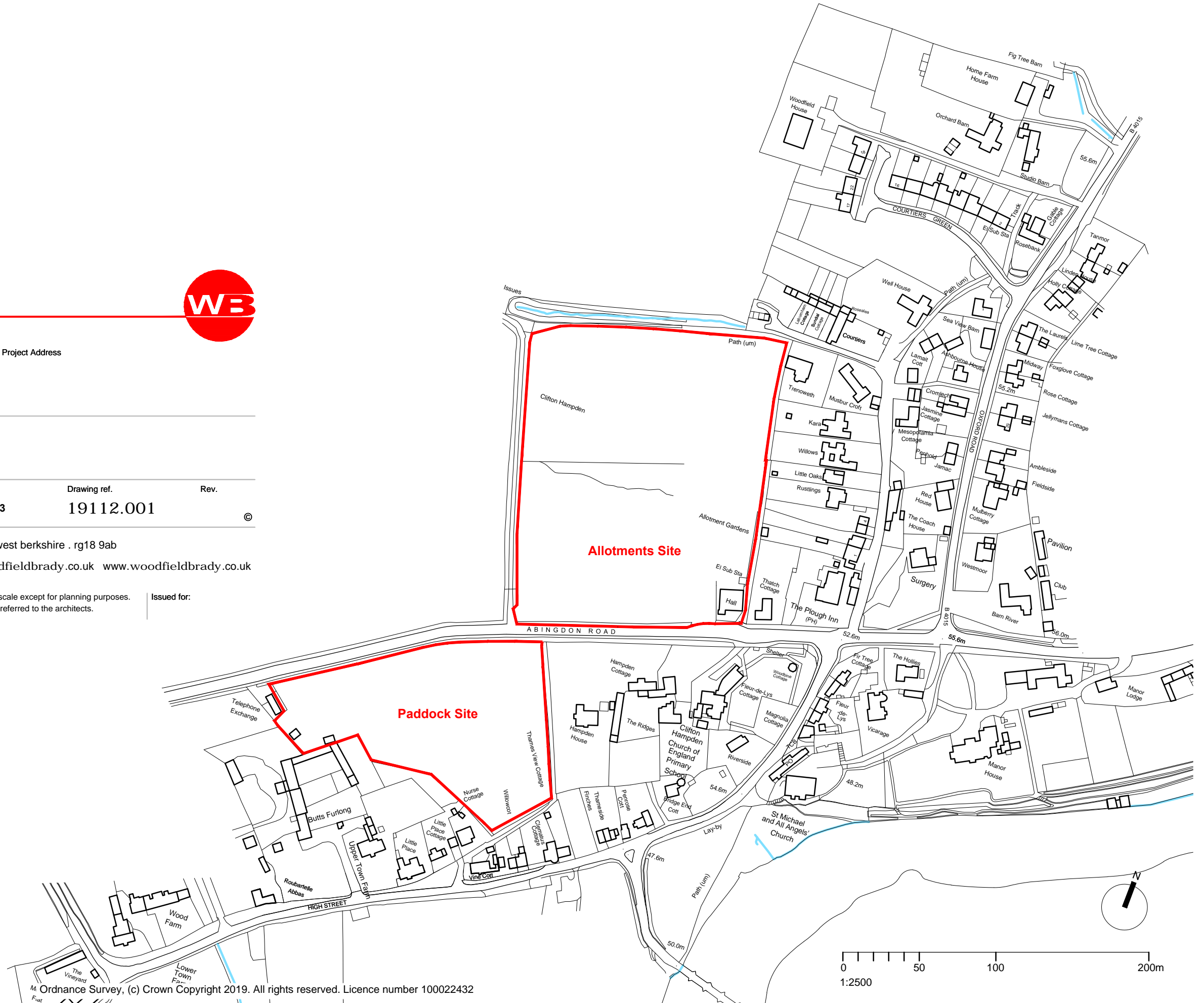
Project Address

Drawing Title  
**LOCATION PLAN**

Date	Drawn	Scale / Page	Drawing ref.	Rev.
MAY '20	KJB	1:2500 @ A3	19112.001	

arlinton house . arlington grange . curridge road . west berkshire . rg18 9ab  
t 01635 247 100 f 01635 247 070 e mail@woodfieldbrady.co.uk www.woodfieldbrady.co.uk

All dimensions to be checked on site prior to construction. Do not scale except for planning purposes. Issued for:  
Any discrepancy between this drawing and other information to be referred to the architects.



# Appendix B Thames Water Asset Records

# Asset location search



## Property Searches

Peter Brett Associates  
First Floor, Southern House  
1 Cambridge Terrace  
OXFORD  
OX1 1RR

**Search address supplied** Village Hall  
Abingdon Road  
Clifton Hampden  
Abingdon  
OX14 3EG

**Your reference** Clifton Hampden

**Our reference** ALS/ALS Standard/2021\_4385746

**Search date** 22 March 2021

### Knowledge of features below the surface is essential for every development

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

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

Contact us to find out more.



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540

**Search address supplied:** Village Hall, Abingdon Road, Clifton Hampden, Abingdon, OX14 3EG

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 search provides 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](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)

## Waste Water Services

**Please provide a copy extract from the public sewer map.**

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

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

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

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

For your guidance:

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

## Clean Water Services

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

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

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



pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

## **Payment for this Search**

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

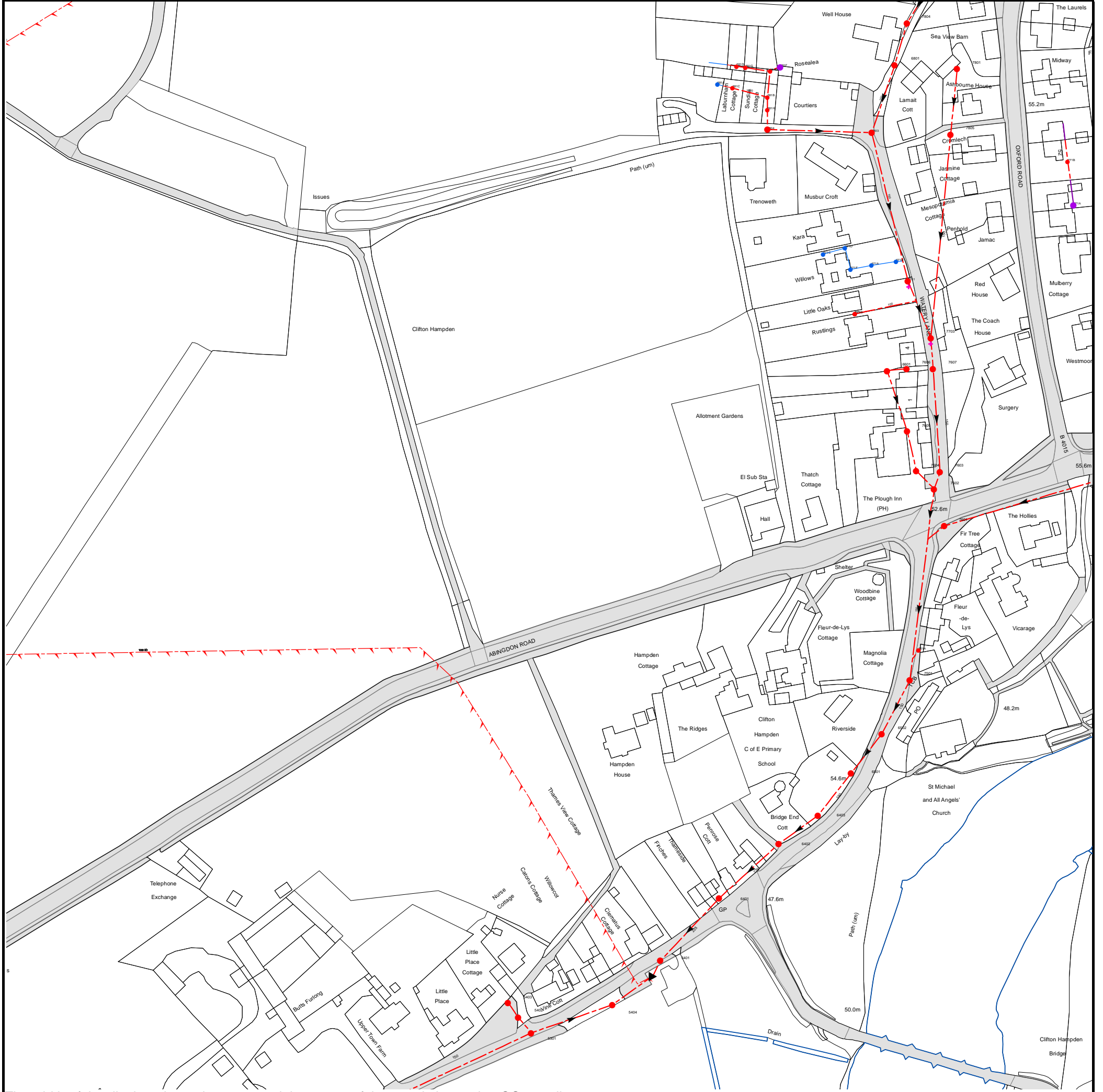
### Clean Water queries

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](mailto:developer.services@thameswater.co.uk)

Asset Location Search Sewer Map - ALS/ALS Standard/2021\_4385746



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 454543,195619

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 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
681E	n/a	n/a
6402	n/a	n/a
681F	n/a	n/a
6403	n/a	n/a
671C	n/a	n/a
671D	n/a	n/a
671F	n/a	n/a
6501	n/a	n/a
671A	n/a	n/a
6803	n/a	n/a
6502	n/a	n/a
6601	n/a	n/a
6801	n/a	n/a
671B	n/a	n/a
7606	n/a	n/a
7804	n/a	n/a
7605	n/a	n/a
7701	n/a	n/a
7501	n/a	n/a
7604	n/a	n/a
751A	n/a	n/a
5403	n/a	n/a
5402	n/a	n/a
5301	n/a	n/a
5404	n/a	n/a
5401	n/a	n/a
681A	n/a	n/a
6401	n/a	n/a
681C	n/a	n/a
681D	n/a	n/a
681G	n/a	n/a
681B	n/a	n/a
681H	n/a	n/a
6804	n/a	n/a
7703	n/a	n/a
7607	n/a	n/a
7602	n/a	n/a
7603	n/a	n/a
7601	n/a	n/a
7805	n/a	n/a
7801	n/a	n/a
7609	n/a	n/a
671G	n/a	n/a
671I	n/a	n/a
771A	n/a	n/a
771B	n/a	n/a

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



# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

-  **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  Trunk Surface Water
-  Trunk Foul
-  Storm Relief
-  Trunk Combined
-  Vent Pipe
-  Bio-solids (Sludge)
-  Proposed Thames Surface Water Sewer
-  Proposed Thames Water Foul Sewer
-  Gallery
-  Foul Rising Main
-  Surface Water Rising Main
-  Combined Rising Main
-  Sludge Rising Main
-  Proposed Thames Water Rising Main
-  Vacuum

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate 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 'D' on a manhole level indicates that data is unavailable.

## 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
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column




## Operational Controls

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

-  Control Valve
-  Drop Pipe
-  Ancillary
-  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.

-  Outfall
-  Undefined End
-  Inlet






## Other Symbols

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








-  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

### Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. 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 present on the plan, please contact a member of Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2021\_4385746



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 454543, 195619.








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







# ALS Water Map Key

## Water Pipes (Operated & Maintained by Thames Water)


- 
**Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 
**Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 
**Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 
**Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 
**Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- 
**Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- 
**Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

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

## Valves

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

## Hydrants








-  Single Hydrant

## Meters










-  Meter

## End Items

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

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



## Operational Sites

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

## Other Symbols

-  Data Logger

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

-  **Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
-  **Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

## Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

### Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call <b>0800 009 4540</b> quoting your invoice number starting CBA or ADS / OSS	Account number <b>90478703</b> Sort code <b>60-00-01</b> A remittance advice must be sent to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b> or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a>	By calling your bank and quoting: Account number <b>90478703</b> Sort code <b>60-00-01</b> and your invoice number	Made payable to ' <b>Thames Water Utilities Ltd</b> ' Write your Thames Water account number on the back. Send to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b> or by DX to <b>151280 Slough 13</b>

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

# Appendix C Greenfield Run-off Rates

Caversham Bridge House  
Waterman Place  
Reading, RG1 8DN



Date 08/07/2022 09:44

Designed by pbunn

File

Checked by

Innovyze

Source Control 2020.1

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 600 Urban 0.000  
Area (ha) 1.000 Soil 0.300 Region Number Region 6

**Results 1/s**

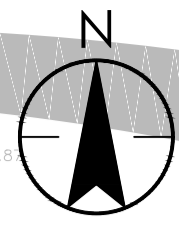
QBAR Rural 1.5  
QBAR Urban 1.5

Q1 year 1.3

Q1 year 1.3  
Q30 years 3.4  
Q100 years 4.9

# Appendix D Proposed Drainage Layout





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### Notes

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- SITE LAYOUT OBTAINED FROM WOODFIELD BRADY ARCHITECTS DATED JUNE 20 DRAWING REFERENCE 19112.003
- CONCEPT DRAINAGE LAYOUT BASED ON THE ASSUMPTION THAT FINISHED ROAD LEVELS WILL BE SET APPROXIMATELY 250mm ABOVE EXISTING GROUND LEVELS
- FLOWS DISCHARGING TO EXISTING WATERCOURSE OR DRAINAGE NETWORK, SURFACE WATER RUN-OFF WILL BE ATTENUATED UP TO AND INCLUDING THE 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE RAINFALL EVENT
- SURFACE WATER RUN-OFF WILL BE LIMITED TO THE MEAN ANNUAL FLOOD (QBAR) = 3.4 l/s
- EXISTING VILLAGE HALL TO BE RETAINED IN THE SE CORNER OF THE NORTHERN SITE
- DETAILED LEVELS DESIGN AND DRAINAGE LAYOUT SUBJECT TO ARCHITECTS CONFIRMATION OF DRAINAGE CONNECTION POINTS
- CONNECTION TO EXISTING FOUL AND SURFACE WATER DRAINAGE NETWORKS SUBJECT TO CCTV SURVEY

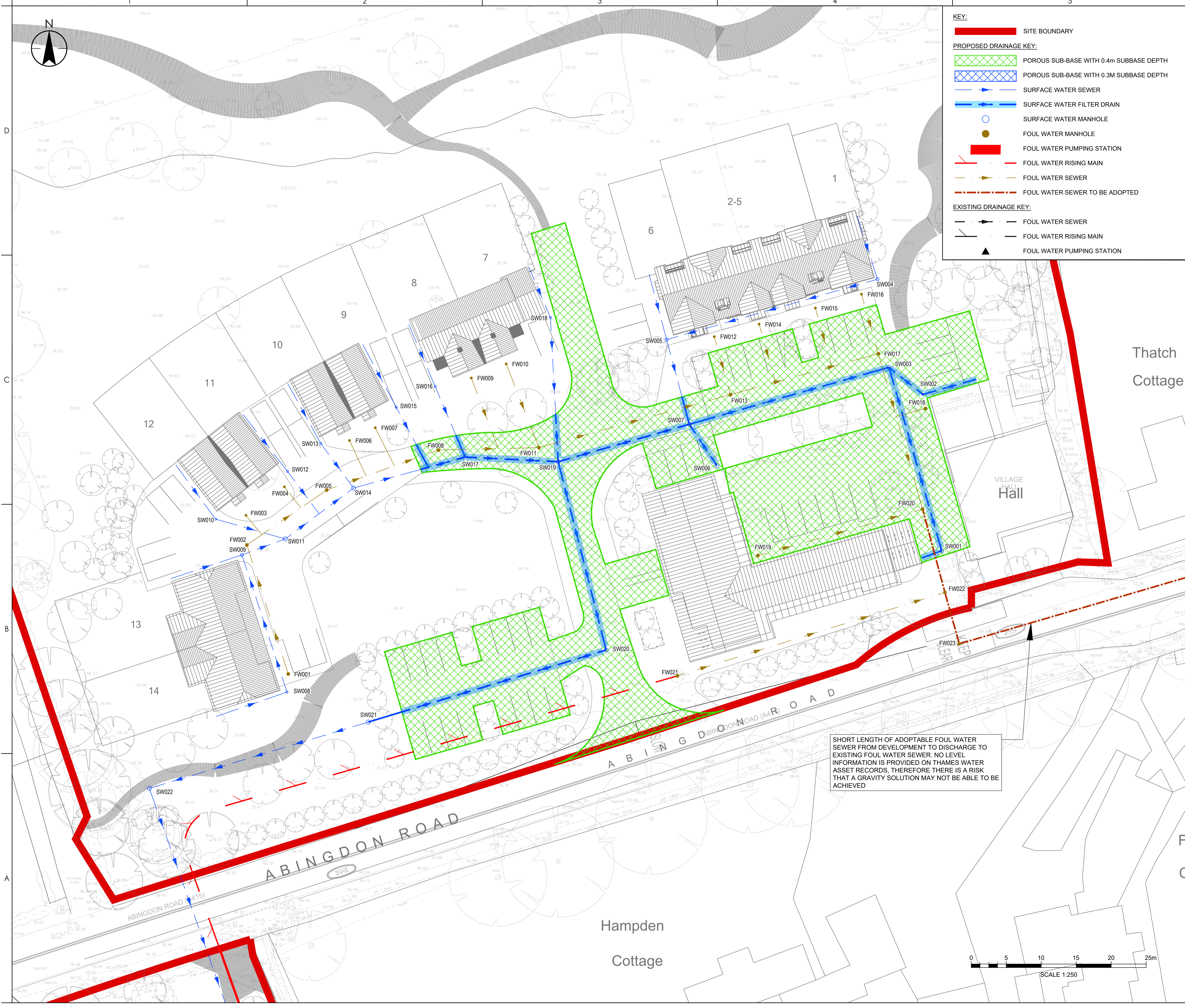
**KEY:**

**PROPOSED DRAINAGE KEY:**

- POROUS SUB-BASE WITH 0.4m SUBBASE DEPTH
- POROUS SUB-BASE WITH 0.3M SUBBASE DEPTH
- SURFACE WATER SEWER
- SURFACE WATER FILTER DRAIN
- SURFACE WATER MANHOLE
- FOUL WATER MANHOLE
- FOUL WATER PUMPING STATION
- FOUL WATER RISING MAIN
- FOUL WATER SEWER
- FOUL WATER SEWER TO BE ADOPTED

**EXISTING DRAINAGE KEY:**

- FOUL WATER SEWER
- FOUL WATER RISING MAIN
- FOUL WATER PUMPING STATION

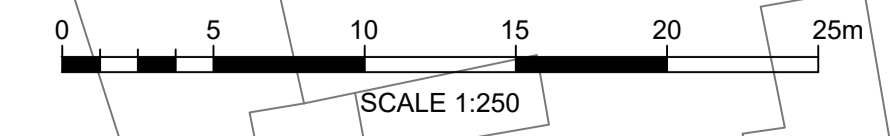


Thatch Cottage

Village Hall

Hampden Cottage

SHORT LENGTH OF ADOPTABLE FOUL WATER SEWER FROM DEVELOPMENT TO DISCHARGE TO EXISTING FOUL WATER SEWER. NO LEVEL INFORMATION IS PROVIDED ON THAMES WATER ASSET RECORDS, THEREFORE THERE IS A RISK THAT A GRAVITY SOLUTION MAY NOT BE ABLE TO BE ACHIEVED



P02 FOR PLANNING	VT	SH	2022.07.07
P01 FIRST ISSUE	VT	SH	2021.08.18
Issue/Revision	By	Appd	YYYY.MM.DD
	VT	SH	2021.08.18
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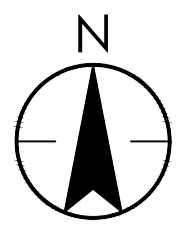
CLIFTON HAMPDEN

Title  
**PROPOSED DRAINAGE LAYOUT**

SHEET 1 OF 2

Project No. 332110526	Scale 1:250 @ A1
Revision <b>P02</b>	Drawing No. <b>332110526-2001-001</b>

P:\0000\332110526\332110526-2001-001.dwg 2022/07/07 10:52:31 AM By: MRM/PLM



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9. CONCEPT DRAINAGE LAYOUT BASED ON THE ASSUMPTION THAT FINISHED ROAD LEVELS WILL BE SET APPROXIMATELY 250mm ABOVE EXISTING GROUND LEVELS
10. FLOWS DISCHARGING TO EXISTING WATERCOURSE OR DRAINAGE NETWORK. SURFACE WATER RUN-OFF WILL BE ATTENUATED UP TO AND INCLUDING THE 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE RAINFALL EVENT
11. SURFACE WATER RUN-OFF WILL BE LIMITED TO THE MEAN ANNUAL FLOOD (QBAR) = 3.4 l/s
12. EXISTING VILLAGE HALL TO BE RETAINED IN THE SE CORNER OF THE NORTHERN SITE
13. DETAILED LEVELS DESIGN AND DRAINAGE LAYOUT SUBJECT TO ARCHITECTS CONFIRMATION OF DRAINAGE CONNECTION POINTS
14. CONNECTION TO EXISTING FOUL AND SURFACE WATER DRAINAGE NETWORKS SUBJECT TO CCTV SURVEY

**KEY:**

**SITE BOUNDARY**

**PROPOSED DRAINAGE KEY:**

- [Green hatched box] POROUS SUB-BASE WITH 0.4m SUBBASE DEPTH
- [Blue hatched box] POROUS SUB-BASE WITH 0.3M SUBBASE DEPTH
- [Blue dashed line with arrow] SURFACE WATER SEWER
- [Blue solid line with arrow] SURFACE WATER FILTER DRAIN
- [Blue circle with dot] SURFACE WATER MANHOLE
- [Yellow circle with dot] FOUL WATER MANHOLE
- [Red rectangle] FOUL WATER PUMPING STATION
- [Red dashed line with arrow] FOUL WATER RISING MAIN
- [Yellow dashed line with arrow] FOUL WATER SEWER
- [Red dashed line with arrow] FOUL WATER SEWER TO BE ADOPTED

**EXISTING DRAINAGE KEY:**

- [Black dashed line with arrow] FOUL WATER SEWER
- [Black solid line with arrow] FOUL WATER RISING MAIN
- [Black triangle] FOUL WATER PUMPING STATION

LOCATION OF FOUL WATER RISING MAIN TAKEN FROM THAMES WATER LTD ASSET RECORDS DATED 22 MARCH 2021. LOCATION PROVIDED IS INDICATIVE, AND FURTHER INVESTIGATION REQUIRED TO CONFIRM ACTUAL POSITION ON SITE BECAUSE THIS PROVIDES A MAJOR CONSTRAINT TO DEVELOPMENT OF THE SITE

SURFACE WATER FLOWS TO BE RESTRICTED TO 6.7 l/s BY A 40mm ORIFICE PLATE FITTED TO OUTGOING PIPE

SURFACE WATER DRAINAGE TO DISCHARGE INTO CULVERTED DITCH CROSSING

EXISTING MANHOLE IDENTIFIED ON TOPOGRAPHICAL SURVEY - FURTHER INVESTIGATION REQUIRED TO DETERMINE WHETHER THIS IS FOR FOUL OR SURFACE WATER DRAINAGE, AS WELL AS CONFIRMING LEVELS AND PIPE SIZES.

P02 FOR PLANNING	VT	SH	2022.07.07
P01 FIRST ISSUE	VT	SH	2021.08.18
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	VT	SH	2021.08.18
	Dwn.	Dsgn.	Chkd.
			YYYY.MM.DD

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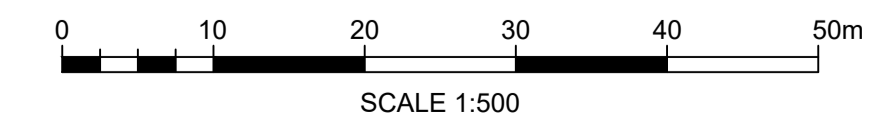
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Title  
**PROPOSED DRAINAGE STRATEGY**  
 SHEET 2 OF 2

Project No. 332110526	Scale 1:500 @ A1
Revision <b>P02</b>	Drawing No. <b>332110526-2001-002</b>



P:\000000\332110526\332110526-2001-002.dwg  
 Plot Date: 2022/07/07 11:42:28 AM  
 Plot Scale: 1:500  
 Plot Size: A1 (841mm x 594mm)  
 Plot Orientation: Landscape  
 Plot Title: PROPOSED DRAINAGE STRATEGY - SHEET 2 OF 2  
 Plot Path: P:\000000\332110526\332110526-2001-002.dwg  
 Plot Device: HP DesignJet T1100PS



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CLIFTON HAMPDEN

Title  
 DRAINAGE MANHOLE SCHEDULES

Project No. 332110526 Scale A2  
 Revision P02 Drawing No. 332110526-2001-003

SURFACE WATER MANHOLE SCHEDULE								FOUL WATER MANHOLE SCHEDULE							
MH NO.	CL	IL	DEPTH	PIPEØ OUT	COVER TYPE	MANHOLE SIZE	MANHOLE TYPE	MH NO.	CL	IL	DEPTH	PIPEØ OUT	COVER TYPE	MANHOLE SIZE	MANHOLE TYPE
SW001	54.65	54.05	0.60m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW001	55.60	55.00	0.60m	150Ø	D400	450Ø	PLASTIC IC
SW002	54.80	53.93	0.87m	100Ø	D400	315Ø	PLASTIC CATCHPIT	FW002	55.60	54.75	0.85m	150Ø	D400	450Ø	PLASTIC IC
SW003	54.70	53.87	0.83m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW003	55.55	54.77	0.78m	100Ø	B125	315Ø	PLASTIC IC
SW004	55.20	54.11	1.09m	100Ø	B125	450Ø	PLASTIC CATCHPIT	FW004	55.55	54.73	0.82m	100Ø	B125	315Ø	PLASTIC IC
SW005	55.20	53.80	1.40m	150Ø	B125	450Ø	PLASTIC CATCHPIT	FW005	55.50	54.65	0.85m	150Ø	D400	450Ø	PLASTIC IC
SW006	70.70	69.30	1.40m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW006	55.43	54.68	0.75m	100Ø	B125	315Ø	PLASTIC IC
SW007	55.28	53.67	1.61m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW007	55.44	54.65	0.79m	100Ø	B125	315Ø	PLASTIC IC
SW008	55.60	54.09	1.51m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW008	55.40	54.53	0.87m	150Ø	D400	450Ø	PLASTIC IC
SW009	55.60	53.87	1.73m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW009	55.45	54.61	0.84m	100Ø	B125	315Ø	PLASTIC IC
SW010	55.55	53.92	1.63m	100Ø	D400	315Ø	PLASTIC CATCHPIT	FW010	55.45	54.59	0.86m	100Ø	B125	315Ø	PLASTIC IC
SW011	55.55	53.82	1.73m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW011	55.30	54.43	0.87m	150Ø	D400	450Ø	PLASTIC IC
SW012	55.55	53.87	1.68m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW012	55.20	54.34	0.86m	100Ø	B125	315Ø	PLASTIC IC
SW013	55.55	53.82	1.73m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW013	55.03	54.24	0.79m	150Ø	D400	450Ø	PLASTIC IC
SW014	55.50	53.74	1.76m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW014	55.20	54.30	0.90m	100Ø	B125	315Ø	PLASTIC IC
SW015	55.55	53.76	1.79m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW015	55.20	54.24	0.96m	100Ø	B125	315Ø	PLASTIC IC
SW016	55.45	53.74	1.71m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW016	55.20	54.20	1.00m	100Ø	B125	315Ø	PLASTIC IC
SW017	55.40	53.63	1.77m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW017	54.70	54.09	0.61m	150Ø	D400	450Ø	PLASTIC IC
SW018	55.45	53.75	1.70m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW018	54.80	54.07	0.73m	150Ø	D400	450Ø	PLASTIC IC
SW019	55.30	53.54	1.76m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW019	55.00	54.09	0.91m	150Ø	D400	450Ø	PLASTIC IC
SW020	55.50	53.35	2.15m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW020	54.70	53.93	0.77m	150Ø	D400	450Ø	PLASTIC IC
SW021	55.50	53.11	2.39m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW021	55.10	54.11	0.99m	150Ø	B125	450Ø	PLASTIC IC
SW022	56.45	52.89	3.56m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW022	54.65	53.84	0.81m	150Ø	B125	450Ø	PLASTIC IC
SW023	55.80	52.66	3.14m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW023	54.50	53.78	0.72m	150Ø	D400	450Ø	PLASTIC IC
SW024	55.73	52.46	3.27m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW101	55.25	54.65	0.60m	100Ø	B125	315Ø	PLASTIC IC
SW025	55.25	52.82	2.43m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW102	55.25	54.40	0.85m	100Ø	B125	315Ø	PLASTIC IC
SW026	55.88	52.67	3.21m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW103	55.65	54.32	1.33m	150Ø	D400	450Ø	PLASTIC IC
SW027	55.20	52.62	2.58m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW104	55.20	54.25	0.95m	100Ø	D400	315Ø	PLASTIC IC
SW028	55.20	52.61	2.59m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW105	55.20	54.18	1.02m	150Ø	D400	450Ø	PLASTIC IC
SW029	55.25	52.56	2.69m	225Ø	B125	600Ø	PLASTIC CATCHPIT								
SW030	55.65	52.46	3.19m	150Ø	B125	450Ø	PLASTIC CATCHPIT								
SW031	55.95	52.14	3.81m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW032	56.10	51.92	4.18m	225Ø	B125	1200Ø	PCC CHAMBER								
SW033	54.95	51.62	3.33m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW034	54.54	51.35	3.19m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW035	52.60	51.05	1.55m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW036	50.80	50.15	0.65m	225Ø	D400	600Ø	PLASTIC CATCHPIT								

COVER LEVELS AND INVERT LEVELS ARE INDICATIVE ONLY. DETAILED LEVELS DESIGN AND DRAINAGE LAYOUT SUBJECT TO ARCHITECTS CONFIRMATION OF DRAINAGE CONNECTION POINTS

# Appendix E    Drainage Standard Details

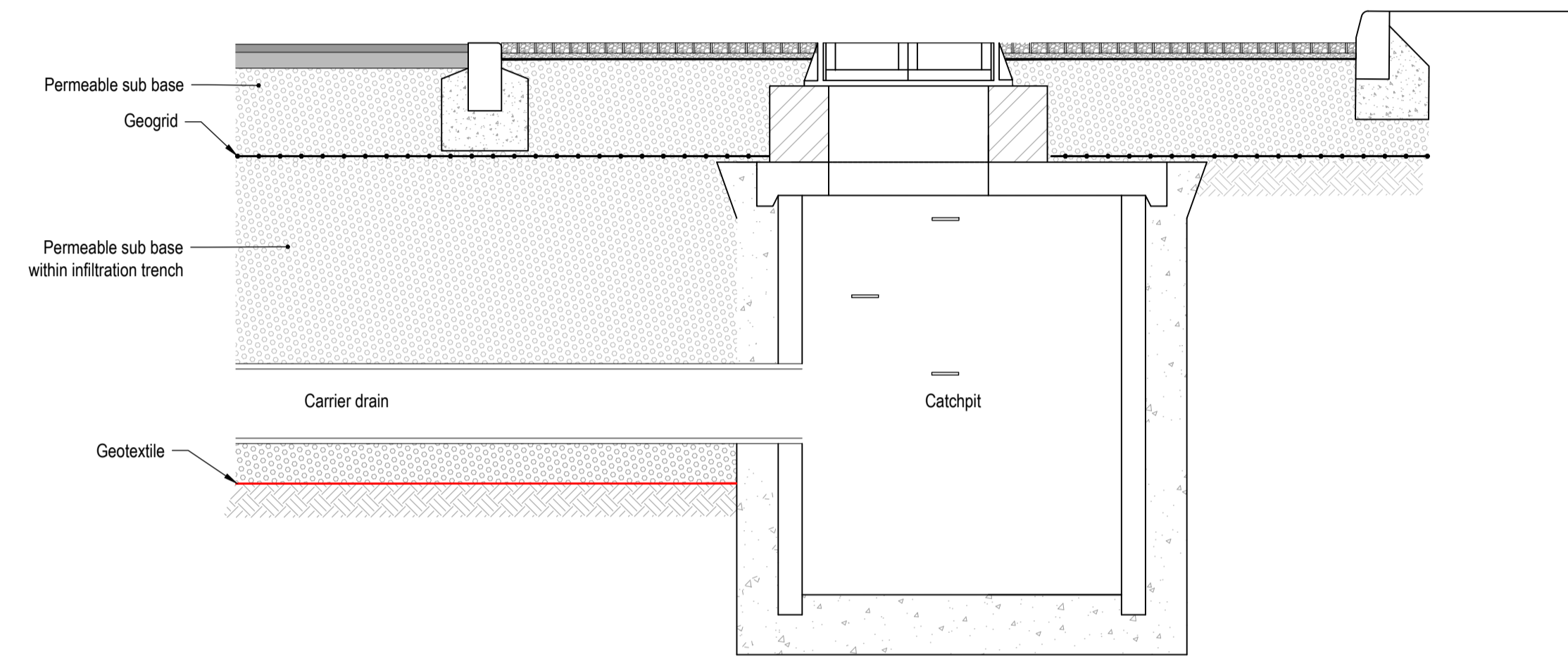


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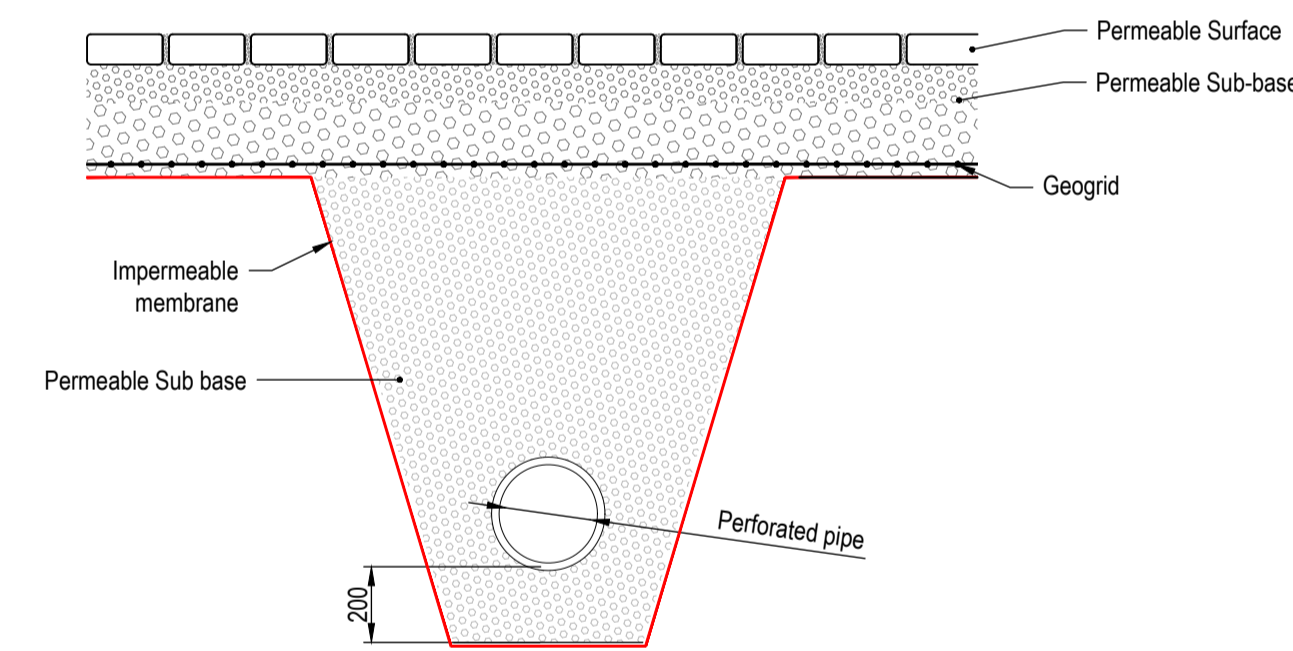
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Notes

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TYPICAL LONG SECTION THROUGH CARRIER DRAIN



TYPICAL SECTION

FILTER DRAIN UNDER POROUS BLOCK PAVING DETAIL  
 SCALE 1:20

P01	FIRST ISSUE	PB	SH	2022.07.07
	Issued/Revision	By	Appd	YYYY.MM.DD
		PB	JS	SH
		Dwn.	Dsgn.	Chkd.
				2022.07.07
				YYYY.MM.DD

Issue Status

**FOR PLANNING**

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo



Client/Project  
 THOMAS HOMES

CLIFTON HAMPDEN

Title  
 STANDARD DETAILS

SHEET 2 OF 2

Project No.	332110526	Scale	AS SHOWN @ A1
Revision	P01	Drawing No.	332110526-2001-007

# Appendix F      Microdrainage Calculation Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.600
Maximum Rainfall (mm/hr)	550	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.500
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm









Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.025	4-8	0.316	8-12	0.300

Total Area Contributing (ha) = 0.641

Total Pipe Volume (m<sup>3</sup>) = 25.578

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.756	0.090	141.7	0.054	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	16.554	0.110	150.5	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	13.377	0.065	205.8	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	49.514	0.330	150.0	0.170	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	28.820	0.192	150.1	0.177	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	20.419	0.136	150.1	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	16.483	0.110	149.8	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	31.466	0.210	149.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	174.28	4.19	53.820	0.054	0.0	0.0	0.0	1.10	43.6	25.5
1.001	170.76	4.45	53.730	0.064	0.0	0.0	0.0	1.06	42.3	29.4
1.002	167.60	4.70	53.620	0.105	0.0	0.0	0.0	0.91	36.1«	47.7
2.000	166.65	4.77	53.870	0.170	0.0	0.0	0.0	1.07	42.3«	76.9
1.003	161.28	5.23	53.540	0.452	0.0	0.0	0.0	1.06	42.3«	197.5
1.004	157.73	5.55	53.350	0.482	0.0	0.0	0.0	1.06	42.3«	205.9
1.005	155.01	5.80	53.200	0.516	0.0	0.0	0.0	1.07	42.4«	216.7
1.006	150.14	6.30	53.110	0.516	0.0	0.0	0.0	1.07	42.4«	216.7



Caversham Bridge House  
Waterman Place  
Reading, RG1 8DN

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Clifton Hampden  
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Checked by Jasper Syms

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### Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
1.007	33.872	0.226	149.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.008	55.984	0.315	177.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
3.000	23.107	0.395	58.5	0.015	4.00	0.0	0.600	o	100	Pipe/Conduit		
4.000	31.381	0.316	99.3	0.020	4.00	0.0	0.600	o	150	Pipe/Conduit		
3.001	24.351	0.162	150.3	0.022	0.00	0.0	0.600	o	150	Pipe/Conduit		
1.009	35.211	0.220	160.1	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.010	16.423	0.130	126.3	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.011	39.436	0.219	180.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.012	75.152	0.550	136.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.013	60.662	1.011	60.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		

### Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.007	145.30	6.83	52.900	0.516	0.0	0.0	0.0	1.07	42.4«	216.7
1.008	137.51	7.78	52.660	0.516	0.0	0.0	0.0	0.98	38.9«	216.7
3.000	171.72	4.38	55.200	0.015	0.0	0.0	0.0	1.01	7.9	6.7
4.000	169.91	4.52	55.230	0.020	0.0	0.0	0.0	1.01	17.8	9.4
3.001	163.73	5.02	52.410	0.057	0.0	0.0	0.0	0.82	14.4«	25.1
1.009	133.34	8.35	52.270	0.600	0.0	0.0	0.0	1.03	41.0«	216.7
1.010	131.71	8.58	52.050	0.641	0.0	0.0	0.0	1.16	46.2«	228.7
1.011	127.11	9.26	51.920	0.641	0.0	0.0	0.0	0.97	38.6«	228.7
1.012	120.11	10.38	51.700	0.641	0.0	0.0	0.0	1.12	44.4«	228.7
1.013	117.65	10.81	51.000	0.641	0.0	0.0	0.0	2.34	258.8	228.7

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	55.500	1.680	Open Manhole	1200	1.000	53.820	225				
2	55.500	1.770	Open Manhole	1200	1.001	53.730	225	1.000	53.730	225	
2	55.500	1.880	Open Manhole	1200	1.002	53.620	225	1.001	53.620	225	
2	55.500	1.630	Open Manhole	1200	2.000	53.870	225				
2	55.500	1.960	Open Manhole	1200	1.003	53.540	225	1.002	53.555	225	15
								2.000	53.540	225	
3	55.500	2.152	Open Manhole	1200	1.004	53.350	225	1.003	53.348	225	
4	55.500	2.300	Open Manhole	1200	1.005	53.200	225	1.004	53.214	225	14
5	55.500	2.410	Open Manhole	1200	1.006	53.110	225	1.005	53.090	225	
6	55.500	2.600	Open Manhole	1200	1.007	52.900	225	1.006	52.900	225	
7	55.800	3.140	Open Manhole	1200	1.008	52.660	225	1.007	52.674	225	14
8	55.800	0.600	Open Manhole	1200	3.000	55.200	100				
10	55.800	0.570	Open Manhole	1200	4.000	55.230	150				
9	55.800	3.390	Open Manhole	1200	3.001	52.410	150	3.000	54.805	100	2345
								4.000	54.914	150	2504
8	55.800	3.552	Open Manhole	1200	1.009	52.270	225	1.008	52.345	225	75
								3.001	52.248	150	
9	55.800	3.750	Open Manhole	1200	1.010	52.050	225	1.009	52.050	225	
10	55.800	3.880	Open Manhole	1200	1.011	51.920	225	1.010	51.920	225	
11	54.950	3.250	Open Manhole	1200	1.012	51.700	225	1.011	51.701	225	1
12	53.050	2.050	Open Manhole	1350	1.013	51.000	375	1.012	51.150	225	
	51.500	1.511	Open Manhole	0		OUTFALL		1.013	49.989	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	454536.389	195623.526	454536.389	195623.526	Required	
2	454546.489	195631.317	454546.489	195631.317	Required	
2	454562.468	195635.644	454562.468	195635.644	Required	
2	454623.653	195648.359	454623.653	195648.359	Required	
2	454575.844	195635.479	454575.844	195635.479	Required	
3	454582.806	195607.512	454582.806	195607.512	Required	
4	454563.195	195601.826	454563.195	195601.826	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
5	454547.413	195597.068	454547.413	195597.068	Required	
6	454517.242	195588.133	454517.242	195588.133	Required	
7	454528.266	195556.105	454528.266	195556.105	Required	
8	454503.433	195506.555	454503.433	195506.555	Required	
10	454450.982	195493.907	454450.982	195493.907	Required	
9	454480.388	195504.862	454480.388	195504.862	Required	
8	454479.180	195529.183	454479.180	195529.183	Required	
9	454448.313	195512.241	454448.313	195512.241	Required	
10	454434.040	195504.118	454434.040	195504.118	Required	
11	454396.210	195492.978	454396.210	195492.978	Required	
12	454332.212	195453.582	454332.212	195453.582	Required	
	454280.515	195421.844			No Entry	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	55.500	53.820	1.455	Open Manhole	1200
1.001	o	225	2	55.500	53.730	1.545	Open Manhole	1200
1.002	o	225	2	55.500	53.620	1.655	Open Manhole	1200
2.000	o	225	2	55.500	53.870	1.405	Open Manhole	1200
1.003	o	225	2	55.500	53.540	1.735	Open Manhole	1200
1.004	o	225	3	55.500	53.350	1.925	Open Manhole	1200
1.005	o	225	4	55.500	53.200	2.075	Open Manhole	1200
1.006	o	225	5	55.500	53.110	2.165	Open Manhole	1200
1.007	o	225	6	55.500	52.900	2.375	Open Manhole	1200
1.008	o	225	7	55.800	52.660	2.915	Open Manhole	1200
3.000	o	100	8	55.800	55.200	0.500	Open Manhole	1200
4.000	o	150	10	55.800	55.230	0.420	Open Manhole	1200
3.001	o	150	9	55.800	52.410	3.240	Open Manhole	1200
1.009	o	225	8	55.800	52.270	3.305	Open Manhole	1200
1.010	o	225	9	55.800	52.050	3.525	Open Manhole	1200
1.011	o	225	10	55.800	51.920	3.655	Open Manhole	1200
1.012	o	225	11	54.950	51.700	3.025	Open Manhole	1200
1.013	o	375	12	53.050	51.000	1.675	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	12.756	141.7	2	55.500	53.730	1.545	Open Manhole	1200
1.001	16.554	150.5	2	55.500	53.620	1.655	Open Manhole	1200
1.002	13.377	205.8	2	55.500	53.555	1.720	Open Manhole	1200
2.000	49.514	150.0	2	55.500	53.540	1.735	Open Manhole	1200
1.003	28.820	150.1	3	55.500	53.348	1.927	Open Manhole	1200
1.004	20.419	150.1	4	55.500	53.214	2.061	Open Manhole	1200
1.005	16.483	149.8	5	55.500	53.090	2.185	Open Manhole	1200
1.006	31.466	149.8	6	55.500	52.900	2.375	Open Manhole	1200
1.007	33.872	149.9	7	55.800	52.674	2.901	Open Manhole	1200
1.008	55.984	177.7	8	55.800	52.345	3.230	Open Manhole	1200
3.000	23.107	58.5	9	55.800	54.805	0.895	Open Manhole	1200
4.000	31.381	99.3	9	55.800	54.914	0.736	Open Manhole	1200
3.001	24.351	150.3	8	55.800	52.248	3.402	Open Manhole	1200
1.009	35.211	160.1	9	55.800	52.050	3.525	Open Manhole	1200
1.010	16.423	126.3	10	55.800	51.920	3.655	Open Manhole	1200
1.011	39.436	180.1	11	54.950	51.701	3.024	Open Manhole	1200
1.012	75.152	136.6	12	53.050	51.150	1.675	Open Manhole	1350
1.013	60.662	60.0		51.500	49.989	1.136	Open Manhole	0

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332110526



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#### Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.022	0.022	0.022
	User	-	100	0.033	0.033	0.054
1.001	User	-	100	0.010	0.010	0.010
1.002	User	-	100	0.012	0.012	0.012
	User	-	100	0.006	0.006	0.018
	User	-	100	0.012	0.012	0.030
	User	-	100	0.012	0.012	0.041
2.000	User	-	100	0.072	0.072	0.072
	User	-	100	0.032	0.032	0.104
	User	-	100	0.066	0.066	0.170
1.003	User	-	100	0.035	0.035	0.035
	User	-	100	0.055	0.055	0.090
	User	-	100	0.069	0.069	0.158
	User	-	100	0.015	0.015	0.173
	User	-	100	0.004	0.004	0.177
1.004	User	-	100	0.028	0.028	0.028
	User	-	100	0.002	0.002	0.030
1.005	User	-	100	0.034	0.034	0.034
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.015	0.015	0.015
4.000	User	-	100	0.020	0.020	0.020
3.001	User	-	100	0.022	0.022	0.022
1.009	User	-	100	0.023	0.023	0.023
	User	-	100	0.004	0.004	0.027
1.010	User	-	100	0.042	0.042	0.042
1.011	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.641	0.641	0.641

#### Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
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1.013		51.500	49.989	50.150	0	0
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#### Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	5	Number of Real Time Controls	0


#### Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000
Return Period (years)	100	Ratio R	0.400
Region England and Wales Profile Type Summer			

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Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30  
Cv (Winter) 0.840

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Online Controls for Storm

Orifice Manhole: 10, DS/PN: 1.011, Volume (m<sup>3</sup>): 5.0

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 51.920

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### Storage Structures for Storm

#### Porous Car Park Manhole: 2, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	186.0
Max Percolation (l/s)	258.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 2, DS/PN: 1.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	110.0
Max Percolation (l/s)	152.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 3, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	52.0
Max Percolation (l/s)	72.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 4, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.0
Membrane Percolation (mm/hr)	1000	Length (m)	21.1
Max Percolation (l/s)	93.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 9, DS/PN: 1.010

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.6
Max Percolation (l/s)	104.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	55.370	Membrane Depth (mm)	0



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Manhole Headloss for Storm

<b>PN</b>	<b>US/MH Name</b>	<b>US/MH Headloss</b>
1.000	1	0.500
1.001	2	0.500
1.002	2	0.500
2.000	2	0.500
1.003	2	0.500
1.004	3	0.500
1.005	4	0.500
1.006	5	0.500
1.007	6	0.500
1.008	7	0.500
3.000	8	0.500
4.000	10	0.500
3.001	9	0.500
1.009	8	0.500
1.010	9	0.500
1.011	10	0.500
1.012	11	0.500
1.013	12	0.500

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.600
Maximum Rainfall (mm/hr)	550	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.500
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm









Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.025	4-8	0.316	8-12	0.300

Total Area Contributing (ha) = 0.641

Total Pipe Volume (m<sup>3</sup>) = 25.578

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.756	0.090	141.7	0.054	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	16.554	0.110	150.5	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	13.377	0.065	205.8	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	49.514	0.330	150.0	0.170	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	28.820	0.192	150.1	0.177	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	20.419	0.136	150.1	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	16.483	0.110	149.8	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	31.466	0.210	149.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	174.28	4.19	53.820	0.054	0.0	0.0	0.0	1.10	43.6	25.5
1.001	170.76	4.45	53.730	0.064	0.0	0.0	0.0	1.06	42.3	29.4
1.002	167.60	4.70	53.620	0.105	0.0	0.0	0.0	0.91	36.1«	47.7
2.000	166.65	4.77	53.870	0.170	0.0	0.0	0.0	1.07	42.3«	76.9
1.003	161.28	5.23	53.540	0.452	0.0	0.0	0.0	1.06	42.3«	197.5
1.004	157.73	5.55	53.350	0.482	0.0	0.0	0.0	1.06	42.3«	205.9
1.005	155.01	5.80	53.200	0.516	0.0	0.0	0.0	1.07	42.4«	216.7
1.006	150.14	6.30	53.110	0.516	0.0	0.0	0.0	1.07	42.4«	216.7

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### Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.007	33.872	0.226	149.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.008	55.984	0.315	177.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	23.107	0.395	58.5	0.015	4.00	0.0	0.600	o	100	Pipe/Conduit	
4.000	31.381	0.316	99.3	0.020	4.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	24.351	0.162	150.3	0.022	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	35.211	0.220	160.1	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.010	16.423	0.130	126.3	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	39.436	0.219	180.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.012	75.152	0.550	136.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.013	60.662	1.011	60.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

### Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.007	145.30	6.83	52.900	0.516	0.0	0.0	0.0	1.07	42.4«	216.7
1.008	137.51	7.78	52.660	0.516	0.0	0.0	0.0	0.98	38.9«	216.7
3.000	171.72	4.38	55.200	0.015	0.0	0.0	0.0	1.01	7.9	6.7
4.000	169.91	4.52	55.230	0.020	0.0	0.0	0.0	1.01	17.8	9.4
3.001	163.73	5.02	52.410	0.057	0.0	0.0	0.0	0.82	14.4«	25.1
1.009	133.34	8.35	52.270	0.600	0.0	0.0	0.0	1.03	41.0«	216.7
1.010	131.71	8.58	52.050	0.641	0.0	0.0	0.0	1.16	46.2«	228.7
1.011	127.11	9.26	51.920	0.641	0.0	0.0	0.0	0.97	38.6«	228.7
1.012	120.11	10.38	51.700	0.641	0.0	0.0	0.0	1.12	44.4«	228.7
1.013	117.65	10.81	51.000	0.641	0.0	0.0	0.0	2.34	258.8	228.7

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	55.500	1.680	Open Manhole	1200	1.000	53.820	225				
2	55.500	1.770	Open Manhole	1200	1.001	53.730	225	1.000	53.730	225	
2	55.500	1.880	Open Manhole	1200	1.002	53.620	225	1.001	53.620	225	
2	55.500	1.630	Open Manhole	1200	2.000	53.870	225				
2	55.500	1.960	Open Manhole	1200	1.003	53.540	225	1.002	53.555	225	15
								2.000	53.540	225	
3	55.500	2.152	Open Manhole	1200	1.004	53.350	225	1.003	53.348	225	
4	55.500	2.300	Open Manhole	1200	1.005	53.200	225	1.004	53.214	225	14
5	55.500	2.410	Open Manhole	1200	1.006	53.110	225	1.005	53.090	225	
6	55.500	2.600	Open Manhole	1200	1.007	52.900	225	1.006	52.900	225	
7	55.800	3.140	Open Manhole	1200	1.008	52.660	225	1.007	52.674	225	14
8	55.800	0.600	Open Manhole	1200	3.000	55.200	100				
10	55.800	0.570	Open Manhole	1200	4.000	55.230	150				
9	55.800	3.390	Open Manhole	1200	3.001	52.410	150	3.000	54.805	100	2345
								4.000	54.914	150	2504
8	55.800	3.552	Open Manhole	1200	1.009	52.270	225	1.008	52.345	225	75
								3.001	52.248	150	
9	55.800	3.750	Open Manhole	1200	1.010	52.050	225	1.009	52.050	225	
10	55.800	3.880	Open Manhole	1200	1.011	51.920	225	1.010	51.920	225	
11	54.950	3.250	Open Manhole	1200	1.012	51.700	225	1.011	51.701	225	1
12	53.050	2.050	Open Manhole	1350	1.013	51.000	375	1.012	51.150	225	
	51.500	1.511	Open Manhole	0		OUTFALL		1.013	49.989	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	454536.389	195623.526	454536.389	195623.526	Required	
2	454546.489	195631.317	454546.489	195631.317	Required	
2	454562.468	195635.644	454562.468	195635.644	Required	
2	454623.653	195648.359	454623.653	195648.359	Required	
2	454575.844	195635.479	454575.844	195635.479	Required	
3	454582.806	195607.512	454582.806	195607.512	Required	
4	454563.195	195601.826	454563.195	195601.826	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
5	454547.413	195597.068	454547.413	195597.068	Required	
6	454517.242	195588.133	454517.242	195588.133	Required	
7	454528.266	195556.105	454528.266	195556.105	Required	
8	454503.433	195506.555	454503.433	195506.555	Required	
10	454450.982	195493.907	454450.982	195493.907	Required	
9	454480.388	195504.862	454480.388	195504.862	Required	
8	454479.180	195529.183	454479.180	195529.183	Required	
9	454448.313	195512.241	454448.313	195512.241	Required	
10	454434.040	195504.118	454434.040	195504.118	Required	
11	454396.210	195492.978	454396.210	195492.978	Required	
12	454332.212	195453.582	454332.212	195453.582	Required	
	454280.515	195421.844			No Entry	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	55.500	53.820	1.455	Open Manhole	1200
1.001	o	225	2	55.500	53.730	1.545	Open Manhole	1200
1.002	o	225	2	55.500	53.620	1.655	Open Manhole	1200
2.000	o	225	2	55.500	53.870	1.405	Open Manhole	1200
1.003	o	225	2	55.500	53.540	1.735	Open Manhole	1200
1.004	o	225	3	55.500	53.350	1.925	Open Manhole	1200
1.005	o	225	4	55.500	53.200	2.075	Open Manhole	1200
1.006	o	225	5	55.500	53.110	2.165	Open Manhole	1200
1.007	o	225	6	55.500	52.900	2.375	Open Manhole	1200
1.008	o	225	7	55.800	52.660	2.915	Open Manhole	1200
3.000	o	100	8	55.800	55.200	0.500	Open Manhole	1200
4.000	o	150	10	55.800	55.230	0.420	Open Manhole	1200
3.001	o	150	9	55.800	52.410	3.240	Open Manhole	1200
1.009	o	225	8	55.800	52.270	3.305	Open Manhole	1200
1.010	o	225	9	55.800	52.050	3.525	Open Manhole	1200
1.011	o	225	10	55.800	51.920	3.655	Open Manhole	1200
1.012	o	225	11	54.950	51.700	3.025	Open Manhole	1200
1.013	o	375	12	53.050	51.000	1.675	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	12.756	141.7	2	55.500	53.730	1.545	Open Manhole	1200
1.001	16.554	150.5	2	55.500	53.620	1.655	Open Manhole	1200
1.002	13.377	205.8	2	55.500	53.555	1.720	Open Manhole	1200
2.000	49.514	150.0	2	55.500	53.540	1.735	Open Manhole	1200
1.003	28.820	150.1	3	55.500	53.348	1.927	Open Manhole	1200
1.004	20.419	150.1	4	55.500	53.214	2.061	Open Manhole	1200
1.005	16.483	149.8	5	55.500	53.090	2.185	Open Manhole	1200
1.006	31.466	149.8	6	55.500	52.900	2.375	Open Manhole	1200
1.007	33.872	149.9	7	55.800	52.674	2.901	Open Manhole	1200
1.008	55.984	177.7	8	55.800	52.345	3.230	Open Manhole	1200
3.000	23.107	58.5	9	55.800	54.805	0.895	Open Manhole	1200
4.000	31.381	99.3	9	55.800	54.914	0.736	Open Manhole	1200
3.001	24.351	150.3	8	55.800	52.248	3.402	Open Manhole	1200
1.009	35.211	160.1	9	55.800	52.050	3.525	Open Manhole	1200
1.010	16.423	126.3	10	55.800	51.920	3.655	Open Manhole	1200
1.011	39.436	180.1	11	54.950	51.701	3.024	Open Manhole	1200
1.012	75.152	136.6	12	53.050	51.150	1.675	Open Manhole	1350
1.013	60.662	60.0		51.500	49.989	1.136	Open Manhole	0

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#### Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.022	0.022	0.022
	User	-	100	0.033	0.033	0.054
1.001	User	-	100	0.010	0.010	0.010
1.002	User	-	100	0.012	0.012	0.012
	User	-	100	0.006	0.006	0.018
	User	-	100	0.012	0.012	0.030
	User	-	100	0.012	0.012	0.041
2.000	User	-	100	0.072	0.072	0.072
	User	-	100	0.032	0.032	0.104
	User	-	100	0.066	0.066	0.170
1.003	User	-	100	0.035	0.035	0.035
	User	-	100	0.055	0.055	0.090
	User	-	100	0.069	0.069	0.158
	User	-	100	0.015	0.015	0.173
	User	-	100	0.004	0.004	0.177
1.004	User	-	100	0.028	0.028	0.028
	User	-	100	0.002	0.002	0.030
1.005	User	-	100	0.034	0.034	0.034
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.015	0.015	0.015
4.000	User	-	100	0.020	0.020	0.020
3.001	User	-	100	0.022	0.022	0.022
1.009	User	-	100	0.023	0.023	0.023
	User	-	100	0.004	0.004	0.027
1.010	User	-	100	0.042	0.042	0.042
1.011	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.641	0.641	0.641

#### Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013		51.500	49.989	50.150	0	0


#### Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 1    Number of Storage Structures 5    Number of Real Time Controls 0

#### Synthetic Rainfall Details


Rainfall Model	FSR	M5-60 (mm)	20.000
Return Period (years)	100	Ratio R	0.400
Region England and Wales Profile Type Summer			

Stantec UK Ltd		Page 7
Caversham Bridge House Waterman Place Reading, RG1 8DN	Drainage Calculations Clifton Hampden 332110526	
Date 07/07/2022 File Network Model 2.MDX	Designed by Peter Bunn Checked by Jasper Syms	
Innovyze	Network 2020.1	

Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30  
Cv (Winter) 0.840



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Caversham Bridge House Waterman Place Reading, RG1 8DN	Drainage Calculations Clifton Hampden 332110526	
Date 07/07/2022 File Network Model 2.MDX	Designed by Peter Bunn Checked by Jasper Syms	
Innovyze	Network 2020.1	

Online Controls for Storm

Orifice Manhole: 10, DS/PN: 1.011, Volume (m<sup>3</sup>): 5.0

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 51.920

Caversham Bridge House  
Waterman Place  
Reading, RG1 8DN

Drainage Calculations  
Clifton Hampden  
332110526

Date 07/07/2022  
File Network Model 2.MDX

Designed by Peter Bunn  
Checked by Jasper Syms



Innovyze

Network 2020.1

### Storage Structures for Storm

#### Porous Car Park Manhole: 2, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	186.0
Max Percolation (l/s)	258.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 2, DS/PN: 1.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	110.0
Max Percolation (l/s)	152.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 3, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	52.0
Max Percolation (l/s)	72.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 4, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.0
Membrane Percolation (mm/hr)	1000	Length (m)	21.1
Max Percolation (l/s)	93.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	54.970	Membrane Depth (mm)	0

#### Porous Car Park Manhole: 9, DS/PN: 1.010

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.6
Max Percolation (l/s)	104.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	55.370	Membrane Depth (mm)	0

Caversham Bridge House  
Waterman Place  
Reading, RG1 8DN

Drainage Calculations  
Clifton Hampden  
332110526



Date 07/07/2022  
File Network Model 2.MDX

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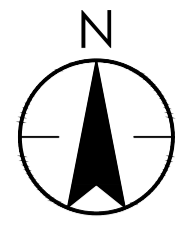
Innovyze

Network 2020.1

Manhole Headloss for Storm

<b>PN</b>	<b>US/MH Name</b>	<b>US/MH Headloss</b>
1.000	1	0.500
1.001	2	0.500
1.002	2	0.500
2.000	2	0.500
1.003	2	0.500
1.004	3	0.500
1.005	4	0.500
1.006	5	0.500
1.007	6	0.500
1.008	7	0.500
3.000	8	0.500
4.000	10	0.500
3.001	9	0.500
1.009	8	0.500
1.010	9	0.500
1.011	10	0.500
1.012	11	0.500
1.013	12	0.500

# Appendix G Flood Exceedance Routes



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- KEY:
- SITE BOUNDARY
  - DIRECTION OF FLOW

P01	FIRST ISSUE	PB	SH	2022.07.07	
	Issued/Revision	By	Appd	YYYY.MM.DD	
		PB	JS	2022.07.07	
		Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

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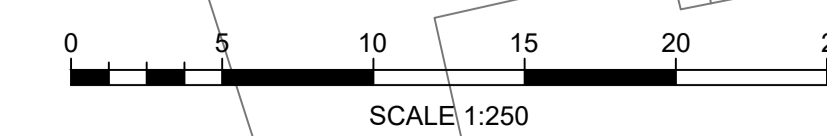
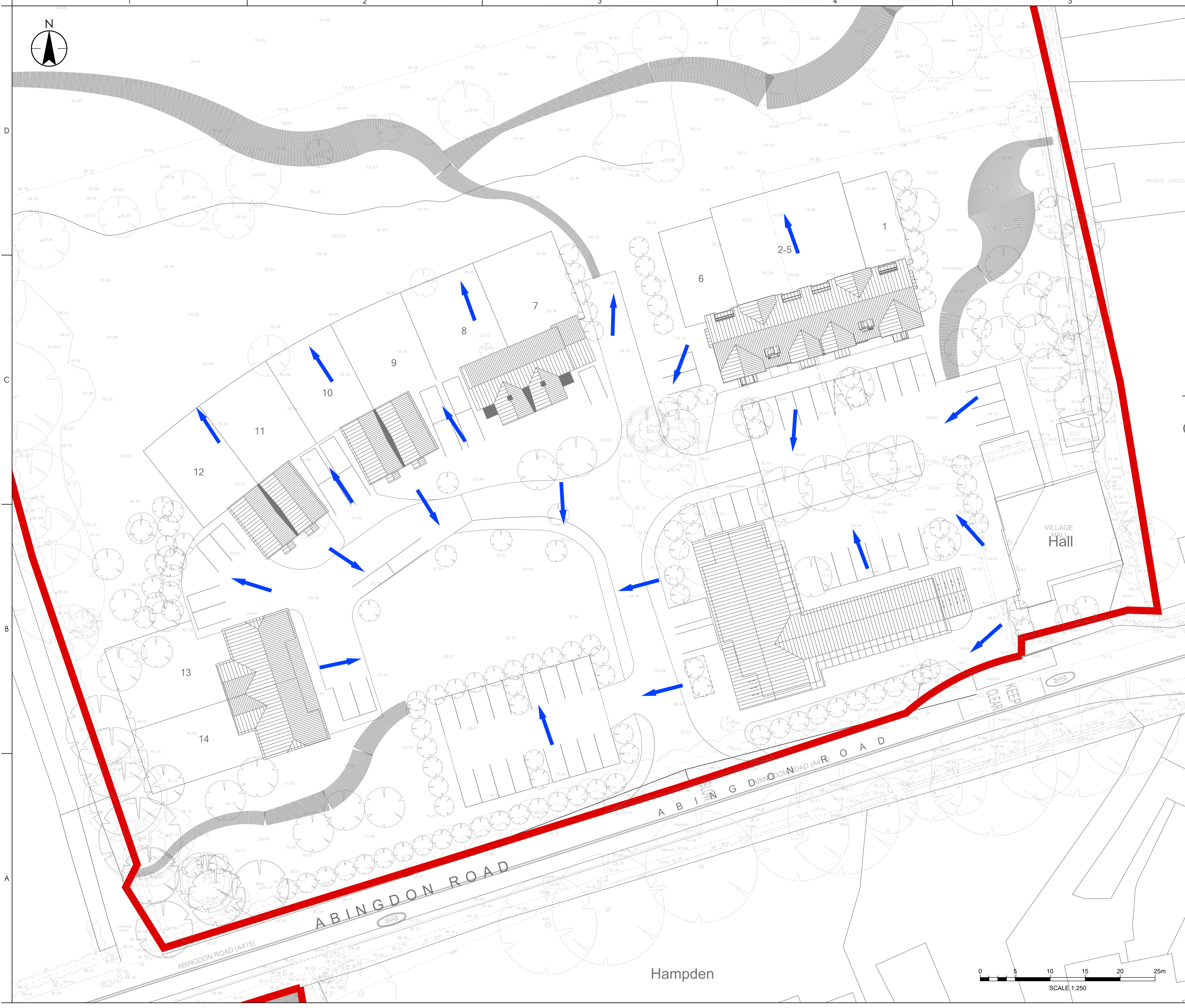


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**THOMAS HOMES**

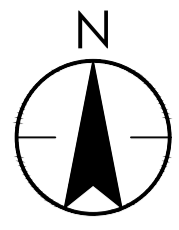
CLIFTON HAMPDEN

Title  
**FLOOD EXCEEDANCE ROUTING**  
 SHEET 1 OF 2

Project No.	Scale
332110526	1:250 @ A1
Revision	Drawing No.
P01	332110526-2001-004



P:\0000\332110526\2001\004\1:250\332110526-2001-004.dwg  
 2022.07.07 11:14:14 AM By: J.S. Dwn. P01  
 PLOT DATE: 2022.07.07 11:14:14 AM By: J.S. Dwn. P01



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- KEY:**
- SITE BOUNDARY
  - DIRECTION OF FLOW

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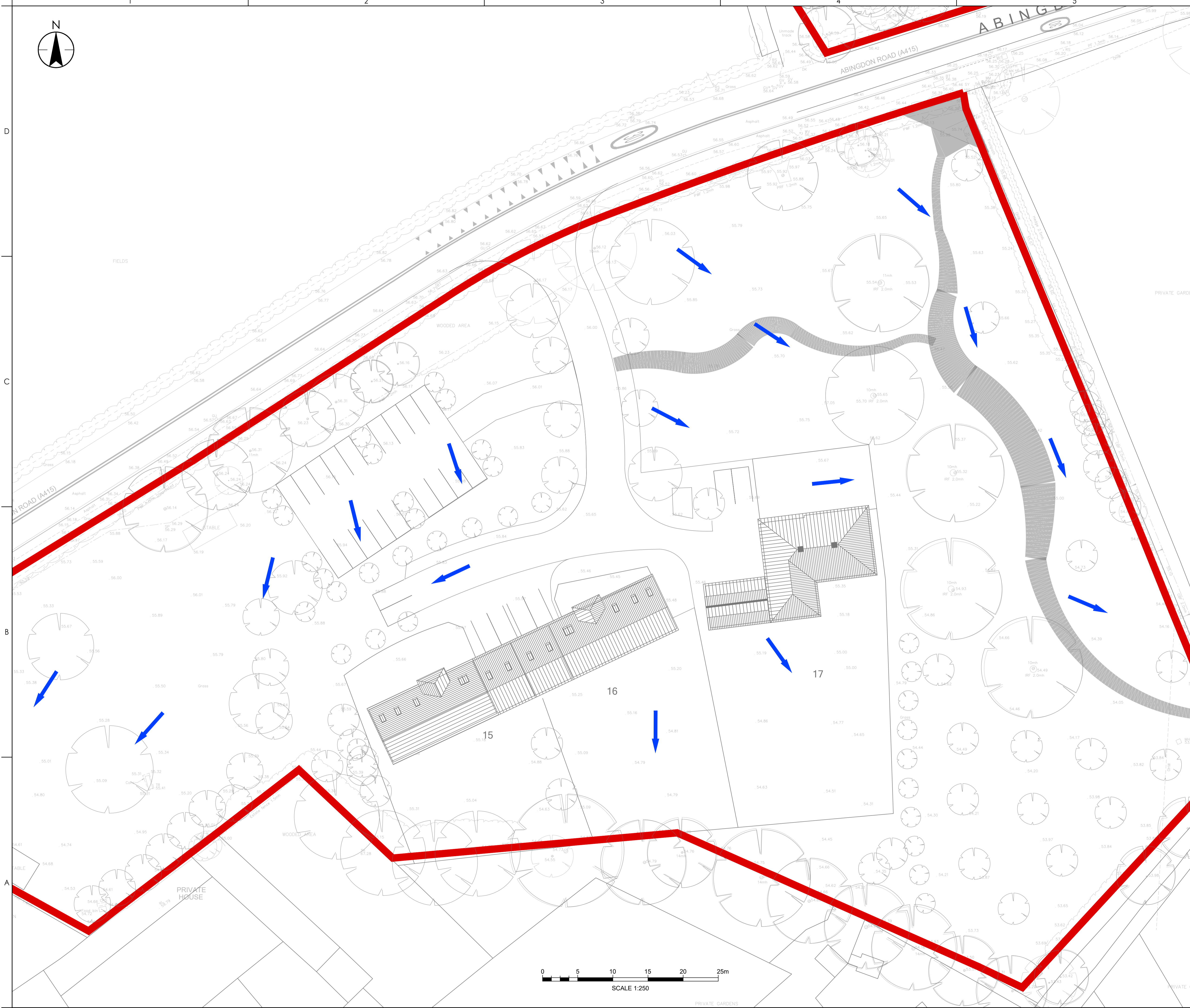
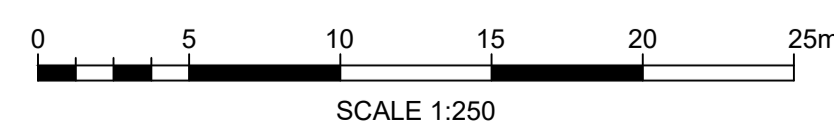
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**THOMAS HOMES**

CLIFTON HAMPDEN

Title  
**FLOOD EXCEEDANCE ROUTING**

SHEET 2 OF 2

Project No.	332110526	Scale	1:250 @ A1
Revision	P01	Drawing No.	332110526-2001-005



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 2022.07.07 14:05:00  
 P:\016\332110526\2022\07\07\332110526-2001-005.dwg  
 2022.07.07 14:05:00

# Appendix H Land Owners Consent

**Bunn, Peter**

---

**From:** gileshlbaxter@btinternet.com  
**Sent:** 14 July 2022 16:30  
**To:** Chris Brotherton  
**Subject:** Burcot and Clifton Hampden Neighbourhood Development Order

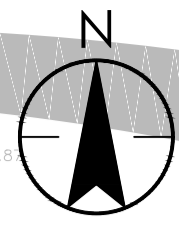
Dear Chris

Please take this email as confirmation that we are content to enter into an Easement permitting discharge of surface water resulting from the NDO development at an appropriate rate into the drainage pipe running across our field.

Giles and Victoria Baxter

Lower Town Farmhouse  
High Street  
Clifton Hampden  
OX14 3EQ





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- CONCEPT DRAINAGE LAYOUT BASED ON THE ASSUMPTION THAT FINISHED ROAD LEVELS WILL BE SET APPROXIMATELY 250mm ABOVE EXISTING GROUND LEVELS
- FLOWS DISCHARGING TO EXISTING WATERCOURSE OR DRAINAGE NETWORK, SURFACE WATER RUN-OFF WILL BE ATTENUATED UP TO AND INCLUDING THE 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE RAINFALL EVENT
- SURFACE WATER RUN-OFF WILL BE LIMITED TO THE MEAN ANNUAL FLOOD (QBAR) = 3.4 l/s
- EXISTING VILLAGE HALL TO BE RETAINED IN THE SE CORNER OF THE NORTHERN SITE
- DETAILED LEVELS DESIGN AND DRAINAGE LAYOUT SUBJECT TO ARCHITECTS CONFIRMATION OF DRAINAGE CONNECTION POINTS
- CONNECTION TO EXISTING FOUL AND SURFACE WATER DRAINAGE NETWORKS SUBJECT TO CCTV SURVEY

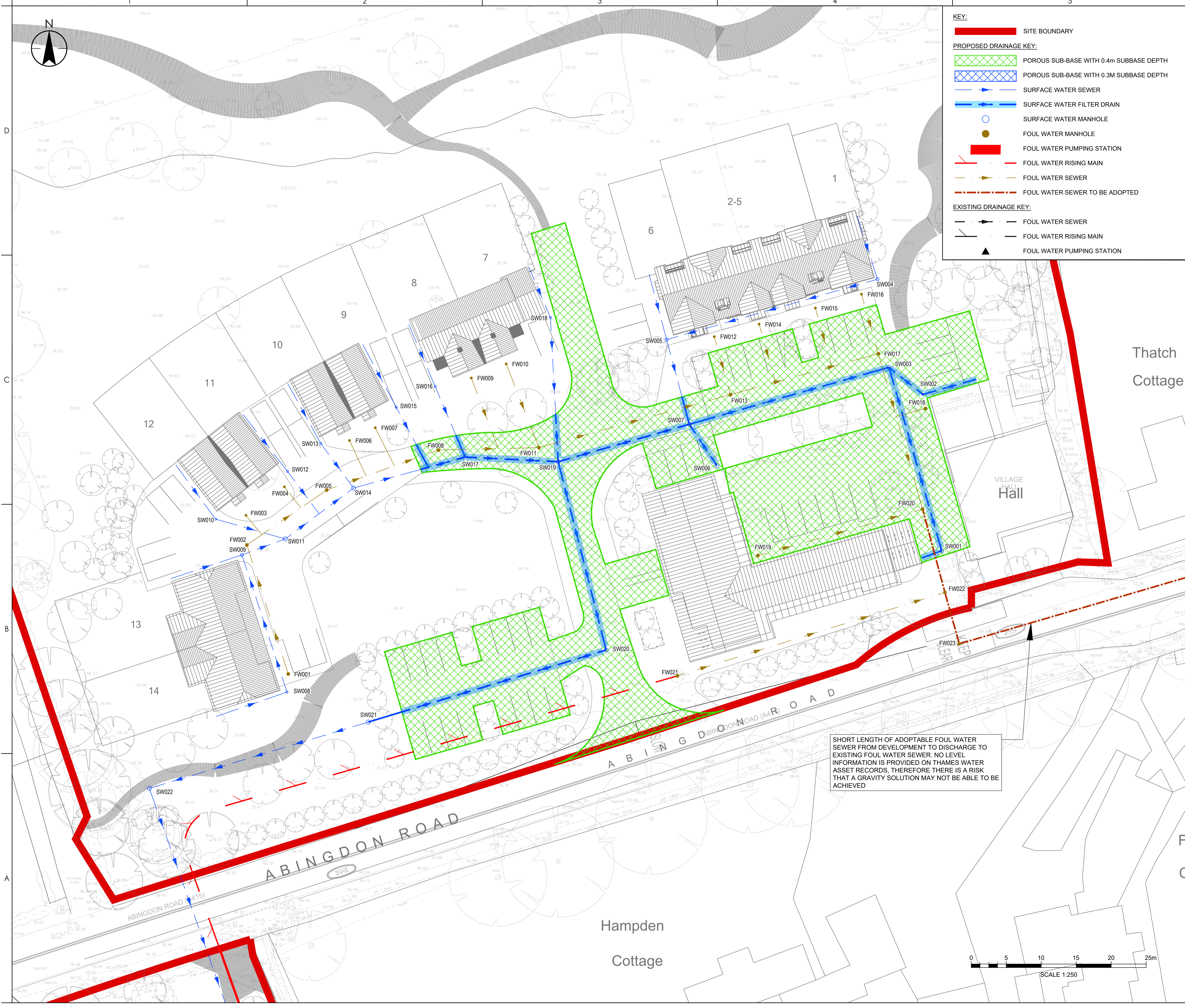
**KEY:**

**PROPOSED DRAINAGE KEY:**

- POROUS SUB-BASE WITH 0.4m SUBBASE DEPTH
- POROUS SUB-BASE WITH 0.3M SUBBASE DEPTH
- SURFACE WATER SEWER
- SURFACE WATER FILTER DRAIN
- SURFACE WATER MANHOLE
- FOUL WATER MANHOLE
- FOUL WATER PUMPING STATION
- FOUL WATER RISING MAIN
- FOUL WATER SEWER
- FOUL WATER SEWER TO BE ADOPTED

**EXISTING DRAINAGE KEY:**

- FOUL WATER SEWER
- FOUL WATER RISING MAIN
- FOUL WATER PUMPING STATION



SHORT LENGTH OF ADOPTABLE FOUL WATER SEWER FROM DEVELOPMENT TO DISCHARGE TO EXISTING FOUL WATER SEWER. NO LEVEL INFORMATION IS PROVIDED ON THAMES WATER ASSET RECORDS, THEREFORE THERE IS A RISK THAT A GRAVITY SOLUTION MAY NOT BE ABLE TO BE ACHIEVED

Thatch Cottage

Village Hall

Hampden Cottage

P02 FOR PLANNING	VT	SH	2022.07.07
P01 FIRST ISSUE	VT	SH	2021.08.18
Issued/Revision	By	Appd	YYYY.MM.DD
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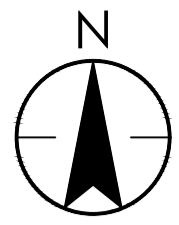
CLIFTON HAMPDEN

Title  
**PROPOSED DRAINAGE LAYOUT**

SHEET 1 OF 2

Project No. 332110526	Scale 1:250 @ A1
Revision <b>P02</b>	Drawing No. <b>332110526-2001-001</b>

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  - FLOWS DISCHARGING TO EXISTING WATERCOURSE OR DRAINAGE NETWORK. SURFACE WATER RUN-OFF WILL BE ATTENUATED UP TO AND INCLUDING THE 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE RAINFALL EVENT
  - SURFACE WATER RUN-OFF WILL BE LIMITED TO THE MEAN ANNUAL FLOOD (QBAR) = 3.4 l/s
  - EXISTING VILLAGE HALL TO BE RETAINED IN THE SE CORNER OF THE NORTHERN SITE
  - DETAILED LEVELS DESIGN AND DRAINAGE LAYOUT SUBJECT TO ARCHITECTS CONFIRMATION OF DRAINAGE CONNECTION POINTS
  - CONNECTION TO EXISTING FOUL AND SURFACE WATER DRAINAGE NETWORKS SUBJECT TO CCTV SURVEY

KEY:	
	SITE BOUNDARY
PROPOSED DRAINAGE KEY:	
	POROUS SUB-BASE WITH 0.4m SUBBASE DEPTH
	POROUS SUB-BASE WITH 0.3M SUBBASE DEPTH
	SURFACE WATER SEWER
	SURFACE WATER FILTER DRAIN
	SURFACE WATER MANHOLE
	FOUL WATER MANHOLE
	FOUL WATER PUMPING STATION
	FOUL WATER RISING MAIN
	FOUL WATER SEWER
	FOUL WATER SEWER TO BE ADOPTED
EXISTING DRAINAGE KEY:	
	FOUL WATER SEWER
	FOUL WATER RISING MAIN
	FOUL WATER PUMPING STATION

LOCATION OF FOUL WATER RISING MAIN TAKEN FROM THAMES WATER LTD ASSET RECORDS DATED 22 MARCH 2021. LOCATION PROVIDED IS INDICATIVE, AND FURTHER INVESTIGATION REQUIRED TO CONFIRM ACTUAL POSITION ON SITE BECAUSE THIS PROVIDES A MAJOR CONSTRAINT TO DEVELOPMENT OF THE SITE

SURFACE WATER FLOWS TO BE RESTRICTED TO 6.7 l/s BY A 40mm ORIFICE PLATE FITTED TO OUTGOING PIPE

SURFACE WATER DRAINAGE TO DISCHARGE INTO CULVERTED DITCH CROSSING

EXISTING MANHOLE IDENTIFIED ON TOPOGRAPHICAL SURVEY - FURTHER INVESTIGATION REQUIRED TO DETERMINE WHETHER THIS IS FOR FOUL OR SURFACE WATER DRAINAGE, AS WELL AS CONFIRMING LEVELS AND PIPE SIZES.

P02 FOR PLANNING	VT	SH	2022.07.07
P01 FIRST ISSUE	VT	SH	2021.08.18
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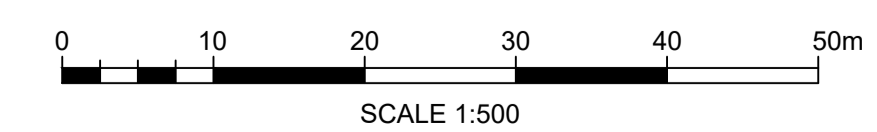
Client/Project  
THOMAS HOMES

CLIFTON HAMPDEN

Title  
PROPOSED DRAINAGE STRATEGY

SHEET 2 OF 2

Project No. 332110526	Scale 1:500 @ A1
Revision P02	Drawing No. 332110526-2001-002





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 OXFORD  
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 OX1 1RR  
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CLIFTON HAMPDEN

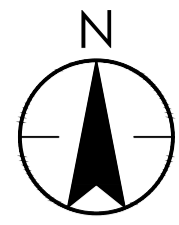
Title  
 DRAINAGE MANHOLE SCHEDULES

Project No.	Scale
332110526	A2
Revision	Drawing No.
<b>P02</b>	<b>332110526-2001-003</b>

SURFACE WATER MANHOLE SCHEDULE								FOUL WATER MANHOLE SCHEDULE							
MH NO.	CL	IL	DEPTH	PIPEØ OUT	COVER TYPE	MANHOLE SIZE	MANHOLE TYPE	MH NO.	CL	IL	DEPTH	PIPEØ OUT	COVER TYPE	MANHOLE SIZE	MANHOLE TYPE
SW001	54.65	54.05	0.60m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW001	55.60	55.00	0.60m	150Ø	D400	450Ø	PLASTIC IC
SW002	54.80	53.93	0.87m	100Ø	D400	315Ø	PLASTIC CATCHPIT	FW002	55.60	54.75	0.85m	150Ø	D400	450Ø	PLASTIC IC
SW003	54.70	53.87	0.83m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW003	55.55	54.77	0.78m	100Ø	B125	315Ø	PLASTIC IC
SW004	55.20	54.11	1.09m	100Ø	B125	450Ø	PLASTIC CATCHPIT	FW004	55.55	54.73	0.82m	100Ø	B125	315Ø	PLASTIC IC
SW005	55.20	53.80	1.40m	150Ø	B125	450Ø	PLASTIC CATCHPIT	FW005	55.50	54.65	0.85m	150Ø	D400	450Ø	PLASTIC IC
SW006	70.70	69.30	1.40m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW006	55.43	54.68	0.75m	100Ø	B125	315Ø	PLASTIC IC
SW007	55.28	53.67	1.61m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW007	55.44	54.65	0.79m	100Ø	B125	315Ø	PLASTIC IC
SW008	55.60	54.09	1.51m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW008	55.40	54.53	0.87m	150Ø	D400	450Ø	PLASTIC IC
SW009	55.60	53.87	1.73m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW009	55.45	54.61	0.84m	100Ø	B125	315Ø	PLASTIC IC
SW010	55.55	53.92	1.63m	100Ø	D400	315Ø	PLASTIC CATCHPIT	FW010	55.45	54.59	0.86m	100Ø	B125	315Ø	PLASTIC IC
SW011	55.55	53.82	1.73m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW011	55.30	54.43	0.87m	150Ø	D400	450Ø	PLASTIC IC
SW012	55.55	53.87	1.68m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW012	55.20	54.34	0.86m	100Ø	B125	315Ø	PLASTIC IC
SW013	55.55	53.82	1.73m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW013	55.03	54.24	0.79m	150Ø	D400	450Ø	PLASTIC IC
SW014	55.50	53.74	1.76m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW014	55.20	54.30	0.90m	100Ø	B125	315Ø	PLASTIC IC
SW015	55.55	53.76	1.79m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW015	55.20	54.24	0.96m	100Ø	B125	315Ø	PLASTIC IC
SW016	55.45	53.74	1.71m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW016	55.20	54.20	1.00m	100Ø	B125	315Ø	PLASTIC IC
SW017	55.40	53.63	1.77m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW017	54.70	54.09	0.61m	150Ø	D400	450Ø	PLASTIC IC
SW018	55.45	53.75	1.70m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW018	54.80	54.07	0.73m	150Ø	D400	450Ø	PLASTIC IC
SW019	55.30	53.54	1.76m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW019	55.00	54.09	0.91m	150Ø	D400	450Ø	PLASTIC IC
SW020	55.50	53.35	2.15m	225Ø	D400	600Ø	PLASTIC CATCHPIT	FW020	54.70	53.93	0.77m	150Ø	D400	450Ø	PLASTIC IC
SW021	55.50	53.11	2.39m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW021	55.10	54.11	0.99m	150Ø	B125	450Ø	PLASTIC IC
SW022	56.45	52.89	3.56m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW022	54.65	53.84	0.81m	150Ø	B125	450Ø	PLASTIC IC
SW023	55.80	52.66	3.14m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW023	54.50	53.78	0.72m	150Ø	D400	450Ø	PLASTIC IC
SW024	55.73	52.46	3.27m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW101	55.25	54.65	0.60m	100Ø	B125	315Ø	PLASTIC IC
SW025	55.25	52.82	2.43m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW102	55.25	54.40	0.85m	100Ø	B125	315Ø	PLASTIC IC
SW026	55.88	52.67	3.21m	150Ø	D400	450Ø	PLASTIC CATCHPIT	FW103	55.65	54.32	1.33m	150Ø	D400	450Ø	PLASTIC IC
SW027	55.20	52.62	2.58m	100Ø	B125	315Ø	PLASTIC CATCHPIT	FW104	55.20	54.25	0.95m	100Ø	D400	315Ø	PLASTIC IC
SW028	55.20	52.61	2.59m	225Ø	B125	600Ø	PLASTIC CATCHPIT	FW105	55.20	54.18	1.02m	150Ø	D400	450Ø	PLASTIC IC
SW029	55.25	52.56	2.69m	225Ø	B125	600Ø	PLASTIC CATCHPIT								
SW030	55.65	52.46	3.19m	150Ø	B125	450Ø	PLASTIC CATCHPIT								
SW031	55.95	52.14	3.81m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW032	56.10	51.92	4.18m	225Ø	B125	1200Ø	PCC CHAMBER								
SW033	54.95	51.62	3.33m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW034	54.54	51.35	3.19m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW035	52.60	51.05	1.55m	225Ø	D400	600Ø	PLASTIC CATCHPIT								
SW036	50.80	50.15	0.65m	225Ø	D400	600Ø	PLASTIC CATCHPIT								

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Plotted: 08.07.2022 22:07:08 1:17:10 PM By: Burn, Peter  
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- KEY:
- SITE BOUNDARY
  - DIRECTION OF FLOW

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	Issued/Revision	By	Appd	YYYY.MM.DD
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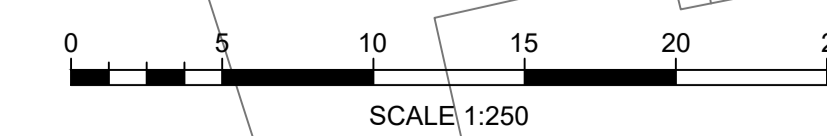
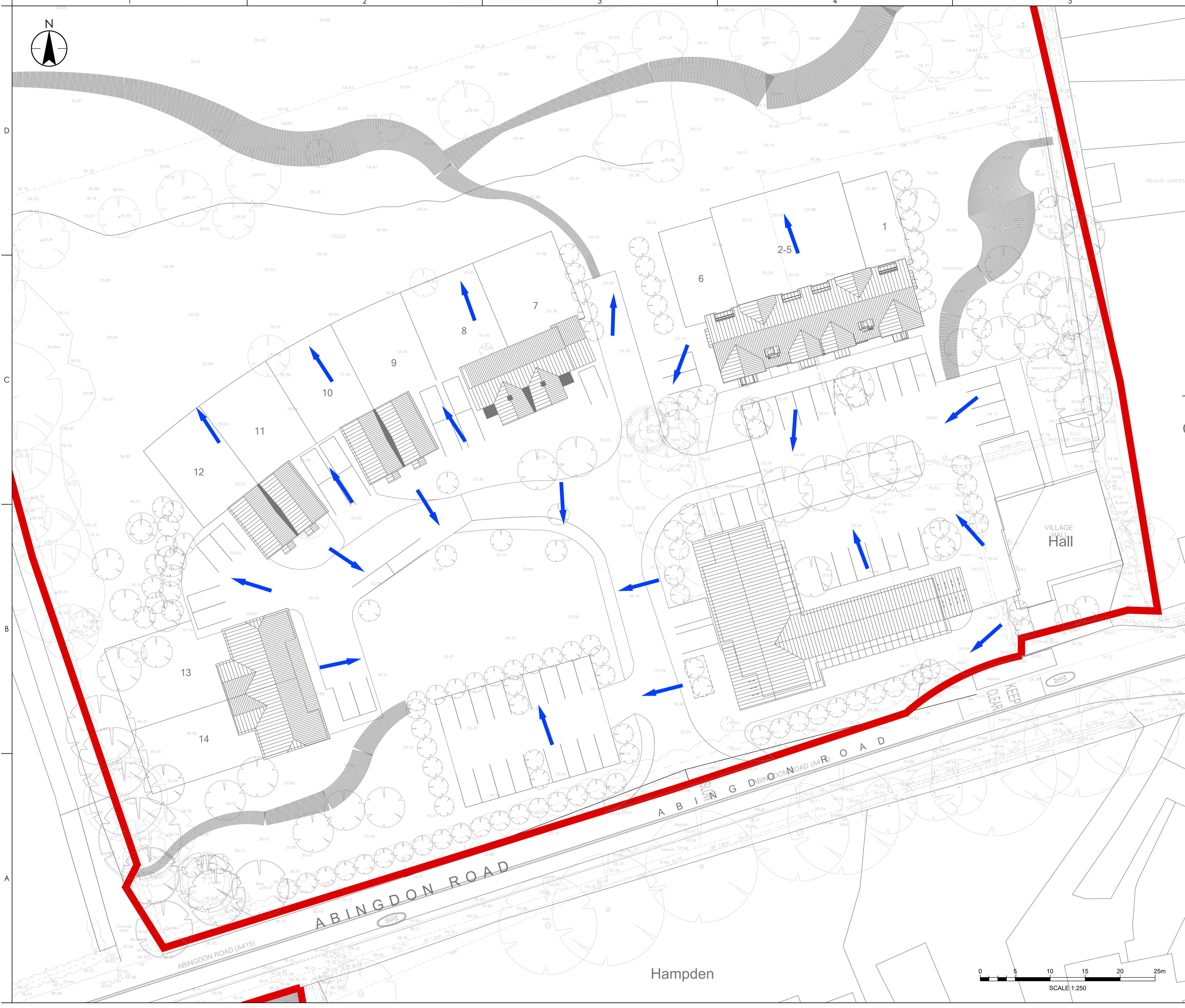
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CLIFTON HAMPDEN

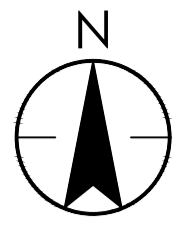
Title  
**FLOOD EXCEEDANCE ROUTING**

SHEET 1 OF 2

Project No. 332110526	Scale 1:250 @ A1
Revision <b>P01</b>	Drawing No. <b>332110526-2001-004</b>



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- KEY:
- SITE BOUNDARY
  - DIRECTION OF FLOW

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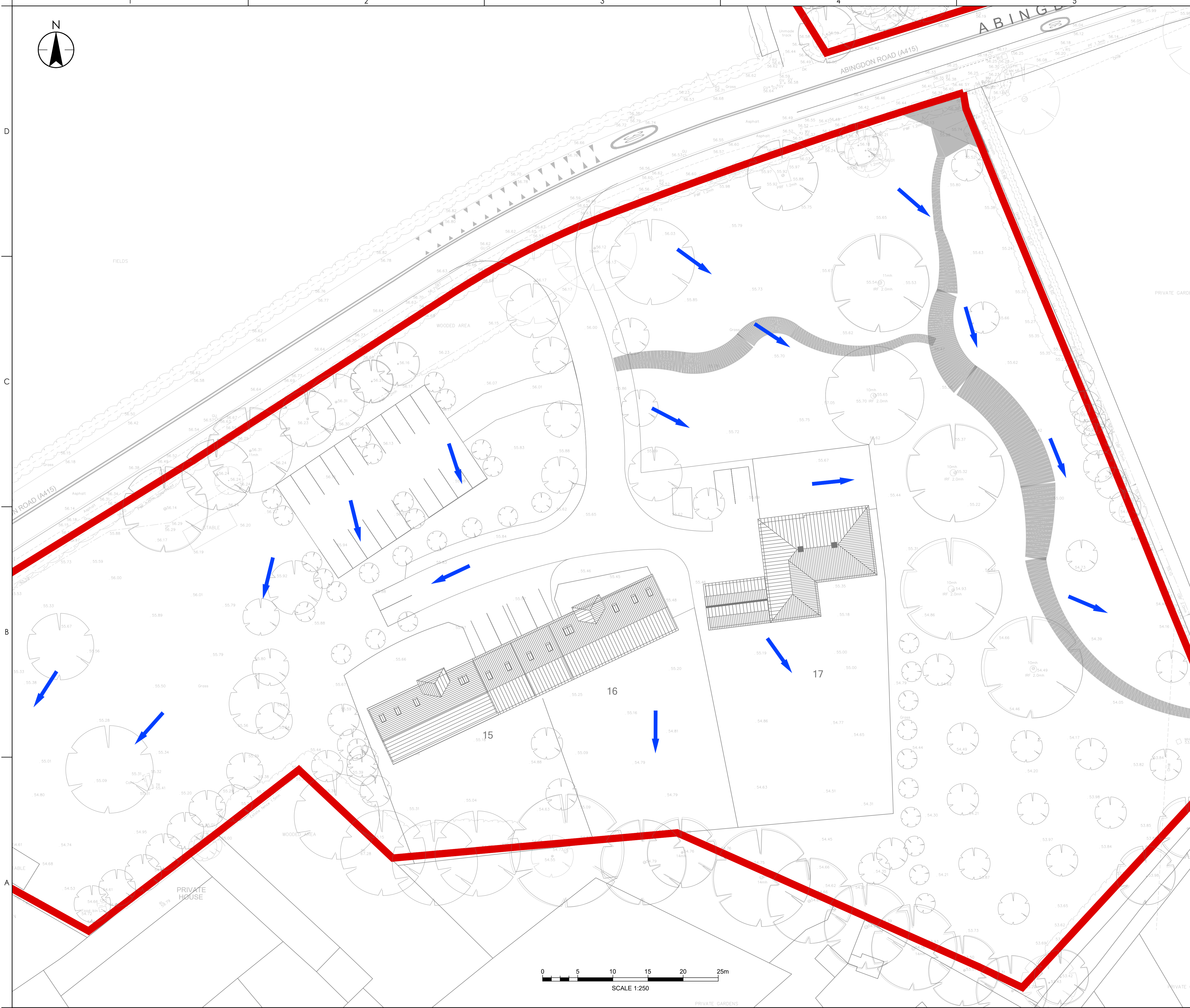
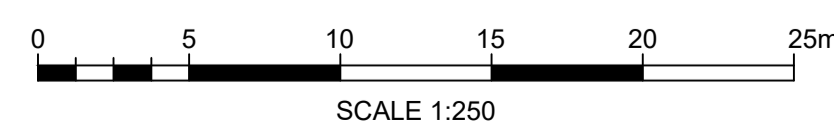
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**THOMAS HOMES**

CLIFTON HAMPDEN

Title  
**FLOOD EXCEEDANCE ROUTING**

SHEET 2 OF 2

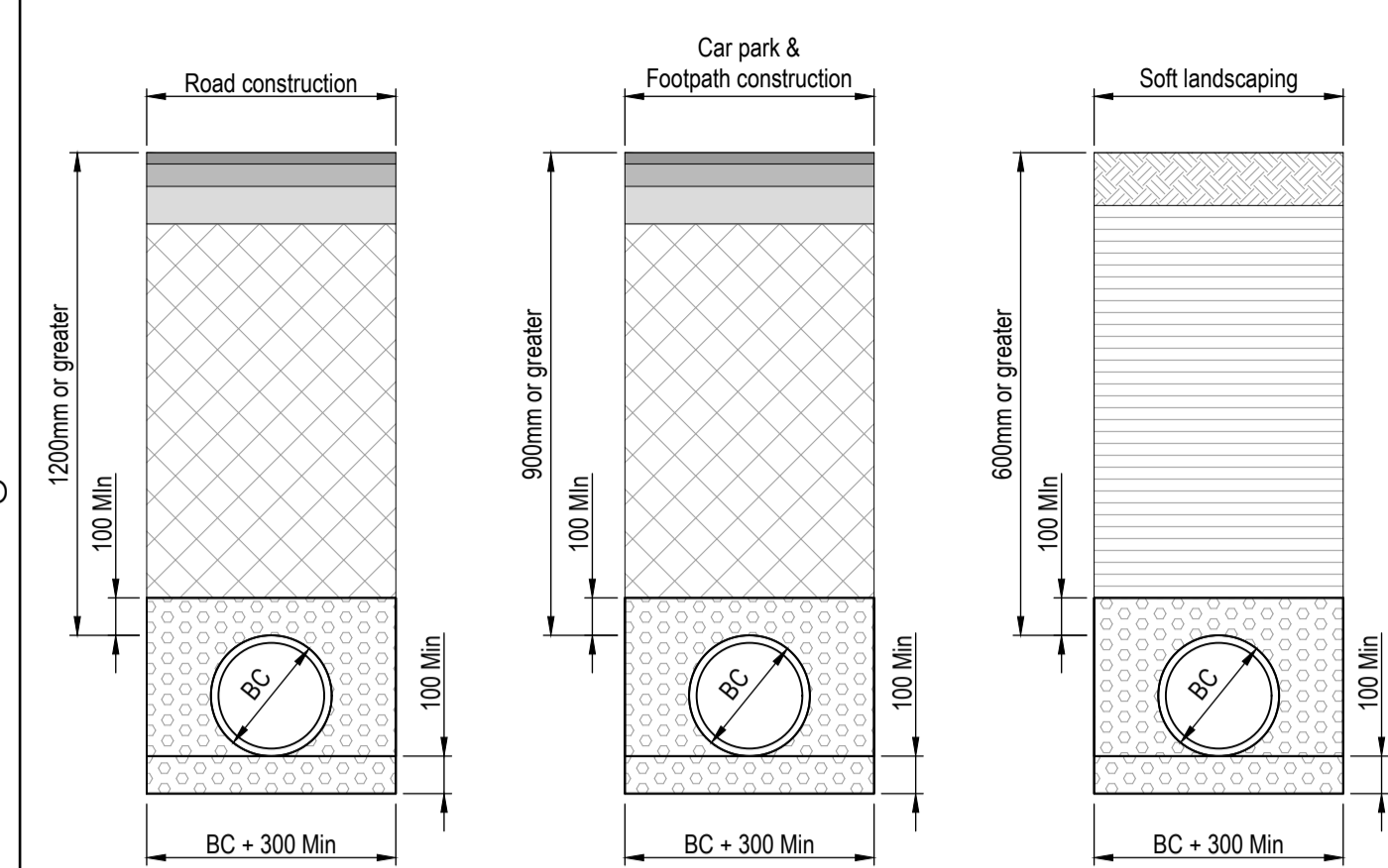
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Revision	P01	Drawing No.	332110526-2001-005



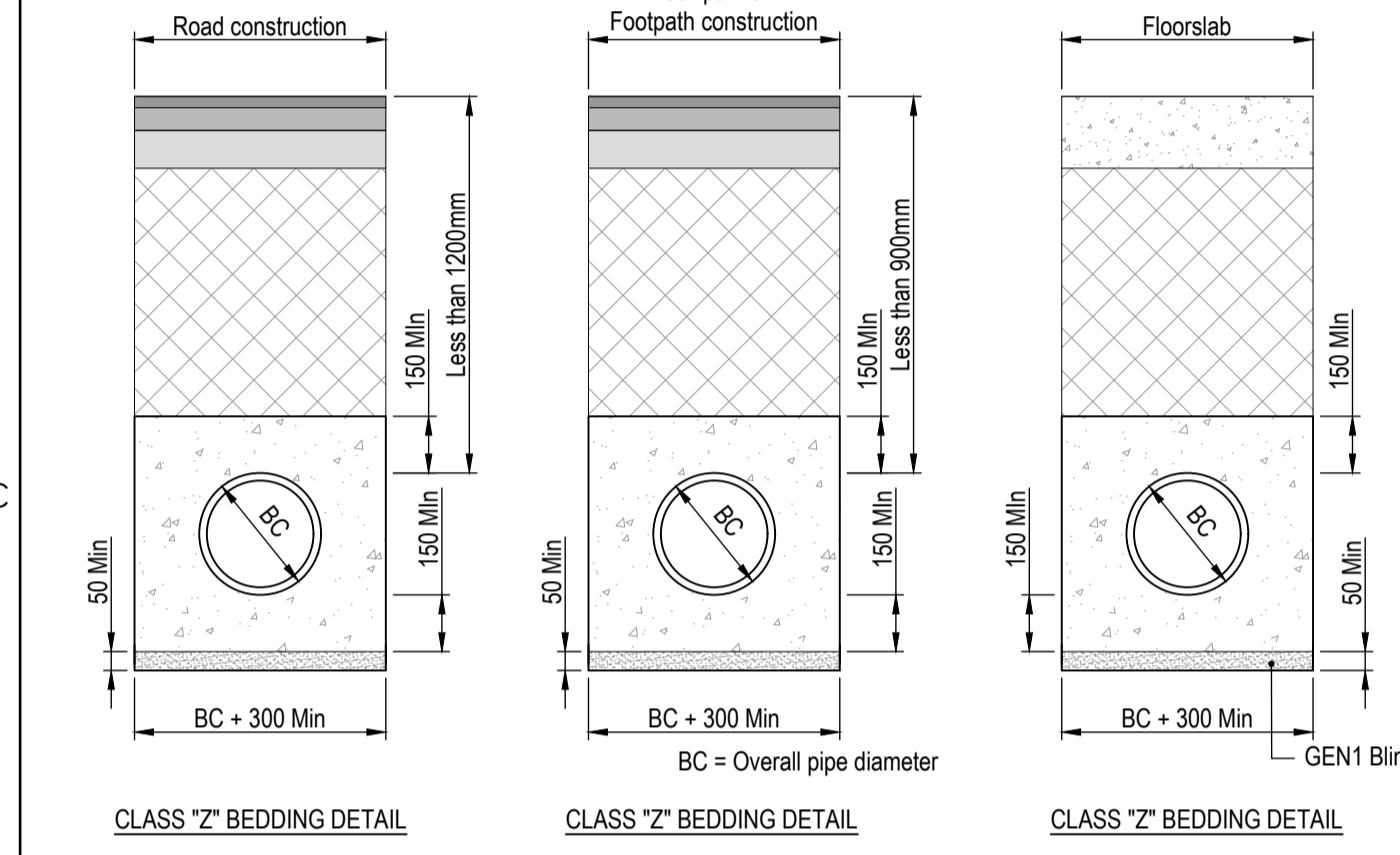
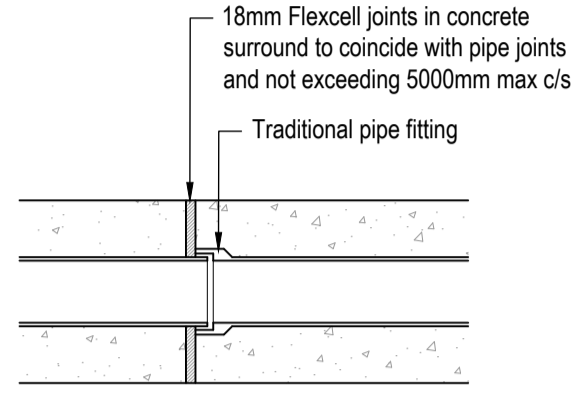
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 Scale: 1:250 @ A1  
 Title: FLOOD EXCEEDANCE ROUTING  
 Sheet: 2 OF 2

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Granular Bedding and Sidefill  
 GEN3 Concrete  
 DOT Type 1 granular fill backfill well compacted in 150mm layers  
 Material excavated from trench compacted in layers not exceeding 300mm thick, do not use heavy compactors before there is 600mm of material over pipes.

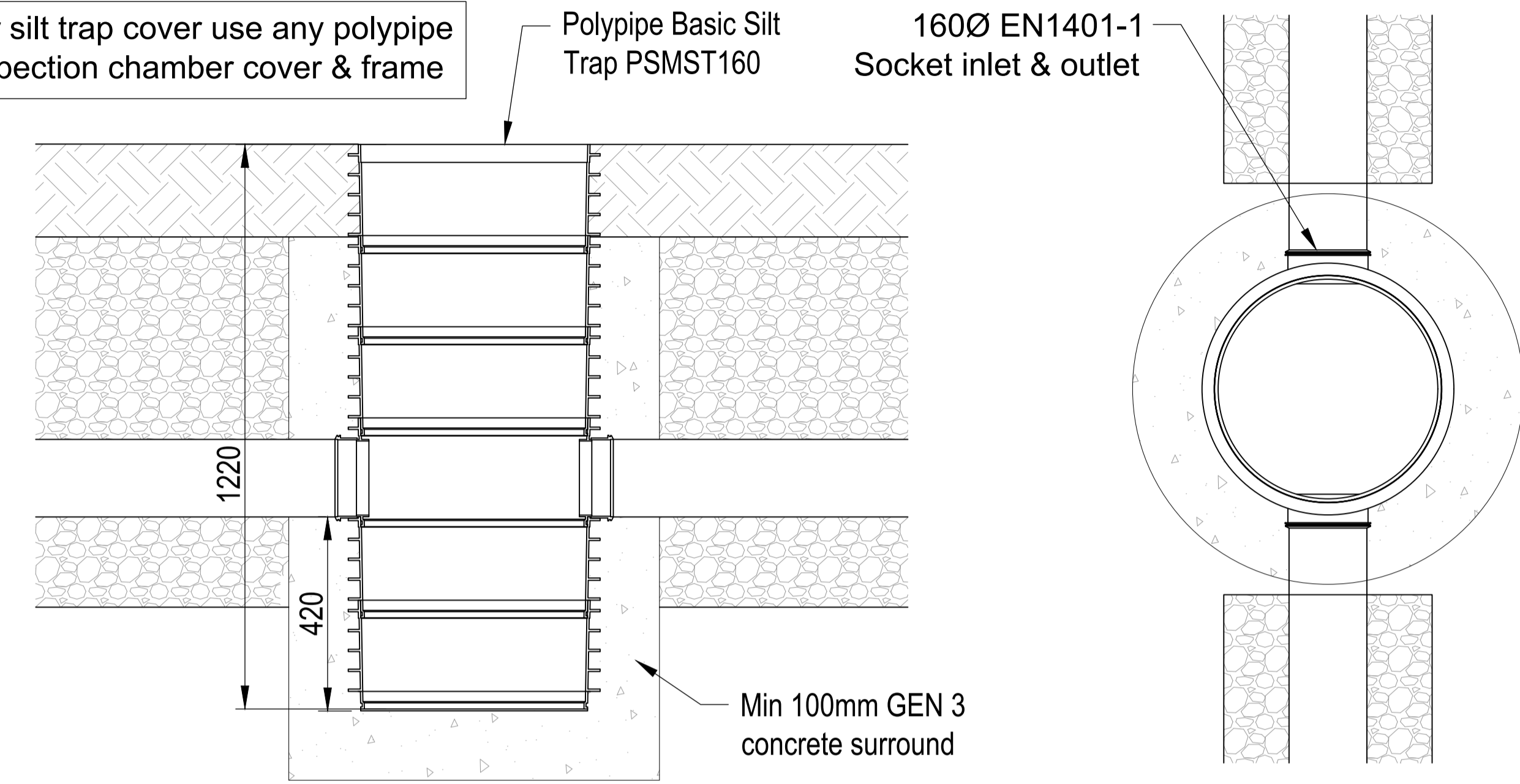


Extract from Table A2 WIS 4-08-02  
 Processed granular bedding and sidefill materials for flexible pipes

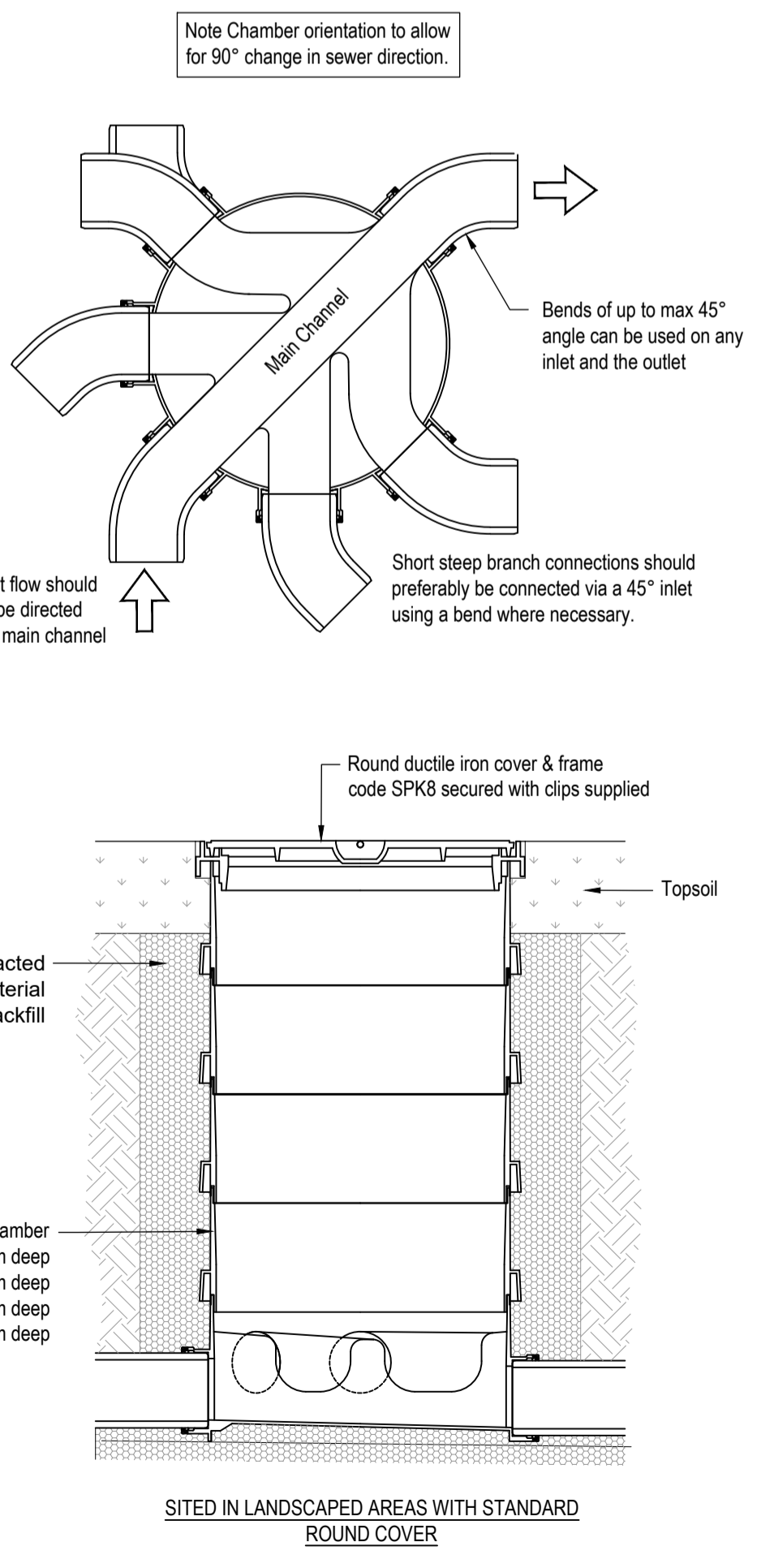
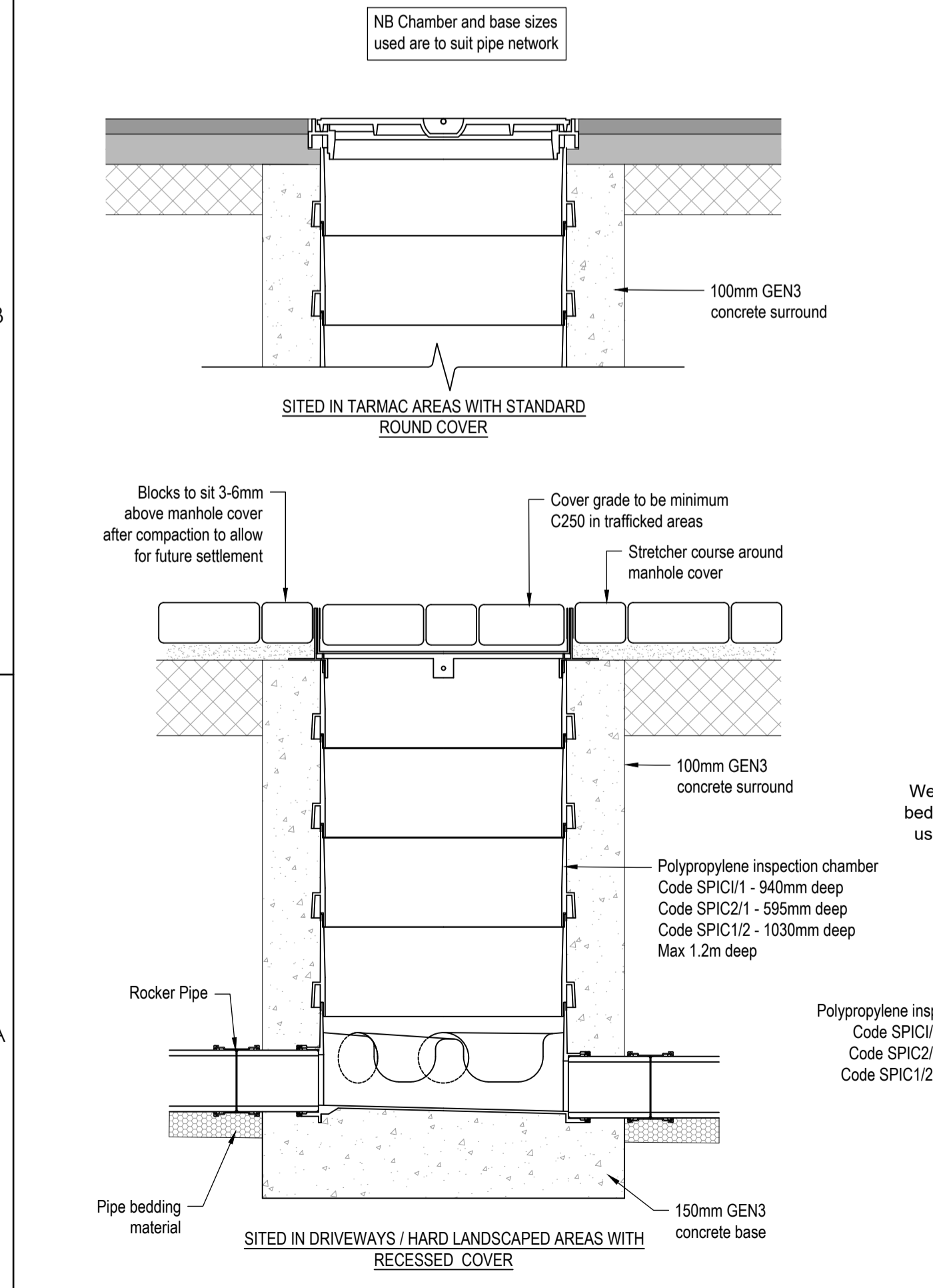
PIPE NOMINAL BORE (mm)	NOMINAL MAXIMUM PARTICLE SIZE (mm)	MATERIALS SPECIFIED IN BRITISH STANDARDS
100	10	10mm nominal single-size
Over 100 to 500	15	10 or 14mm nominal single-size or 14mm to 5mm graded
Over 150 to 300	20	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 550	20	14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 550	40	14, 20 or 40mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded

PLASTIC PIPE BEDDING DETAIL  
 SCALE 1:20

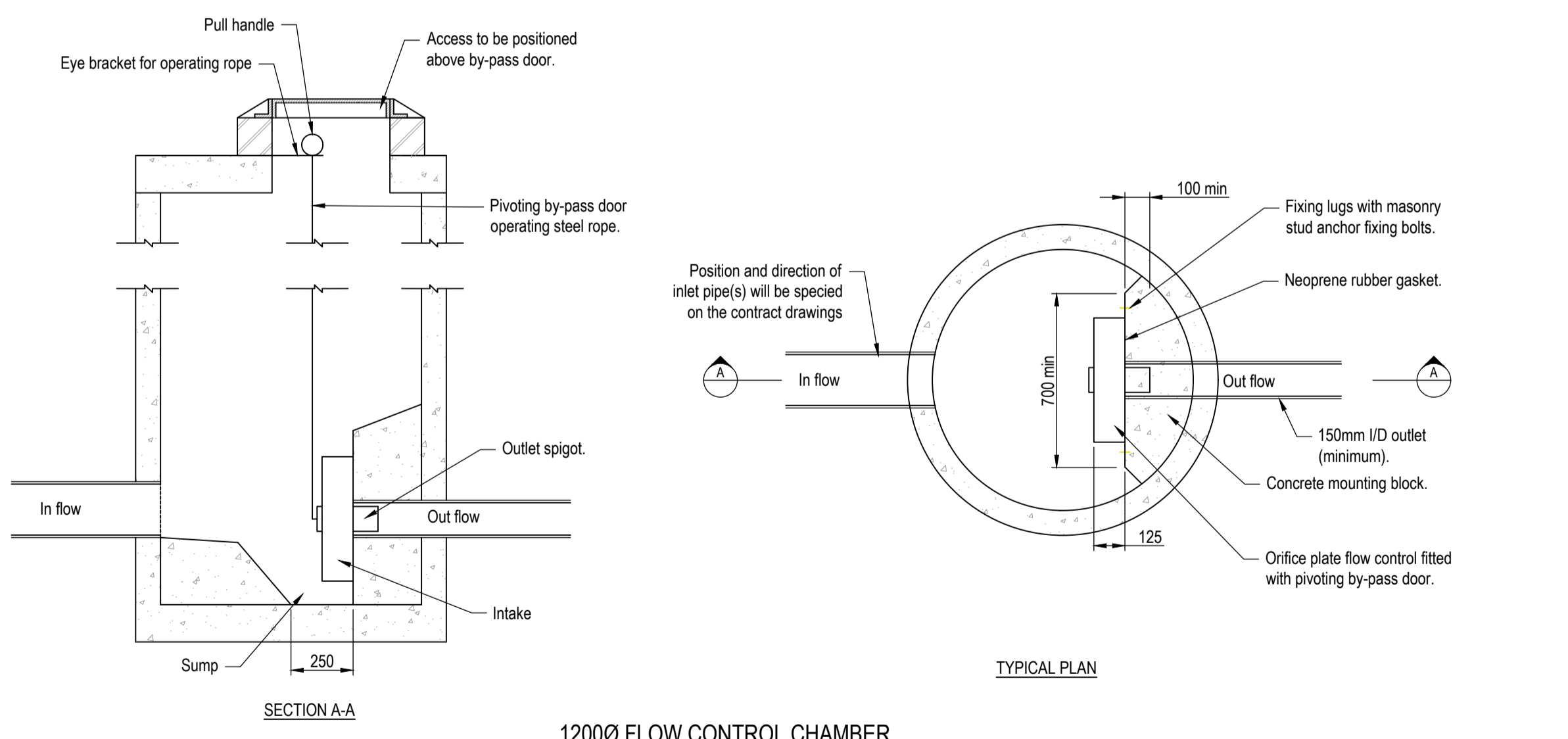
NOTE: For silt trap cover use any polypipe 460Ø inspection chamber cover & frame



TYPICAL SECTION  
 TYPICAL PLAN  
 PLASTIC CATCHPIT DETAIL  
 SCALE 1:10



PLASTIC INSPECTION CHAMBER DETAIL  
 SCALE 1:10



1200Ø FLOW CONTROL CHAMBER  
 SCALE 1:20

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**STANDARD DETAILS**  
 SHEET 1 OF 2

Project No.	332110526	Scale	AS SHOWN @ A1
Revision	P01	Drawing No.	332110526-2001-006

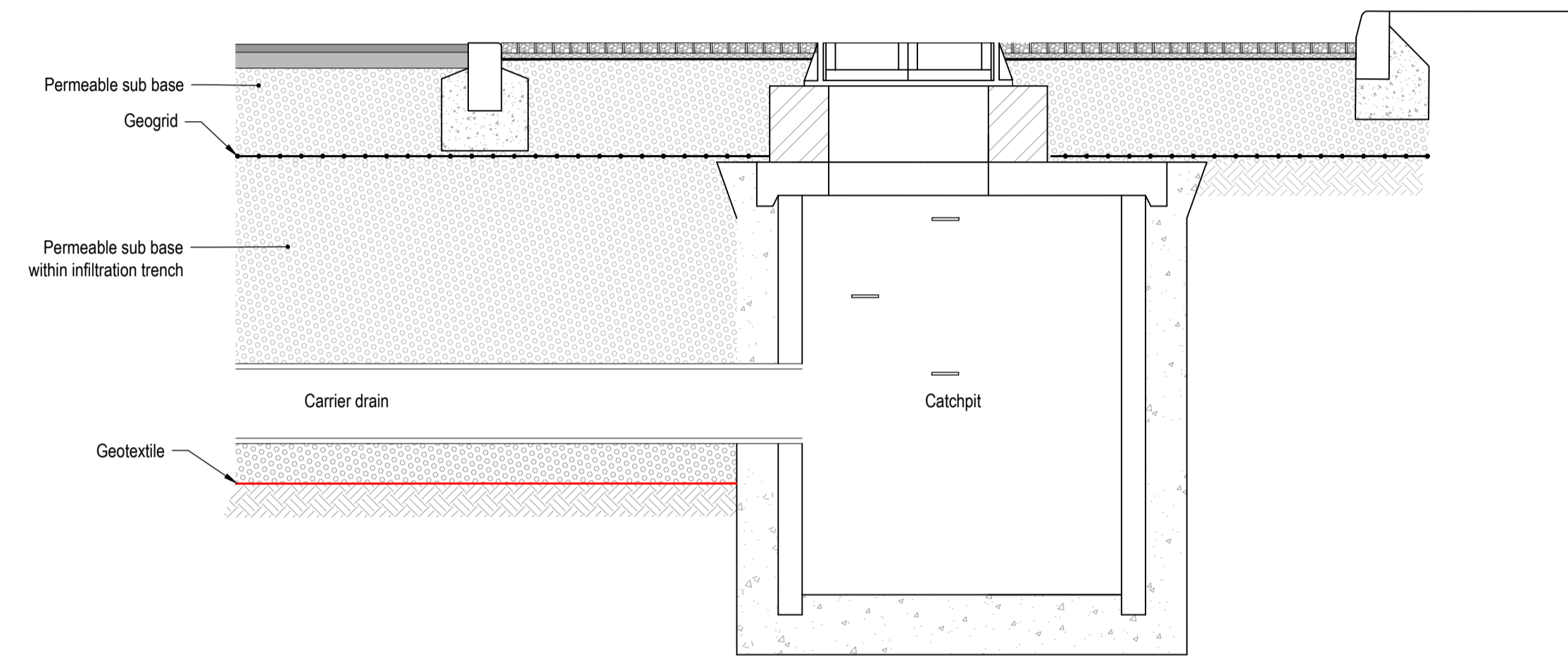
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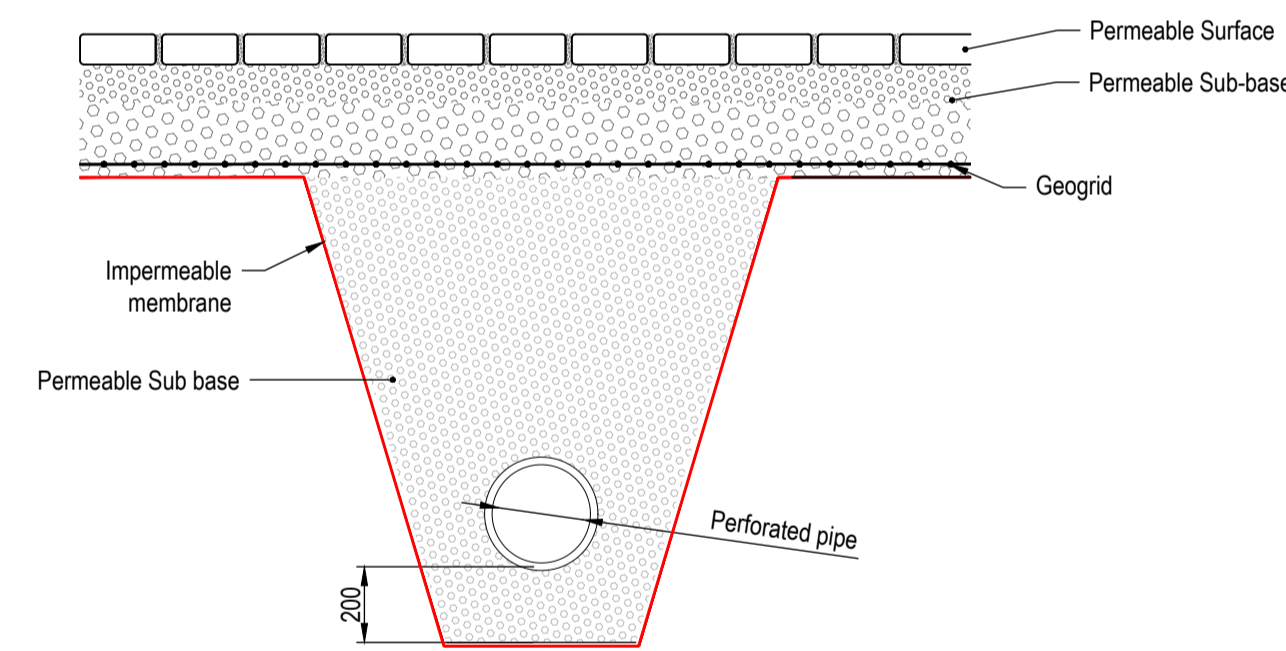
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TYPICAL LONG SECTION THROUGH CARRIER DRAIN



TYPICAL SECTION

FILTER DRAIN UNDER POROUS BLOCK PAVING DETAIL  
 SCALE 1:20

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 STANDARD DETAILS

SHEET 2 OF 2

Project No.	332110526	Scale	AS SHOWN @ A1
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