

**Application for approval of details reserved by condition.
 Town and Country Planning Act 1990
 Planning (Listed Buildings and Conservation Areas) Act 1990**

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Upon receipt of this form and any supporting information, it is the responsibility of the Local Planning Authority to inform you of its obligations in regards to the processing of your application. Please refer to its website for further information on any legal, regulatory and commercial requirements relating to information security and data protection of the information you have provided.

Local Planning Authority details:



Development Control
 Gloucester City Council
 PO Box 3252, Gloucester, GL1 9FW
 01452 396396
development.control@gloucester.gov.uk
www.gloucester.gov.uk/planning

Publication of applications on planning authority websites

Information provided on this form and in supporting documents may be published on the authority's planning register and website.

Please ensure that the information you submit is accurate and correct and does not include personal or sensitive information. If you require any further clarification, please contact the Local Planning Authority directly.

If printed, please complete using block capitals and black ink.

It is important that you read the accompanying guidance notes and help text as incorrect completion will delay the processing of your application.

1. Applicant Name and Address

Title: First name:

Last name:

Company (optional):

Unit: House number: House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Country:

Postcode:

2. Agent Name and Address

Title: First name:

Last name:

Company (optional):

Unit: House number: House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Country:

Postcode:

3. Site Address Details

Please provide the full postal address of the application site.

Unit: House number: House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Postcode (optional):

Description of location or a grid reference. (must be completed if postcode is not known):

Easting: Northing:

Description:

4. Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application? Yes No

If Yes, please complete the following information about the advice you were given. (This will help the authority to deal with this application more efficiently).

Please tick if the full contact details are not known, and then complete as much as possible:

Officer name:

Reference:

Date (DD/MM/YYYY):

(must be pre-application submission)

Details of pre-application advice received?

5. Description Of Your Proposal

Please provide a description of the approved development as shown on the decision letter, including the application reference number and date of decision in the sections below:

Reference number:

Date of decision:

(Date must be pre-application submission) (DD/MM/YYYY)

Please state the condition number(s) to which this application relates:

1.		6.	
2.		7.	
3.	PLAN FOR DISPOSAL OF SURFACE WATER	8.	
4.	DRAINAGE STRATEGY	9.	
5.		10.	

Has the development already started?

Yes No

If Yes, please state when the development started (DD/MM/YYYY):

(date must be pre-application submission)

Has the development been completed?

Yes No

If Yes, please state when the development was completed (DD/MM/YYYY):

(date must be pre-application submission)

6. Discharge Of Condition

Please provide a full description and/or list of the materials/details that are being submitted for approval:

7. Part Discharge Of Condition(s)

Are you seeking to discharge only part of a condition?

Yes No

If Yes, please indicate which part of the condition your application relates to:

8. Planning Application Requirements - Checklist

Please read the following checklist to make sure you have sent all the information in support of your proposal. Failure to submit all information required will result in your application being deemed invalid. It will not be considered valid until all information required by the Local Planning Authority (LPA) has been submitted.

The original and 3 copies* of a completed and dated application form:

The original and 3 copies* of other plans and drawings or information necessary to describe the subject of the application:

The correct fee:

*National legislation specifies that the applicant must provide the original plus three copies of the form and supporting documents (a total of four copies), unless the application is submitted electronically or, the LPA indicate that a smaller number of copies is required. LPAs may also accept supporting documents in electronic format by post (for example, on a CD, DVD or USB memory stick). You can check your LPA's website for information or contact their planning department to discuss these options.

9. Declaration

I/we hereby apply for planning permission/consent as described in this form and the accompanying plans/drawings and additional information. I/we confirm that, to the best of my/our knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the person(s) giving them.

Or signed - Agent:

Date (DD/MM/YYYY):

17/02/2022

(date cannot be pre-application)

10. Agent Contact Details

Telephone numbers

Country code: National number: Extension number:

Country code: Mobile number (optional):

Country code: Fax number (optional):

Email address (optional):

12. Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land? Yes No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact? (Please select only one)

Agent Applicant Other (if different from the agent/applicant's details)

If Other has been selected, please provide:

Contact name:

Telephone number:

Email address:



4 Innsworth Lane, Gloucester

PJS Development Solutions Ltd

Technical Note 001 – Drainage Strategy

CTP-22-0130

February 2022

1. Introduction

- 1.1 Cotswold Transport Planning (CTP) provide expert Transport Planning, Highways, Infrastructure and Flood Risk consultancy services throughout the UK.
- 1.2 CTP were appointed by PJS Development Solutions Ltd (the applicant) to discharge condition's 3 and 4 (pre commencement) in support of planning application 21/00142/FUL to Gloucester City District Council, which are as follows:

Condition 3

“No above ground works shall take place until details for the disposal of surface water have been submitted to and approved in writing by the Local Planning Authority. The details submitted shall include proposals for the disposal of surface water in accordance with the principles of Sustainable Drainage Systems (SuDS) and shall be implemented prior to the first use or occupation of the development and maintained for the life of the development.”

Condition 4

“Before the commencement of construction works hereby permitted, the proposed drainage strategy for the site shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out, and the drainage maintained/managed, in accordance with the approved details. The strategy shall include details of how the proposed development will connect to existing drainage on the site and how any detrimental impact on water quality leaving the site will be managed.”

- 1.3 The proposed development consists of the erection of a new two storey residential dwelling with an associated parking area. A proposed site plan is included in **Appendix A**.
- 1.4 This Technical Note will cover the existing drainage arrangement, the proposed surface water drainage arrangement, and demonstrate compliance with the principles of Sustainable Drainage Systems (SuDS).

2. Existing Site Conditions

- 2.1 The existing site consists of a residential property, associated access and garden area.
- 2.2 An existing access is present from Innsworth Lane on the western boundary.

3. Existing Drainage

- 3.1 Severn Trent Water asset records (**Appendix B**) indicate the presence of a 225mm diameter combined sewer to the west of the site within Innsworth Lane flowing in a southern direction. Records also illustrated that a 225mm diameter foul sewer asset is present in Innsworth Lane, flowing in a northern direction. A 450mm diameter surface water asset is shown to flow in a northern direction and go directly through the site boundary. However, a trace of this sewer was undertaken (**Appendix C**), indicating that the sewer is located within the footway within Innsworth Lane.
- 3.2 A private foul sewer is noted to be located within the site with a manhole located in the western edge of the site near the main accessway.
- 3.3 A CCTV survey of the existing private drainage system within the site boundary will be completed prior to construction to confirm the extent of the private network.
- 3.4 There are no other known drainage features within the development boundary. The nearest watercourse is a tributary of the Wotton Brook, approximately 600 metres southwest of the site.

4. Existing Geology

- 4.1 Online British Geological Society (BGS) mapping indicates that the site is underlain by the Charmouth Mudstone Formation – Mudstone.

- 4.2 The nearest borehole log with freely available information is located approximately 300m east of the site and was recorded to a depth of 3.04m, obtained via online BGS maps. The borehole log reference number is SO81NE1. The log identifies presence of brown and grey clay and blue and grey clay.
- 4.3 The Cranfield Soil and Agrifood Institute 'Soilscapes' online mapping tool indicates the local geology to be 'freely draining lime-rich loamy soils.'
- 4.4 Infiltration testing was completed 18th January 2022, with results included within **Appendix D**.
- 4.5 The testing has confirmed soakaways area viable method of surface water management and an infiltration rate of 2.1×10^{-5} has been used for design purposes.

5. Proposed Drainage

- 5.1 The drainage strategy drawing is included in **Appendix E**.
- 5.2 Surface water runoff shall be collected through gravity-fed gutters and downpipes for the proposed dwelling and discharged to a private garden soakaway.
- 5.3 The proposed parking and access area will be discharged via permeable paving which will also provide water quality benefits.
- 5.4 The soakaway system has been designed to cater for a 100-year storm with a 40% allowance for climate change. The proposed dwelling generates an impermeable area of 45m². A minimum water volume of **2.53m³** is required to safely store excess flows up to and including the 100-year storm with 40% climate change allowance. This shall be accommodated in a soakaway 2.4m long, 1.6m wide and 0.66m deep, with 95% porosity. MicroDrainage calculations showing the required storage calculations are provided within **Appendix F**.
- 5.5 Foul drainage generated from the proposed dwelling shall be conveyed to the western site boundary and connected to the existing private asset in line with best practice. The location of proposed foul drainage is likely to change following confirmation of below-ground foul connection points.

6. Water Quality

- 6.1 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use,

according to the pollution hazard indices. For this site contaminant risks come from the parking area and roofing.

- 6.2 To ensure adequate treatment is provided the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices. Surface water runoff from the residential parking area is considered to present a low hazard to water quality, whilst the residential roofing of the flats above the retail store presents a very low hazard.
- 6.3 To ensure suitable mitigation index is achieved the affected stormwater system has been assessed.
- 6.4 The table below indicated satisfactory water quality is achieved through the use of permeable paving. It is also recommended, as good practice, that gullies and chambers have suitable silt traps/catchpits to reduce sediments entering the system.

		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Land Use	Residential Car Parking	Low	0.5	0.4	0.4
Total			0.5	0.4	0.4
SuDS Component	Pervious Pavement (where the pavement is not designed as an infiltration component)		0.7	0.6	0.7
Total			0.7	0.6	0.7
Total SuDS Mitigation Indices \geq Pollution Hazard Indices			Yes	Yes	Yes

7. SuDS/Drainage Management

- 7.1 Maintenance of SuDS features is essential to ensure that the surface water drainage system operates effectively and that flooding of the site and surrounding areas is prevented.
- 7.2 The responsibility of maintaining the drainage components would lie with the development landowner, unless responsibility has been delegated to an appointed external Management Company.
- 7.3 A full maintenance regime should be carried out to ensure that the drainage system remains operational over its lifetime. Table A summarises an initial maintenance plan for the drainage components proposed within this development. The SuDS Manual (CIRIA C753) and manufacturer's guidelines should be referred to for further information.

Drainage Component	Required Action	Typical Frequency
Pipework, manholes, chambers, catch pits and silt traps	Stabilise adjacent areas	As required
	Remove weeds	As required
	Clear any poor performing structures.	As required
	Inspect all structures for poor operation	Six monthly, 48 hours after large storms in first six months
	Monitor inspection chambers. Inspect silt accumulation rates and determine silt clearance frequencies	Annually
Soakaway Device	Check upstream silt traps	Monthly and after large storms
Permeable Paving	Brushing and vacuuming	Once a year or as required
	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required.
	Inspect for evidence of poor operation and/or weed growth	3 monthly, 48 hours after large storms in first 6 months

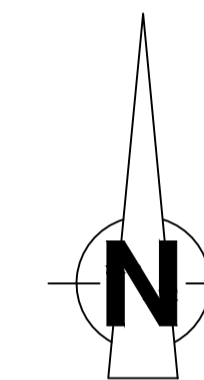
8. Supporting Information

- Appendix A – Proposed Site Plan
- Appendix B – Severn Trent Water Asset Records
- Appendix C – Existing Sewer Trace
- Appendix D – Infiltration Testing Results
- Appendix E – Drainage Strategy
- Appendix F – Surface Water Storage Volume Calculations

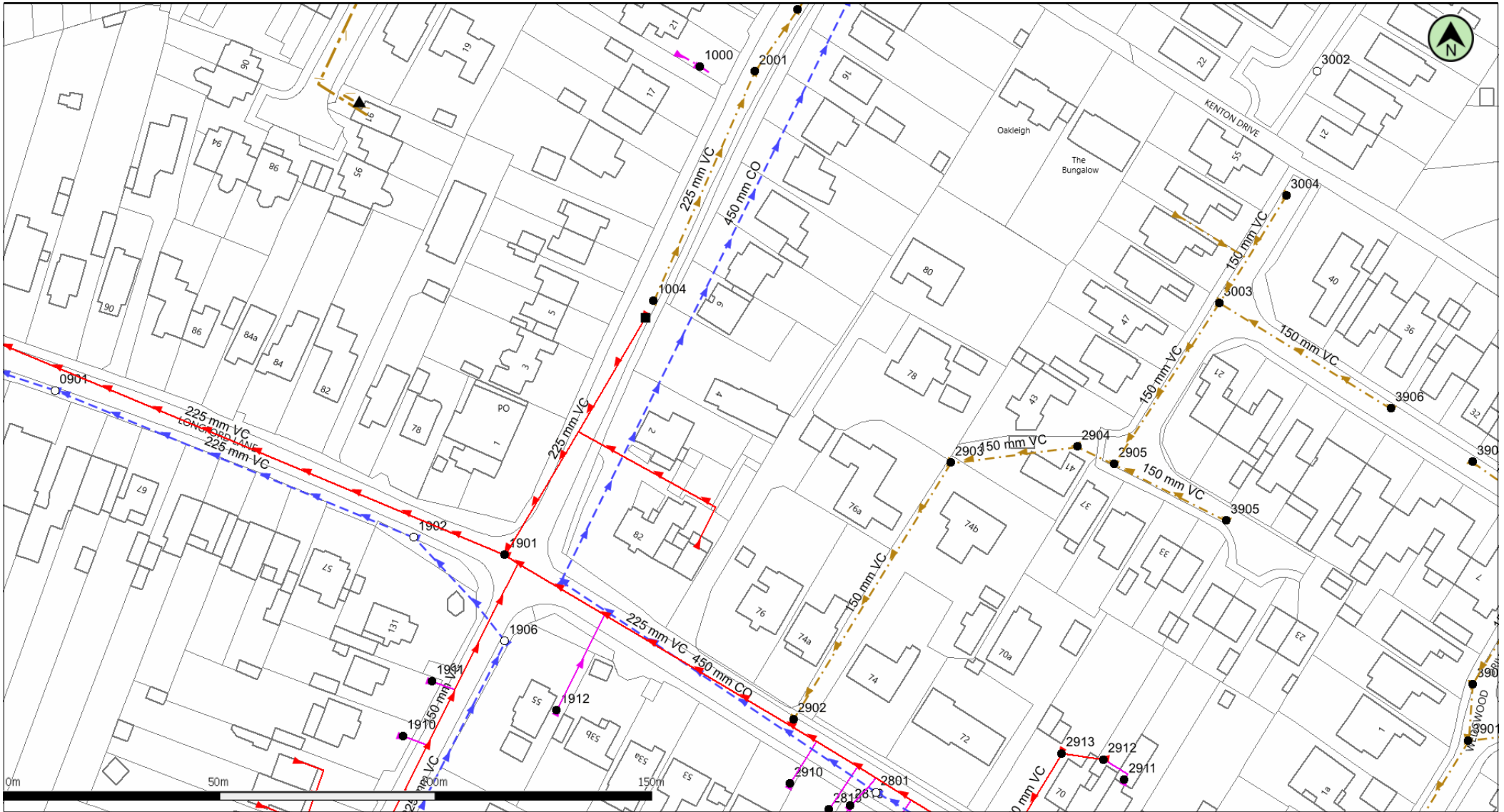
Appendix A

When printed correctly, at A2, this line will measure 100mm at full size
CHECK PRINTED SIZE

When printed correctly, at A2, this line will measure 100mm at full size



Appendix B



(c) Crown copyright and database rights 2021 Ordnance Survey 100031673 Date: 25/03/21 Scale: 1:1250 Map Centre: 385206,219987 Data updated: 14/03/21 Our Ref: 528749 - 1 Wastewater Plan A4

Do not scale off this Map. This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems. On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, Transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map. Reproduction by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and database right 2004. All rights reserved. Ordnance Survey licence number: 100031673. Document users other than SEVERN TRENT WATER business users are advised that this

Public Foul Gravity/Lateral Drain		Highway Drain		Manhole Foul	
Public Combined Gravity/Lateral Drain		Overflow Pipe		Manhole Surface	
Public Surface Water Gravity/Lateral Drain		Disposal Pipe		Abandoned Pipe	
Pressure Foul		Culverted Water Course		Section 104 sewers are shown in green	
Pressure Combined		Pumping Station		Private sewers are shown in magenta	
Pressure Surface Water		Fitting			

[Redacted]

QT-0497

GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on:

0800 783 4444 (24 hours)

- a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991 (a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "STW Apparatus" in these general conditions and precautions.
- b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- c) On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- d) STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- e) The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- f) No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

1. All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.

4. During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
5. Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
6. Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
7. Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
8. No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
10. Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
13. You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,
14. No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

15. Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.
16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May2014

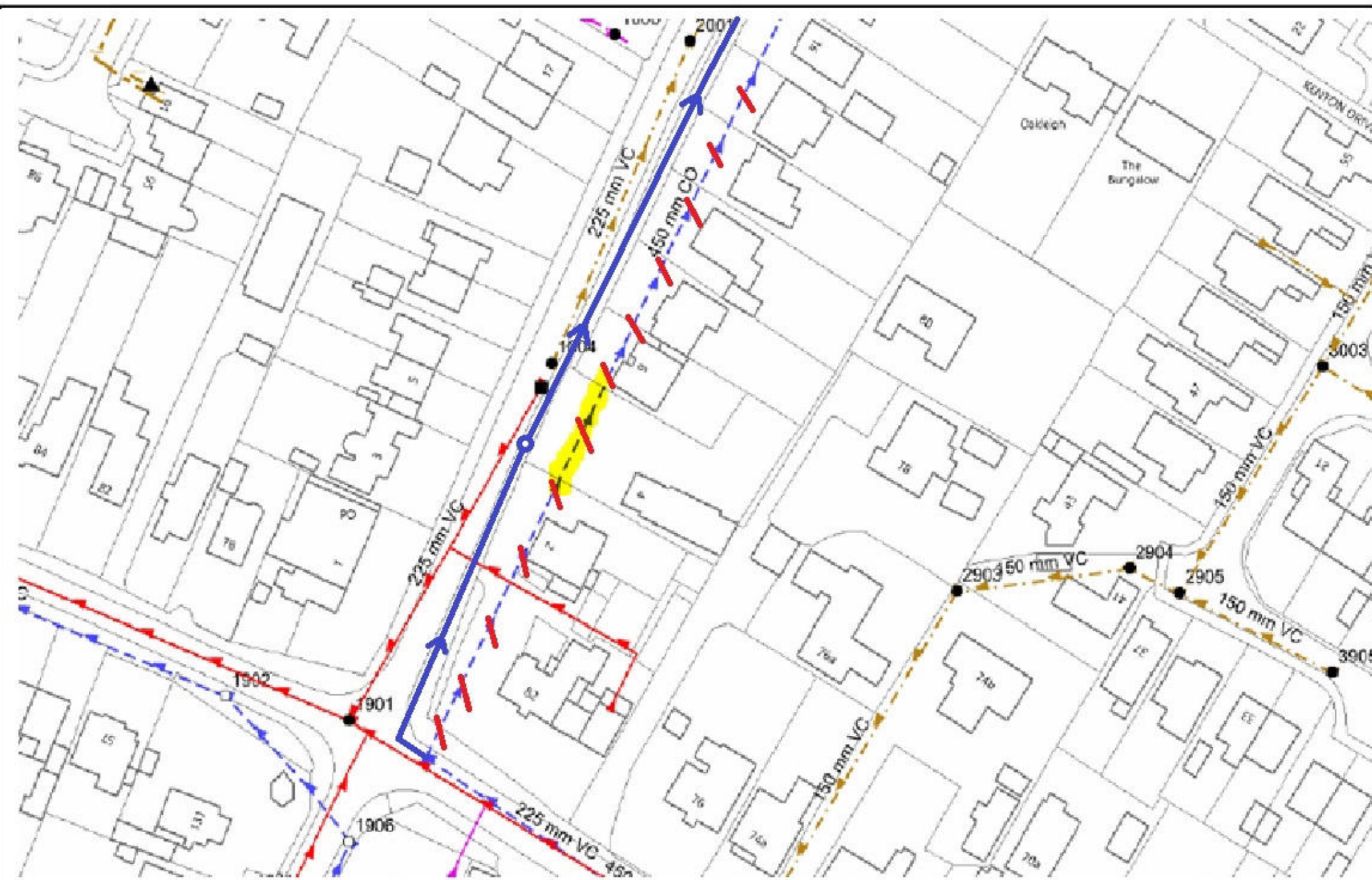
18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other STW Apparatus.

19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main or other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1901	C	18.03	15.28	2.76
1910	C	-	0	0
1911	C	-	0	0
2818	C	-	0	0
2819	C	-	0	0
2910	C	-	0	0
2911	C	-	0	0
2912	C	-	0	0
2913	C	-	0	0
1000	F	-	0	0
1004	F	17.4	15.38	2.02
1912	F	-	0	0
2001	F	17.25	15.09	2.16
2002	F	17.14	15	2.14
2902	F	18.04	15.95	2.09
2903	F	17.96	16.4	1.56
2904	F	17.91	16.52	1.39
2905	F	18.21	16.65	1.56
3003	F	18.27	16.95	1.32
3004	F	18.34	17.15	1.19
3901	F	19.35	17.18	2.17
3902	F	19.22	17.29	1.93
3904	F	18.73	17.73	1
3905	F	18.48	16.91	1.57
3906	F	18.6	17.25	1.35
0901	S	17.48	16.21	1.27
1902	S	17.86	16.72	1.14
1906	S	18.12	16.72	1.4
2801	S	18.26	16.88	1.38
3002	S	18.14	17.67	0.47

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix C



WILLIAM ROSE DRAIN SERVICES LTD



WILLIAM ROSE DRAIN SERVICES LTD
 21 Oak Drive, Bredon
 Tewkesbury GL20 7PW
 01684 438950
 www.williamrosedrains.co.uk

Description	Rev	Date	By	Drawn
Original Issue for Comments	01	03/02/22	TC	
Revisions	A2			
	A3			
	A4			
	A5			
	A6			
	A7			

Revision	Checked	Approved
BM	TC	BM

Location: **Innsworth Lane**

Work/Detain: Sewer Survey

Revision	Checked	Approved
BM	TC	BM

Scale: @ Original Size A3
NOT TO SCALE

Date: **03/02/2022**

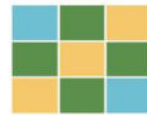
Drawing Number: **W21040308L**

Revision: **P1**

Appendix D

Soil Infiltration Calculation

to BRE Digest 365 Soakaway Design

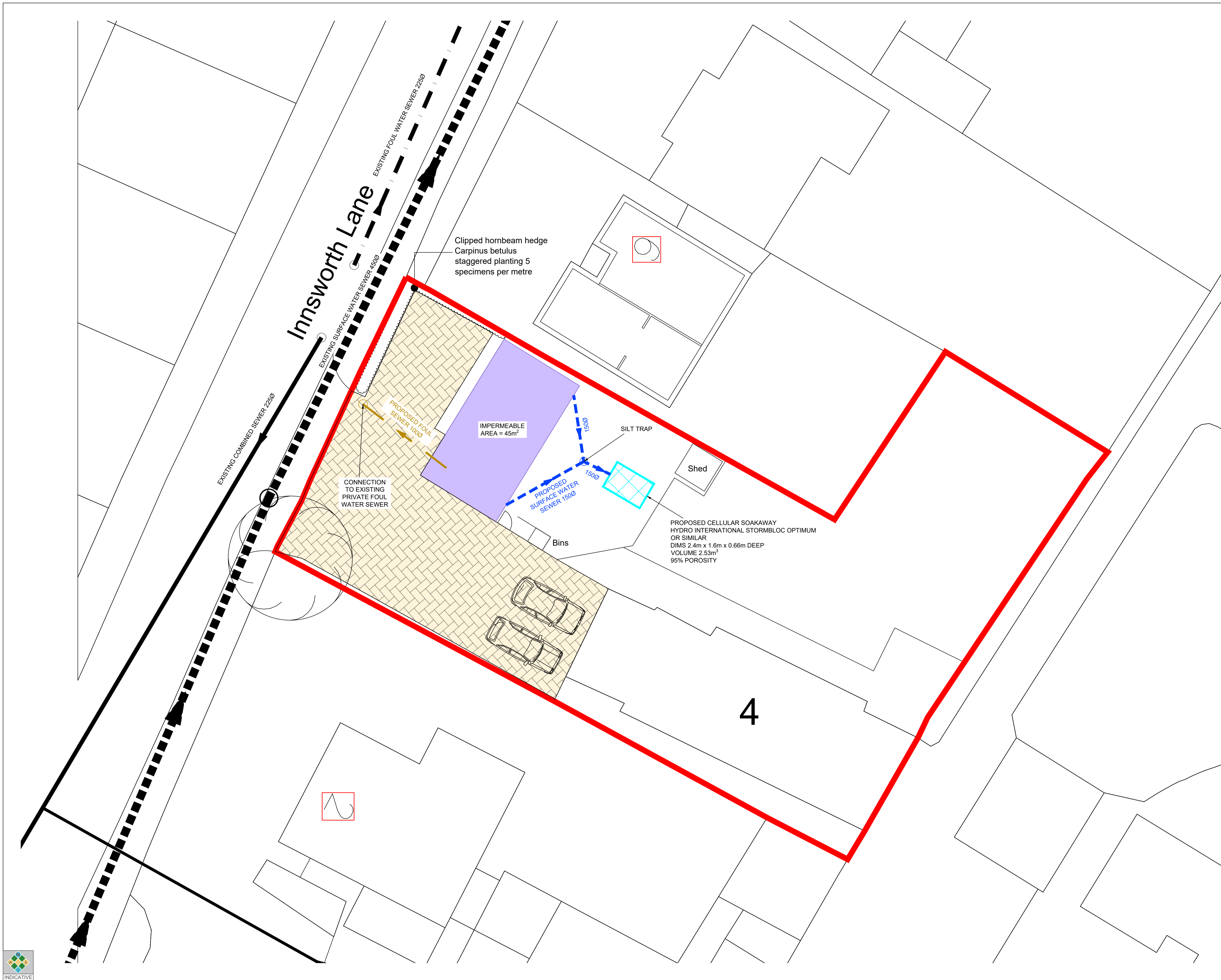


COTSWOLD
TRANSPORT
PLANNING

Project No: 22-0130
Project Name: 4 Innsworth Lane, Gloucester
Date: 18-Jan-22

Soakaway test pit:		Pit 1 - Test 1	
Length of test pit =	0.450	m	
Width of test pit =	1.050	m	
Depth of test pit from ground level =	1.000	m	
Soakaway test No. 1:			
Distance from G.L. to datum water level at start of test =	0.550	m	
Total drop below datum water level at end of test =	0.450	m	
75% of effective depth below datum =	0.113	m	Time, t_{75} = 7.68 mins
50% of effective depth below datum =	0.225	m	
25% of effective depth below datum =	0.338	m	Time, t_{25} = 38.60 mins
V_{p75-25} =	0.106	m^3	t_{p75-25} = 31 mins
A_{p50} =	1.148	m^2	
Soil infiltration rate, f =	5.0E-05	m/sec	
Soil infiltration rate, f =	0.180	m/hr	
Soakaway test pit:		Pit 1 - Test 2	
Length of test pit =	0.450	m	
Width of test pit =	1.050	m	
Depth of test pit from ground level =	1.000	m	
Soakaway test No. 2:			
Distance from G.L. to datum water level at start of test =	0.440	m	
Total drop below datum water level at end of test =	0.560	m	
75% of effective depth below datum =	0.140	m	Time, t_{75} = 12.00 mins
50% of effective depth below datum =	0.280	m	
25% of effective depth below datum =	0.420	m	Time, t_{25} = 78.30 mins
V_{p75-25} =	0.132	m^3	t_{p75-25} = 66 mins
A_{p50} =	1.313	m^2	
Soil infiltration rate, f =	2.5E-05	m/sec	
Soil infiltration rate, f =	0.091	m/hr	
Soakaway test pit:		Pit 1 - Test 3	
Length of test pit =	0.450	m	
Width of test pit =	1.050	m	
Depth of test pit from ground level =	1.000	m	
Soakaway test No. 3:			
Distance from G.L. to datum water level at start of test =	0.415	m	
Total drop below datum water level at end of test =	0.585	m	
75% of effective depth below datum =	0.146	m	Time, t_{75} = 17.72 mins
50% of effective depth below datum =	0.293	m	
25% of effective depth below datum =	0.439	m	Time, t_{25} = 99.75 mins
V_{p75-25} =	0.138	m^3	t_{p75-25} = 82 mins
A_{p50} =	1.350	m^2	
Soil infiltration rate, f =	2.1E-05	m/sec	
Soil infiltration rate, f =	0.075	m/hr	

Appendix E



NOTES:

- DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS ARE IN METRES, UNLESS STATED OTHERWISE.
- THIS DRAWING IS BASED ON THE ARCHITECTS' LAYOUT RECEIVED IN 2021.
- ORDNANCE SURVEY, (C) CROWN COPYRIGHT 2020. ALL RIGHTS RESERVED. LICENCE NUMBER 100022432.
- DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER 5 WORKING DAYS IN ADVANCE OF UNDERTAKING ANY WORK.
- THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION.
- INVERT LEVELS AND DIAMETERS OF EXISTING SEWERS TO BE CONFIRMED PRIOR TO DETAILED DESIGN.
- RAINWATER DOWNPIPES ARE SHOWN AS INDICATIVE ONLY, AND ARE SUBJECT TO FURTHER DESIGN.
- INTERNAL FOUL CONNECTION POINTS TO BELOW GROUND DRAINAGE SHOWN AS INDICATIVE ONLY, AND ARE SUBJECT TO FURTHER DESIGN.
- PIPE DIAMETERS AND GRADIENTS ARE SHOWN INDICATIVELY ONLY.

KEY:

	EXISTING SURFACE WATER INSPECTION CHAMBER/MANHOLE
	EXISTING SURFACE WATER SEWER
	EXISTING FOUL WATER INSPECTION CHAMBER/MANHOLE
	EXISTING FOUL WATER SEWER
	EXISTING COMBINED INSPECTION CHAMBER/MANHOLE
	EXISTING COMBINED SEWER
	SURFACE WATER INSPECTION CHAMBER/MANHOLE
	SURFACE WATER SEWER
	FOUL WATER INSPECTION CHAMBER/MANHOLE
	FOUL WATER SEWER
	GEOCELLULAR ATTENUATION SYSTEM
	PERMEABLE PAVING
	IMPERMEABLE AREA

Rev	Date	Drawn By	Checked By
04/02/22	ISSUED FOR INFORMATION	CE	KT



CLIENT:
PJS DEVELOPMENT SOLUTIONS LTD

PROJECT:
**4 INNSWORTH LANE,
GLOUCESTER**

TITLE:
DRAINAGE LAYOUT

STATUS:
INFORMATION

SCALE @ A1:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:100	04/02/22	CE	KT	KT
JOB NO:	DRAWING NO:	REVISION:		
CTP-22-0130	C001	-		



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Appendix F

CTP House, Knapp Road
Cheltenham
Gloucestershire, GL50 3QQ

4 INNSWORTH LANE,
GLOUCESTER



Date 20/01/2022
File 220120 Infiltration Cra...

Designed by CE
Checked by KT

Innovyze Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 237 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	98.289	0.289	0.1	1.1	O K
30 min Summer	98.379	0.379	0.1	1.4	O K
60 min Summer	98.466	0.466	0.1	1.7	O K
120 min Summer	98.531	0.531	0.1	1.9	O K
180 min Summer	98.548	0.548	0.1	2.0	O K
240 min Summer	98.552	0.552	0.1	2.0	O K
360 min Summer	98.545	0.545	0.1	2.0	O K
480 min Summer	98.533	0.533	0.1	1.9	O K
600 min Summer	98.519	0.519	0.1	1.9	O K
720 min Summer	98.503	0.503	0.1	1.8	O K
960 min Summer	98.472	0.472	0.1	1.7	O K
1440 min Summer	98.415	0.415	0.1	1.5	O K
2160 min Summer	98.341	0.341	0.1	1.2	O K
2880 min Summer	98.282	0.282	0.1	1.0	O K
4320 min Summer	98.191	0.191	0.1	0.7	O K
5760 min Summer	98.128	0.128	0.1	0.5	O K
7200 min Summer	98.086	0.086	0.0	0.3	O K
8640 min Summer	98.059	0.059	0.0	0.2	O K
10080 min Summer	98.048	0.048	0.0	0.2	O K
15 min Winter	98.324	0.324	0.1	1.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	117.448	0.0	18
30 min Summer	79.010	0.0	33
60 min Summer	50.812	0.0	62
120 min Summer	31.621	0.0	120
180 min Summer	23.637	0.0	168
240 min Summer	19.105	0.0	196
360 min Summer	14.037	0.0	260
480 min Summer	11.286	0.0	328
600 min Summer	9.522	0.0	398
720 min Summer	8.282	0.0	468
960 min Summer	6.640	0.0	606
1440 min Summer	4.854	0.0	878
2160 min Summer	3.541	0.0	1256
2880 min Summer	2.828	0.0	1644
4320 min Summer	2.055	0.0	2376
5760 min Summer	1.637	0.0	3064
7200 min Summer	1.371	0.0	3752
8640 min Summer	1.186	0.0	4416
10080 min Summer	1.049	0.0	5136
15 min Winter	117.448	0.0	18

CTP House, Knapp Road
Cheltenham
Gloucestershire, GL50 3QQ

4 INNSWORTH LANE,
GLOUCESTER



Date 20/01/2022
File 220120 Infiltration Cra...

Designed by CE
Checked by KT

Innovyze Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	98.427	0.427	0.1	1.6	O K
60 min Winter	98.526	0.526	0.1	1.9	O K
120 min Winter	98.606	0.606	0.1	2.2	O K
180 min Winter	98.629	0.629	0.1	2.3	O K
240 min Winter	98.631	0.631	0.1	2.3	O K
360 min Winter	98.622	0.622	0.1	2.3	O K
480 min Winter	98.605	0.605	0.1	2.2	O K
600 min Winter	98.583	0.583	0.1	2.1	O K
720 min Winter	98.560	0.560	0.1	2.0	O K
960 min Winter	98.513	0.513	0.1	1.9	O K
1440 min Winter	98.429	0.429	0.1	1.6	O K
2160 min Winter	98.326	0.326	0.1	1.2	O K
2880 min Winter	98.246	0.246	0.1	0.9	O K
4320 min Winter	98.133	0.133	0.1	0.5	O K
5760 min Winter	98.064	0.064	0.0	0.2	O K
7200 min Winter	98.045	0.045	0.0	0.2	O K
8640 min Winter	98.039	0.039	0.0	0.1	O K
10080 min Winter	98.035	0.035	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	79.010	0.0	32
60 min Winter	50.812	0.0	62
120 min Winter	31.621	0.0	118
180 min Winter	23.637	0.0	172
240 min Winter	19.105	0.0	222
360 min Winter	14.037	0.0	276
480 min Winter	11.286	0.0	354
600 min Winter	9.522	0.0	430
720 min Winter	8.282	0.0	506
960 min Winter	6.640	0.0	652
1440 min Winter	4.854	0.0	936
2160 min Winter	3.541	0.0	1340
2880 min Winter	2.828	0.0	1728
4320 min Winter	2.055	0.0	2460
5760 min Winter	1.637	0.0	3064
7200 min Winter	1.371	0.0	3672
8640 min Winter	1.186	0.0	4408
10080 min Winter	1.049	0.0	5144

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 Gloucestershire, GL50 3QQ

4 INNSWORTH LANE,
 GLOUCESTER



Date 20/01/2022
 File 220120 Infiltration Cra...

Designed by CE
 Checked by KT

Innovyze Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.005

Time (mins)	Area
From:	To: (ha)
0	4 0.005

CTP House, Knapp Road
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Gloucestershire, GL50 3QQ

4 INNSWORTH LANE,
GLOUCESTER



Date 20/01/2022
File 220120 Infiltration Cra...

Designed by CE
Checked by KT

Innovyze Source Control 2020.1.3

Model Details

Storage is Online Cover Level (m) 100.000

Cellular Storage Structure

Invert Level (m) 98.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.07500 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.07500

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	3.8	3.8	0.661	0.0	9.4
0.660	3.8	9.4			