

DRAINAGE STATEMENT
GREEN BANK, STATION ROAD, WHITWELL
FOR
SAM SMITH



46003-002

15th June 2021

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Issue 1: 15th June 2021

EXECUTIVE SUMMARY

Surface water disposal is considered in accordance with the drainage hierarchy in Building Regulations Part H 2010 and Planning Practice Guidance 'Reducing the causes and impacts of flooding', paragraph 080 reference ID 7-080-20150323.

It is understood the current development drains to a soakaway. Infiltration type SuDS such as soakaways may be feasible given the likely presence of dolostone. It is recommended this is investigated through soakaway testing.

Should soakaway testing prove unsuccessful, surface water discharge should be attenuated to 3.5 l/s as the minimum practical rate. Attenuation storage for events up to the 1 in 100 year plus 30% climate change rainfall should be provided. An estimated total storage of 55 m³ will be required. Discharge could be to the public surface water / combined sewers in, or to the east of, Station Road.

Foul effluent will discharge to the public combined sewer within Station Road east of the site.

1.0 INTRODUCTION

The site is located at Greenbank, Station Road, Whitwell (Appendix 1). Proposals are for the conversion of the existing house and the demolition and replacement of the outbuildings. There will be no increase in the overall footprint of the buildings (Appendix 2).

A topographic survey was provided however the levels were found to be incorrect. A corrected topographic survey was not available at the time of writing.

2.0 DRAINAGE STRATEGY

2.1 Existing drainage

Severn Trent Water sewer maps (Appendix 3) show a 450 mm public combined sewer in Station Road to the east of the site. A 225 mm public surface water sewer is also shown in Station Road east of the site. A 225 mm public foul sewer is shown in Holmefield Road which joins the 225 mm surface water sewer in Station Road to become a 225 mm public combined sewer. This then joins the 450 mm combined sewer to become a 675 mm diameter. 375 mm and 450 mm public surface water sewers are recorded on the east side of Station Road with manholes present in the road verge to the south of the junction with Holmefield Road.

A site walkover was carried out on 20th April 2021. An inspection chamber in the courtyard to the rear of the existing building was lifted which covers a disused septic tank. The septic tank is brick-lined and approximately 2 m wide by 3 m long and 1.95 m deep from the surface. The septic tank will be abandoned as part of the redevelopment.

The site is understood to have a foul connection to the public sewer network.

Surface water from the site is understood to drain to an on-site soakaway.

2.2 Ground conditions

The British Geological Survey maps show the bedrock underlying the site is dolostone of the Cadeby Formation. Superficial Head deposits are also shown to underlie the north-eastern site boundary.

There are no boreholes within 250 m of the site.

2.3 Drainage hierarchy

Surface water disposal should be in accordance with the drainage hierarchy in Building Regulations Part H 2010¹ and Planning Practice Guidance 'Reducing the causes and impacts of flooding', paragraph 080. Disposal via SuDS methods should be considered as the first option. Disposal to the public sewer should be considered only when SuDS methods and disposal to the watercourse are shown to be unsuitable.

2.3.1 Sustainable Drainage Systems (SuDS)

SuDS methods include water infiltration systems such as soakaways, basins and filter strips, together with swales, pervious pavements, detention basins, ponds and other wetland solutions. The various methods are considered in detail in The SuDS Manual (CIRIA C753).

Surface water drainage via soakaway may be feasible for the proposed development (subject to satisfactory infiltration test results) given the likely presence of dolostone. It is understood the current development drains to on-site soakaways.

An assessment of SuDS methods and their applicability to this site is included in Appendix 4.

2.3.2 Watercourse

There are no nearby watercourses within at least 1 km of the site. Discharge to watercourse is therefore unviable.

2.4 Proposals for surface water disposal

The final design will need the approval of the relevant statutory bodies but will broadly follow these principles:-

- Surface water disposal will be either to soakaway (subject to satisfactory infiltration test results) or to the surface water / combined sewers in, or to the east of, Station Road.
- If infiltration testing proves unsuccessful surface water discharge should be attenuated to 3.5 l/s as the minimum practicable rate.

¹ <https://www.gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h>

- Attenuation storage for events up to the 1 in 100 year plus 30% climate change rainfall should be provided. An estimated total storage of 55 m³ will be required. Calculations are provided in Appendix 4.

2.5 Residual flood risk

There is a potential flood risk to site occupiers and to others from surface water runoff as a result of developing the site. The residual risk can be managed by the general flood mitigation measures outlined below.

2.6 Mitigation measures

The proposed surface water drainage system will be designed to current best practice and to the standards laid out in the publication 'Design and Construction Guidance for foul and surface water sewers' and Building Regulations Part H 2010.

In the event of surface water failure for rainfall in excess of the design standard, the site will be laid out so that surface water runoff is directed away from the development and neighbouring houses.

3.0 CONCLUSIONS

1. Surface water disposal has been considered in accordance with the drainage hierarchy in Building Regulations Part H 2010 and Planning Practice Guidance 'Reducing the causes and impacts of flooding', paragraph 080 reference ID 7-080-20150323.
2. It is understood the current development drains to a soakaway. Infiltration type SuDS such as soakaways may be feasible given the likely presence of dolostone. It is recommended this is investigated through soakaway testing.
3. If soakaway testing proves unsuccessful, surface water discharge should be attenuated to 3.5 l/s as the minimum practical rate. Attenuation storage for events up to the 1 in 100 year plus 30% climate change rainfall should be provided. An estimated total storage of 55 m³ will be required. Discharge could be to the public surface water / combined sewers in, or to the east of, Station Road.
4. Foul effluent will discharge to the public combined sewer within Station Road east of the site.

APPENDICES

APPENDIX 1



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OS LOCATION PLAN



Scale.	1:1250	Drawn.	
Date.	19.03.2021	Ref. No.	
DWG. No.		Rev.	
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GREEN BANK
STATION ROAD
WHITWELL

EXTENSIONS AND ALTERATIONS

OS/LOCATION PLAN

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APPENDIX 2

DO NOT SCALE
All dimensions in Millimetres
unless specified otherwise and
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PRELIMINARY/DRAFT

GREEN BANK
STATION ROAD
WHITWELL

EXTENSIONS AND ALTERATIONS PROPOSED SITE PLAN

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Scale.	1:100	Drawn.	
Date.	29.03.2021	Ref. No.	20.137
WG. No.	P 10	Rev.	B
cm	2 cm	4 cm	6 cm

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APPENDIX 3

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 May 2014

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
0302	C	92.33	91.73	0.6
0305	C	92.02	90.85	1.17
1401	C	87.13	85.13	2
1402	C	87.95	85.93	2.02
1403	C	89.17	87.27	1.9
1408	C	91.24	89.9	1.34
1409	C	88.64	85.89	2.75
1410	C	87.32	85.67	1.65
2301	C	85.21	83.66	1.55
2302	C	85.64	83.79	1.85
2303	C	85.77	84.63	1.14
3301	C	85.05	83.6	1.45
3302	C	84.78	83.65	1.13
3303	C	88.01	86.87	1.14
3304	C	87.99	86.85	1.14
	F			
	F			
	F			
	F			
	F			
	F			
	F			
	F			
	F			
	F			
2203	F	87.6	86.07	1.53
2308	F	87.09	85.39	1.7
2313	F	85.89	84.98	0.91
2401	F	86.44	85.28	1.16
2402	F	87.36	85.86	1.5
3402	F	88.44	86.91	1.53
4202	F	86.73	0	0
4306	F	87.74	85.39	2.35
1405	S	87.48	86.46	1.02
1406	S	87.98	87.03	0.95
1407	S	87.17	86.17	1
2204	S	87.65	86.53	1.12
2304	S	86.13	84.13	2
2305	S	86.08	0	0
2306	S	86.37	85.12	1.25
2307	S	85.33	84.35	0.98
2310	S	87.1	85.92	1.18
2311	S	85.78	84.94	0.84
2312	S	85.21	83.94	1.27
2403	S	87.31	85.91	1.4
2404	S	89.2	87.63	1.57
2405	S	87.13	86.18	0.95
3305	S	85.17	83.09	2.08

[illegible][illegible]

3306	S	85.85	83.68	2.17
3307	S	87.26	83.73	3.53

APPENDIX 4

SUDS Type	SUDS Technique	Description	Suitable	Comments
Source Control	Green roof	Vegetated roof that reduces runoff volume and rate	No	Expected planning requirement for traditional pitched roofs to match neighbouring housing.
	Rainwater harvesting/rainwater butts	Rainwater is stored and re-used	Possible	Individual water butts could be used for garden watering.
	Permeable paving	Paving which allows inflow of rainwater into underlying construction/soil	Possible	May be suitable for private drive areas. Private permeable paving areas could provide limited infiltration to ground subject to soakaway testing or within the underlying construction material.
Infiltration	Soakaway	Pit or trench which stores and disposes of water to the ground	Possible	Expected presence of permeable dolostone. Infiltration tests required.
	Filter Drain	Trench which conveys and/or disposes of water to the ground.		
	Infiltration Basin	Shallow basin which stores and disposes of water to the ground		
Conveyance	Swale	Shallow vegetated depression which conducts and retains water	No	Difficulties of adoption and lack of space.
Detention	Subsurface storage	Traditional underground pipes, tank storage, or modular systems	Yes	Area available for an attenuation tank / underground crates.
	Detention Basin	Normally dry but may have small permanent water pools at the inlet and outlet. They can function as POS	No	Inefficient use of POS.
	Pond	Permanent body of water	No	Unsuitable for small sites.
	Wetland	Permanent body of shallow water or marsh		

Project:	Greenbank	Sheet	1.00
location	Station Road	Job No.	46003
town	Whitwell	Date	28.04.21
Subject:	Surface Water Drainage	Designed	IH
	Storage Estimates	Checked	
		Revision	A

Site Details :

Information From Wallingford Maps :

Location :	Whitwell	M5-60	20.0	mm
Grid Ref :	453210, 376386	r	0.40	
		SAAR	646	mm
Total Site Area	0.375	ha	UCWI	65 (Fig. 9.7)
Deduct areas to soakaways	0.000	ha	Soil Type	1
Effective Drainage Area	0.375	ha	SOIL	0.15 (Section 7.4)

Total Impermeable	0.130	ha	55%	assumed impermeable area
Allow for Urban Creep	0.013	ha	10%	
Total Impermeable	0.142	ha		

PIMP	38.0%	
PR	19.6	Equation 7.3
Cv	0.52	Equation 7.21
Default Cv	0.85	Designer to insert to override calculated Cv

Design Return Period	100	Years	Max. Branch Length	100	metres
			Approx. Time of Flow	1.7	mins

Percentage Increase For Climate Change: **30%**

Details of Restricted Discharge :

Maximum Permitted Rate of Flow from the System	Litres/sec.ha
	3.5 Litres/sec
Assumed Average Flow as a Proportion (Estimate)	90 %
Average Rate of Flow	3.2 Litres/sec

Calculation of Critical Duration and Storage Volume Required :

Trial Durations (mins)	15	30	60	120	240	360	480
Average Point Intensity (mm/hr)	98.7	64.8	40.5	24.5	14.3	10.4	8.3
Volume of Run-off for the period = Area x Cv x i x D (m3)	29.9	39.2	49.0	59.2	69.5	75.7	80.4
With climate change	38.8	51.0	63.8	77.0	90.3	98.4	104.5
Volume of Out-flow for the period = Ave. flow x (D+Tf)(m3)	3.2	6.0	11.7	23.0	45.7	68.4	91.0
Storage Volume for this Duration (m3)	36	45	52	54	45	30	14

Storage Volume Required for

100 Year Return Period = **54** m³

Is this the worst case (ie. Critical Duration)? 1 (1 = Yes, 0 = No)