



RIDGE

DRAINAGE STATEMENT

ONE HORTON HEATH- LOWER ACRE

November 2022



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November 2022

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1. INTRODUCTION

1.1. Appointment and Brief

Eastleigh County Council has commissioned Ridge and Partners LLP to prepare a Drainage Statement. The purpose of the report is to outline any changes in the drainage strategy that was previously issued by Odyssey (19-367 Flood Risk assessment and water management strategy and addendum 1 and 2). The development proposal aims to manage the wastewater and surface water runoff generated by the scheme in line with current sustainable drainage principles.

1.2. Limitations

The purpose of this report is outlined in Section 1.1, together with those related matters specifically referred to therein and it is not intended to be used for any other purposes. The report is for the sole benefit and may only be relied upon by the addressee, to whom we will owe a duty of care. The report and any part of it are confidential to the addressee and should not be disclosed to any third party for any purpose, without the prior written consent of Ridge and Partners LLP as to the form and context of such disclosure. The granting of such consent shall not entitle the third party to place reliance on the report, nor shall it confer any third-party rights pursuant to the Contracts (Rights of Third Parties) Act. The report may not be assigned to any third party.

1.3. Reference Information

The following information has been obtained and interrogated as part of this study:

- 19-367 Flood Risk Assessment and Water Management Strategy Part 1 and 2 (Rev B)- Dec 2020
- 19-367 Flood Risk Assessment and Water Management Strategy (Addendum 1)- May 2021
- 19-367 Flood Risk Assessment and Water Management Strategy (Addendum 2)- Sept 2021
- Detailed Planning Application Upper Acre- Ground Investigation Report Dec 2020

2. PROJECT BACKGROUND

2.1. Site Location and Existing Land Use

The application site is located south of Horton Heath Village. The site is currently being used as an agricultural field and is bounded by Burnetts Lane on the eastern side. Refer to Appendix A for the Site Plan.

The Ordnance Survey (OS) grid reference for the application site is SU 49072 16324, approximately 449072E, 116324N and the nearest postcode is SO50 7FD. The total site boundary is circa 12.90hectares,



Figure 1 – Site Location Plan

2.2. Topography

The site predominantly slopes from south to north from an elevation of 25m to 21m with an approximate gradient of 1 in 97. The ground slopes from east to west from an elevation of 26m to 22m with an approximate gradient of 1 in 49.

2.3. Geology and Hydrogeology

British Geological Survey (BGS) online mapping indicates that the majority of the lower acre site is underlain by Wittering Formation- Sand, Silt and Clay. However, a small area of the site is made up of Earnley Sand Formation (sand, silt and clay).

There are no superficial deposits recorded within the Lower acre of the Horton Heath site.

Groundwater mapping published by the EA indicates that the site is not located within a groundwater source protection zone. Groundwater levels were recorded across the wider site as part of the ground investigation. BGS hydrogeology mapping shows that the site is located within the moderately productive aquifer.

The infiltration test result showed that the site is unsuitable for infiltration due to slow or no ingress of Water. The ground investigation report states that this is likely due to cohesive ground conditions. Refer to Appendix B for the ground investigation report.

2.4. Hydrological Settings

Environmental Agency (EA) online maps indicate that the nearest main river Itchen is 4700m away from the site. The tributary of River Itchen runs north of the site.

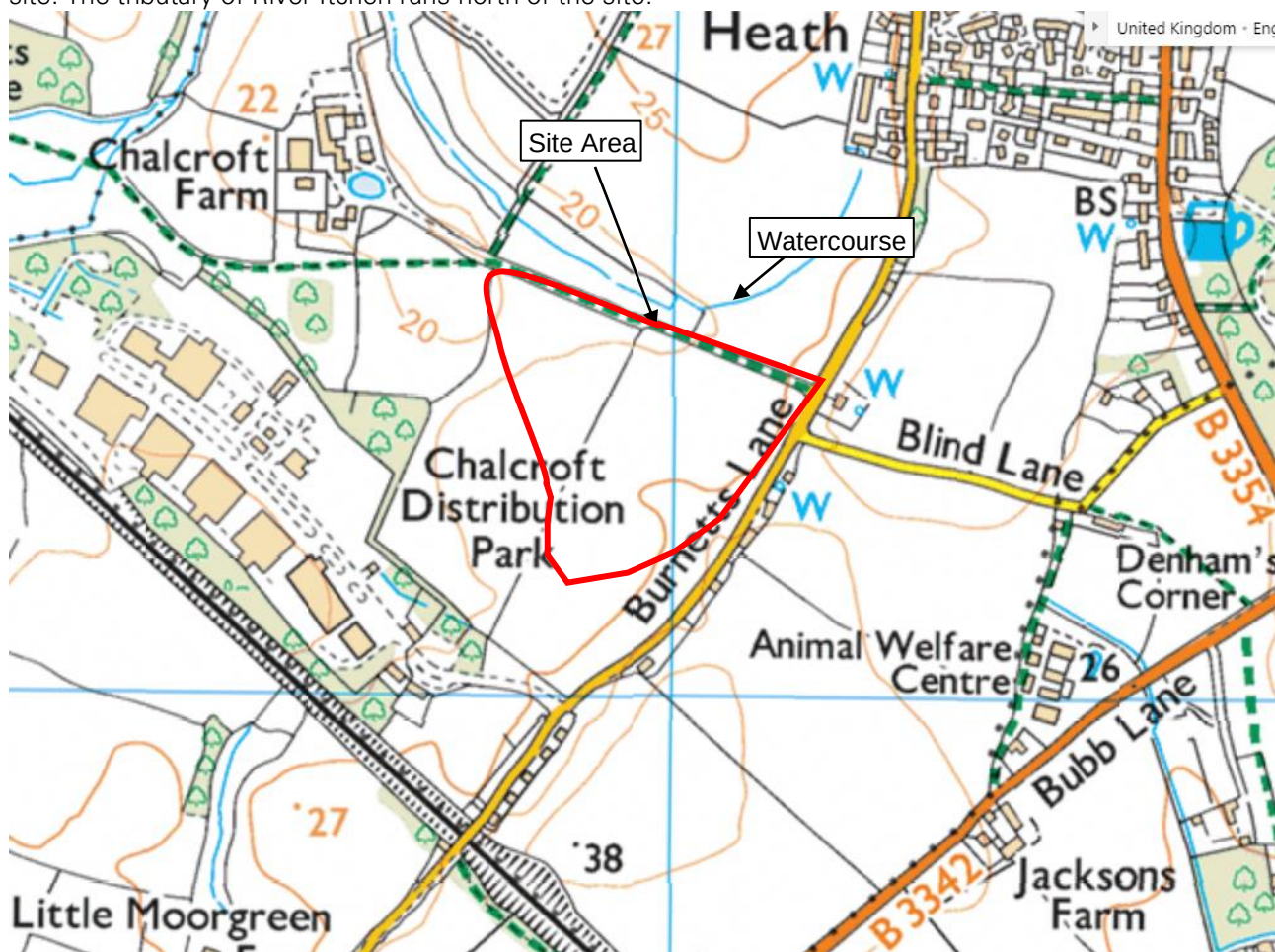


Figure 2 – Watercourse near the site

3. EXISTING DRAINAGE REGIME

The site is largely undeveloped, with an attenuation pond on the western side of the site. However, the surface water from the site is discharged to the nearest watercourse or infiltrated directly into the ground. As per the Flood Risk Assessment, undertaken by Odyssey, in September 2021, the mean annual discharge for the Existing Site [QMED], has been estimated at 8.1 l/s/ha.

4. PROPOSED SURFACE WATER DRAINAGE

4.1. Drainage hierarchy

4.1.1. Current guidance states that a hierarchy of potential methods for discharging surface water from development must be followed:

- i. A soakaway or another adequate infiltration system; or where this is not practical
- ii. A watercourse: or where this is not practicable
- iii. A sewer.

- 4.1.2. The Environment Agency and relevant Government Legislation require surface water strategies for new development are in line with sustainable development through the use of Sustainable Drainage Systems (SuDS).
- 4.1.3. Without mitigation and consideration, the proposed redevelopment of the site could lead to an unacceptable increase in the rate and volume of surface water generated from the site.
- 4.1.4. To comply with current guidance and best practice, sustainable drainage systems (SuDS) will be required to be implemented in order to manage the volume, rate and quality of surface water discharged off-site.

4.2. Contributing Areas

It is proposed to erect 381 new dwellings as shown in latest axis mason site plan with the provision of new access roads and associated car parking, amenities and landscaping. As a result of the scheme, an approximate impermeable area of 56250m² will be introduced within the site boundary and therefore surface water runoff will increase compared to the baseline scenario. The proposed drainage strategy layout is provided in Appendix C.

4.3. SuDS Management Train

As per the ground investigation report, the site is unsuitable for infiltration and the surface water gets diverted towards the attenuation pond before being discharged to the nearest watercourse.

To comply with SuDS Policy 2, it is proposed to utilise a flow control in order to restrict the post-development runoff rate to the Greenfield rate. The attenuation ponds had a restricted flow which is as follows:

SUDS FEATURE	ALLOW DISCHARGE RATE (L/S)
Basin I	29.6
Basin K	13.6
Basin M	39.6

Table 1: Restricted flow for Pond

4.4. Allowance for Climate Change

Table 2 (Peak Rainfall Intensity Allowance in Small and Urban Catchments) of Environment Agency (2019) Flood Risk Assessments: Climate Change Allowances confirms the climate change allowance of 40% should be adopted for the Application Site, assuming a lifespan of 100 years.

4.5. Allowance for Creep

The proposed residential buildings have a creep allowance of 10% added. The total impermeable area including the allowance for creep is 58350m². This has been included within the inputted areas within the Info drainage Model developed for the scheme Appendix D- Pg 15.

4.6. Proposed Drainage

- 4.6.1. It is proposed to manage surface water from rainfall events from a 1 in 100-year annual probability plus 40% climate change is to be stored within an attenuation Pond on the north side of the site.
- 4.6.2. A detailed Info drainage model was created for the whole site with the results included in Appendix D to this document and compared with the model and flow rates created by Odyssey. The changes are as follows:

FLOW RATE CHANGED CATCHMENT	ODYSSEY MICRODRAINAGE MODEL FLOW RATE (L/S)	INFODRAINAGE MODEL DISCHARGE RATE CHANGE (L/S)
A	4.5	8.0
B	No flow control	15
C	3.9	10
D	2.1	5.0

Table 1: Change in Flow rate compared to Odyssey drainage strategy

The changes in flow control are mostly carried out on the eastern side of the development area (catchment area hatched) as seen in Figure 3.

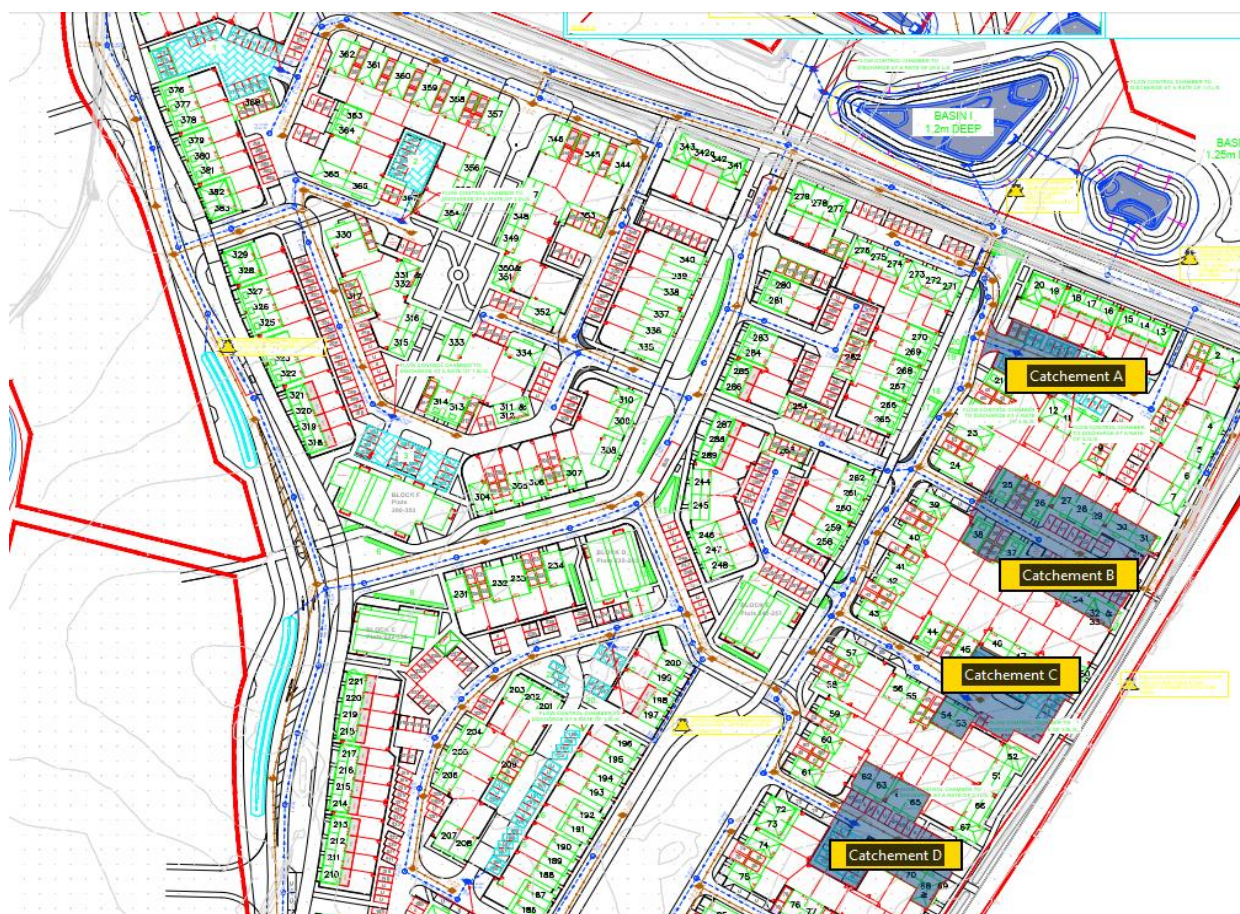


Figure 3: Catchment areas where flow control has increased.

- 4.6.3. Runoff from the roof is to be collected via private drains surrounding the building and discharged into a manhole which will then be controlled by a flow control device prior to discharge to the nearest watercourse via an attenuation pond.
- 4.6.4. Runoff from the road network and permeable paving within the site boundary is to be collected via linear drainage channels or gullies and discharged to the attenuation pond.
- 4.6.5. Out of 138 manholes within the development area, the size of 24 manholes was increased to more than 1.2m in diameter to avoid any risk of flooding within the area. Refer to the manhole schedule within the surface water Info drainage model results appendices (Pg 1- 33).

Note: Flood risk assessment and water management report and their addendum prepared by Odyssey have been added to Appendix F of this report.

4.7. Water Quality

- 4.7.1. It is proposed that the new buildings could utilise flow paths through conventional a short network of the piped network to permeable paving.
- 4.7.2. Private parking areas will utilise a flow path through permeable paving prior to the main site surface water network.
- 4.7.3. The introduction of SuDS features via the permeable paving and pond will improve the overall quality of water entering the water course.

5. PROPOSED FOUL WATER DRAINAGE

- 5.1 It is proposed to discharge foul water runoff into the existing public sewer at the Southern Water manhole as suggested in the Odyssey drainage strategy. Consent from Southern Water via an S106 application [Water Act 1990] is required prior to any connection being made.
- 5.2 Connection to the site-wide infrastructure which includes a pumping station which is to be offered for adoption to southern water.
- 5.3 On-site shared drainage will also be offered for adoption to southern water under the section 104 agreement.
- 5.4 Wastewater preplanning enquiry has been submitted to Southern water at the time of writing this report.
- 5.5 The proposed foul water drainage strategy is provided in Appendix C and Appendix D for Info drainage model foul water calculations.

6. CONCLUSIONS

- 6.1.1. The site currently comprises an area currently being used as agricultural land to the south of Horton Heath Village. Based on the topographical survey elevation generally falls east to west with an approximate gradient of 1 in 42 and south to north with a gradient of 1 in 97.
- 6.1.2. This document has highlighted all the changes that were carried out in the Info drainage model and compared them with the output and drainage strategy issued by Odyssey.
- 6.1.3. The geotechnical assessment indicates that the majority of the lower acre site is underlain by Wittering Formation- Sand, silt, and clay. However, a small area of the site is made up of Earnley Sand Formation- Sand, silt, and clay. There are no superficial deposits recorded within the lower acre of the Horton Heath development site.
- 6.1.4. An ordinary watercourse flows north of the site, which subsequently discharges to the tributary of River Itchen. According to the report issued by Odyssey, the groundwater level recorded is 2.70m bgl. However, the ground investigation report carried out by Geo-environmental Service for lower acre is between 1.1m bgl and 3.3m bgl.
- 6.1.5. The site is undeveloped therefore there are no connections to the public drainage network. The foul network will be connected to the Southern Water asset as suggested by the Odyssey drainage strategy.
- 6.1.6. On-site shared drainage will also be offered for adoption under section 104.
- 6.1.7. The Info drainage model output includes an allowance for creep which is 10%.
- 6.1.8. In line with the LLFA Strategic Flood Risk Assessment statement it is proposed to store the runoff generated by the 1 in 100 plus 40% climate change within the attenuation pond via a manhole.
- 6.1.9. The flow rate used in the Odyssey drainage strategy increased the risk of flooding. Therefore, the flow rate towards the eastern part of the development has been increased and provided in table 2 of this report.
- 6.1.10. Out of 138 manholes, the diameter of 24 manholes is increased to minimise the risk of flooding whereas the micro drainage model output prepared by Odyssey suggests keeping it at 1.2m diameter. Refer to the Info drainage manhole schedule to identify the manhole diameter.
- 6.1.11. The pipe diameter has also been increased throughout the development site to minimise the flooding risk.
- 6.1.12. Permeable car parking areas are to be provided for the removal of pollutants from surface runoff. Gullies are to convey runoff from the roadways to an attenuation pond, providing an adequate level of source control and pollution treatment for the application site.
- 6.1.13. Surface water from the development is proposed to be collected via a network of gravity drains and discharged to the nearest watercourse via an attenuation pond.

- 6.1.14. The peak FW flow rate from the development is predicted to be 17.69/s. Wastewater from the dwellings is proposed to be collected via a network of private drains and discharged into the proposed adopted public foul sewer. At the time of writing this report, Southern Water has been contacted for a wastewater pre-planning enquiry information.
- 6.1.15. An agreement with the water undertaker is to be in place prior to connection to their network. This will be managed under Section 106.

APPENDIX A

PROPOSED SITE PLAN

APPENDIX B

DETAILED PLANNING APPLICATION- GROUND INVESTIGATION REPORT

APPENDIX C

PROPOSED SURFACE AND FOUL WATER DRAINAGE STRATEGY

APPENDIX D

INFODRAINAGE MODEL SURFACE WATER CALCULATIONS

APPENDIX E

INFODRAINAGE MODEL FOUL WATER CALCULATIONS

APPENDIX F

FLOOD RISK ASSESSMENT AND WATER MANAGEMENT REPORT (ODYSSEY)



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