

Reading Borough Council

Lowfield Road, Reading, RG4 6NL

Drainage Strategy

22nd June 2016 V2

This report is based on the instructions given by our client. It is not intended for use by a third party, and no responsibility will be given to any third party.

The consultant has followed accepted procedure in providing the services, but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the consultant takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the services.

Clive Onions Director
BSc CEng FICE FCIWEM
MIStructE MCIHT

Clive Onions Ltd
2 Stowey Cottages
Golds Cross
Pensford
Bristol BS39 4DL

t 01275 332 216
m 07836 268 939
e info@cliveonions.com
www.cliveonions.com

Company registered in
England and Wales number:
7444467
Registered office:
61 Queen Square, Bristol BS1 4JZ

Contents

- 1 Introduction
- 2 Site Location and Setting
- 3 Existing Site and Ground Conditions
- 4 Proposed Development
- 5 Hydrology
- 6 Surface Water Drainage and Sustainable Drainage
- 7 Management and Maintenance
- 8 Foul Water Drainage
- 9 Conclusions and Recommendations

Report prepared by Clive Onions - BSc CEng FICE FCIWEM MStructE MCIHT

Version history

Version	Date	Prepared by	Approved by	Comment
V1	21.06.16	CO	CO	Issued for approval
V2	22.06.16	CO	CO	Comments incorporated

Issue history

Version	Date	Issued to	Method
V1	21.06.16	Pegasus Group, Reading Borough Council	Email pdf
V2	22.06.16	Ditto	Ditto

1. Introduction

Reading Borough Council is applying for permission for 28 temporary accommodations units on land which was previously occupied by mobile homes on land at Lowfield Road, Reading.

The Planning Authority has requested the submission of a Drainage Statement to accompany the planning application.

This report considers the hydrology and describes a strategy for draining the site and shows that a surface water drainage solution can be provided which meets the highest target in the SUDS hierarchy.

2. Site Location and Setting

The site is located at Lowfield Road, Reading, RG4 6NL the site is on rising land at about 53m AOD.

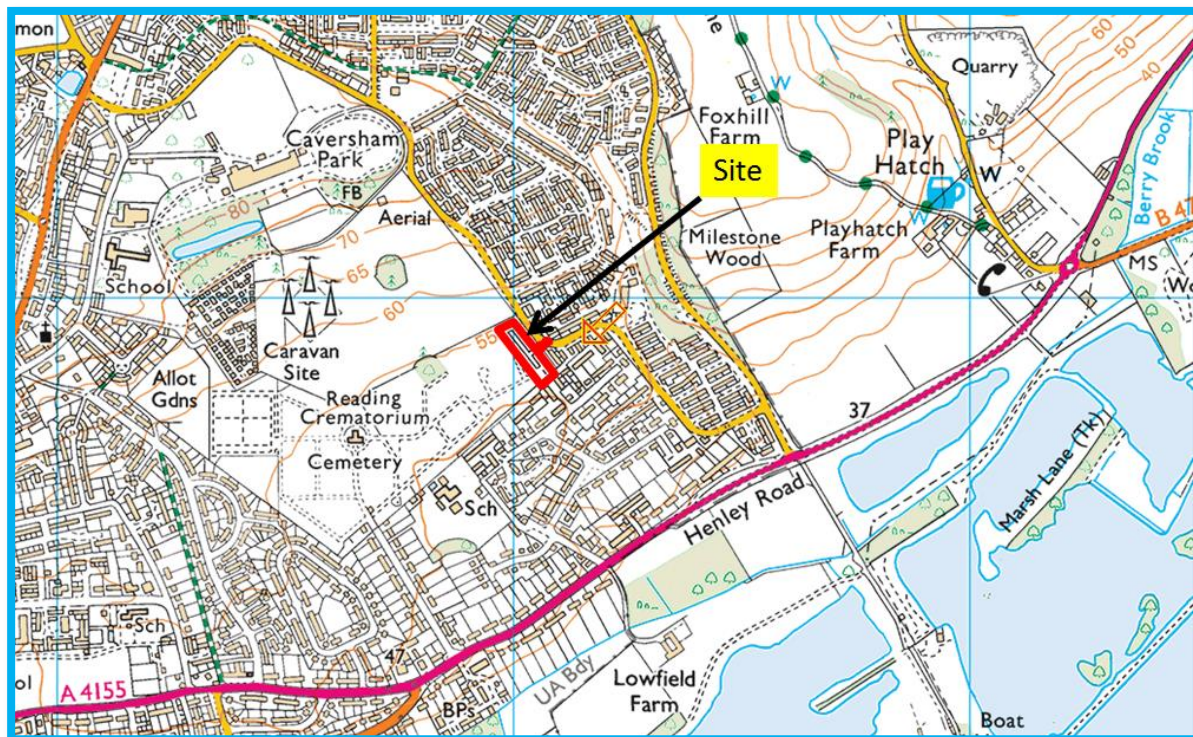


Fig 1 Site location on elevated ground (Streetmap).

The site is in the following setting:

- North of the site is Lowfield Road, beyond which is the residential area of Caversham Park, on gently rising land.
- East of the site is Lowfield Road, beyond which is more housing leading into a minor valley beyond which is arable farming with oil seed rape etc, and a chalk quarry.
- South of the site is more residential development, leading gently downhill to the River Thames, gravel pits and lakes resulting from gravel extraction.
- West of the site is Reading Cemetery on land at similar level to the site.

The site can therefore be described as being located on gently sloping land within a residential area of Reading with the cemetery to the west.

3. Existing Site and Ground Conditions

The site is almost rectangular, approx. 142m northwest to southeast and 37m northeast to southwest, with a vehicular access from Lowfield Road. Its previous use had been for mobile homes, prior to which it was a disused part of the crematorium, and a field up until the mid 1980's, according to historical maps.

A detailed topographic survey has been undertaken and shows the site to fall from 55.4m AOD in the northwest to 51.0m in the southeast, giving a uniform gentle fall of 1 in 33.

The site contains a macadam road along its spine, with access from Lowfield Road. To the side of the spine road are bases, being the remnants of the previous mobile home plots. The area seems to have been neglected, and some of the bases have become overgrown with vegetation.



Fig 2 Satellite view of site with cemetery to the west (Google image by Infoterra and Bluesky Ltd).

The boundary is formed by a metal fence with shrubbery along the western and southern sides.



Fig 3 Oblique view of site with former temporary housing, looking west (Bing Maps – Bird's eye view).

The Cranfield University Soilscape Viewer shows the soil to be free draining, and describes it as lime rich loamy soils; the British Geological Survey viewer shows the underlying geology to be chalk. This is reinforced by the chalk quarry to the east of the site. The ground water level is likely to be low given that the chalk quarry is quite deep.

The absence of watercourses in the vicinity and the above geology all point to the fact that the ground conditions are permeable and suitable for soakaways.

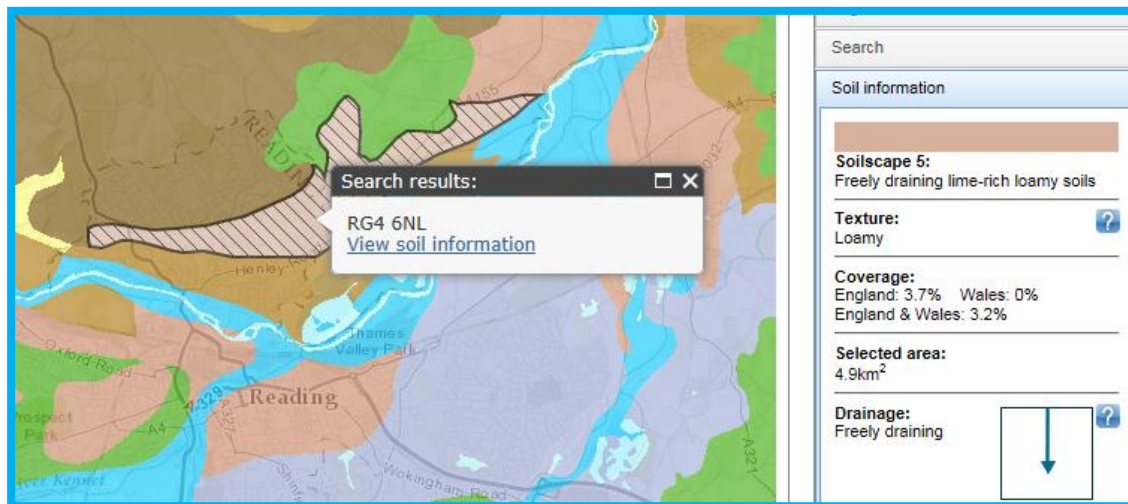


Fig 4 Extract from Cranfield University Viewer.

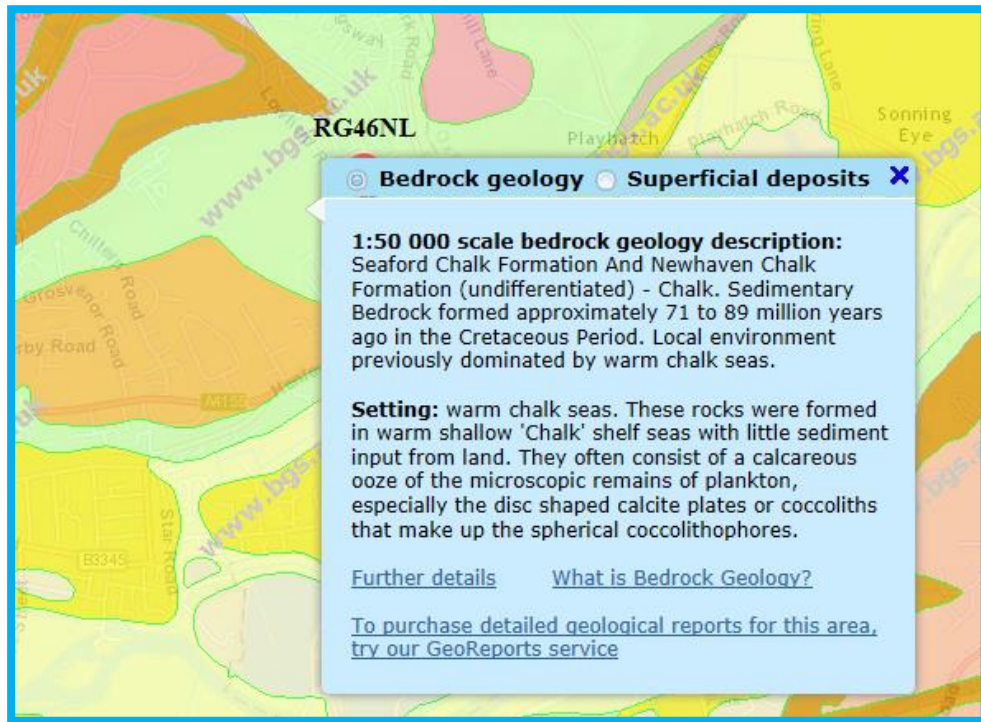


Fig 5 Extract from BGS Viewer showing the underlying geology to be chalk.

There are no watercourses, ponds or other natural features within the site, but according to the topographic survey the site is serviced with streetlights and an overhead cable. Each base is shown to have a water connection and drain inspection chamber. There are manholes within the road indicating a foul drain running from north to south through the site to collect foul drainage from the former mobile homes.

4. Proposed Development

The proposed development comprises 28 flats, within 7 main 2-storey units, which will have flat roofs. It is intended that they have a 5 year lifespan.

The units will have permeable resin bound aprons abutting the existing road, which will be retained. Parking will be on permeable Grasscrete or similar areas, and a play space is proposed at the south of the site.

The spaces between the buildings will be planted with trees and dwarf hedges to add to the amenity of the site.

It is intended to provide a sustainable drainage system to encourage rainfall to infiltrate into the ground through a variety of SUDS features.



Fig 6 Landscape Masterplan showing houses, with resin bound aprons, Grasscrete parking and landscaping, with a play area to the south.

5. Hydrology

The site is located in Flood Zone 1, at low risk of flooding, consistent with its elevated location, over 15m above the River Thames flood plain.

The Environment Agency surface water flooding map shows no risk of surface water flooding affecting the site, or running off the site. A small area of shallow ponding is shown at the south end of the spine road, but further interrogation shows this is isolated and has a low chance of occurring, ie between 1 in 100 and 1 in 1000 years.

Based on the topography, geology and hydrology the site is not considered sensitive in terms of drainage or flooding and displays the characteristics of being located on permeable terrain.

6. Surface Water Drainage and Sustainable Drainage

The proposal is to exploit the virtues of the permeable ground and meet the highest target in the Sustainable Drainage (SUDS) hierarchy by creating a strategy which drains surface water through infiltration.

This method improves water quality, recharges the groundwater and provides irrigation for vegetation.

Adopting a sustainable development approach, the existing macadam spine road will be retained. This is formed as a crown road without raised edge kerbs, and has a fall north to south – water is therefore shed to the sides.

Water will runoff into the Grasscrete (or similar) parking areas, which will be over a permeable gravel base.

The resin bound material is laid over a porous macadam base which will also be placed on a permeable gravel bed. The buildings will have flat roofs, which slow down the rate of runoff more than pitched roofs. The rainwater pipes will direct runoff into the base of the parking bays.

The parking bays will therefore act as large flat soakaways, providing substantial storage and ample capacity to allow the water to drain away in an extreme event into the underlying chalk.

The remaining site will be soft landscaped. The landscape buffer and play area will be formed to provide a buffer for residual runoff and avoid site runoff in storms less frequent than 1 in 100 years. The life span of the developments only 5 years and as such the effects of climate change will not be significant and therefore do not need to be considered.

The proposed parking areas will provide the multiple uses of performing as an infiltration system as well as parking area and a grass habitat, reflecting the objective of the Defra SUDS guidance in seeking multiple uses of spaces. And the landscaping at the south of the development will also provide multiple uses.

The general planting will contribute to amenity and encourage evapotranspiration.

Once the Contractor is on site, soakaway tests should be undertaken in accordance with BRE Digest 365, and the permeability determined to confirm that the structural permeable gravel base will provide adequate storage for water to infiltrate from an extreme storm. However, given the nature of the material, it is likely that the structural depth required for vehicles will provide generous capacity for the drainage, from previous experience.

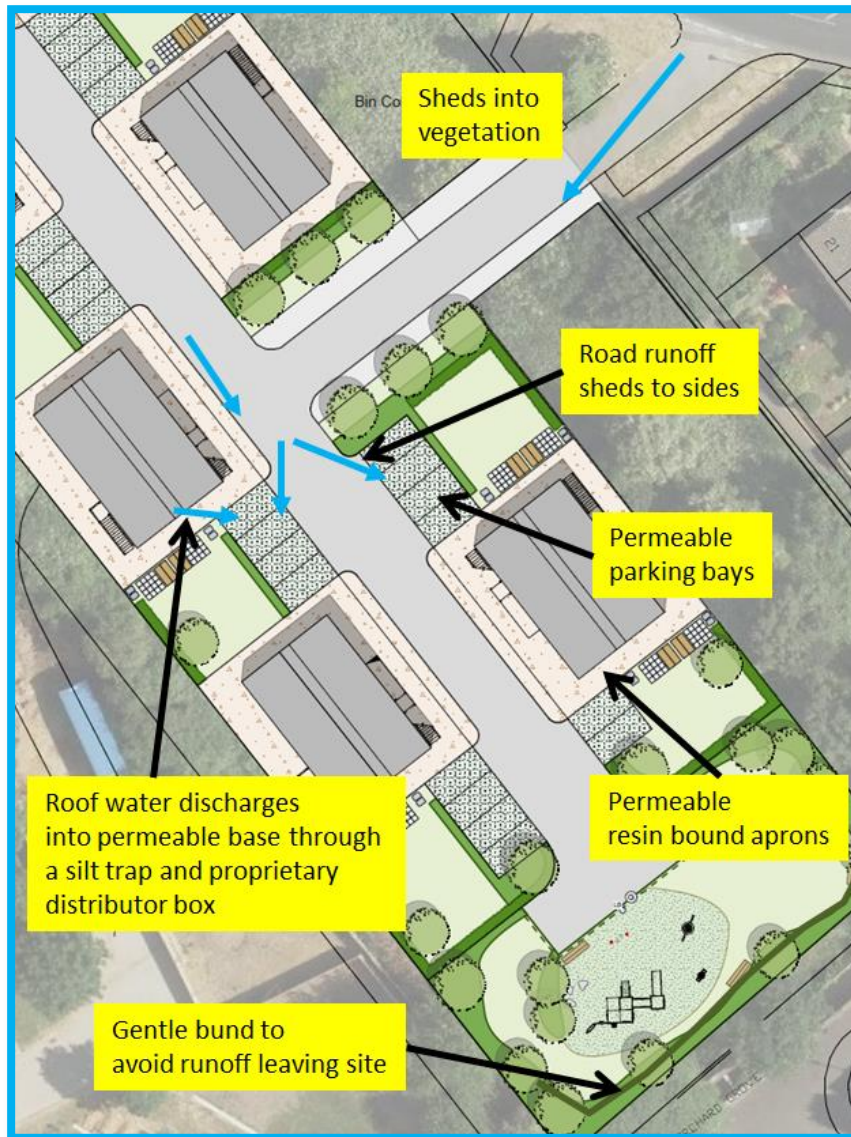


Fig 7 Description of drainage strategy and SUDS features.

In summary the proposed surface water drainage system will meet the highest target in the SUDS hierarchy by providing complete infiltration, and improving water quality. It will be a dispersed and robust system, which makes multiple uses of features, thus adding to the sustainability credentials of the site.

7. Management and Maintenance

The Council will manage the common parts of the development and the infrastructure.

The proposed SUDS scheme is robust and will need little maintenance.

Rainwater pipes should incorporate silt traps which can be inspected, prior to discharging into the parking bay permeable base.

The rainwater pipe traps, Grasscrete and resin paving should be inspected annually, preferably in autumn, to ensure it is clean and will perform as intended. Silt traps should be cleared of debris and permeable surfaces cleaned if necessary.

If ponding occurs the source of the problem should be investigated and the problem rectified.

8. Foul Water Drainage

Existing inspection chambers should be located, and if they remain unused should be properly sealed for safety and for hygiene.

The retained system is to be inspected by CCTV and maintained as necessary to ensure a compliant system.

New connections for the proposed houses shall be made with minimum disruption and designed in accordance with Building Regulations.

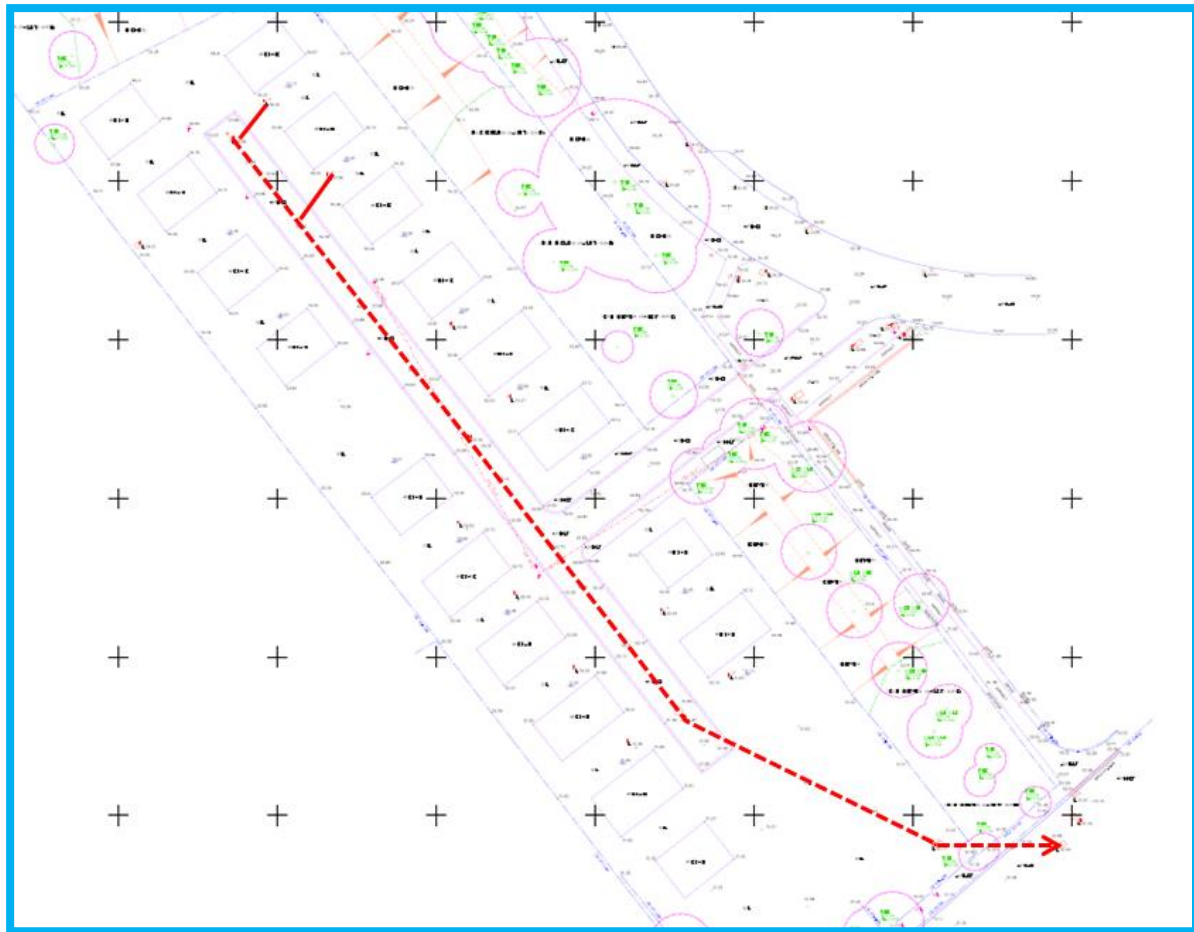


Fig 8 Topographic survey with foul drainage system highlighted, and two typical connections from existing inspection chambers. The drain leads into the main public system in Orchard Grove, to the south of the site.

9. Conclusions and Recommendations

A site which formerly contained mobile homes, has become neglected, and only the foundations and primary infrastructure remain.

Reading Borough Council proposes to develop 7 blocks, each of four flats, adapted to the existing infrastructure where possible.

This drainage report has examined the existing ground conditions and considered the proposals, and concludes that a SUDS system which meets the highest target in the SUDS hierarchy can be provided, directing all water to infiltration.

The existing foul drainage system can be retained and adapted to the proposed development once inspected, maintained and made safe where appropriate.

The proposal therefore complies with the Defra SUDS guidance and the Planning Policy Guidance.