

# Drainage Statement

*Phase 1a & 1b, Hoplands Farm, Hersden, Canterbury, Kent*

**Client**

Redrow Homes South East  
Prince Regent House  
Quayside  
Chatham, Kent  
ME4 4QZ  
7178/2.3B  
First Issue: 5 September 2018  
Rev A Issue: 7 November 2018

**Consulting Engineers**

GTA Civils Ltd  
66a Church Walk, Burgess Hill  
West Sussex RH15 9AS  
Tel: 01444 871444  
Fax: 01444 871401



## 1.0 INTRODUCTION

---

This report has been prepared in relation to the proposed drainage scheme submitted for the development of the site at Phase 1a & 1b, Hoplands Farm, Hersden, Canterbury, Kent, CT3 4HQ, planning ref CA/16/00404/OUT.

The aim of this report is to explain the detailed site drainage design, including the SuDS components, that are shown on the proposed site drainage layout drawings submitted with this document. The Management and Maintenance Plan is covered separately in another document by GTA Civils Ltd.

This report has been specifically designed to provide information to enable discharge of condition 11 of the consent:

*11 Prior to the commencement of the development a detailed sustainable surface water drainage scheme for the site has been submitted to (and approved in writing by) the local planning authority. The detailed drainage scheme shall demonstrate that the surface water generated by this development (for all rainfall durations and intensities up to and including the climate change adjusted critical 100yr storm) can be accommodated and disposed of through the methods detailed in the submitted Flood Risk Assessment.*

*No infiltration of surface water drainage into the ground at this site is permitted other than in accordance with the approved surface water drainage scheme.*

**REASON:** *To prevent pollution of controlled waters and comply with the NPPF.*

## 2.0 LIMITATIONS

---

This report has been prepared for Redrow Homes Ltd in relation to the proposed development at Phase 1a & 1b, Hoplands Farm, Hersden, Canterbury. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

### 3.0 EXISTING DRAINAGE

---

The development site (red line boundary), whose area is approximately 18.806 Ha, was formerly agricultural fields. Existing levels vary from 35.00m A.O.D in the north west corner to 2.00m A.O.D. along the southern boundary associated with the existing receiving watercourse.

Southern Water records, in Appendix A, show a network of existing foul and surface water sewers across the site which serve the existing developments to the north of Island Road. These sewer networks have been fully surveyed to accurately determine their location and depths through the development site.

Currently the site discharges surface water unrestricted into the ditch system in the south eastern corner of the site which conveys surface water via a secondary river towards the Great Stour River, approximately 268m south east of the site.

Microdrainage Greenfield Runoff analysis of the red line boundary area confirms existing runoff rates of

#### ICP SUDS Mean Annual Flood

Input			
Return Period (years)	1	Soil	0.300
Area (ha)	18.806	Urban	0.000
SAAR (mm)	697	Region Number	Region 7
Results l/s			
QBAR Rural	34.1		
QBAR Urban	34.1		
Q1 year	29.0		
Q1 year	29.0		
Q30 years	77.3		
Q100 years	108.8		

## 4.0 PROPOSED SURFACE WATER DRAINAGE

---

The following drawings contained in Appendix B show the proposed drainage and catchment details:

2655-21-06-506	-	Road and Main Sewer Layout – Phase 1a
2655-21-06-507	-	Road and Main Sewer Layout – Phase 1b
2655-21-06-508	-	Catchments Plan – Phase 1a
2655-21-06-509	-	Catchments Plan – Phase 1b

The flood risk assessment prepared by RMA Environmental (RMA-C1577, February 2016) for the planning application identified a total proposed flow rate of 54.1 litres/second from the site (at the equivalent greenfield rates up to and including the 1 in 100 year runoff rate inclusive of climate change requiring a total attenuation volume of 10,687 m<sup>3</sup>).

However, during discussions with Kent LLFA it was confirmed that for the detailed drainage design a discharge rate equivalent to 4 litres/second/Ha is to be utilised for all storm events up to the 1 in 100 year event + climate change allowance.

The local sites total greenfield area has been calculated as 7.3735 Ha. If 4 litres/second/Ha is applied, this generates a peak flow of 29.5 litres/second for events up to the 1 in 100 year storm event + 40% climate change allowance which has been utilised in the detailed drainage design. This is just over the peak 1 in 1 yr existing greenfield site runoff rate and 27% of the existing peak 1 in 100 year runoff rate.

The development sites of Phase 1a & 1b are in 3 distinctive zones with Phase 1a effectively split by the two existing public sewers flowing north to south through the centre of the phase. It is proposed that each zone is provided with attenuation storage ponds locally to the development areas.

Microdrainage calculations in Appendix C are based on accurate impermeable area catchments and utilise FEH Rainfall Data and show that the following peak storage volumes are required (for the 1 in 100 year storm event + 40% climate change allowance):

Phase 1a – West	- 1433 m <sup>3</sup> , draining to -
Phase 1a – East	- 1125 m <sup>3</sup>
Phase 1b	- 606 m <sup>3</sup>
Total	= 3164 m <sup>3</sup>

The microdrainage calculations show that there is no flooding of the system in a 1 in 100 year + 40% critical storm event in the networks.

The main surface water drains in the road will be offered for adoption under a Section 104 agreement with Southern Water. The 1 in 30 year storm event will be held fully within the pipework without flooding.

A proposed swale running north to south has been shown on the detailed design drawings to convey the discharges from the Phase 1a East & Phase 1b attenuation storage ponds to the existing watercourses. There are designed with check weirs and 'rip-rap' stone channels to slow the surface water though the steeper gradients.

The ponds are provided with a deeper, permanently wet section which will provide silt capacity for the development and will help prevent siltation of the outfall pipe, when combined with a maintenance regime. The permanent water also provides ecological enhancements.

As there it has been demonstrated that the surface water can be disposed of without increased risk of flooding it is proposed that planning condition 11 is deemed to be satisfied.

Total Peak storage volumes requirements are as follows:

<b>Storm Event</b>	<b>Peak Storage Volume requirement m.cu</b>	<b>Peak Flow l/sec</b>
1 in 2 year	251 + 177 + 99 = <b>527</b>	24.2 + 5.0 = <b>29.2</b>
1 in 30 year	643 + 446 + 233 = <b>1322</b>	24.4 + 5.1 = <b>29.5</b>
1 in 100 year	975 + 694 + 391 = <b>2060</b>	24.4 + 5.1 = <b>29.5</b>
1 in 100 year + 40%	1433 + 1125 + 606 = <b>3164</b>	24.4 + 5.1 = <b>29.5</b>

## 5.0 POLLUTION CONTROLS

The development site lies within the Stodmarsh designations and relates to the Designated Special Area of Conservation (SAC) and specifically Annex II relating to the Desmoulin's whorl snail which lives beside ditches within pasture. The drainage strategy proposes ponds and swales beyond the limits of any existing ditches and will increase the overall wetland areas on the site.

The ponds and swales are in accordance with CIRIA guidelines in providing treatment for the surface water discharge. With reference to the CIRIA table 26.2 in Appendix D, the "Individual property driveways, etc" line confirms a Low Pollution Hazard Level, with TSS at 0.5, Metals at 0.4 and Hydrocarbons at 0.4. Table 26.3 provides mitigation indices and confirms Swales provide TSS at 0.5, Metals at 0.6 and Hydrocarbons at 0.6 which exceed the Pollution Hazard Indices. The ponds provide mitigation indices in excess of the Swales and therefore the drainage strategy provides double the Pollution Protection requirements.

## 6.0 PROPOSED FOUL DRAINAGE DESIGN

---

Foul water is proposed to drain as per the drainage layout drawings 506 & 507 into the existing foul sewers crossing the site by gravity. New connections will be formed to the existing network manholes to serve the entire development.

In accordance with Sewers for Adoption's 7th edition requirements, the peak design discharge rates for foul water flow for the domestic component is based on the "domestic peak" rate of 4000 litres per dwelling per day, this equates to a peak flow rate of 8.1 l/s.

A Section 104 application for the adoption of these sewers has been applied for along with a Section 106 application for the 2 sewer connections.

*Prepared by:*

David Smith

GTA Civils Ltd

*Checked by:*

Martin Roberts I.Eng ACIWEM MCIHT

GTA Civils Ltd