John Newton and Partners
jnpgroup
Consulting Engineers

SURFACE WATER DRAINAGE STRATEGY TECHNICAL NOTE

1.0 INTRODUCTION

Bellway Homes are proposing to develop land south of Bartons Road, Havant for 175 dwellings to include roads and drainage infrastructure, parking courts, play areas and public open space. The site is Greenfield in nature and currently used for agricultural purposes. The site is approximately 7.2ha in size and levels fall north to south from 34.5m at the site entrance to 18.5m AOD in the south. This translates to an average gradient of 1:25.

Outline planning approval was granted for the development in 1 December 2016, Planning Application Ref: APP/15/01435.

This technical note is provided in support of the Reserved Matters planning application being submitted by Bellway Homes.

This technical note should be read in conjunction with the following documents:

- Flood Risk Assessment by C&A Consulting Engineers Ltd (ref: 14-018-005 Dec 2015)
- Phase 1 Adoptable Drainage Layout Drg.No.C85850-D101
- Phase 1 Drainage Catchment Plan Drg.No.C85850-D111
- Phase 1 MicroDrainage Surface Water Hydraulic Calculations Ref.C85850-C100
- Phase 2 Surface Water Drainage Strategy Drg.No.C85850-D131
- Phase 2 Surface Water Drainage Catchment Plan Drg.No.C85850-SK113
- Phase 2 MicroDrainage Surface Water Hydraulic Calculations Ref.C85850-C101

2.0 OUTLINE PLANNING SURFACE WATER DRAINAGE STRATEGY

A Flood Risk Assessment and outline surface water drainage strategy prepared by C&A Consulting Engineers Ltd (ref: 14-018-005 Dec 2015) submitted as part of the original outline planning application, proposed discharge of surface water generated by the development via infiltration to ground. An overflow system would connect the infiltration devices to the existing 375mm diameter public surface water sewer immediately east of the site.

3.0 GROUND CONDITIONS

Bellway Homes have undertaken a detailed Ground Investigation (ref: 16524/GIR Oct 2017) across the site including four soakage tests.

The ground investigation confirmed the following succession of soils at the site:

- Made Ground / topsoil (MG – clayey silt, TS – gravelly silt)
- Head Deposits (gravelly clay)

- River Terrace Deposits (very clayey sandy gravel & slightly sandy gravelly clay)
- London Clay Formation (clay)

Of the four soakage tests undertaken, two tests failed to drain and the remaining two tests did not drain sufficiently., Soakage rates were however, extrapolated for the latter tests with rates varying between 1.04×10^{-6} m/s and 2.2×10^{-7}m/s. Due the failed soakage tests and poor extrapolated results, the Ground Investigation report recommended that infiltration is not deemed suitable for disposal of surface water from the development.

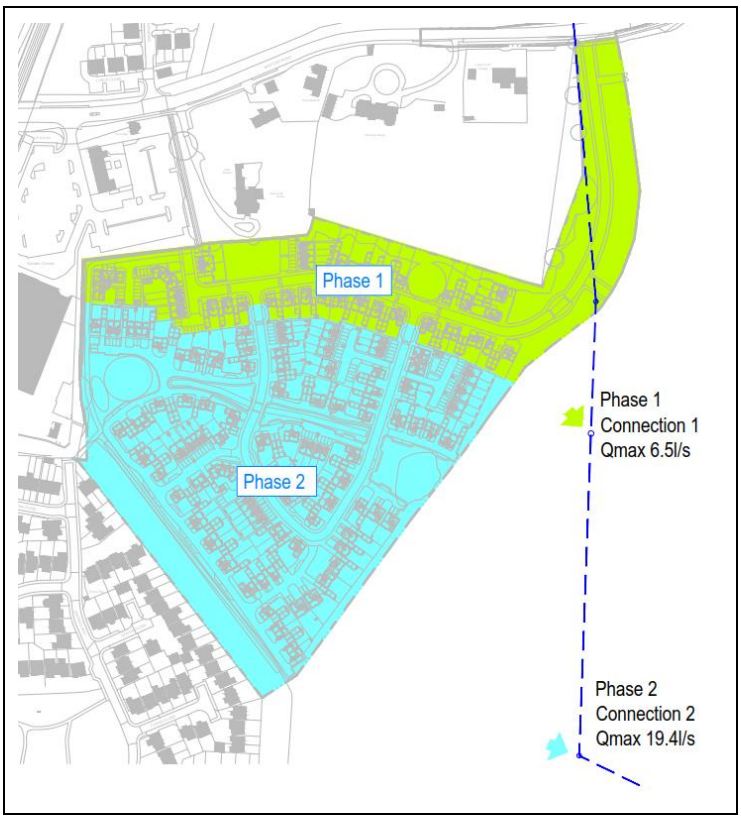
4.0 RESERVED MATTERS PLANNING SURFACE WATER DRAINAGE STRATEGY

In view that ground conditions are unsuitable as a means of discharging surface water to ground, surface water from the development will connect to the existing public surface water sewer running north to south and immediately east of the site. The outline drainage strategy by C&A Consulting Engineers Ltd proposed that overflow from the infiltration devices connect to this public surface water sewer at the pre-development Greenfield Qbar runoff rate of 25.9l/s. As infiltration is no longer viable, permanent connections are proposed to this public surface water sewer with a total discharge limited to the Qbar figure of 25.9l/s.

Bellway Homes have advised that the northern area of the site, comprising the adoptable S38 access road and dwellings directly off this road, will constitute the first phase of construction. The remainder of the site to follow thereafter. These areas of the site are herein referred to as Phase 1 & Phase 2 respectively.

Proposed surface water drainage from the development is split into two sub-catchments reflecting Phase 1 & Phase 2, with each catchment connecting separately to the existing public surface water sewer at two locations, refer to Fig.1.

Fig.1 Surface Water Sub-catchment and Public Sewer Connection Points



Proposals for the Phase 1 and Phase 2 surface water drainage strategy are indicated on Drg.No.C85850-D101 and D131. A summary of the drainage design parameters and approximate attenuation volumes is provided in Table.1 below:

Table.1 – Proposed surface water design parameters and attenuation volumes

	Phase 1	Phase 2	Total Site
Site Area (ha)	2.57	4.63	7.2
Impermeable Area (ha)	1.132 (44%)	2.044 (44%)	3.176 (44%)
Maximum Discharge Rate (l/s)	6.5	19.4	25.9
Attenuation Volume 1:30yr	354m³	627m³	981m³
Attenuation Volume 1:100yr + 30% Climate Change (total)	704m³	1270m³	1974m³

Surface water drainage attenuation will be provided within a combination of below ground oversized pipes, permeable pavements and above ground swales. All existing land drains will become redundant as a result of the development together with the outfall pipe from the pond to public surface water sewer which will be disconnected.

The relatively steep topography of the site does not lend itself well to the use of permeable pavements which may increase flood risk and earthworks operations across the site. Therefore, the use of permeable pavements should be considered carefully with suitable locations to be located within shared parking courts / access drives, and along the contour, as proposed in the Phase 2 area of the site.

It is the intention of Bellway Homes to offer the Phase 1 spine road and sewers for adoption (S38 & S104 respectively). This would allow the Phase 1 infrastructure to be constructed without reliance on construction of the Phase 2 surface water drainage. Phase 2 is to remain wholly private.

5.0 PUBLIC SURFACE WATER SEWER CAPACITY ASSESSMENT

A surface water capacity check was undertaken by Southern Water as part of the FRA works by C&A Consulting Engineers Ltd for connection to the public surface water sewer network. Southern Water confirmed that there was no capacity within the public surface water sewer in Snowberry Crescent southwest of the site to accept. Southern Water recommended that a Section 98 sewer requisition application be submitted as a means for Southern Water to provide sufficient capacity to accommodate surface water flows from the new development.

Consultations with Southern Water are currently being progressed to provide capacity within the public sewer network to accept a maximum Qbar discharge rate of 25.9l/s from the development.

6.0 MANAGEMENT & MAINTENANCE

Proposed surface water drainage across both Phases 1 & 2 will comprise a combination of below ground tanks, oversized pipes, permeable pavements and above ground swales and ponds. Table 2 below summarises the various drainage and SuDS features together with management & maintenance responsibilities.

Table.2 – Drainage & SuDs Maintenance & Management Responsibilities

Feature	Location	Function	Management & Maintenance Responsibility
Large Diameter Attenuation Pipes	Access roads	Convey and store surface water runoff	Phase 1 – Southern Water Phase 2 – Private Management Company
Swales	Open spaces	Treat, store & convey surface water runoff	Private Management Company
Permeable Pavements	Parking courts & shared access drives	Treat, store & convey surface water runoff	Private Management Company
Ponds	Open space	Store surface water runoff	Private Management Company
Below Ground Tanks	Open spaces, parking courts & shared access drives	Store surface water runoff	Private Management Company
Conveyance / Connecting Pipework	Access roads, open spaces, parking courts & shared access drives	Convey surface water runoff	Phase 1 – Southern Water Phase 2 – Private Management Company

Refer to SuDS Maintenance Report ref. C85850-R100 for maintenance schedules of the various drainage and SuDS features mentioned above.