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FORD LANE, YAPTON

DRAINAGE STATEMENT

ARUN DISTRICT COUNCIL Y/26/21/DOC

PROPOSED DEVELOPMENT AT FORD LANE, YAPTON

DRAINAGE STATEMENT
ON BEHALF OF CLIENT

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DOCUMENT CONTROL SHEET

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CONTENTS

1.0 INTRODUCTION 1

2.0 EXISTING SITE 2

3.0 PROPOSED DRAINAGE 3

4.0 TREATMENT OF SURFACE WATER RUN-OFF 6

5.0 OVERLAND FLOW ROUTES AND EXCEEDANCE ROUTES 7

6.0 CONCLUSION 8

APPENDICES

Appendix A Odyssey Drawings 18-344/800-802 (Engineering Layouts)

Appendix B Odyssey Drawings 18-344/821, 823 – 825, 836 (Construction Details)

Appendix C Odyssey Drawing 18-344/108 (Surface Water Catchment and Implementation Plan)

Appendix D Odyssey Drawing 18-344/107 (Overland Flow Routes)

Appendix E Odyssey Drawing 18-344/110 (Winter Groundwater and Infiltration Data Plan)

Appendix F Odyssey Drawing 18-344/113 (Basin Sections)

Appendix G Windes Calculations

Appendix H Arun DC Surface Water Checklist

1.0 INTRODUCTION

1.1.1 Odyssey has been commissioned by Redrow Homes to prepare this drainage report in support of their Reserved Matters (RM) application for the residential development at Ford Lane, Yapton. This follows the grant of outline planning permission on 15th January 2019 (Ref: Y/80/16/OUT). This report also sets out the background, existing drainage regime, proposed drainage regime, overland flow routes and maintenance of SuDS features.

1.1.2 The description of the development at the outline application was:

"Outline application with some matters reserved for 4.5 hectares of residential development comprising 3.4 hectares of land for up to 100 dwellings (up to 30 (30%) affordable housing) together with 1.1 hectares of land set aside for public open space and strategic landscaping and 2.2 hectares of public open space and green corridors with vehicular access from Ford Lane and pedestrian/cycle access only from North End Road."

ARUN DISTRICT COUNCIL Y/26/21/DOC

2.0 EXISTING SITE

2.1.1 The proposed development site comprises 6.7ha of greenfield land and is located off Ford Lane to the north east of Yapton Village in West Sussex. The site is surrounded by arable land to the north and east, Orchard Business Park and residential dwellings to the south and North End Road to the west.

2.1.2 The topographical survey shows the site to be relatively flat with one half of the site falling from north to west and the other falling from north to south. Levels range from approximately 8.24m AOD in the north to 6.46m AOD in the west.

2.1.3 It is understood that there are no public surface water sewers in close proximity to the site and the existing drainage regime relies on surface water infiltrating through the underlying strata.

2.1.4 An intrusive ground investigation was conducted by Eastwood & Partners in October 2019. A total of 5 No. sample pits were excavated up to a maximum depth of 4m bgl across the development site to allow for the installation of groundwater monitoring wells. The findings in their report indicate that the existing geology consists predominantly of river terrace sands and clays underlain by the chalk.

2.1.5 In accordance with the Arun DC requirements, ten rounds of groundwater monitoring were completed during the winter period (October to March inclusive) and groundwater was encountered at depths ranging between 2.79 – 6.57m bgl.

2.1.6 In January 2020, infiltration testing was also completed at 5 locations across the site. Each location underwent two tests, one shallow and one deep. The shallow tests had a base depth of around 1m and the deeper tests around 3m. Results from the testing identified rates that ranged from 5.50 x 10-6m/s and 0.13 x 10-6m/s.

2.1.7 It is also understood that there are no foul water sewers present within the site. The nearest public foul water sewer is located in North End Road and currently serves existing residential dwellings in the surrounding area.

ARUN DISTRICT COUNCIL Y/26/21/DOC

3.0 PROPOSED DRAINAGE

3.1.1 New foul and surface water drainage networks are proposed across the development site. The proposed foul and surface water drainage designs are shown on Odyssey **Drawings 18-344/800-802** provided with this report in **Appendix A**.

3.2 Design Criteria

3.2.1 The design criteria applied for the proposed drainage are as follows:

- Pipework beneath existing and proposed highways is to have cover of at least 1.2m where possible
- Private foul and surface water drainage is to be in accordance with Approved Document H of the Building Regulations
- Adoptable drainage is to be in accordance with Sewers for Adoption
- 10% urban creep has been allowed for the dwellings' hard standing areas (roofs and garages)

3.3 Surface Water Drainage

3.3.1 The proposed surface water scheme has been designed in accordance with the strategy set out in the Flood Risk Assessment (FRA) submitted as part of outline planning application for the site. The FRA proposes the use of sustainable drainage techniques to control the surface water from the development.

3.3.2 Based on the testing undertaken by Eastwood & Partners, the infiltration potential varies across the site for both shallow (1m) and deep (3m) tests/rates. The design is to infiltrate surface water run-off for the whole development from roads, roofs, parking bays and parking courts into the existing strata either with shallow systems or at depth depending on the infiltration rates in the associated infiltration areas.

3.3.3 The site is split into various catchment areas and infiltration rates as shown on **drawing 18-344/108** in **Appendix D** and **drawing 18-344/110** in **Appendix E**. Principally, the west part of the site drains into permeable paved drives/roads or courtyards, the central/northern areas into permeable paved drives/roads or cellular soakaways, the eastern side into permeable paved drives/roads and rear garden soakaways, with some perimeter visitor parking to a boundary swale via gullies. The southern area drains to permeable drives or rear garden soakaways with a small hard paved area/catchment draining via kerb drains to the basin in the open space.

ARUN DISTRICT COUNCIL Y/26/21/DOC

3.3.4 The surface water drainage systems have been designed to accommodate all rainfall events up to 1 in 100-year event plus climate change (+40%) with no flooding. Due to some lower/slower inflation rates and extended drain times additional capacity has been added into the drainage storage/systems to allow for further storms over and above the 1 in 100 year + CC. Supporting calculations can be found within **Appendix G**. The remaining depth in the structures above the highest storms/water level shows the extra over capacity provided/available.

3.3.5 At the request of Arun District Council, Odyssey has undertaken drainage calculations to test the system under the conditions of a modelled 1 in 10-year flood event plus climate change event. Sample worst case assessments have been provided in **Appendix G**.

3.3.6 Surface water treatment would be provided by the permeable paving via both the grit layer and geotextile that the blocks are bedded on, as well as the underlying gravel media comprising of washed no fines material. These measures provide filtration and the breakdown of hydrocarbons as the water is conveyed through the system and into the piped network.

3.3.7 The swales and basin are open features which offer some treatment and attenuation locally and provide a softer and aesthetic/enhanced landscape to those areas.

3.4 Maintenance and Management Plan

3.4.1 The details for the maintenance and management of the surface water network and SuDS features is covered under a separate report (Odyssey Report reference **18-344-13 Management & Maintenance Manual**). The surface water features/systems for the whole site will be kept private and maintained by a maintenance and management company.

3.5 Urban Creep

3.5.1 The CIRIA SuDS Manual states that urban creep is defined as any increase in the impervious area that is drained to an existing drainage system without planning permission being required, and therefore without any consideration of whether the capacity of the receiving sewer system can accommodate the increased flow. An increase of 10% has been applied to areas which may be subject to urban creep to allow for future urban expansion on a local scale.

3.6 Foul Drainage

3.6.1 The proposed foul water drainage design utilises a combination of gravity and pumped systems.

ARUN DISTRICT COUNCIL Y/26/21/DOC

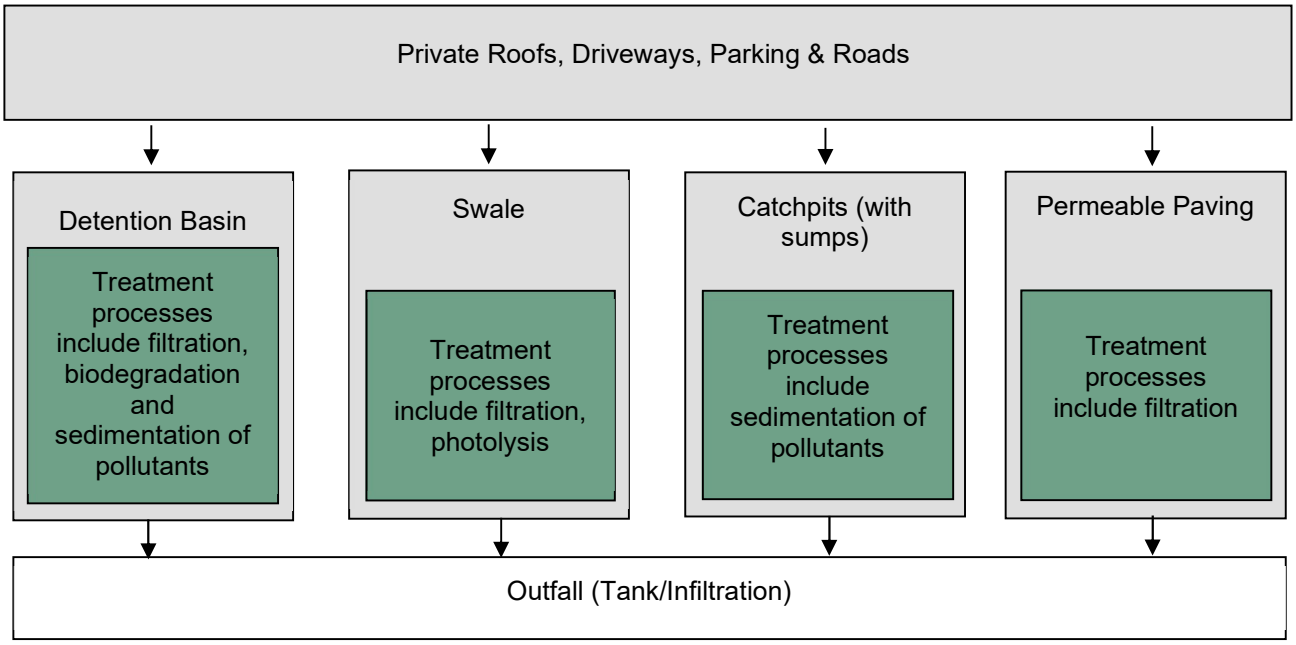
3.6.2 It is proposed that foul flows from the development will be conveyed and discharged into the existing Southern Water sewer located in the North End Road via a new manhole.

3.6.3 Due to the existing topography of the site, foul flows from a number of dwellings to the east would be conveyed to a Southern Water adopted pumping station located towards the south of the site before being pumped north via a rising main into the main network.

ARUN DISTRICT COUNCIL Y/26/21/DOC

4.0 TREATMENT OF SURFACE WATER RUN-OFF

4.1.1 Surface water will be subject to the following treatment train prior to infiltration. The levels of proposed treatment are shown below.



ARUN DISTRICT COUNCIL Y/26/21/DOC

5.0 OVERLAND FLOW ROUTES AND EXCEEDANCE ROUTES

5.1.1 The calculations provided in **Appendix G** show there to be no flooding for storm events up to and including the 1 in 100 year event plus 40% climate change.

5.1.2 Overland flow routes have been shown on Odyssey **drawing 18-344/107**, which is supplied in **Appendix D**.

5.1.3 As an extra over provision, a bund has been proposed at the southern end of the site. This will allow for any overland flow to be contained within the open space area and channelled to the east. The full extent of this can be seen on Odyssey **drawing 18-344/802** in **Appendix A.**

ARUN DISTRICT COUNCIL Y/26/21/DOC

6.0 CONCLUSION

6.1.1 The surface water drainage scheme for this site proposes a mixture of piped/cellular storage systems, permeable paving and open features ultimately leading to discharge/disposing of surface water via infiltration into the existing ground below.

6.1.2 Treatment is provided in the form of silt traps/sumps, permeable paved roads/drives, swales and a basin.

6.1.3 All system/features are design to accommodate the 100 year event + 40% climate change with some spare capacity over and above this.

6.1.4 The surface water systems/features will be kept private and maintained by a private management company.

6.1.5 The foul will discharge via gravity and an onsite pumping station/rising main to the existing Southern Water sewer in North End Road.

ARUN DISTRICT COUNCIL Y/26/21/DOC