

Finchwood Park, Parcel 6 Finchampstead

Drainage Technical Note

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Contents

Page

1. INTRODUCTION	2
2. EXISTING SITE CONDITIONS & DRAINAGE	3
3. PROPOSED SURFACE WATER DRAINAGE	4
4. WATER QUALITY	7
5. PROPOSED FOUL WATER DRAINAGE	9

Appendices

Appendix 1	- Finchwood Park Foul & Surface Water Strategies (JNP Group)
Appendix 2	- Topographic Survey
Appendix 3	- Impermeable Areas Plan
Appendix 4	- Proposed Drainage Layout
Appendix 5	- Causeway Flow Calculations
Appendix 6	- Exceedance Flow Plan

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1. Introduction

- 1.1 Morgan Civil & Structural were instructed by Vistry Thames Valley to produce a foul and surface water drainage strategy for parcel 6 of the Finchwood Park development, near Finchampstead.
- 1.2 Parcel 6 will consist of 142 dwellings with associated drainage, access, hard and soft landscaping.
- 1.3 This technical note and supporting drainage strategy plan is further to the outline application reference O/2014/2179, and subsequent application 181194.
- 1.4 The drainage design has been developed in line with LLFA guidance and Sustainable Drainage Systems (SuDS) principles.

Background

- 1.5 The purpose of this technical note is to develop design principles established as part of outline planning application O/2014/2179 and subsequent 181194.
- 1.6 As part of application 181194, JNP Group produced the approved drainage strategy for the Finchwood Park development site, ref C85672-R003A, and Flood Risk Assessment, C85672-R001A.
- 1.7 Key information extracted from JNP Group's approved documentation, relevant to Parcel 6 is as follows:
 - Existing topography falls to the south.
 - ICOSA have obtained a NAV for the entirety of the Finchwood development, and as such Parcel 6 will be designed in accordance with ICOSA's requirements, and Sewerage Sector Guidance, Appendix C.
 - Parcel 6 surface water drainage has been allocated to SANG Basin 2, with allocated connections per drawing C85672-SK-204 rev B.
 - An impermeable area total of 2.78Ha has been allocated on C85672-SK-204 rev B for Parcel 6.
 - Parcel 6 foul drainage has been allocated to 'foul pump station 1' located in Parcel 5 per drawing C85672-SK-220.
- 1.8 C85672-SK-204 rev B & C85672-SK-220 have been included in **Appendix 1.**

2. Existing Site Conditions & Drainage

- 2.1 Parcel 6 is one of the later parcels to be developed in Finchwood Park, and as such, key site wide infrastructure has been constructed in advance of this parcel.
- 2.2 The latest topographical survey, included in **Appendix 2**, confirms the main spine road access through Parcel 6 has been constructed, along with key foul and surface water drainage.
- 2.3 As per the survey, the main surface water sewer which connects northern parcels through Parcel 6 to SANG Basin 2 to the south has been constructed. In addition, the main foul sewer connecting Parcels 1 – 3, 7 and Parcel 6 to the pump station in Phase 5 is constructed.
- 2.4 It is assumed the rising main from Parcel 5 has also been installed through the constructed Spine Road.
- 2.5 Numerous connection spurs have been provided in the constructed drainage for Parcel 6 drainage connections. These will be utilised as part of the drainage design.

3. Proposed Surface Water Drainage

- 3.1 As per the approved strategy to date, Parcel 6 is to connect to the main surface water network already constructed in the Spine Road. Overall, this forms a single network for Parcel 6.
- 3.2 It is noted that additional drainage has been constructed in the spine road from that shown in C85672-SK-204 rev B, and this needs to be considered against the allocated flow rates.
- 3.3 Whilst the SANG Basin 2, which incorporates a wetland, provides the majority of water quality treatment, additional SuDS features will be incorporated as good practise for the site, including;
- Swales around the southern and western perimeters
 - Rain Gardens in the central site area
 - Permeable Paving on driveways and private drives
- 3.4 The following tables summarise the total flow rate allowances estimated from the outline strategy, and those calculated in detail for this reserved matters strategy:

Outline pipe reference 20.001 (RM Reference 1.012)	Outline Strategy	Reserved Matters Strategy
Impermeable Area	1.59Ha	1.91Ha
Q2 Discharge	60l/s	85.2l/s
Q30 Discharge	80l/s	149.6l/s
Q100 Discharge	111l/s	150.9l/s
Storage provided	N/A	845.3m ³

Outline pipe reference 21.001 (RM Reference 11.004)	Outline Strategy	Reserved Matters Strategy
Impermeable Area	0.69Ha	0.37Ha
Q2 Discharge	26l/s	10.4l/s
Q30 Discharge	35l/s	11.8l/s
Q100 Discharge	48l/s	13.6l/s
Storage provided	N/A	228.2m ³

Outline pipe reference 22.001 (RM Reference 15.004)	Outline Strategy	Reserved Matters Strategy
Impermeable Area	0.50Ha	0.25Ha
Q2 Discharge	19l/s	8.7l/s
Q30 Discharge	25l/s	13l/s

Q100 Discharge	35l/s	17.7l/s
Storage provided	N/A	193.6m ³

- 3.5 It should be noted that whilst the outline strategy allocated certain areas to the three key pipes, the development of the layout and constructed assets have caused re-allocation of impermeable areas as listed above.
- 3.6 A summary table is therefore provided of the total allocation at outline and reserved matters for ease:

	Outline Strategy	Reserved Matters Strategy
Impermeable Area	2.78Ha	2.53Ha
Q2 Discharge	105l/s	104.3l/s
Q30 Discharge	140l/s	174.4l/s
Q100 Discharge	194l/s	182.2l/s
Storage provided	N/A	193.6m ³

- 3.7 The Q2 and Q100 rates at reserved matters achieve less than total allocation, however Q30 is over.
- 3.8 As this is the final parcel prior to outfall to SANG Basin 2, additional flows are not expected. Thus, whilst the Q30 flows are higher than allocation the system is sized to handle Q100 flows, therefore they have capacity for the higher flows and the design solution is suitable.
- 3.9 The impermeable areas plan is included in **Appendix 3** for reference and confirms a total of 2.53Ha of proposed impermeable areas.
- 3.10 The proposed drainage layout is included in **Appendix 4**, with supporting Causeway Flow calculations in **Appendix 5**.
- 3.11 Causeway Flow calculations confirm minor flooding in the 1 in 100 year + 40% climate change scenario at chamber S6 and the permeable paving of plots 237-240. Volumes are 3.9m³ and 2.8m³ respectively.
- 3.12 Flooded volume at plot 237-254 paving is anticipated to flow into the adjacent swale where it will be temporarily stored and drain back into the network. Equally, volume at S6 will travel down highways and be captured by the swales by S21 and S26 for temporary storage and drain down into the system. There will be no risk to people and property as per the SuDS Manual.

Exceedance Flows:

- 3.13 In the case of system failure, or an event beyond the 1 in 100 Year + 40% Climate Change Storm, exceedance flows for the site must be considered.

Version: 1.0324

- 3.14 The current site falls to the south. Proposed levels will direct flows to the south via Highways and /or Swales to be intercepted by the existing ditches, and/or into SANG Basin 2.
- 3.15 An exceedance flow plan has been included in **Appendix 6**.

4. Water Quality

- 4.1 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices.
- 4.2 As per Table 26.2 of the SuDS Manual, the site will comprise of 144 properties and their associated residential car parking and low traffic roads.
- 4.3 Using Tables 26.2 and 26.3 of the SuDS Manual the water quality mitigation has been assessed in the following table:

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads	Low	0.5	0.4	0.4
SuDS Component & Mitigation Indices				
Permeable Paving		0.7	0.6	0.7
Mitigation Indices $\geq$ Pollutants		Yes	Yes	Yes

Table 4.1 – Simple Index Approach for Water Quality Mitigation at Site.

- 4.4 As per the above table, the permeable surfacing mediums provide suitable mitigation for Water Quality on site.
- 4.5 It should be noted that the wider drainage network of Finchwood Park utilises multiple SuDS features in series, and thus further mitigation is provided downstream.
- 4.6 In any case, further methods of good practise shall still be utilised across site.
- 4.7 It is recommended that any gullies have suitable silt traps/catchpits to reduce sediments entering the system.
- 4.8 It is advised that for maintenance, and the reduction of blockage risk to control devices, upstream and downstream chambers of SuDS and/or attenuation features have suitable catchpits to reduce sediments/particles and their associated risk of blockage.
- 4.9 It is recommended that all properties utilise rainwater butts to intercept water for re-use.

Maintenance Regime:

- 4.10 Morgan Civil and Structural have provided an Operations and Maintenance Manual to accompany this technical note to discharge conditions, ref 128057-MCS-XX-RP-OM-01.

5. Proposed Foul Water Drainage

- 5.1 It is proposed to drain the foul sewerage for the site via traditional gravity system with connections to the spine road. As previously highlighted, this drains off site to an adopted pumping station located to the West of the site in Parcel 5.
- 5.2 As per Sewerage Sector Guidance, proposed foul flows based on 4000l/dwelling/day equates to 6.7l/s.
- 5.3 The drainage strategy is included in **Appendix 4**, and confirms proposed connection points.

APPENDIX 1

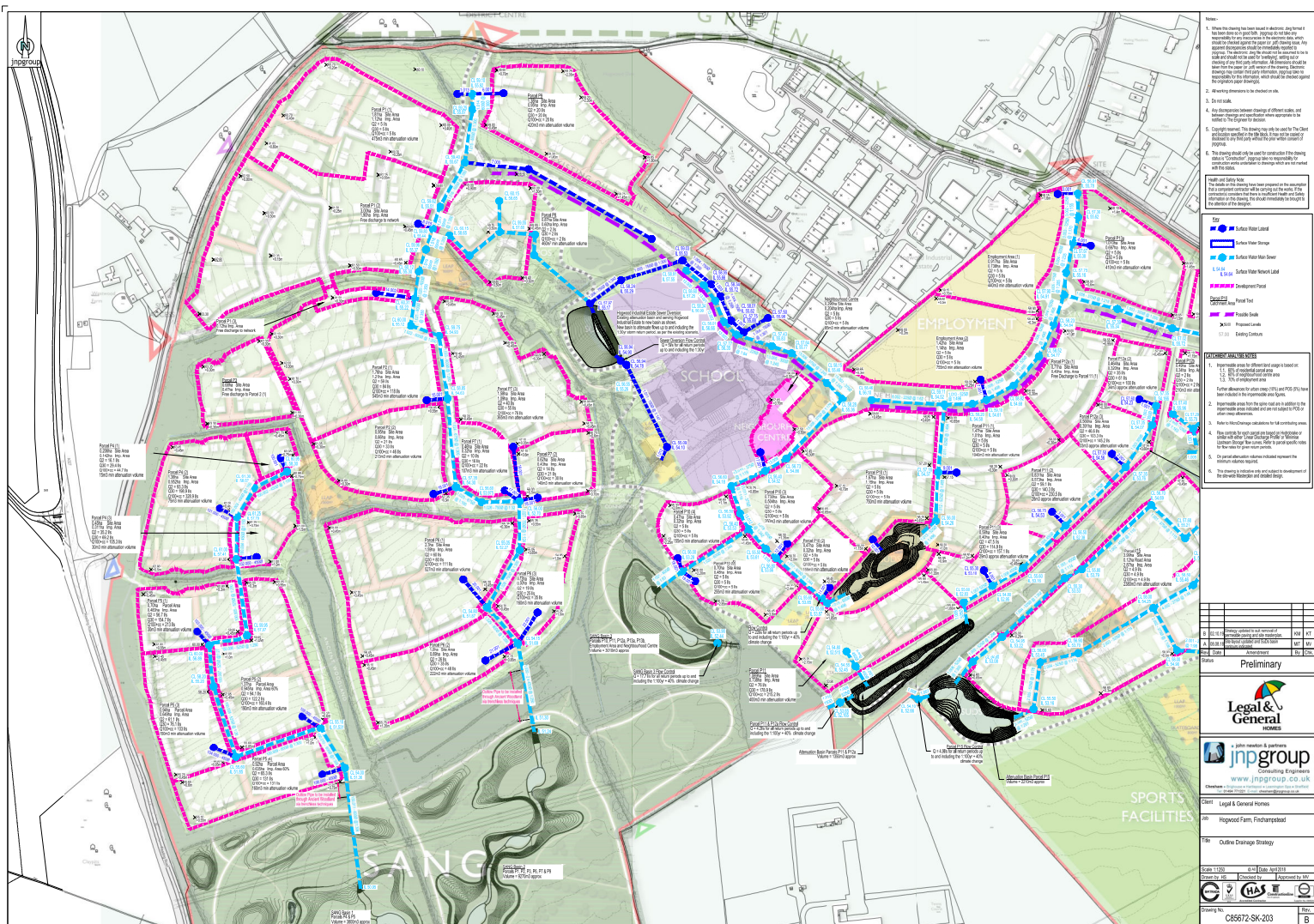
Finchwood Park Foul & Surface Water Strategies (JNP Group)

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Connection point based on TWU Equal Water Impact

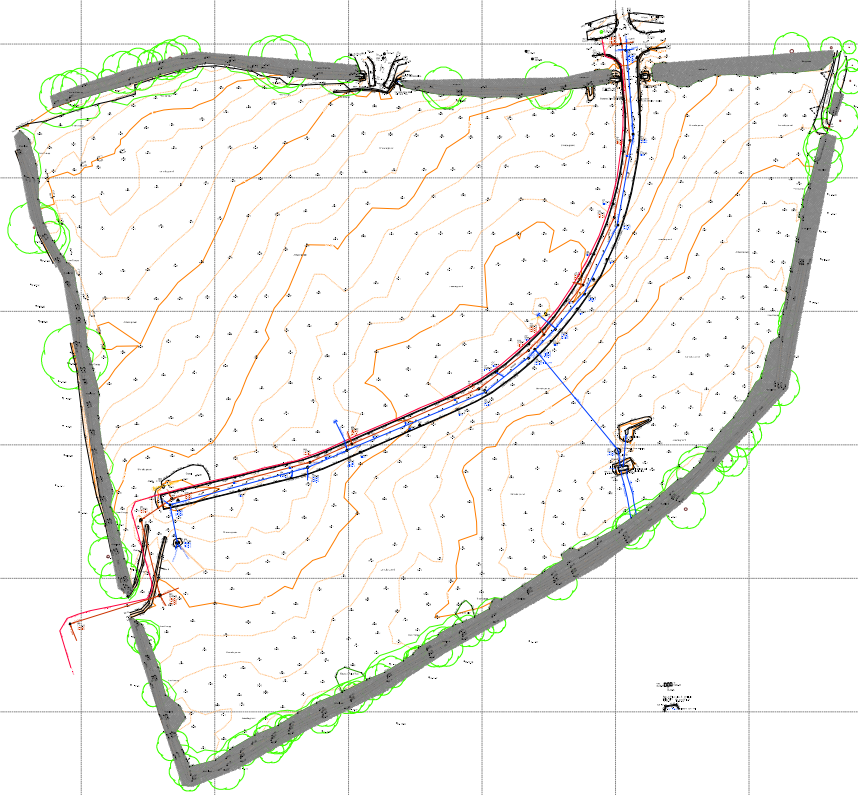
SITE

- | | | | |
|---|---|------------------|--|
| Scale: 1"=50' | | Date: March 2019 | |
| Drawn By: KSB | Eng. Check: | Tech. Check: | |
|     |  | | |
| Drawing No. C85672-SK-220 | | Rev. | |



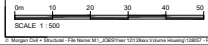
APPENDIX 2

Topographic Survey



APPENDIX 3

Impermeable Areas Plan



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Any discrepancies must be reported immediately to the Engineer for the Project before proceeding.
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SAFETY: read the plan, understand the implications
Refer to the relevant Construction (Design and Management) documentation where applicable.
It is assumed that all works on this drawing will be carried out by a competent contractor, working where appropriate to an approved method statement.

Key:

- Impermeable area - Road (0.60 ha)
- Impermeable area - Shared Surface (0.40 ha)
- Impermeable area - Housing (0.95 ha)
- Impermeable area - Private Drive (0.61 ha)

Total Impermeable area - 2.56 ha

Rev. 100/2017: Rev 0000

Rev. Date: 05/05/2017

Client: Vistry Thames Valley

Project: Finchwood Park, Parcel 6
Finchampstead

Site: Impermeable Area Layout

Drawing Title: **PLANNING**

Drawn	Checked	Approved	Date	Scale @ A1
AM	EE	NT	MAY 2025	1:500

Project No: 128057
Drawing No: 128057-MCS-KX-DR-C-0200
Revision: P01

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APPENDIX 4

Proposed Drainage Layout

