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**FORMER SHRUBLANDS NURSERY,
ROUNDSTONE LANE, ANGMERING**

**FLOOD RISK ASSESSMENT
AND DRAINAGE STRATEGY**



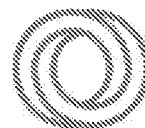
**FORMER SHRUBLANDS NURSERY
ROUNDSTONE LANE
ANGMERING**

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

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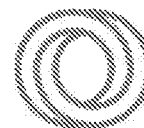


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Project No. 20-016

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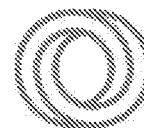
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1.0 INTRODUCTION

1.1 *General*

1.1.1 Odyssey have been instructed by Sigma Homes to undertake a Flood Risk Assessment (FRA), incorporating a surface water (SW) and foul water (FW) drainage strategy to be submitted in association with a planning application for a proposed re-development at former Shrublands Nursery, Roundstone Lane, Angmering.

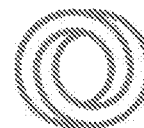
1.1.2 The site is located within the administrative boundary of Arun District Council (ADC) with West Sussex County Council (WSCC) acting as a Lead Local Flood Authority (LLFA). A location plan is presented in **Appendix A**.

1.1.3 The development site is approximately 1.33 hectares (ha) in area, and currently comprises a horticultural nursery with access served from Roundstone Lane.

1.1.4 The development proposal will see the provision of 40 dwellings provided on site. Vehicular and pedestrian access to the site would be served from Roundstone Lane. The proposed site layout is presented in **Appendix B**.

1.1.5 This report comprises the following elements:

- Summary of relevant planning policies and strategies.
- Review of existing site conditions including the hydrology, geology and existing drainage regime of the site.
- Assessment of the existing flood risk to the site.
- Proposed surface water and foul drainage strategy.



2.0 PLANNING POLICY

2.1 *Flood and Water Management Act (2010)*

2.1.1 The Flood and Water Management Act (FWMA) received royal assent on 8th April 2010. It was intended to implement Sir Michael Pitt's recommendations following the widespread summer 2007 floods. Guidance and information notes are published online by the Department for Environment, Food and Rural Affairs (Defra) to address a range of aspects concerning the act.

2.1.2 The FWMA encourages the use of Sustainable Drainage Systems (SuDS) on development sites by removing the automatic right to connect to sewers.

2.1.3 The development proposals for the site considered by this report will adhere to the FWMA through the provision of SuDS as a fundamental component of the surface water drainage scheme.

2.2 *National Planning Policy Framework (2019)*

2.2.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies, and how these policies should be applied. Planning Practice Guidance (PPG) is available online and provides additional guidance to the NPPF, as well as providing links to relevant current detail documents. Please refer to **Section 2.3** for further detail.

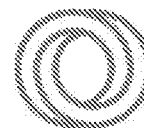
2.2.2 Paragraph 155 of the NPPF states that *"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas of highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere."*

2.2.3 Paragraph 163 of the NPPF states *"When determining planning applications, Local Planning Authorities (LPAs) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

- *within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location;*
- *the development is appropriately flood resistant and resilient;*
- *it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- *any residual risk can be safely managed; and*
- *safe access and escape routes are included where appropriate, as part of an agreed emergency plan."*

2.2.4 In accordance with the NPPF, a site-specific FRA is required for sites within the following categories:

- In Flood Zone 1, all proposals involving:
 - sites of 1 hectare or more;



- land which has been identified by the Environment Agency (EA) as having critical drainage problems;
- land identified in a strategic flood risk assessment as being at increased flood risk in future;
- land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use;
- All proposals for development in Flood Zones 2 or 3.

2.3 Planning Practice Guidance (2019)

2.3.1 The PPG for Flood Risk and Coastal Change provides additional direction to the NPPF, with details provided in each section of the document on how to conform to the NPPF.

2.3.2 All land in England is classified as falling into one of the flood zones, with the zones referring to the probability of river and sea flooding, ignoring the presence of defences. Table 1 of the PPG identifies and describes the Environment Agency (EA) flood zones as:

- Flood Zone 1: Low probability, land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Flood Zone 2: Medium probability, land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%) or land having between a 1 in 200 and 1 in 1000 annual probability of sea flooding;
- Flood Zone 3: High probability, land assessed as having a 1 in 100 or greater annual probability of river flooding (≥1%), or a 1 in 200 or greater annual probability of sea flooding (≥0.5%);
- Flood Zone 3b: The Functional Floodplain, land where water has to flow or be stored in times of flood (as identified by the LPAs in the Strategic Flood Risk Assessments).

2.3.3 Paragraph 080 of the PPG sets out the following drainage hierarchy that the discharge of surface water runoff should adhere to:

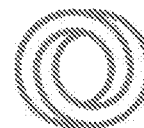
- into the ground (infiltration);
- to a surface water body;
- to a surface water sewer, highway drain, or another drainage system; and,
- to a combined sewer.

2.4 Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)

2.4.1 The Non-Statutory Technical Standards for Sustainable Drainage Systems was published by Defra in March 2015.

2.4.2 The Technical Standards document provides guidance on runoff destination, peak flow rate and volume control.

2.4.3 The LPA may set local requirements for planning permission that have the effect of more stringent requirements than those of the standards referred to above.



2.5 Adopted Arun Local Plan 2011-2031 (July 2018)

2.5.1 The Local Plan sets out the vision for the future of Arun and guides development to achieve that vision.

2.5.2 The purpose of the Local Plan is to encourage sustainable development and manage future growth whilst ensuring that change across the District is appropriate to meet local need.

2.5.3 To help achieve the plan's vision and purpose, various policies has been formed, with some of them focusing on drainage and flood risk.

2.5.4 Policy W DM2 of the Local Plan refers specifically to 'Flood Risk'. It states that:

"Development in areas at risk from flooding, identified on the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment (SFRA), will only be permitted where all of the following criteria have been satisfied:

- a. The sequential test in accordance with the National Planning Policy Guidance has been met.*
- b. A site specific Flood Risk Assessment demonstrates that the development will be safe, including access and egress, without increasing flood risk elsewhere and reduce flood risk overall.*
- c. The sustainability benefits to the wider community are clearly identified.*
- d. The scheme identifies adaptation and mitigation measures.*
- e. Appropriate flood warning and evacuation plans are in place; and*
- f. New site drainage systems are designed to take account of events which exceed the normal design standard i.e. consideration of flood flow routing and utilising temporary storage areas."*

2.5.5 Policy W DM3 of the Local Plan refers specifically to 'Sustainable drainage systems'. It states that:

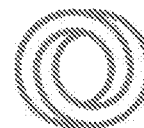
"To increase the levels of water capture and storage and improve water quality, all development must identify opportunities to incorporate a range of Sustainable Urban Drainage Systems (SUDS), appropriate to the size of development, at an early stage of the design process.

Proposals for both major and minor development proposals must incorporate SUDS within the private areas of the development in order to provide source control features to the overall SUDS design..."

2.6 West Sussex LLFA Policy for the Management of Surface Water (November 2018)

2.6.1 The LLFA is required to provide consultation responses on the surface water drainage provisions associated with major development.

2.6.2 This policy statement sets out the requirements that the LLFA has for drainage strategies and surface water management provisions associated with applications for development.



2.6.3 West Sussex LLFA has adopted the policies summarised below to conform to statutory policy and best practice. Policies 1 to 6 set out the requirements for a drainage strategy to be compliant with the NPPF and Non-Statutory Technical Standards for Sustainable Drainage. Policies 7 to 10 set out expectations to be considered within a drainage strategy, in response to environmental legislation and guidance that West Sussex County Council and the Local Planning Authorities have a duty to comply with.

Policies Summary

- SuDS Policy 1 Follow the drainage hierarchy
- SuDS Policy 2 Manage Flood Risk Through Design
- SuDS Policy 3 Mimic Natural Flows and Drainage Flow Paths
- SuDS Policy 4 Seek to Reduce Existing Flood Risk
- SuDS Policy 5 Maximise Resilience
- SuDS Policy 6 Design to be Maintainable
- SuDS Policy 7 Safeguard Water Quality
- SuDS Policy 8 Design for Amenity and Multi-Functionality
- SuDS Policy 9 Enhance Biodiversity
- SuDS Policy 10 Link to Wider Landscape Objectives

2.6.4 All the policies reflect the requirements of the Local Flood Risk Management Strategy, Surface Water Management Plans and Local Planning Authority Local Plans. Sufficient information must be submitted to demonstrate compliance.

2.7 Angmering Neighbourhood Plan 2014-2029 (Version 4.06)

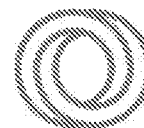
2.7.1 The Angmering Neighbourhood Plan Group has prepared the Neighbourhood Plan (NP) to provide a vision for the future of the village. It sets out clear policies and objectives to realise these visions through planning and controlling land use and development change over the NP period 2014 to 2029.

2.7.2 These policies accord with higher level planning policy, principally the National Planning Policy Framework (NPPF) and the Arun District Council Local Plan, as required by the Localism Act.

2.7.3 Policy EH3 of the NP relates to flood prevention. It states that:

“Angmering is categorised as at a medium to high risk of flooding from rainfall runoff from the land and is also a groundwater emergence zone and for these two criteria have been assigned the highest risk categories.

- *Any new development must ensure that the prospect of flooding within the development boundaries is mitigated.*
- *Any new development must ensure that it does not increase the flooding impact it may have on surrounding properties and areas.*
- *Development at risk from flooding should incorporate a sustainable urban drainage system unless it is demonstrated that an alternative drainage system is appropriate.”*



3.0 EXISTING SITE CONDITIONS

3.1 Location

3.1.1 The development site is located on the western side of Roundstone Lane, approximately 220 metres (m) to the north of the roundabout junction of the A259 Roundstone By-Pass Road and Roundstone Lane.

3.1.2 The National Grid Reference for the centre of the site is E: 507305, N: 103462 and the postcode of the site is BN16 4AT.

3.1.3 The site presently comprises a horticultural nursery with the eastern boundary partially formed by Roundstone Lane, and partially by a single residential plot. The northern boundary is adjacent to the Farrow Field industrial estate and the western boundary is adjacent to a storage and service yard. The southern boundary is partially formed by a residential plot with some extensive outbuildings, and partially by undeveloped land.

3.2 Topography

3.2.1 A topographical survey was completed in December 2019 by InCo Surveys. The survey plan is presented in **Appendix C**.

3.2.2 The site is relatively flat with no particular and prevailing fall. An average ground level for most of the of the site is in the region of 10.5m above ordnance datum (AOD).

3.2.3 There is a localised mound of rubble and mud spoil at the west and north-west corner of the site, with the top level approaching 11.5m AOD.

3.2.4 The site currently comprises a large greenhouse, several outbuildings (serving as a warehouse, store, office building and workshop), paved access track, and concrete service yard. The remainder of the site is divided into parcels with planting crops.

3.2.5 The existing roof and hardstanding totals to approximately 0.28ha (excluding any broken tarmac or paving type of surfacing), which is approximately 21% of the total site area.

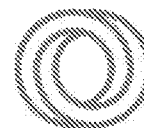
3.3 Hydrology

3.3.1 The nearest EA designated main river, the Black Ditch, passes approximately 0.9 kilometres (km) to the north-west of the site. For EA mapping and data please see **Appendix D**.

3.3.2 It is noted that there are no ordinary watercourses on site or in the immediate vicinity of the site.

3.4 Geology and Hydrogeology

3.4.1 British Geological Survey (BGS) online maps (accessed January 2021) indicate that the site is underlain by a range of different soil types. Please refer to **Appendix E** for BGS records.



3.4.2 There are superficial deposits which comprise sand, silt and clay River Terrace Deposits (undifferentiated). The bedrock geology is classed as Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated).

3.4.3 EA mapping indicates that the site is not situated in any of the EA's Groundwater Source Protection Zones (SPZs).

3.4.4 An intrusive ground investigation was undertaken by Leap Environmental Ltd between the end of 2020 and start of 2021 – please refer to **Appendix F** for ground investigation report. The ground investigation report sets out the ground conditions encountered at different depths below ground level (bgl). The findings are summarised in **Table 3.1**.

Table 3.1 Ground Investigation Findings

Top Depth (m bgl)	Base Depth (m bgl)	Description
0	0.20 – 0.50	TOPSOIL and MADE GROUND of sandy gravel (gravel is brick, concrete, tiles).
0.20 – 0.50	1.90 – 3.80	CLAY: Soft to Firm silty CLAY with rare fine flint gravel.
1.90 – 3.80	4.20	GRAVEL: medium dense becoming dense, gravel is fine to cobble sized.

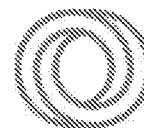
3.4.5 Soakage testing at three separate locations and depths between 2.5m and 3.0m bgl was undertaken in January 2021. The resulting infiltration rates are set out in **Table 3.2**.

Table 3.2: Summary of Soil Infiltration Testing Results

Location	Infiltration Rate (metres per second (m/s))		
	Test Cycle 1	Test Cycle 2	Test Cycle 3
TP101	8.6×10^{-5}	8.2×10^{-5}	5.1×10^{-5}
TP102	1.0×10^{-5}	8.8×10^{-6}	8.1×10^{-6}
TP103	1.2×10^{-5}	-	1.3×10^{-5}

3.4.6 Groundwater monitoring at three separate locations recorded water levels at 2.5m and 1.92m below existing ground. However Leap Environmental Ltd reports that “...On several occasions during the monitoring, surface water was noted to have ponded around the well covers and drained into the well when the bung was removed. The water levels recorded within both WS104 and WS106 are therefore considered to either represent small amounts of perched water present within the clays or flooding of the well from the surface during monitoring”.

3.4.7 Knowledge of local developments with associated groundwater monitoring confirms the overall groundwater level in the area to be approximately 3m bgl and lower, which would support Leap Environmental Ltd statement regarding elevated groundwater level readings.



3.5 Existing Drainage Regime

3.5.1 The existing drainage system has not been confirmed nor surveyed. However, based on topographical survey not showing any significant inspection covers, it is anticipated that surface water currently infiltrates into the ground.

3.5.2 According to Southern Water Services Ltd (SWSL) records, there is no public surface water sewer network on site, or in the immediate vicinity of the site. The absence of a surface water network at the site further supports the view that surface water currently infiltrates into the ground.

3.5.3 According to SWSL records, there is no public foul water sewer network on site, or in the immediate vicinity of the site. The foul drainage system for the site has not been confirmed, however it is believed to drain to a form of a private system. SW records are shown in **Appendix G**.

3.5.4 The developable area for this site is less than 50ha, meaning that the Institute of Hydrology (IoH) Report 124 Flood Estimation for Smaller Catchments (1994) method is suitable to estimate greenfield / urban peak flow rates (50ha is used in the formula and the flow rate value is linearly interpolated based on the ratio of the development area). This methodology is approved in the EA's Rainfall Runoff Management for Developments Report; the parameters used are shown in **Table 3.3**.

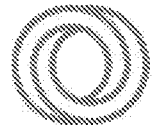
Table 3.3: Interim Code of Practice SuDS Parameters

Parameter	Value	Unit
SAAR	717	mm
Soil Index	0.400	-
Region	6	-
Urban	0.210	-

3.5.5 **Table 3.4** summarises the estimated current urban and greenfield discharge rates for the site. Calculations are provided in **Appendix H**.

Table 3.4: Existing Surface Water Discharge Rates

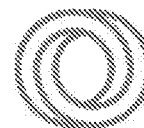
Return Period	Existing Greenfield and Urban Discharge Rates from Site (litres per second (l/s))	Existing Greenfield and Urban Discharge Rates per Hectare (l/s/ha)
Q_{BAR}	6.6	4.9
Q_{30}	13.7	10.3
Q_{100}	17.8	13.4



4.0 DEVELOPMENT PROPOSALS

4.1 General

4.1.1 The development proposals for the site are for the demolition of existing horticultural buildings and the construction of new buildings; providing 40 dwellings, the creation of new vehicular access routes within the site, and the provision of landscaped public open space, together with associated landscaping, drainage and utilities. A proposed site layout can be found in **Appendix B**.



5.0 SOURCES OF FLOOD RISK

5.1 Fluvial Flooding

5.1.1 Fluvial flooding is caused by flows in rivers or streams exceeding the capacity of the river channel and spilling into the floodplain. Fluvial flooding can also occur on designated floodplain land after a period of heavy rainfall.

5.1.2 The EA's Flood Map for Planning (accessed January 2021) shows that the site is entirely located in Flood Zone 1; land assessed as *"having a less than 1 in 1,000 annual probability of river or sea flooding"* (<0.1% Annual Exceedance Probability [AEP]). For EA data, refer to **Appendix D**.

5.1.3 The flood risk vulnerability classification of dwellings is deemed as *"more vulnerable."* In accordance with the Planning Practice Guidance (PPG), development of this nature in Flood Zone 1 is acceptable.

5.1.4 Arun District Council Strategic Flood Risk Assessment (SFRA) (September 2016), prepared by JBA consulting, shows that the site is located entirely outside the present and future Flood Zones 2 and 3. For risk mapping, refer to **Appendix D**.

5.2 Surface Water Flooding

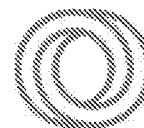
5.2.1 Surface water (pluvial) flooding is caused by rainfall levels exceeding the natural infiltration properties of the surrounding soils. Flooding can occur where there is a lack of a formalised drainage system or as a result of a poorly designed or maintained sewer system. Flooding can also occur owing to the absence of a natural method of drainage such as watercourses or ditches, or where soil infiltration rates are low. Flooding often results in ponding of water at low points or when surface water flow routes are blocked by an obstruction.

5.2.2 The EA's (accessed January 2021) and the SFRA Risk of Flooding from Surface Water (RoFSW) mapping shows that the majority of the site is at *"very low (less than 0.1% AEP)"* risk of pluvial flooding.

5.2.3 There are two distinct locations where the risk of flooding from surface water is assessed as 'Low' or 'Medium' on the site, meaning that these locations have a chance of flooding of between 0.1% and 1% and between 1% and 3.3% respectively. For flood risk mapping refer to **Appendix D**.

5.2.4 A review of the mapped flood risk locations against site ground levels suggests that these risk areas are in the form of ponding and are resultant of local site topography (i.e. local depressions). These areas are not a result of a surface water run-off originating outside of the site and do not form part of any overland flood route crossing the site.

5.2.5 The proposed development would have site levels locally adjusted to either eliminate the current risk of surface water flooding, or surface water would be diverted into areas designated to hold and/or convey water as part of the surface water drainage design for the site.



5.2.6 The proposed drainage infrastructure and site levels strategy would set finished floor levels (FFLs) for dwellings at a minimum of 150 millimetres (mm) above surrounding ground levels and would reduce a risk of internal and off-site surface water flooding.

5.3 Groundwater Flooding

5.3.1 Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A groundwater flood event results from a rise in groundwater level sufficient for the water table to intersect the ground surface and inundate low lying land. Periods of prolonged rainfall may also be a cause of groundwater flooding, with aquifers and soils becoming saturated.

5.3.2 The SFRA mapping shows the site to be located in an area with the lowest 25% susceptibility to groundwater.

5.3.3 Groundwater with a maximum level of 1.92m bgl was encountered on site during the ground investigation. There is no proposal to construct any basements and the risk of groundwater flooding to the site and development is considered to be low.

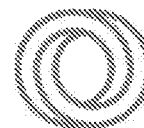
5.4 Sewer Flooding

5.4.1 Sewer flooding can occur due to the failure of existing foul or surface water drainage infrastructure. If flows within the drainage system exceed the designed capacity, or if foreign matter causes blockages, overflow to the surface can occur, leading to flooding.

5.4.2 According to Southern Water records, there is no public surface or foul water sewer on site or in the immediate vicinity of the site. The topographical survey also did not identify any drainage networks within the site itself, therefore the risk of flooding from sewers is considered to be low.

5.5 Reservoir Flooding

5.5.1 The EA online map (assessed January 2021) shows that there is no risk of reservoir flooding to the site.



6.0 SURFACE WATER DRAINAGE STRATEGY

6.1 *Surface Water Drainage Strategy Requirements*

6.1.1 Any surface water drainage strategy must demonstrate that the proposed development would be drained in a sustainable manner, commensurate with local and national policy. The NPPF requires that flood risk to land and property is not increased as a result of new development.

6.1.2 The drainage system for the proposed development has been designed to ensure that there would be no increase in surface water discharge from the site post development.

6.2 *Proposed Surface Water Drainage Strategy*

6.2.1 The proposed surface water management strategy described below is outlined in **Drawing 20-016-010** in **Appendix H**.

6.2.2 As set out in **Section 2.3**, the drainage hierarchy states that the first option for surface water discharge should be infiltration. The infiltration rates achieved at the site suggest that infiltration SuDS would be suitable at the site.

6.2.3 It is proposed that surface water generated by the proposed development would drain to an infiltration blanket located underneath public open space, or to individual trench soakaways located in the rear gardens of contributing properties.

6.2.4 The infiltration structures have been calculated to cater for flows for all rainfall events up to a 1 in 100 year storm plus 40% to account for climate change. In adopting a conservative approach, the lowest infiltration rate achieved during the soakage tests (in the nearest BRE365 location) has been used in the drainage calculations.

6.2.5 The infiltration structures and drainage systems have been designed to cater for the 1 in 10 year storm (with 40% climate change) between the invert of the entry pipe to the infiltration structure and the base of the structure.

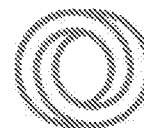
6.2.6 For infiltration structures that fall between BRE365 locations, the design infiltration rate was averaged between the lowest rates achieved during the tests for the nearest BRE365 test.

6.2.7 Urban creep would be accounted for in drainage calculations by incorporating an additional 10% of the roof area to the total impermeable area. Urban creep uplift was omitted for the roof area of the proposed flats.

6.2.8 With regards to exceedance flows, it is anticipated that surface water would be conveyed to the topographical low points on site and routed away from proposed dwellings. The proposed site wide levels aim to set FFLs above adjacent road levels, thus creating and allowing overland flow routes away from the dwellings and mitigating the risk of internal flooding to houses.

6.3 Water Quality

6.3.1 Improving water quality is a key principle of a SuDS system. Steps would be taken to ensure that water quality on site is not negatively impacted by the proposed development. **Table 6.1** details



the Pollution Hazard Indices of the different land use classifications of the site, in accordance with the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2015 (C753).

Table 6.1: Pollution Hazard Indices for Proposed Development

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4

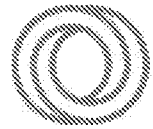
6.3.2 The pollution hazard level for the proposed development would be “Low”. All roof surface water generated by the proposed development would pass through silt traps as a minimum (for trench soakaways serving roofs only), and through gullies or sumps and hydrodynamic vortex separator (where the system serves roads), before being connected into an infiltration structure discharging into the ground. The SuDS mitigation indices have been calculated in **Table 6.2**, in accordance with the guidance contained in the CIRIA SuDS Manual.

Table 6.2: SuDS Mitigation Indices for Proposed SuDS Features

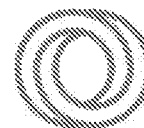
Type of SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Soil with good contaminant attenuation potential of at least 300mm in depth – for trench soakaway serving roofs only	0.4	0.3	0.3
Proprietary treatment systems (Mitigation indices shown for Aqua-swirl vortex grit separator)	0.8	0.5	0.7

6.4 SuDS Maintenance Requirements

6.4.1 Maintenance of the drainage system and of any implemented SuDS features would be carried out in accordance with the manufacturer guidance and through an approved maintenance management plan to minimise the residual flood risk of drainage system blockage.



6.4.2 It is anticipated that the responsibility for maintenance would be with the Management Company serving the site.



7.0 FOUL WATER DRAINAGE STRATEGY

7.1 General

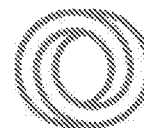
7.1.1 There is no public foul sewer network in the immediate vicinity of the site. It is proposed that foul water from the development would be conveyed via gravity to a pumping station, initially shown at the south-east corner of the proposed public open space; this is subject to further detailed design.

7.1.2 The pumping station would convey the foul water via a rising main to the proposed connection point with the existing public foul sewer network. Currently proposed option involves connection into the public foul water sewer located in Bramley Way - to the north of the site - however there are other potential routes available and these will be investigated further at the detailed design stage.

7.1.3 There are a number of routes that could be considered and may come available given all the surrounding data

7.1.4 Subject to discussions with SWSL, a Section 106 connection would be made in accordance with the Water Industries Act to seek approval to connect to the public sewer.

7.1.5 SWSL has a duty to improve its network to cater for proposed developments. This is funded via increased infrastructure charges to developers. Should there be a requirement for offsite improvement works, SWSL would programme these works with due regard to Sigma Homes build programme.



8.0 SUMMARY AND CONCLUSIONS

8.1 General

8.1.1 Odyssey has been commissioned by Sigma Homes to undertake a Flood Risk Assessment (FRA), incorporating a surface water and foul water drainage strategy to support the proposed development at former Shrubland Nursery, Roundstone Lane, Angmering.

8.1.2 Based on EA flood maps, the site is shown to be located within Flood Zone 1.

8.1.3 There are two distinct locations where the risk of flooding from surface water is assessed as 'Low' or 'Medium', meaning that these locations have a chance of flooding of between 0.1% and 1% and between 1% and 3.3% respectively. A review of the mapped flood risk locations against site ground levels suggests that these risk areas are in the form of ponding and are resultant of local site topography (i.e. local depressions). These areas are not a result of a surface water run-off originating outside of the site and do not form part of any overland flood route crossing the site.

8.1.4 Intrusive ground investigation soakage testing results suggest that infiltration-based SuDS would be feasible at the site. It is proposed that surface water runoff would be discharged into the ground via infiltration structures. The infiltration structures have been designed to accommodate flows from a 1 in 100 year storm event plus 40% to account for climate change.

8.1.5 Foul flows would drain to a pumping station on site and be discharged to the existing SWSL public foul network. SWSL has a duty to cater for proposed development flows through its ongoing asset management improvement works.

8.1.6 This FRA demonstrates that the proposed development can be drained in a sustainable manner, commensurate with national and local policy.

APPENDIX A

Site Location Plan

APPENDIX B

Site Layout

APPENDIX C

Topographical Survey

APPENDIX D

Flood Risk Data

APPENDIX E

British Geological Survey Data

APPENDIX F

Ground Investigation Report

APPENDIX G

Public Sewer Records

APPENDIX H

Proposed Drainage Strategy and Microdrainage Calculations