

Drainage and Maintenance Statement

Project Manor Nursery, High Street, Angmering
Project Number 22995
By Tom Zajac
Date 19 March 2018



The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex BN41 1RA

Proposed Development

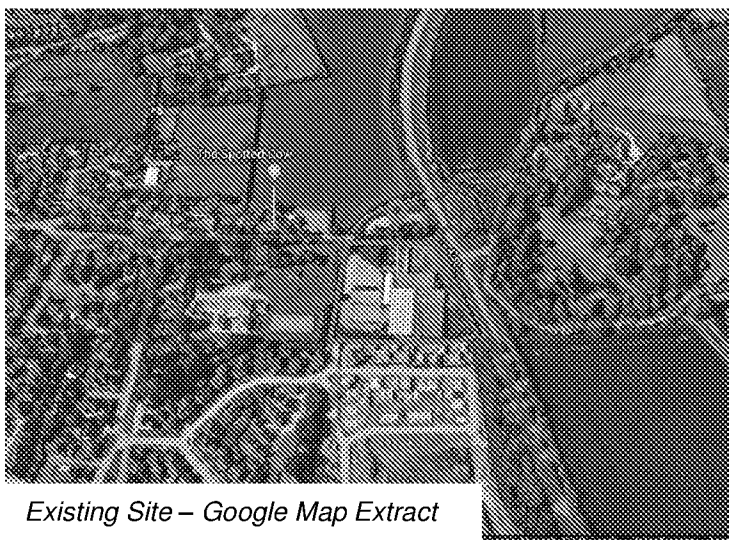
This Statement has been produced in support of an application for the discharge of Conditions 6, 19, 21, 22 of Outline Planning Permission 16/03057/OUT.

The Statement has been produced in line with the Flood Risk Statement & Development Drainage Strategy produced by MJA Consulting Civil & Structural Engineers reference 14/0186/4963 during the planning application process.

The proposed drainage incorporates a SuDS compliant system and infiltration to ground and is broadly in line with the drainage strategy noted in the FRA submitted as part of the Outline Application. With the exception of the detail of the drainage strategy noted in this Statement the FRA submitted with the Outline Application remains current.

The development proposals are for the construction of 32 residential dwellings of mixed development sizes, together with associated open spaces and access.

The development site is located approximately 1km east of Angmering village at the end of High Street. The nearest postcode is BN16 4AW, Ordnance Survey reference TQ 076 042. Please see Google Map extract below.



Existing Site – Google Map Extract

The site itself is a brownfield site that was occupied by a large glasshouse and nursery building, (now demolished). There is a large unmade surface car park on the western portion of the site. Access to the site is via the High Street in the north-west corner. The site measures circa 1.14ha.



The Civil Engineering Practice Ltd
Registered Number 278754 England

The site is bounded by a residential dwelling to the west, a public car park and a bridleway that extend from the eastern end of the High Street to the north, a byway open to all traffic to the east and new residential development to the south.

The site location plan, existing site layout and proposed site layout are attached in Appendix 1 at the rear of this Statement.

Design Criteria

The surface water drainage system has been designed in accordance with the National Planning Policy Framework (NPPF), its accompanying Guidance and Technical Standards for SuDS. It also complies with the requirements under Building Regulations Part H.

The surface water drainage system incorporating storage/infiltration has been designed to accept the discharge from a 100 year return period pluvial event with a further 30% allowance for future climate change and 10% for Urban Creep increase to impermeable area.

In accordance with CIRIA SuDS Manual 2015 (Report C753), NPPF and Building Regulations Part H surface water drainage design follows a discharge destination hierarchy ranging from infiltration to ground as first priority before consideration of discharging to a watercourse and as a last resort discharging to a public sewer.

The foul drainage system has been designed to Sewers for Adoption 7th Edition.

Geology

The available information hosted on the British Geological Society notes the site is underlain by River Terrace Deposits overlaying Lewes Nodular Chalk Formation. The information available in the public domain for the adjoining site confirms infiltration varies between $4.0 \times 10^{-3} \text{ m/s}$ and $5.0 \times 10^{-4} \text{ m/s}$ within the sand/gravel layers of the river terrace deposits. It is assumed that these infiltration rates are likely to be achieved for this site.

Furthermore the available borehole and ground investigation information confirms no presence of ground water within the gravel layers beneath the Head Deposits.

Extracts of the British Geological Society Borehole logs together with the borehole information are attached in Appendix 2 at the rear of this Statement.

Surface Water

The catchment area plan is attached in Appendix 3 at the rear of this Statement.

The soakage tests of 2.0×10^{-4} m/s have been adopted for the calculations.

The calculations were undertaken using a factor of safety of 2 to make allowance for the various depths and locations of permeable strata layers.

The calculations will be revised at detailed design stage to confirm the detailed soakaway sizes with final on site infiltration testing in the location of each proposed soakaway.

The proposed development site occupies an area of approximately 1.15ha and upon completion will generate a total impermeable area of approximately 0.58ha.

Surface water runoff from roofs will be collected and channelled through a positive drainage system and discharge into the ground either via cellular crate or concrete ring soakaways.

The proposed semi detached/detached houses comprises approximately 120m³ of roof area which based on assumed infiltration rate will require 1.8mØ x 2.1m deep concrete ring soakaway for each dwelling to discharge surface water via infiltration. The proposed block of terrace houses will require two 2.1mØ x 2.1m deep concrete ring soakaways.

It is proposed the surface water runoff from the proposed driveways, parking areas and access roads will be collected via positive drainage and discharged into the ground using Cellular Crates soakaways. It is proposed that a minimum of 2 cellular crates are constructed within the sand/gravel layers to allow surface water discharge into the soils with better permeability characteristics.

The proposed drainage system will provide storage for exceedance events for up to 1 in 100 year rainfall event including 40% for climate change. An allowance of 10% has been made for Urban Creep accounting for future property owners extending their houses or adding to the impermeable areas.

The surface water drainage calculations are attached in Appendix 4 at the rear of this Statement.

Surface Water Quality

Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types and uses and defines residential roofs to be at very low potential for pollution. The table below summarises the anticipated pollution hazard index from the proposed development.

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roof	Very low	0.2	0.2	0.05
Individual property driveways, low traffic roads	Low	0.5	0.4	0.4

Using the worst case for the low risk element to mitigate water quality, the site will need to provide SuDS elements with mitigation indices that equal or exceed the hazard index above.

The following tables detail the mitigation indices for this drainage system. The total mitigation indices with the combined surface water drainage system is as follows:

Roof	Mitigation Indices		
SuDS Type			
	Total suspended solids (TSS)	Metals	Hydro-carbons
Cellular Crates soakaway with 300mm soil with good contaminant attenuation potential	0.4	0.3	0.3

Residential Roads and private driveways	Mitigation Indices		
SuDS Type			
	Total suspended solids (TSS)	Metals	Hydro-carbons
Cellular Crates soakaway with 300mm soil with good contaminant attenuation potential	0.4	0.4	0.4

The mitigation indices for the roof drainage are in excess of the minimum level required to achieve effective treatment as suggested in C753 The SuDS Manual.

To meet the mitigation indices and provide treatment for all surface water runoff from the residential access roads and private driveways it is proposed to use Bypass Separators prior to discharge into the cellular soakaways.

The proposed Bypass Separator together with the combination of road gullies, catchpits and ACO channels will provide treatment for all flows for the area served, generated by rainfall rates of up to 6.5mm hour providing additional settlement for suspended solids reducing the risk of pollution of receiving water from the site. Therefore, the mitigation indices for the proposed access road and private driveways are at the minimum level required to effective treatment.

Foul Water

It is proposed to discharge foul water to the existing Southern Water public foul sewer located beneath High Street to the north east of the site.

From 1 April 2018 Southern Water can no longer charge for improving offsite infrastructure to provide capacity. This work is included with their new infrastructure charge which for this site will be £756 per property.

The Southern Water sewer record plan is attached in Appendix 5 at the rear of this statement.

It is proposed that both surface water and foul water sewers within the site will be kept privately maintained by a Maintenance Management Company and Property Owners.

A copy of the proposed surface water drainage layout including proposed foul drainage and drainage calculations are attached in Appendix 6 at the rear of this Statement.

Indicative Schedule of Maintenance

Once appointed the Contractor will prepare a site specific method statement for the control of silt and other pollutants during construction. CIRIA Report C532, Control of Water Pollution from Construction Sites, provides further guidance on this.

The Contractor will maintain the proposed drainage system during construction and until the handing over of the site. Upon completion the maintenance will be passed on to the property owner.

The attached maintenance schedule details the typical tasks to be undertaken at different intervals.

Indicative Schedule of Maintenance for the Proposed Drainage System:

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from silt trap chambers, ACO channels and inlet chambers	6 monthly
	Litter and debris removal – above ground	Monthly or as required
	Litter and debris removal – Catch Pits, Soakaways	Monthly or as required
	Surface and Foul water pipe work – jetting/rodding	Every 2 years or as required
	Manage other vegetation and remove nuisance plants – aesthetics	As required
Irregular Maintenance	Remove debris/blockages to silt traps/ACO Channels/ Ring Soakaways	As required
Corrective Maintenance	Repairs to access chambers/MH covers/ Ring Soakaway covers	As required
	Inspect inlet, outlet from downpipe and gullies for blockages, standing water and clear	As required

Manor Nursery, High Street, Angmering
Drainage System Maintenance Summary Sheet:
For Maintenance Management Company and Property Owners

Inspection/ Action Required	Gutters	Gullies/ ACO Channels	Catchpits/ Silt Traps/	Concrete Ring Soakaways	Surface/ Foul Water Pipework
After leaf fall in Autumn	✓	✓	✓	✓	
6 Months	✓	✓	✓		
1 Year				✓	
2 Years					✓

List of Appendices

Appendix 1	Site Location Plan, Existing and Proposed Site Layouts
Appendix 2	British Geological Society Borehole Logs and WB Report Extracts
Appendix 3	Proposed Site Catchment Area Plan
Appendix 4	Surface Water Drainage Calculations
Appendix 5	Southern Water Infrastructure Record
Appendix 6	Proposed Surface and Foul Water Drainage Layout