

### Summary of Drainage Strategy

The site is located on the western side of Scotter Road within the development boundary of Messingham towards the south of the village. The postcode for the site is DN13 3QE and the approximate centre of the site at National Grid Reference coordinates are Easting: 489340.0 & Northing: 403891.0

The site size is less than a hectare (0.99 ha) and is located within Flood Zone 1. The site is currently undeveloped farmland.

The proposed development includes proposals for the construction of up to 20 dwellings. It is expected that the Site will be developed with an adoptable section of road and private driveways as follows:

- Housing (Roofs) : 1600m<sup>2</sup>
- Driveways and Parking : 1000m<sup>2</sup>
- Adoptable Road: 1125m<sup>2</sup>
- Total Impermeable area: 3725m<sup>2</sup> (Approx 37% of the Site)

Borehole records indicate that the ground consists of a 1.8m deep layer of clay overlying a 10m layer of shale without indication of water encounters. Deep Soakaways are proposed to be used penetrating the clay layer and discharging to shale. Infiltration rate assumed 1 x 10e-5 m/s. A Percolation test according to BRE365 shall be conducted to confirm the infiltration rate as well as the Ground water table level.

### Drainage Hierarchy

The CIRIA SuDS Manual 2015 explains the philosophy of SuDS in Chapter 1 of the manual as follows:

The philosophy of sustainable drainage systems is about maximizing the benefits and minimizing the negative impacts of surface water runoff from developed areas.

The SuDS approach involves slowing down and reducing the quantity of surface water runoff from a developed area to manage downstream flood risk, and reducing the risk of that runoff causing pollution. This is achieved by harvesting, infiltrating, slowing, storing, conveying and treating runoff on site and, where possible, on the surface rather than underground. Water then becomes a much more visible and tangible part of the built environment, which can be enjoyed by everyone.

The technical Standards for Sustainable Drainage produced by the Local Authority SuDS Office Organisation (LASOO) suggest the following Drainage Hierarchy to be followed as reasonably practicable

Drainage Hierarchy	Y / N	Comment
1 Infiltration to the maximum extent that is practical	Y	Soakaway will be utilised. Percolation Test to BRE365 Standards shall be carried out to confirm the infiltration rate estimated (1x10e-5 m/s) as well as the Ground water table level
2 Discharge to surface waters	N	It is proposed to drain storm water into Soakaways as the Ground Conditions suggest that Soakaways can be utilised
3 Discharge to Surface Water Sewer	N	No existing surface sewers around the site
4 Discharge to combined sewer (last resort)	N	No Combined Sewer exists

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#### Storm Water

- Private driveways & parking spaces shall be surfaced in permeable blockwork filtering runoff and receiving flows from roofs. Subbase attenuation / crates can be used to receive runoff for all storms up to 1 in 100-year event plus 40% climate change. Discharge to Soakaways in rear gardens shall be placed 5m away from any building and 2m away from the site boundary.
- Storm water run-off from the adoptable road will be collected in filter drains along the side of the road and discharge to the infiltration basin within a Public Open Space.

#### For the Private System

- Attenuation Volume Provided in Sub-base: 650m<sup>3</sup>
- Attenuation Volume used in 1 in 30 yrs storm event: 54%
- Attenuation Volume used in 1 in 100 yrs storm event: 69%
- Attenuation Volume used in 1 in 100 yrs storm event + 40% Climate Change : 98%

#### Foul Water

- An adoptable foul water system should be provided with effluent to an Adoptable Manhole in Scotter Road.

#### Exceedence Flows

Storm Water System is designed to receive and contain within the site boundary all rainfall up to & including 1:100 AEP +40%.

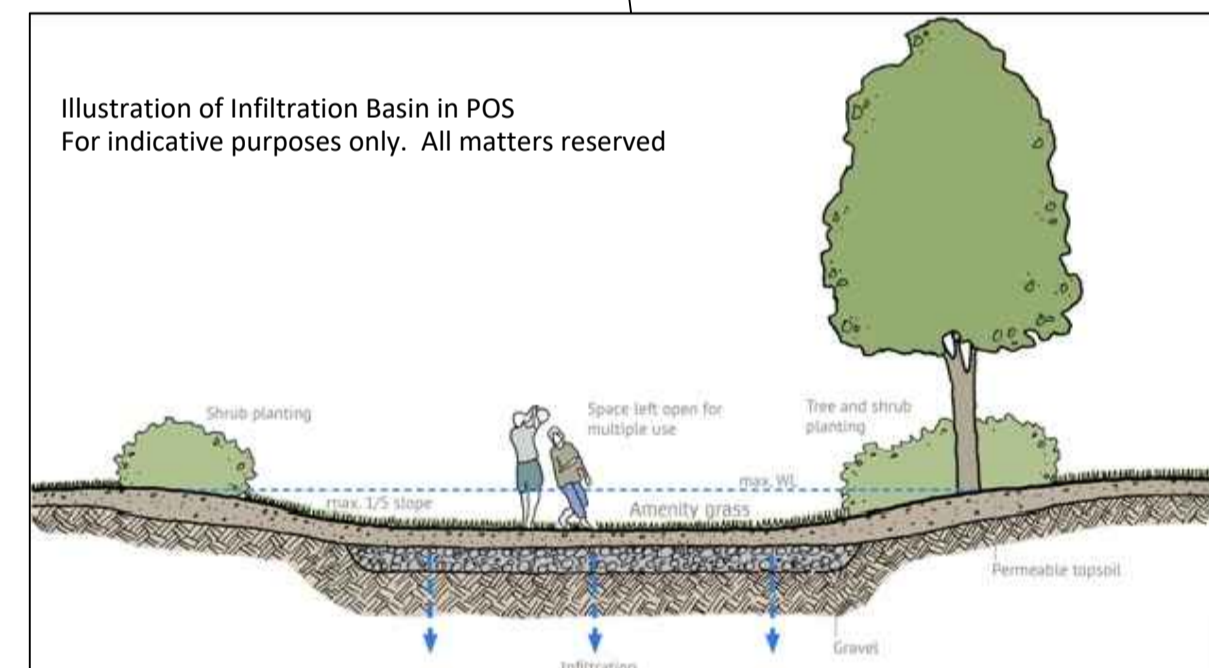
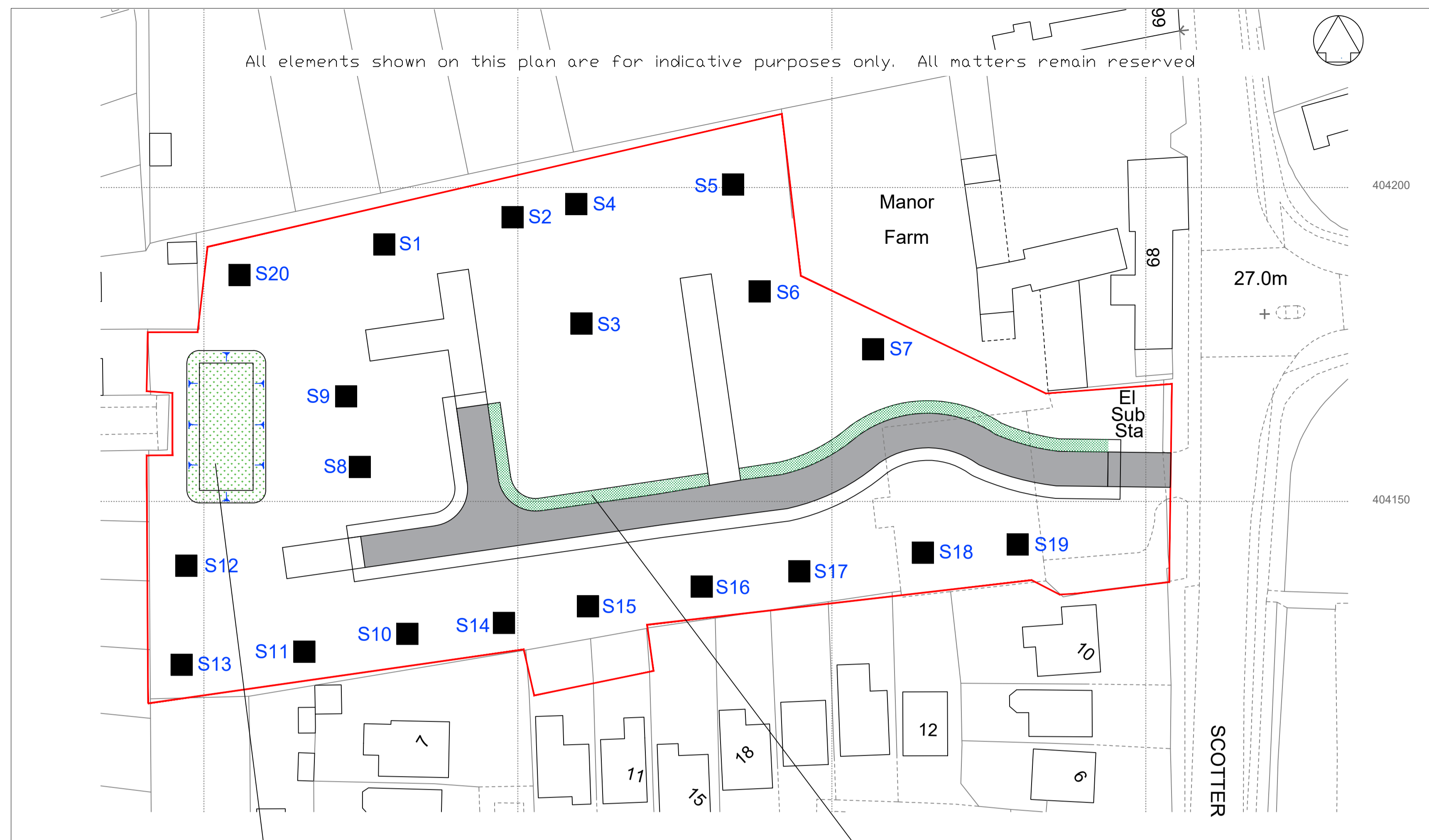
Exceedence Flows is exceptional events or due to blockage will be routed away from all properties.

- For exceptional events and storm water events up to 1:100 AEP +40% storm event the storm water will be contained underground into the attenuation provided.
- For storm events bigger than 1:100 AEP +40% excessive water will follow the topography of the site and will be routed away from all properties

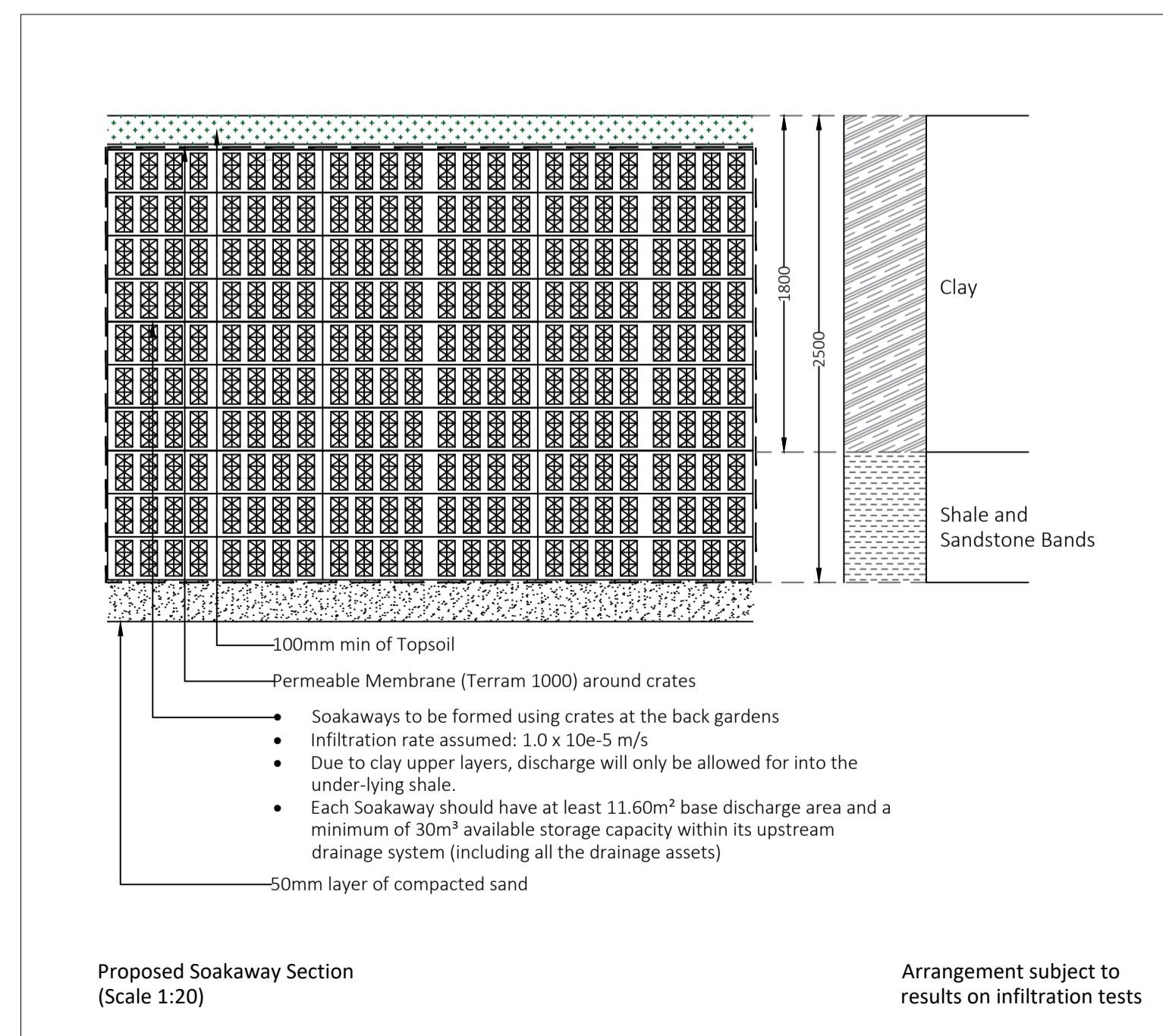
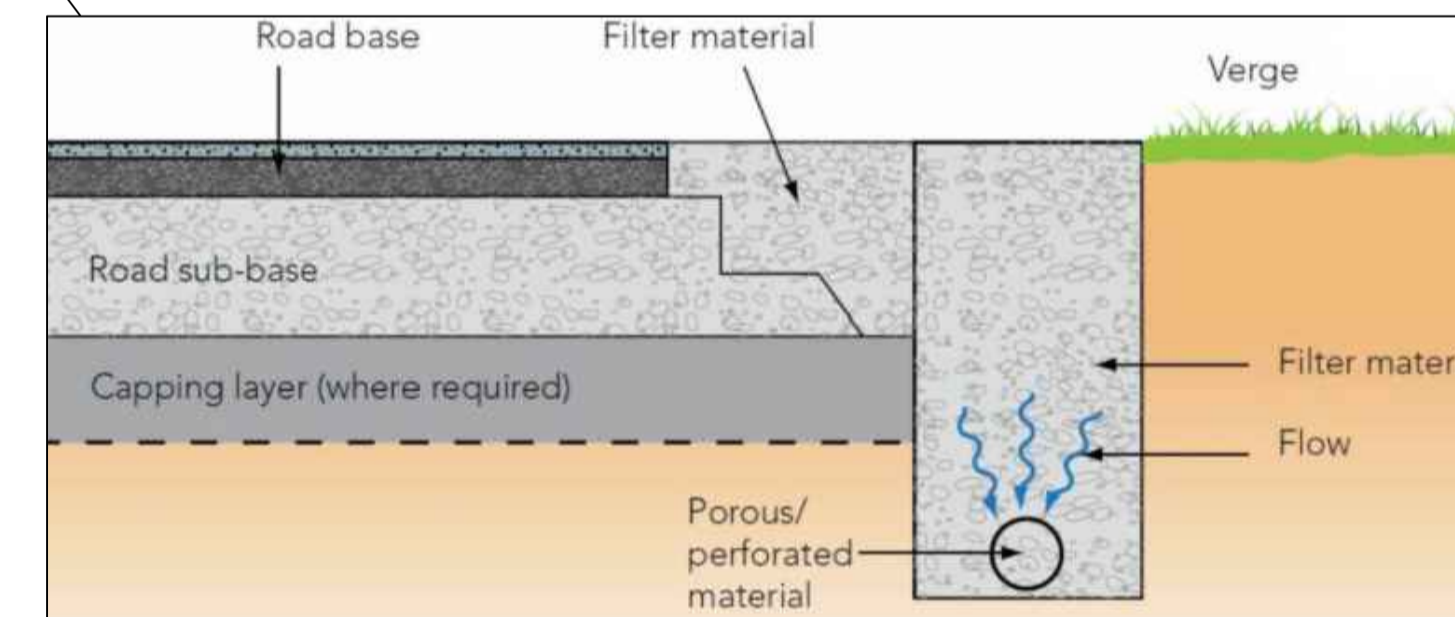
### Management & Maintenance

The maintenance activities listed below are considered to be the basic tasks necessary to keep the site drainage systems working at optimum efficiency, which is necessary to ensure that they have capacity to deal with extreme / unusual events. Other activities, such as litter removal / repairs etc. will also be required.

Area	Maintenance Activity	Frequency	Responsibility
Development Site Access Roads	Periodic sweeping to remove debris, leaves etc	Every 2-4 weeks during Autumn	Highways Authority
Foul Drainage	CCTV / Jetting of Sewers	Every 10-years	Anglian Water
	Repairs to sewers	As required	Anglian Water
Adoptable Road Drainage	Inspection and maintenance, gully cleaning etc.	As required	Highways Authority
'On-plot' Hard-surfacing & Drainage	Blockwork paved areas to be swept and de-weeded	As required during Spring and Summer months	Plot owners
	CCTV / Jetting of Sewers	Recommended every 10-years	Plot owners
Building Roof Drainage	Inspection of Manholes / Chambers	Recommended every 5-years	Plot owners
	Gutters to be cleared of debris	Recommended every 2-years	Plot owners
Building Foul Drainage	Cleaning of below ground pipework	Recommend every 10-years	Plot owners



Site Plan (Scale 1:500)  
 \*Road & Bioretention Basin shown is indicative  
 ■ Soakaways located at the Back-gardens  
 — Site Boundary



CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015  
 THE CONTRACTORS ATTENTION IS DRAWN TO THE ABNORMAL RISKS IDENTIFIED BELOW, ANNOTATED ON THE DRAWING AND EXPLAINED IN THE ASSOCIATED DESIGN RISK REGISTERS

LEGEND

- ⊘ YOU MUST NOT DO
- ⚠ HAZARD OR DANGER
- ⓘ YOU MUST DO
- ⚠ CAUTION

ABNORMAL RISKS IDENTIFIED:

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#### NOTES

1. Do not scale this drawing.
2. All dimensions are in millimetres unless stated otherwise.
3. This drawing to be read in conjunction with all other relevant drawings and specifications.
4. All proprietary items to be installed in strict compliance with manufacturers instructions and recommendations.

P2 Attenuation Lagoon position amended TBP 26-06-21

Rev Amendments Rev'd by Date

Client  
 Jackson Philips Asset Solutions

Project  
 Manor Farm  
 Scotter Road  
 Messingham

Title  
 Drainage Strategy

Job No 21121

Drawing No 21121-001 Rev P2

Status Preliminary

Scale As Stated Date 09-06-21

Project Engineer TBP Drawn By ZEK Checked By TBP Approved By



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