

**LAND EAST OF TOLL COTTAGE, LAKE
LANE, BARNHAM, WEST SUSSEX PO22
0AD**

**DRAINAGE MAINTENANCE AND
MANAGEMENT SCHEDULE**

Residential Development

Prepared on Behalf of

Seaward Properties

D1042

14 August 2018

DOCUMENT CONTROL

Project: Land East of Toll Cottage, Lake Lane, Barnham, West Sussex PO22 0AD
Drainage Maintenance and Management Schedule

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1 INTRODUCTION

- 1.1 This document details the principles concerning the effective long-term management of the surface water Sustainable Drainage Systems (SuDS) and their ongoing maintenance for the development at **Land East of Toll Cottage, Lake Lane, Barnham, West Sussex PO22 0AD**.
- 1.2 The purpose of this document is to set out the basis of the development's drainage maintenance requirements as well as to ensure that the Management Company who will be responsible for the development has a detailed programme in view of both inspection and maintenance. This is to ensure that the surface water drainage network can operate to its optimum level, as intended through its design. It is also intended that this document will assist in ensuring that the surface water drainage network is continually maintained for the lifetime of the development to prevent an increased risk of flooding both on and off site in accordance with the National Planning Policy Framework (NPPF).
- 1.3 The tasks detailed within this document are generic in relation to the SuDS applicable to the development and represent the **minimum** maintenance and inspection requirements. This is not to say, however, that additional tasks or varied maintenance frequencies may be instructed or implemented by the maintenance company as deemed appropriate. The specific maintenance needs of the SuDS implemented across the development should be monitored and maintenance schedules adjusted to suit the specific requirements of the development.
- 1.4 The SuDS implemented in relation to the development will initially be the responsibility of Seaward Properties Ltd (The Developer). Following installation and an initial period of operation (which is to be confirmed), an appointed Management Company will take over responsibility. An agreement is to be initiated by Seaward Properties Ltd. which will confirm when the maintenance agreement has been delivered with the Management Company and is in full operation. It is not until this time that the Management Company is responsible for maintaining the surface water drainage network including all associated SuDS components as detailed within this document.
- 1.5 All those responsible for maintenance should adhere to current Health and Safety Legislation enforced at the time of the work(s) being undertaken when carrying out the activities detailed within this document, with risk assessments being completed before any work commences.
- 1.6 Any third-party contractors employed by the Management Company shall carry out periodic maintenance of all SuDS in accordance with the schedules listed in this document. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within this document whereby the appropriate work is to be carried out.
- 1.7 The maintenance detailed in this document must be undertaken throughout the lifetime of the development. Failure to undertake this maintenance may result in the drainage system not operating as designed, increasing the risk of flooding.
- 1.8 Drawings detailing the design of the drainage system are referenced on **2015-D1042-002 Rev. E 'Engineering Layout'**.

2 BRIEF DESCRIPTION OF THE SURFACE WATER DRAINAGE SYSTEM

- 2.1 The below ground surface water drainage system at the site comprises a traditional piped system, connecting the dwellings into the permeable driveways and permeable shared access road via 8 No. diffuser units located within the sub-base layer of the driveway/road construction. The permeable paving system then allows rainwater and surface water run-off to percolate into the underlying soils via minimal infiltration. The permeable paving will serve as a self-draining surface – any water which falls directly onto this will be able to percolate through its construction, into the sub-base layer and into the underlying soils, whilst the rainwater pipes serving the roofs of the properties will also discharge to the sub-base in order to allow infiltration to occur. Owing to the potentially low rates of infiltration and the possible presence of high groundwater (which could saturate the available storage) a flow control device will allow surface water to discharge to the adjacent watercourse at a controlled rate of 5l/s, mimicking greenfield run-off rates.
- 2.2 The surface water drainage for the site will not be offered for adoption to the statutory sewerage undertaker.
- 2.3 The system operates entirely by gravity and does not rely on moving parts to remain operational.

3 BRIEF DESCRIPTION OF THE FOUL WATER DRAINAGE SYSTEM

- 3.1 The below ground foul water drainage system comprises of a traditional piped system, drained entirely by gravity to the public foul water sewer(s) located within Lake Lane via a new manhole connection, as accepted by Southern Water under a Section 106 agreement.
- 3.2 All parts of the foul water drainage system constructed in association with the development will remain private, with no elements being offered for adoption by the sewerage undertaker, Southern Water.
- 3.3 The system operates entirely by gravity and does not rely on any moving parts to remain operational.

4 RESPONSIBILITY FOR MAINTENANCE

- 4.1 In September 2014, the government published a consultation document on 'Delivering Sustainable Drainage Systems' which outlined several options, as detailed below;
- **Service Management Company** – These will manage public spaces on new developments and maintenance of sustainable drainage systems, funded by a binding annual fee paid by the owners/occupiers.
 - **Water and Sewerage Company** – A developer can build (or contribute to) a SuDS feature that the water and sewerage company will own, through an agreement. The maintenance costs are then funded through the surface water drainage element of household water bills. A water and sewerage company could also act as a service Management Company.
 - **Local Authority** – Some local authorities may take on the responsibility of maintaining SuDS as part of their wider public open space and amenity management function and/or where the SuDS benefit the wider community.
 - **Private Individuals** – Where SuDS elements are serving individual properties, it is reasonable to expect the owners/occupiers of the property to be responsible for maintenance. For low-maintenance SuDS features serving small numbers of properties, the maintenance responsibility can be agreed between the owners.
- 4.2 The communal road services and landscaped areas, including the SuDS drainage system of permeable carriageway will be the responsibility of a Management Company (following completion of the initial operational period).
- 4.3 When a home is purchased on the development the purchaser(s) will be required to enter into a legal agreement to bind all parties to co-operate with the responsibilities of that of the Management Company.
- 4.4 Each household on the development will be required to financially contribute equally for the upkeep of the shared facilities.
- 4.5 Where surface or foul water drainage benefits only that of the conveyed plot itself, the future maintenance of this drainage will be the responsibility of that household. This would be applicable to the permeable paving of private driveways. Whereby apparatus serve more than one property, the responsibility for maintenance will be shared between those plots.

5 MAINTENANCE REQUIREMENTS

5.1 Surface Water Drainage

Maintenance plays an important part in the long-term performance of a surface water drainage system and will be required to ensure that it remains fully operational.

Whilst the drainage system has been designed to operate with as little maintenance as possible, there are key operations that must regularly be undertaken to ensure that it remains in optimal condition.

Most of these tasks consist of 'general housekeeping' activities that should be undertaken for any drainage system, but with additional attention to the catchpits and permeable paving elements. These operations are summarised below together with recommended frequencies;

- Periodic desilting of catchpits, soakaways, gully sumps and channel drains. These should be emptied at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years. The desilting of these items is required to ensure that the system operates as designed, and reduces the risk of blockages which can impact upon the effectiveness and efficiency of the system
- Periodic jetting or rodding of pipework as required to clear blockages
- Gratings on any gullies and channel drains to be kept clear of debris
- Any manufacturer specific requirements for maintenance (i.e. for domestic sewage treatment plants) should be added to the periodic maintenance

5.2 Permeable Paving / Diffuser Units

The areas of permeable paving are designed to allow minimal infiltration of rainwater and surface water run-off through the joints in the block paving surface course and into the sub-base below. The water can then infiltrate into the underlying soils where these soils allow.

As part of the permeable paving system, diffuser units are also to be installed within the sub-base layers of the permeable paving construction. These diffuser units are small heavy-duty cellular units which allow more efficient discharge of surface water into the sub-base of the permeable paved areas.

The areas of permeable paving will require additional maintenance measures to ensure they operate as designed. Failure to carry out this maintenance could increase the risk of flooding. The additional measures are as follows;

- Periodic surface sweeping to reduce silt and debris accumulation. The permeable surfaces should be swept at least every 8 to 12 weeks with additional sweeping undertaken in the autumn to clear fallen leaves
- Removal/management of weed growth, as required. Typically, once or twice a year for regularly used areas

- Periodic silt removal from permeable surfaces as described by manufacturer. If any areas are showing signs of ponding, they shall be dealt with by raking out the joints and re-dressing. The entire surface shall be monitored and when there are signs of excessive siltation resulting in poor drainage over the whole area, the blocks shall be taken up and a replacement of bedding layer and geotextile shall be undertaken
- Re-dressing of joints on the block paving as required
- Catchpits upstream of diffuser units should be emptied and inspected on the same regime as all catchpits specified previously set out in this document

Owing to the potentially low infiltration rates of the underlying soils, the permeable paving structure will also provide an outfall to the existing watercourse network, courtesy of a flow control chamber, restricting the rate of discharge.

5.3 Hydrobrake (Flow Control Chamber)

A Hydrobrake flow control system is self-activating, relying on upstream hydraulic head to generate an air-filled vortex within the centre of the casing. Once the vortex is initiated water drains down through a small opening in the back of the device at the designed restricted flow rate.

The flow control device has two measures incase of emergency (i.e. blockage). The first is a door situated in the front of the unit itself, this can be operated from the surface by a release cable situated just under the manhole cover which closes under its own weight and does not require any mechanism to operate. The second is a high-level overflow pipe situated with the flow control manhole. Both measures allow the system to drain down freely, until the blockage can be cleared.

The Hydrobrake flow control chambers will require additional maintenance measures to ensure it operates as designed. The additional measures are as follow:

The sump within the flow control chamber should be monitored for build-up of silts and should be emptied as a minimum on the same regime as specified for catchpits previously within this document.

The drain down door located on the centre of the unit will require inspection and opening annually, to ensure it is operating as intended.

5.4 Ordinary Watercourse

An existing watercourse network existed within the bounds of the site prior to development, as well as abutting the site boundary. A section of the existing ditch and culvert which crossed the site has been 'grubbed up' and backfilled, with a new culvert and headwall arrangement constructed to the north-western extent of the development.

Each plot whereby the watercourse passes through its conveyed boundaries has Riparian responsibilities to ensure that the watercourse is clear of any debris, silt and general obstructions (including but not limited to branches, vegetation and other such foliage) as so not to negatively impact upon the ditch's flow and/or carrying capacity.

Buffer zones have been provided and rear gates to gardens have been installed to allow the occupant(s) to undertake their responsibilities as Riparian owners and ensure that the ditches remain clear of any obstructions and can be maintained as required.

A new culvert and headwall arrangement has been constructed on Lake Lane at the site access. It is important that these structures are also maintained and cleared of any silt and debris as so to remain operational as designed. The maintenance should be undertaken in view of these elements, as detailed below;

- Clearance to be undertaken as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years. The desilting of these items is required to ensure that the system operates as designed, and reduces the risk of blockages which can impact upon the effectiveness and efficiency of the system
- Periodic jetting or rodding of pipework as required to clear blockages

5.5 Remedial/Repair Actions

Significant storm events may cause considerable damage to SuDS. As such it may be necessary to inspect and carry out essential recovery works to return the feature to full working order.

Resetting of uneven blocks by lifting the block area, removing bedding material and relaying to match original design should be undertaken as required should damage occur.

5.6 Accidental Spillages

It is not envisaged that any materials which could cause major spills and potential pollution issues within the drainage system are to be stored on-site once the development has been completed.

If this situation alters in the future a specialist will be required to be contacted to confirm if any upgrades to the existing system are required.

Minor spillages of fuels and oils from motor vehicles will be dealt with by the permeable paving and deep trapped gullies, by bio-degrading/collecting the hydrocarbons respectively.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, the spillage should be isolated with the use of soil, turf or fabric with outlet pipes from chambers downstream of the spillage blocked with a bung/bungs.

The Environment Agency should then be contacted immediately on their incident hotline; **0800 80 70 60**.

5.7 Future Alterations to the Development

Any future alterations to the permeable paving should be confirmed by a specialist. Where possible any future services are to avoid being located through areas of permeable paving. If new services are required to run through areas of permeable paving, services should be installed below the permeable paving level with the permeable system reinstalled above.

6 CONTACT INFORMATION

6.1 For any concerns, refer to the following contacts:

Involvement	Developer
Contact Name	David West
Company Name and Address	Seaward Properties Ltd Metro House Northgate Chichester West Sussex PO19 1BE
Website	[REDACTED]
Email	[REDACTED]
Telephone	[REDACTED]
Involvement	Management Company
Contact Name	TBC
Company Name and Address	TBC
Website	TBC
Email	TBC
Telephone	TBC

- This drawing is to be read in conjunction with all other RGP drawings, and with all relevant Architect's and Engineer's drawings and specification. Any discrepancies found are to be reported immediately to the Engineer.
- RGP accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
- Do not scale. Work to figured dimensions only. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
- Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care whilst undertaking the works.
- All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
- The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. RGP logos and company information must be removed from copies if information is re-used.
- The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
- The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
- The contractor must comply with all current legislation relating to health & safety.
- All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any RGP drawings, the manufacturers instructions must be used.

DRAINAGE NOTES:

- All drainage works to be constructed in strict accordance with specification of the local authority, building regulations, sewers for adoption, BS8501 & BSEN 752-1.
- For location and setting out of building drainage points refer to architects drawings.
- All pipe runs near buildings to comply with the building regulations 2002 Part H1. Where a pipe is within 1m of a foundation the trench shall be filled with class GEN3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
- Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
- Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid with a concrete bed and surround.
- In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
- All private building drainage shall be constructed in strict accordance with BS8501 & BS5481, unless otherwise specified. Building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 = 1 in 40 x 1 in 80 for foul drains and 1 in 80 for surface water drains.
- All pipes, bends and junction for private building drainage shall be upvc conforming to BS4660 and BS5481 as appropriate and shall be laid in accordance with the manufacturer's specification.
- All gully connections other than at manholes to be 'Y' junctions. All road gully connections to be 150mm diameter.
- All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
- All connections to be soffit to soffit unless otherwise noted.
- All concrete and concrete products to be in accordance with BRE 363 for sulphates.
- The locations and sizes of all svps and rvps shall be cross referenced against the architects drawings during setting out.
- The precise depth and location and size of existing pipes or manholes where connections or diversion are proposed must be confirmed and reported to the engineer prior to commencement.
- All soakaways are to be located a minimum of 5m from any proposed or existing buildings.

SUPPORTING DRAWINGS:

Dwg No.	Dwg Title.
002	Engineering Layout
003	Surface Finishes & Vehicle Tracking
004	Construction Details Sht 1
005	Construction Details Sht 2
006	Construction Details Sht 3
007	Ordinary Watercourse Information

E	18/01/2017	Updated Architect's Layout	RAA	MJA
D	07/10/2016	Land drainage comments dated 07/10/16	RAA	MJA
C	30/09/2016	Land drainage comments dated 27/09/16	RAA	MJA
B	09/09/2016	New Architect's Layout	RAA	MJA
A	08/09/2016	Amendments based on email dated 02/09/16	RAA	MJA
-	23/08/2016	Original Issue	RAA	MJA

Rev.	Date	Amendments	Drawn	Appr.
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Transport Planning and Infrastructure Design Consultants
Metro House, Northgate, Chichester, West Sussex, PO19 1BE
Tel: 01243 410418 Fax: 01483 861682 www.rgp.co.uk

Client: **Seaward Properties Limited**

Project: **Land East of Toll Cottage, Lake Lane, Barnham, West Sussex, PO22 0AD**

Drawing Title: **Engineering Layout**

Scale	1:200	Drawn By	RAA	Checked By	MJA	Approved By	MJA
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Date	August 2016	Drawing No.	2015-D1042-002	Rev.	E
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