

Land at Cambridge Batch, Flax Bourton

Surface Water Drainage Maintenance & Management Plan

FLAX/MMP/01
Version 2
May 2023

Contents	page
1.0 Introduction	3
2.0 Existing Site Summary	4
3.0 Flood Risk Assessment	5
4.0 Proposed Surface Water Drainage Summary	6
5.0 Proposed Foul Water Drainage Summary	7
6.0 Drainage Management & Maintenance Plan	8
7.0 Management and Maintenance Requirements	9

Version Number	Date	Revision Details
1	February 2023	First Issue
2	May 2023	Permeable paving added to private drives. All surface water drainage to remain private.

1.0 INTRODUCTION

- 1.1. This document and the details contained within relate to a proposed residential development of 11 units by Strongvox Ltd at Land at Cambridge Batch, Flax Bourton.
- 1.2. A Drainage Strategy has been produced to accompany the planning application for this development (FLAX-C-300-1000 Drainage Strategy Plan).
- 1.3. This document sets out the principles for the long-term management and maintenance of the adoptable and private drainage and Sustainable Urban Drainage Systems (SuDS) that are to be installed on this development. The purpose of this document is to ensure that the management and maintenance of all foul drainage and surface water features follow a robust inspection and maintenance regime to ensure the optimum operational efficiency of the foul and surface water drainage network is maintained for the lifetime of the development. This regime will prevent the increased risk of flooding both on and off site in accordance with national and local policies.

This plan has been compiled utilising the minimum requirements set out in the CIRIA Report 753 The SuDS Manual and sets out specific sections and details including:

- A description of the generic SuDS component and its intended use.
- Maintenance requirements and frequencies.
- Inspection requirements and frequencies.

There are four categories of maintenance activities referred to in this report

1. Monitoring – Generally consisting of high frequency visual inspections of inlet/outlet structures, banksides, areas of ponding etc.
2. Regular Maintenance – Consisting of basic tasks undertaken on a frequent and predictable schedule including vegetation management, litter/debris removal and inspections.
3. Occasional Maintenance – Comprising tasks that are likely to be required periodically but much less frequent and predictable as routine tasks (sediment removal for example).
4. Remedial Actions – Comprises intermittent tasks which may be required to rectify faults identified with the system. These faults can be minimised by good design and high-quality workmanship during installation. Remedial work will generally result from site specific issues, therefore, the timings of these are difficult to predict.

This report is to be reviewed and adjusted if the drainage strategy evolves at detailed design stage from that provided in support of the reserved matters application. Specific maintenance needs of the SuDS features should be monitored, and the regime adjusted to suit site specific requirements and the evolution of the features over their lifespan

- 1.4. This document should be read in accordance with the very latest versions of the following drawings and documents:
 - FLAX-C-300-1000 Drainage Strategy Plan
 - FLAX_SWS_1 SW Sewer Calculations 1 in 1, 30 & 100 year plus 40%

2.0 EXISTING SITE SUMMARY

- 2.1. The site is located at Cambridge Batch Garage, off Weston Road in Flax Bourton, Bristol, has a total area of approximately 0.93 Hectares. The site is currently accessed from Weston Road to the south
- 2.2. The site currently comprises an active commercial area with a number of automotive commercial units, a car sales yard and a number of fuel pumps in the south (now disused), with an undeveloped wooded area in the west and northwest of the site.
- 2.3. The site is bounded to the north by agricultural fields with Land Yeo River beyond, to the east by residential property with agricultural fields beyond, to the south by Weston Road and to the west by residential properties with rifle range and agricultural fields beyond.
- 2.4. Based upon the latest Flood Zone Mapping issued by the Environment Agency (EA), the application site lies within Flood Zone 1.

3.0 FLOOD RISK ASSESSMENT

Requirements for a Flood Risk Assessment

3.1. The requirements for FRA are provided in the NPPF and associated PPG. Paragraph 163 of the NPPF (2019) requires that a site-specific FRA should be submitted with planning applications:

- for all sites greater than 1 ha in Flood Zone 1;
- for sites of any size within Flood Zones 2 or 3;
- in an area within Flood Zone 1 which has critical drainage problems;
- in an area within Flood Zone 1 which is identified in a strategic flood risk assessment as being at increased flood risk in the future; and/or
- an area within Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

3.2. The EA Flood Zones are defined as follows:

- Flood Zone 1 is defined as land with little or no flood risk (an annual exceedance probability [AEP] of flooding of less than 0.1%);
- Flood Zone 2 is defined as having a medium flood risk (an AEP of between 0.1% and 0.5% for tidal areas or 0.1% and 1.0% for rivers); and
- Flood Zone 3 is defined as high risk (with an AEP of greater than 0.5% for tidal areas or greater than 1.0% for rivers).

3.3. FRAs should describe and assess all flood risks (from rivers, the sea, surface water, reservoir, sewers and groundwater) to and from the development and demonstrate how they will be managed, including an evaluation of climate change effects.

Conclusion

3.4. As the total site area is less than 1 Hectare, is located in entirely in Flood Zone 1 and is not covered by the criteria set out in 3.1 above, a Flood Risk Assessment is not required.

4.0 PROPOSED SURFACE WATER DRAINAGE DESIGN SUMMARY

- 4.1. There are no existing adoptable surface water sewers located within the vicinity of the site.
- 4.2. There is an existing watercourse located to the north east of the site.
- 4.3. Limited infiltration testing was carried out on site as part of the ground investigation. Both tests failed. Further testing will be carried out following demolition of the existing buildings and site clearance to confirm whether infiltration is a viable means of drainage for the proposed development.
- 4.4. It is, therefore, proposed to drain all surface water runoff from the site into the existing watercourse to the north east.
- 4.5. The site has a total area of approximately 0.93 Hectares. The existing garage, buildings and hardstandings cover an area of approximately 0.49 Hectares (49%). Though there are existing drainage gullies and channels on site, there is no evidence of a positive outfall into the existing sewers or watercourse.
- 4.6. Greenfield runoff rates for a development with an impermeable area of 0.368 Ha have been calculated as follows:

Qbar	0.1 l/s
1 year	0.1 l/s
30 year	0.2 l/s
100 year	0.2 l/s
- 4.7. Subject to agreement with the LLFA, the maximum discharge rate from the site is to be restricted to 2.0 l/s for all events up to and including 1 in 100 year plus 40% climate change.
- 4.8. Attenuation is to be provided within oversized pipes within the road and cellular storage tanks located within private drives.
- 4.9. Private drives to be constructed in tanked permeable block paving. These will be for treatment of the runoff only and not as part of the attenuation
- 4.10. Discharge will be restricted using a Hydro Brake flow control or similar approved.
- 4.11. All surface water drainage for the site up to the point of outfall to the existing watercourse is to remain private.
- 4.12. Surface water drainage subject to detailed design. Invert levels may be adjusted during the detail design to accommodate private connections as required.
- 4.13. Agreement has been reached with the adjacent land owner for the proposed offsite sewers to be laid within their land.
- 4.14. Land Drainage Consent will be sought for the proposed outfall into the existing watercourse.

5.0 PROPOSED FOUL WATER DRAINAGE DESIGN SUMMARY

- 5.1. There are existing 100mm and 150mm diameter adoptable foul sewers located within the site boundary. These serve existing properties upstream of the site and are to be maintained/diverted as part of the development.
- 5.2. Wessex Water have advised that there is sufficient capacity within the existing foul network to serve the site.
- 5.3. Foul drainage subject to detailed design. Invert levels may be adjusted during the detail design to accommodate private connections as required.
- 5.4. All works for adoption under a Section 104 agreement shall be carried out to the latest approved DSG guidance and shall be in accordance with the Drainage Authority's requirements.

6.0 DRAINAGE MANAGEMENT AND MAINTENANCE PLAN

- 6.1. Surface water runoff from the site is to discharge into the existing watercourse to the north east.
- 6.2. The proposed surface water drainage system located within the roads and including the outfall to the existing watercourse, consisting of manholes, sewers, gullies, headwall and flow control are to remain private. The future maintenance responsibility will be that of the Management Company.
- 6.3. The proposed cellular storage will remain private and will be managed and maintained by a Management Company.
- 6.4. Surface water run-off from all private roof, driveway and parking areas will be collected in private drainage networks.
- 6.5. Located around the footprint of each house, these private drainage networks, together with the proposed rain gardens/bio-retention areas, will become the responsibility of the property owner. This is to be documented by way of insertion of a clause into the property deeds at the time of sale.
- 6.6. For the avoidance of doubt, no part of the development shall be connected to the attenuation features until the attenuation features have been completed and are operational to service that part.
- 6.7. Upon handover, the proposed Public Open Space shall be owned by a Resident's Management Company and maintained on their behalf by the Management Company (*to be confirmed*).

7.0 MANAGEMENT AND MAINTENANCE REQUIREMENTS

The maintenance requirement for the SuDS features listed in the previous chapter are outlined in the tables below.

Adoptable Foul Water Pipes and Manholes

Wessex Water will have their own maintenance schedules and plans for the adoptable pipes and manholes which will be designed to their specific requirements.

Until the Section 104 agreement is signed and liability transferred to Wessex Water (after the maintenance period and occupation thresholds are reached), the maintenance of the adoptable pipes and manholes will be the responsibility of Strongvox Homes.

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Regular Maintenance	Wessex Water	Inspect manholes for blockages of inlets and outlets and clear as necessary.	Every three months
		Jet through pipelines and carry out CCTV survey to check conditions	Every 12 months
Remedial Actions	Wessex Water	Reconstruct pipe lines and manholes	As required

Flow Control Device

The purpose of a flow control device is to restrict the flow from a drainage network to a specific design discharge rate. This typically leads to small orifices which are susceptible to blockage. To enable maintenance, each flow control device must be provided with suitable access.

Consideration must be given during design for how any device will be accessed allowing for where the operative may stand and where any debris could be temporarily placed.

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Monitoring	Management Company	Visual inspections of device and clear if required.	Monthly in first year and then annually
Regular Maintenance	Management Company	Inspect control chambers and remove litter, debris and rubbish.	Monthly.
		Remove debris from the upstream catchment	Monthly.
		Repair any damage to inlet/outlet structures.	As required
Occasional Maintenance	Management Company	Inspection of mechanical elements.	Annually.
Remedial Actions	Management Company	Full replacement of the controls if damaged or not performing as design.	As required

Cellular Storage

The cellular storage will be managed and maintained by a Management Company.

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Monitoring	Maintenance Company	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually

		Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
Regular Maintenance	Maintenance Company	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
		Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
		Remove sediment from pre-treatment structures and/or internal forebays	Annually or as required
Remedial Actions	Maintenance Company	Repair/rehabilitate inlets, outlet, overflows and vents	As required

Permeable Paving

The proposed permeable paving areas are to provide conveyance and treatment for private drives, parking areas and shared drives.

Private drives will be the responsibility of all dwellings using the driveway. Parking areas and Shared driveways will be managed and maintained by a Management Company.

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Regular Maintenance	Homeowners/ Management Company	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Homeowners/ Management Company	Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required - once per year on less frequently used pavements
Remedial Actions	Homeowners/ Management Company	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard	As required

		to users, and replace lost jointing material	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Homeowners/ Management Company	Initial inspection	Monthly for three months after installation
		Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three-monthly, 48 h after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually

Private Pipes and Manholes

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Regular Maintenance	Homeowners/ Management Company	Inspect manholes for blockages of inlets and outlets and clear as necessary.	Every three months
		Jet through pipelines and carry out CCTV survey to check conditions	Every 12 months
Remedial Actions	Homeowners/ Management Company	Reconstruct pipe lines and manholes	As required

Private Gullies

Maintenance Schedule	Responsibility	Required Action	Typical Frequency
Monitoring	Homeowners/ Management Company	Inspect silt traps and note rate of sediment accumulation.	Monthly in first six months then annually
		Inspect gully structure and grating.	Every three months for first year then annually
Regular Maintenance	Homeowners/ Management Company	Inspect for sediment and debris in sump	Annually
		Cleaning of any surface debris and inlet blockages	Every four months, including after autumn leaf fall, frequency subject to site specific conditions and should be adjusted accordingly
Occasional Maintenance	Homeowners/ Management Company	Remove sediment and debris from gully trap two years minimum)	As required, based on inspection (Every two years minimum)
Remedial Actions	Homeowners/ Management Company	Reconstruct gully	As required
		Replace/remediate damaged gully grating.	As required