Millstream Gardens, Eardisley

Cotswold Oak Ltd

Operations & Maintenance Manual

April 2023

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1 Introduction

1.1 Rappor has been appointed by Cotswold Oak Ltd to undertake an Operations and Maintenance Manual (O&M Manual) for Drainage components on a proposed residential development of 18 units and associated infrastructure at Millstream Gardens, Eardisley.

Scope of O&M Manual

1.2 This manual is intended to give an overview of the operation and maintenance for the range of SuDs features included with the drainage strategy and in relation to typical details only.

1.3 Where proprietary products are specified the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

1.4 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

Schedule of Components

1.5 The following **Table 1.1** contains a schedule of onsite drainage components and who is responsible for the operation and maintenance.

Component	Adoptable (S104)	Persons responsible for operation and maintenance
Manholes – Storm and Foul	No	Welsh Water
Pipes – Storm and Foul	No	Welsh Water
Attenuation Feature - Basin	No	Management Company – Andrews Leasehold
Pumping Station - Foul	No	Welsh Water

Table 1.1 Schedule of Onsite Components

1.6 For further information on the listed components refer to Rappor Drainage Strategy Drawing 22843-RAP-XX-XX-DR-C-3100 included in **Appendix A**.

1.7 The following sections of this report are for all components and intended for guidance only.

2 Pipework and Manholes

2.1 Pipes are the main conveyance across the site with the networks as shown on drainage strategy found at **Appendix A**.

2.2 Pipes are proprietary products, and the materials can vary across the site. As such where used the manufacturer's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the drainage specification.

Operation

2.3 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except during rainfall events. These have been designed to be self-cleansing where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

2.4 Access for maintenance is provided through access chambers, manholes, rodding plates and rodding eyes.

Inspection and Maintenance Regime

2.5 Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly thus exposing the development to a greater level of flood risk. Maintenance responsibility for the pipes should be placed with Welsh Water for public sewers, the Highway Authority (Herefordshire County Council) for highway drains, a resident's management company for any non-adopted drainage and SuDS features and their respective pipe connections, and the individual resident ('riparian owner') for private drains.

2.6 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols, as run-off is taken from potentially contaminated areas such as highways/parking areas.

2.7 **Table 2.1** outlines the maintenance requirements for pipework and manholes, as well as the typical frequency for these actions.

Maintenance Schedule	Required Action	Typical Frequency
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required
	If continued poor performance jet and CCTV survey poorly performing runs.	As required
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required if above does not improve performance
Monitoring	Initial inspection should be provided as post construction CCTV survey.	Monthly for three months after installation
	Inspect for evidence of poor operation via water level in chambers and if required, take remedial action	Three monthly, 48 hours after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 2.1 Maintenance Schedule for Pipework & Manholes

3 Attenuation Basin

3.1 Attenuation basins require regular maintenance to ensure continuing operation. Maintenance of Basins is relatively straightforward.

3.2 The basin is located in the central eastern area of the site, as indicated on the drainage strategy which can be found at **Appendix A**.

Inspection and Maintenance Regime

3.3 Regular inspection and maintenance is important for the effective operation of the systems. Maintenance responsibility for the basin and its surrounding area will be with the management company, Andrews Leasehold.

3.4 **Table 3.1** outlines the typical maintenance requirements for basins and adjoining structures, as well as the typical frequency for these actions.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut grass - public areas	Monthly (during growing season), or as required
	Cut grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required.
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from inlets, outlets and forebay	Annually, or as required.
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings (Note: tree maintenance is usually part of overall landscape management contract)	Every two years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required.	Every five years, or as required
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Table 3.1 Maintenance Schedule for Basin

4 Package Pump Station

4.1 Package Pump Stations require regular maintenance to ensure continuing operation. Maintenance of Pumping Stations is typically done by regular pumping station services and remedial actions post service, or as required.

4.2 There is one package pump station located on site serving the foul drainage system. The pump station is located in the central eastern area of the site, as indicated on the drainage strategy which can be found at **Appendix A**.

Operation

4.3 Pump stations are utilised when site drainage levels outfall at lower levels than the proposed connection points. They enable the utilisation of rising mains to direct pumped flows up to outfall. Rising Mains are designed to be self-cleansing with suitable pressure relief points where necessary, and break manholes prior to connection with existing drainage apparatus/outfall location.

4.4 Access for maintenance is provided via access covers on the pumping station chamber.

Inspection and Maintenance Regime

4.5 Regular inspection and maintenance is important for the effective operation of the systems. Maintenance responsibility for the package pumping stations and their surrounding area will be with Welsh Water.

4.6 **Table 4.1** outlines the typical maintenance requirements for package pumping stations and adjoining structures, as well as the typical frequency for these actions.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Visually inspect pumps for correct operation/damage	Annually (or as required)
	Assess motor/pump bearing condition	Annually (or as required)
	Check motor windings for continuity and insulation integrity	Annually (or as required)
	Check motor cables for wear and water ingress	Annually (or as required)
	Check level floats/ultrasonic head	Annually (or as required)
	Check condition/serviceability of pump lifting system	Annually (or as required)
	Check operation of isolation and reflux valves	Annually (or as required)
	Check condition of wet well, valve chamber and pipework	Annually (or as required)
	Check and adjust all pump controls where necessary	Annually (or as required)
	Check and test all safety/alarm facilities	Annually (or as required)
	Check earth loop resistance	Annually (or as required)
	Clean and remove potential items to cause pump blockages from pump chamber.	Annually (or as required)
Occasional Maintenance	Lift pump (s), clean and check pump data plate	Annually (or as required)
	Check pump volute for damage	Annually (or as required)
	Check impeller for debris and damage and unblock as required	Annually (or as required)
	Check wear ring (s) for damage	Annually (or as required)
	Remove oil drain plug and check oil for water ingress (where appropriate)	Annually (or as required)
	Refit oil drain plug with new “O” ring refill / replace oil (where appropriate)	Annually (or as required)
	Check and clean level floats/ultrasonic head	Annually (or as required)
	Check condition of wet well, valve chamber and pipework including access covers.	Annually (or as required)
Remedial Actions	Replace pump parts/pump	As required
	Replace Wet Well Pipe work	As required

Table 4.1 Maintenance Schedule for Package Pump Stations

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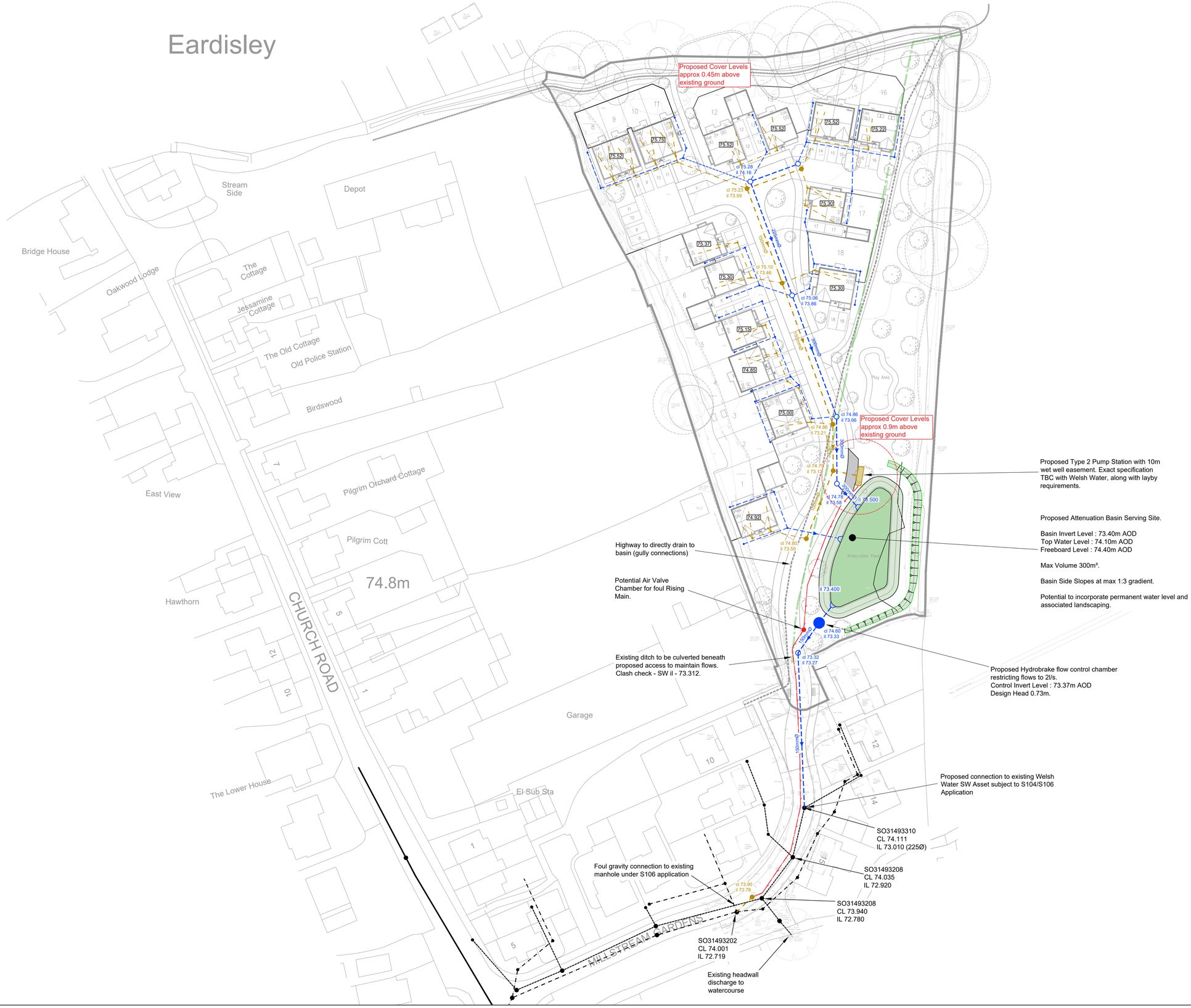
Appendix A – Drainage Strategy



Notes:

1. Scale for planning purposes only.
3. All adoptable drainage shall be in accordance with Sewers for Adoption 7th Edition and statutory undertakers requirements
4. All private drainage shall be in accordance with BS8301 and relevant sections of approved Document H of the building regulations
5. The contractor is to check the level of existing sewers being used as outfalls or crossing proposed drainage runs prior to laying any pipes. Any discrepancies are to be reported to the engineer
6. All connections for private drainage shall be 100mm unless noted otherwise. All connections when laid shall be plugged, protected as necessary and marked with a stake for future use.
7. For private drains where cover to pipes is less than 900mm in vehicular areas or 600mm in other areas protection in the form of Type "Z" bedding shall be used.
8. Where pipes pass through screen walls, footings or retaining walls lintels are to be provided over. Under buildings pipes shall be surrounded with 150mm thickness of granular material. Where drains pass within 1m of buildings the wall foundation shall be taken down below the invert of the pipe.
9. All gullies and rainwater downpipes connected directly to drains are to be roddable.
10. All drainage shall be laid upstream and each run between manholes shall be laid complete prior to backfilling. Where this is not practical trial holes or other means of identifying the line and level of services shall be carried out prior to works commencing.
11. Internal drainage to be laid at a minimum gradient of 1 in 40 in accordance with BS830
12. All gullies to be trapped.

Key:

- Redline Boundary
- 43.00 Contour Major (0.5m)
- Contour Minor (0.1m)
- Foul Water Sewer
- Foul Water Manhole
- Foul Water Rising Main
- Surface Water Sewer
- Surface Water Manhole
- Headwall
- Highway Gully and Connection
- Easement
- Exceedance Flow Route

Existing:

- Public (DCWW) Foul Water Sewer
- Public (DCWW) Surface Water Sewer
- Public Right of Way (PROW)

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