

Rustington Golf Centre, Angmering SuDS Maintenance Plan

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Issue	Issue date	Compiled	Checked
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1 Introduction and Ownership & Maintenance Responsibilities

- 1.1 This Plan sets out the framework for the management of the proposed sustainable drainage systems (SuDS) serving the Retail Unit and Driving Range Extension at Rustington Golf Centre.
- 1.2 The surface water from the roofs of the new retail building and the extended driving range will be routed to the existing network discharging west to the irrigation ponds. The discharge rate is limited via orifice flow controls, with attenuation storage provided in two distinct cellular attenuation tanks. A swale is provided for treatment prior to the connection to the pre-existing network. The drainage layout is included in Appendix A.
- 1.3 The drainage will remain under the ownership and responsibility of the Golf Club (Applicant).
- 1.4 The following sections show schedules detailing the maintenance requirements for each of the main drainage features. The Golf Club will undertake the inspections and maintenance activities in accordance with these schedules.
- 1.5 Additional reference has been made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).
- 1.6 This Plan is to be a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance of the drainage systems over time. Changes are to be agreed with the drainage authority (LFA) and recorded and dated in the Plan. A SuDS maintenance checklist is included in Appendix B.
- 1.7 Any performance issues should be raised in the first instance with the management of the Golf Centre. Should maintenance and/or remediation actions, as recommended within the schedule in this Plan, not be sufficient to restore normal performance, a suitably qualified civil engineer should be contacted for advice.
- 1.8 Important safety information is set out in the next section.

2 Health and Safety

- 2.1 All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:
- The Health and Safety at Work etc Act 1974
 - The Management of Health and Safety at Work Regulations 1999
 - The Workplace (Health, Safety and Welfare) Regulations 1992
- 2.2 The Golf Club is responsible for suitable risk assessment and management to ensure safe working conditions and practices. Measures to protect potential visitors also need to be considered.
- 2.3 Specialist contractors used should work to industry guidelines and be able to demonstrate safe working practices.
- 2.4 Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and policies implemented based on risk assessment.
- 2.5 Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.
- 2.6 Entry of pipes, chambers, tanks and culverts should be avoided. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.
- 2.7 For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

3 Schedule A – Sewers & Manholes

- 3.1 Regular inspection and maintenance is required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.
- 3.2 Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems.
- 3.3 The report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client & Management Company for future reference.
- 3.4 Operation and maintenance requirements for all sewers, manholes and gullies are described in the following table.

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly intervals.
	Hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems.	Monthly.
	Lift and inspect receiving manholes to check for any blockages.	Monthly.
Remedial Actions	Repair any damaged gratings.	As required.
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits during the survey.	10-yearly intervals.

- 3.5 Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements.

- 3.6 In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in 'Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.

4 Schedule B – Swale

- 4.1 **Function:** the swale is a conveyance feature, providing treatment of runoff and allowing smaller rainfall events to infiltrate into the ground. Surface water should flow free from obstruction from the inlet headwall to the outlet headwall – with a design longitudinal slope of 1 in 192.
- 4.2 **Risks:** Obstructions within the swale or at the outlet can lead to ponding within and around the swale, as the surface water can no longer be effectively conveyed to the downstream network. Accumulation of silts would reduce treatment and interception performance.
- 4.3 **Inspection Frequency and Maintenance Requirements:** as per table below.

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required
	Inspect inlets, outlets & overflows for blockages and clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record where water is ponding for > 48 hours	Monthly, or when required
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required or if bare soil is

		exposed over 10% or more of the swale treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or reseedling	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

5 Schedule C – Attenuation Tanks

- 5.1 Function: The tanks are designed offline to accommodate the 1 in 100-year storm (+45% climate change). They will fill up with water in larger storm, as flow is restricted through the control chambers (see Schedule D).
- 5.2 The tanks have been specified with an impermeable liner which functions both to hold the water, and to prevent groundwater ingress.
- 5.3 Risks: Reduction in performance would lead to surcharge of the upstream system, and flooding should available storage volumes be reduced.
- 5.4 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	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	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	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

6 Schedule D – Control Manholes/Orifice Chambers

6.1 Inspection Frequency: 6 months

6.2 Function: To restrict surface water flows

6.3 Risks: Should orifices become blocked, flooding of the upstream system and increased frequency of uncontrolled discharges are likely.

6.4 Maintenance Requirements: Open all control chambers every 6 months and check that each orifice plate is clean and free of debris. Clean out as necessary.

6.5 Carefully check for blockage at each of the orifice openings on the control chambers noted on the drainage layout. The sump to the control chambers should be free of silt and the orifice should be clearly seen and unobstructed.

7 Contamination or Dilution of Spillage

- 7.1 In the event of a spillage, it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

7.2 Environment Agency – Emergency Contact Number

In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is **0800 80 70 60** (Freephone 24hrs).

Appendix A

- DESIGN NOTES**
1. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 45 %.
 2. DRAIN POINTS AND LOCATIONS TO BE CONFIRMED BY ARCHITECT.
 3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.
 4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE. ANY DRAIN ROUTE THROUGH ROOT PROTECTION AREAS TO BE INSTALLED IN ACCORDANCE WITH ARBORICULTURAL SPECIALIST REQUIREMENTS.
 5. REFER TO DRAWING 1701-1702 FOR DETAILS

- GENERAL NOTES**
1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from not intrusive observations, record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gta prior to works commencing.
 2. Tender or billing drawings shall not be used for construction or the ordering of materials.
 3. Do not scale. All dimensions and levels to be site confirmed.
 4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements.
 5. Copyright: This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.
 6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly as the Clients risk. gta hold no responsibility for resulting abortive works or costs.
 7. Viewing this drawing as an AutoCAD file (.dwg) in digital format then it is done so with this disclaimer due to the fact that it can be altered and manipulated following its issue by GTA Civils & Transport and therefore any alteration or modification of DWG data file provided by GTA Civils & Transport, by you or a third party, without GTA Civils and Transport's express written approval is done so entirely at your own risk. Modification includes (but is not limited to) turning layers on and off, unfreezing layers and reloading, turning on and off print functions and unloading a vett.
 8. Your attention is also drawn to the fact that the information contained within this file may be subject to alteration at any time, pending technical approval from an approving authority or at the client's instruction. It is therefore strongly recommended that multiple and regular cross-checks are made against the current contract drawings. It is your responsibility to ensure that the correct issue or revision of the DWG data file is being used and requests for updated information made accordingly.
 9. Should any apparent discrepancies between the data contained within the DWG file and the current contract drawings become evident, it must be reported back to GTA Civils & Transport as soon as reasonably practicable. Precedence should be given to the current contract drawings (PDF) unless advised otherwise.

- SPECIFICATION NOTES**
- All drainage shall be constructed and commissioned in accordance with BS EN 205 & BS EN 252. Building Regulations Doc. H and any particular requirements of the Building Control Officer.
- Drainage pipelines shall be in PVC-u below ground as Markly or similar approved, or vitrified clay.
- All sewer pipelines to be VC only.
- This drawing shall be read in conjunction with all other relevant drainage drawings, architectural drawings and structural drawings.
- For manhole details, gully details, bedding etc., refer to gta detail sheets.
- All foul water drain runs shall have a fall of 1:40 or steeper, unless noted otherwise.
- All current used for concrete drainage installations shall be suitable resistant to class 3 of BRE Digest 363 (Grade ST5)
- The use of short radius or 90° bends for changes in direction is not permitted, only long or medium radius 45° bends shall be used. All junctions shall be 45°.
- All drains shall have granular bed and surround as class 'S' bedding, unless noted otherwise.
- All drainage works shall commence from the downstream end first unless agreed otherwise. Detail level to be checked by contractor prior to any works commencing and any discrepancy identified to engineer prior to laying and drainage.

- ABBREVIATIONS**
- | | |
|-------|---|
| FD | FULL DRAIN |
| SWD | SURFACE WATER DRAIN |
| FWS | ADOPTABLE FOWL WATER SEWER |
| SWS | ADOPTABLE SURFACE WATER SEWER |
| PH | MANHOLE |
| IC | INSPECTION CHAMBER |
| SA | SOAKAWAY |
| RIC | 450mm DIA. FOWL INSPECTION CHAMBER |
| SIC | 450mm DIA. SURFACE WATER INSPECTION CHAMBER |
| PAC | 300mm DIA. FOWL ACCESS CHAMBER |
| SAC | 300mm DIA. SURFACE WATER ACCESS CHAMBER |
| CT | CAST IRON |
| VC | VITRIFIED CLAY |
| C/VC | CONCRETE |
| PVC-U | POLY VINYL CHLORIDE - UNPLASTICISED |
| G | SMALL GULLY |
| VG | YARD GULLY |
| CPS | CURB PARK GULLY |
| DP | BELOW GROUND DRAIN POINT |
| SPP | SOIL VENT PIPE DROP |
| SP | STUB STACK OR DIRECT DRAIN CONNECTION |
| BP | EXTERNAL BROADCAST POINT |
| DT | SURFACE WATER DISTRIBUTION TANK |
| FL | FINISHED FLOOR LEVEL |
| SSL | STRUCTURAL SLAB LEVEL |
| QL | GROUND LEVEL |
| CL | COVER LEVEL |
| IL | INVERT LEVEL |
| SL | SUMP LEVEL |
| BL | BASE LEVEL |
| HL | HIGH LEVEL |
| RD | BACKDROP |
| CBS | CONCRETE BED & SURROUND |
| GBS | GRANULAR BED & SURROUND |
| CLS | CLASS 5 |

- KEY**
- Existing surface water drain
 - Private surface water drain
 - Private Surface Water Manhole
 - SIC 450mm Plastic Inspection Chamber
 - PAC 300mm diameter Surface Water Access Chamber
 - RP+ Rodding point
 - RFP+ Rod Protection Area (RPA)
 - Surface Water Flood Risk - 1 in 30yr
 - Surface Water Flood Risk - 1 in 100yr
 - Surface Water Flood Risk - 1 in 1000yr
 - OVERLAIN FLOW DIRECTION

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Drawing Number	13361/1101		Rev: P4

Appendix B

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Appendix B: Maintenance inspection checklist



Table B.25 SuDS maintenance inspection checklist			
General information			
Site ID			
Site location and co-ordinates (GIS if appropriate)			
Elements forming the SuDS scheme		Approved drawing reference(s)	
Inspection frequency		Approved specification reference	
Type of development		Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)	

Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
General inspection items								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?								

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Silt/sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)?)								
Does permeable or porous surfacing require sweeping to remove silt?								
System blockages and litter build-up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Vegetation								
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)								
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required								
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (eg wheel ruts?)								

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Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow controls?								
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
Other observations								
Information appended (eg photos)								
Suitability of current maintenance regime								
Continue as current Increase maintenance Decrease maintenance								
Next inspection								
Proposed date for next inspection								