

Stanton Yard, Havant, Portsmouth

SuDS Drainage Operations and Maintenance Manual

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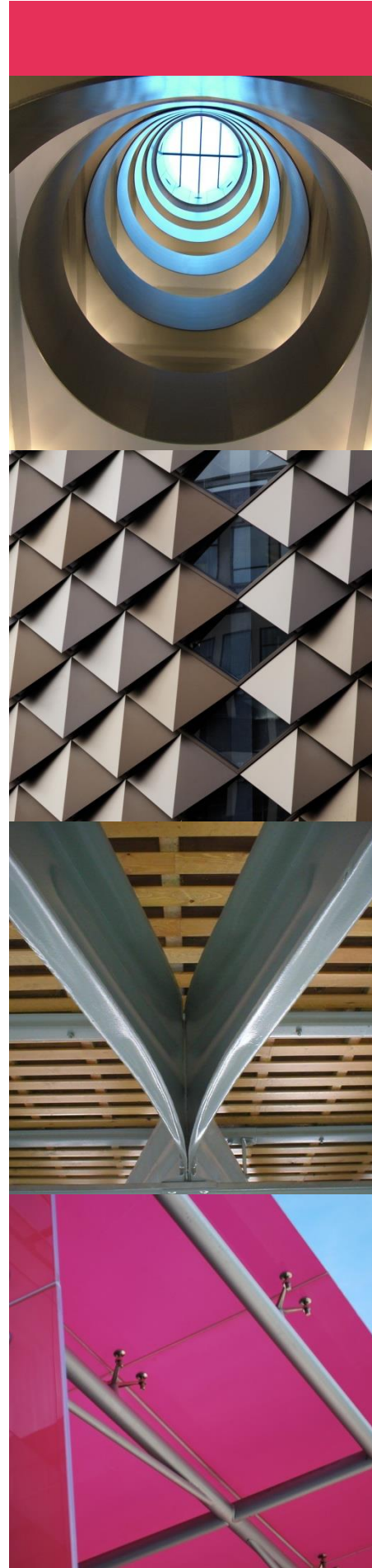
Client Address: Wilford House, 1 Clifton Lane, Wilford, Nottingham, NG11 7AT

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Curtins
2 The Wharf, Bridge Street,
Birmingham, B1 2JS
Tel: 0121 643 4694
www.curtins.com

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Author	Signature	Date
Alicja Smolen BSc (Hons) Project Engineer		13/05/19

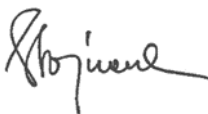
Reviewed	Signature	Date
Ania Wojnowska BSc (Hons) Principal Engineer		13//05/19



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Appendices

Appendix A

Drainage Plan Layout

1.0 Introduction

1.1 Project Background

Stanton Yard is a proposed development located within the north-western area of Havant Borough, east of the A3(M) and south of Purbrook Way.

The purpose of this document is to provide a SuDS Drainage Operations and Maintenance Manual for the proposed development of the Stanton Yard. Particular reference is paid to the inspection, aftercare and maintenance of SuDS drainage features as part of this manual to demonstrate to the LLFA or adopting authority the effectiveness and longevity of the SuDS features designed within the scheme as opposed to the standard Building Regulations local and domestic drainage and/or the main discharge drainage connections to 'Sewers for Adoption' standards.

This report is based on current best practice guidance.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design, and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.2 Scope of O&M Manual

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. 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.

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.

2.0 Flow Control Units

2.1 Location and Description

The location of the flow control unit is indicated on Curtin's Drainage Plan Layout, please refer to **Appendix A**. The flow control device is specified as Hydro-brake or similar approved and is a proprietary product; therefore, the manufacturer's recommendations should also be taken in to consideration.

2.2 Operation

The Hydro-brake is intended to be the surface water flow control feature to reduce the discharge from the site including the 100-year plus 40% climate change event.

2.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the flow control unit. Being part of private drainage, whole life cycle maintenance of the flow control unit shall be the responsibility of the owners of the Stanton Yard Development.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance/inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Six months
	Remove sediment and debris from flow control chambers.	Annually (or as required after heavy rainfall events).
Remedial actions	Repair/rehabilitation of inlets.	As required.

The design life expectancy of flow control unit is as per manufacturer specification. Once the unit has passed its design life, it may require replacement to original specification. This should only be

undertaken if performance is deemed unsatisfactory following detailed inspection and remedial maintenance regime.

3.0 Attenuation Tank

3.1 Location and Description

The location of the attenuation tank is indicated on Curtin's Drainage Plan Layout, please refer to **Appendix A**.

3.2 Operation

The attenuation tank is intended to be the surface water storage feature for Drainage Plan Layout, to attenuate the discharge from the site including the 100-year plus 40% climate change event. The tank is intended to be empty between rainfall events. Access for maintenance has been provided from the manhole chambers upstream and downstream of the tank. The tank has been located within the lanes of the car park specifically to provide convenient access during maintenance.

3.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the attenuation tank. The catchpit immediately upstream of the attenuation tank should be cleansed of silt annually to prevent silt from entering the tank. Being part of private drainage, whole life cycle maintenance of the drainage scheme shall be the responsibility of the owners of the Stanton Yard Development.

The following Inspection instructions were taken from the AQUACELL Brochure, and are specifically for AQUACELL Cellular Tanks only:

'Inspection and maintenance

CCTV inspection at every inspection point is recommended:

- ❖ ***after every major storm***
- ❖ ***at regular intervals according to the specific maintenance plan for the site***

Silt traps prior to inlet pipework should be routinely inspected and cleaned out to minimise debris reaching the tank. It is important to prevent construction silt from entering the AquaCell structure.'

Regular Maintenance	
Monthly	- Inspect and identify any areas that are not operating correctly. If required, take remedial action. (for 3 months following installation) - Debris removal from catchment surface (where may cause risks to performance) - Inspect systems as specified by the manufacturer - Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.
Sixth Monthly	Inspect and identify any areas that are not operating correctly. If required, take remedial action. (following initial 3-month period)
Annually	- Remove sediment from pre-treatment structures (e.g. upstream silt traps or Vortex flow control upstream) and geo-cellular system where required (High pressure water jetting) - Inspect and document the presence of wildlife
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, many actions may be required following such events	
Following all significant storm events	Inspect and carry out essential recovery works to return the feature to full working order

The design life expectancy of attenuation tank is as per manufacturer specification. Once the attenuation tank has passed its design life, it may require replacement to original specification. This should only be undertaken if performance is deemed unsatisfactory following detailed inspection and remedial maintenance regime.

4.0 Permeable Block Paving

4.1 Location and Description

The location of permeable paving is indicated on Curtin's Drainage Plan Layout, please refer to **Appendix A**.

4.2 Operation

Permeable Pavement is intended to be the surface water storage feature to attenuate the discharge from the site including the 100-year plus 40% climate change event.

4.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the permeable paving. Being part of private drainage, whole life cycle maintenance of the drainage scheme shall be the responsibility of the owners of the Stanton Yard Development.

Regular Maintenance	
Monthly	- Refer to manufacturers specifications - For sealed systems, inspection of outfalls should be undertaken
Six Monthly	Brushing and vacuuming to manufacturer requirements. Re-grit where necessary after brushing.
Annually	N/A
As Required	- Inspect/check all inlets, outlets, inspection chambers, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required (for 3 months following installation). - Removal of weeds where required - Stabilizing and mowing of contributing areas where required.
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events.	
Following all significant storm events	Inspect and carry out essential recovery works to return the feature to full working order.

Life expectancy of porous block paving is estimated to be 20-25 years after which the pavement should be fully replaced to the original specification or equivalent including attenuation sub-base depth.

5.0 Filter Drain

5.1 Location and Description

The location of permeable paving is indicated on Curtin's Drainage Plan Layout, please refer to **Appendix A**.

5.2 Operation

The filter drains are intended to be surface water conveyance, water quality and attenuation storage features for the proposed footpaths on site. These features are intended to be dry except during rainfall events.

The surface water should permeate through the upper layer of the feature in to the permeable stone below. The water is then collected and conveyed in the perforated pipe within the aggregate trench.

Access for maintenance has been provided through inspection chambers.

5.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the features. Maintenance responsibility for the feature and their surrounding area should be placed with the client's wider site maintenance team.

Sediment\material removal should be undertaken in consultation with the guidance provided by environmental regulator.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect feature surface to identify evidence of erosion, compaction, ponding, sedimentation and contamination	Half yearly and after large storms.
	Check feature surface for even gradients	Half yearly
	Inspect chambers for evidence of clogging	Half yearly.

	Inspect silt accumulation rates and establish appropriate removal frequencies.	Half yearly.
Regular maintenance\inspection	Litter and debris removal	Monthly or as required
	Grass cutting (to maintain grass height within landscape architect's specified design range)	To be confirmed by Landscape Architect [Monthly (during growing season) or as required]
	Manage other vegetation and remove nuisance plants/dead growth.	Monthly (at start, then as required).
	Remove sediment from main channel.	Annually (or as required after heavy rainfall events)
Occasional maintenance	Re-seed areas of poor vegetation growth (seed mix to landscape architect's specification).	Annually, or as required. As per landscape architect's specification
Remedial actions	Repair of erosion or other damage by re-seeding or re-turfing. Soil reinforcement such as coir matting should be used and staked in accordance with manufacturer's instructions.	As required.
	Realignment of flow channel surface.	As required.
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required.
	Re-level uneven surfaces and reinstate design levels. This may be required as part of sediment removal.	As required.
	Replace geotextiles and clean and replace filter media, if clogging occurs. Terram 1000 typical design life is 25 years.	As required.

	Excavate trench walls to expose clean soils if infiltration performance reduces to unacceptable levels	As required.
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The design life expectancy of filter drain is approximately 20 years after which the filter drain may require full replacement to original specification. This should only be undertaken if performance is deemed unsatisfactory following detailed inspection and remedial maintenance regime.

6.0 Appendices

Appendix A



GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- THIS DRAWING MAY BE ONLY BE SCALED FOR PLANNING PURPOSES. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED/VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING.

TO BE READ IN CONJUNCTION WITH THE DRAWINGS:
-068960-CUR-00-XX-DR-C-91001- PROPOSED LEVELS DESIGN
-4231-AL-(0)110-PROPOSED GROUND FLOOR PLAN BY HOLMES MILLER ARCHITECTS

KEY:

- PROPOSED SURFACE WATER DRAIN AND MANHOLE / INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAIN AND MANHOLE / INSPECTION CHAMBER
- PROPOSED FOUL WATER DOWN PIPE
- PROPOSED RAIN WATER PIPES
- PROPOSED SURFACE WATER GULLY
- PROPOSED SURFACE WATER LINEAR CHANNEL DRAIN
- PROPOSED SURFACE WATER DISHED CHANNEL
- PROPOSED SURFACE WATER FILTER DRAIN
- PROPOSED PERMEABLE CAR PARKING BAY
- PROPOSED SURFACE WATER ATTENUATION
- EXISTING PUBLIC COMBINED WATER SEWER
- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER

DESIGN NOTES:

- DRAINAGE DESIGN BASED ON SPATIAL DIMENSIONS SURVEY INFORMATION - 18154_01 - TOPOGRAPHICAL SURVEY, FROM MAY 2018. LEVELS AND USE OF THE EXISTING SEWERS TO BE CONFIRMED BY THE CONTRACTOR VIA CCTV SURVEY. SURFACE AND FOUL WATER PIPES TO BE SURVEYED UP TO PUBLIC MH650 AND MH6502 AS PER SOUTHERN WATER SEWER RECORDS.
- AREA NOT COVERED BY AVAILABLE TOPOGRAPHICAL SURVEY. EXISTING LEVELS ASSUMED AND ARE SUBJECT TO CONFIRMATION VIA AN ADDITIONAL SURVEY. ANY DISCREPANCIES BETWEEN THE EXISTING AND ASSUMED LEVELS MAY AFFECT THE FINAL DESIGN.
- FOUL WATER POP UPS LOCATION INDICATIVE ONLY - TO BE CONFIRMED BY M&E ENGINEER.
- RWP LOCATIONS INDICATIVE ONLY - TO BE CONFIRMED BY THE ARCHITECT. SLOPES AND LEVELS TO BE FURTHER COORDINATED WITH ARCHITECT TO SUIT DRAINAGE PROPOSAL.
- CONNECTION TO THE PUBLIC SEWER SUBJECT TO AGREEMENT WITH SOUTHERN WATER.
- SURFACE WATER DESIGN HAS BEEN BASED ON 100 YEAR STORM EVENT + 30% CLIMATE CHANGE.
- ATTENUATION VOLUME: UNDER PERMEABLE PAVING - 31.4m³. TOTAL SITE ATTENUATION - 163.5m³.
- DRAINAGE CONSTRUCTION WITHIN THE TREE ROOT PROTECTION AREAS TO BE CONFIRMED BY AN ARBORICULTURIST.
- INFILTRATION DEEMED UNVIABLE DUE TO GROUND CONDITIONS AS PER FOUR SITE REPORT - 068960-CUR-20-XX-RP-S-0001-V01_ENGINEERING SITE DUE DILIGENCE PROVIDED BY CURTINS IN JUNE 2018.
- DISCHARGE RATE OF 5/s IS APPROVED BY SOUTHERN WATER.
- ALL LEVELS ARE IN METERS ABOVE ORDNANCE DATUM.
- SOUTHERN WATER CONFIRMED 5/s SURFACE WATER RUNOFF DISCHARGE FROM THIS SITE, THEREFORE THE DISCHARGE RATE FROM THIS SITE SHOULD NOT BE HIGHER THAN 5 L/S FOR 1 IN 100 PLUS 40%CC.

NOTE:
FURTHER COORDINATION REQUIRED:
1. THE EXISTING DRAINAGE CONNECTION TO THE PUBLIC SOUTHERN WATER SEWER INDICATED ON THE SEWER RECORDS TO BE SURVEYED TO CONFIRM THE SURFACE AND FOUL WATER DISCHARGE POINTS.
2. ARBORICULTURIST TO CONFIRM THE DRAINAGE CONSTRUCTION WITHIN THE TREE ROOT PROTECTION ZONES.

P04	AMENDED TO SUIT PLANNING COMMENTS	13.05.19	AS	ID
P03	AMENDED AS CLOUDED	25.09.18	AS	ID
P02	PROPOSED POINT OF CONNECTION NOTE AMENDED. ISSUED FOR PLANNING	28.08.18	AS	ID
P01	ISSUED FOR PLANNING	24.08.18	AS	ID
Rev:	Description:	Date:	By:	Chkd:



Office
Telephone 0115 941 5551
Email info@curtins.com
Web www.curtins.com

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Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kent • Leeds • Liverpool • London • Manchester • Nottingham

Status:

PLANNING

Project:

STANTON YARD,
HAVANT, PORTSMOUTH

Orig Title:

DRAINAGE STRATEGY

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
1:250	A1	24.08.18	AS	AS	ID
Scale:					
Project Code:	Originator:	Zone:	Level:	Type:	Discipline: Category / Number: Rev:

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Our Locations

Birmingham

2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol

Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cambridge

50 Cambridge Place
Cambridge
CB2 1NS
T. 01223 631 799
cambridge@curtins.com

Cardiff

3 Cwrt-y-Parc
Earlwood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas

Varley House
29-31 Duke Street
Douglas
Isle of Man
IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Dublin

39 Fitzwilliam Square
Dublin 2
Ireland
T. 00353 1 507 9447
dublin@curtins.com

Edinburgh

1a Belford Road
Edinburgh
EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Glasgow

Queens House
29 St Vincent Place
Glasgow
G1 2DT
T. 0141 319 8777
glasgow@curtins.com

Kendal

28 Lowther Street
Kendal
Cumbria
LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds

Rose Wharf
Ground Floor
Leeds
L29 8EE
T. 0113 274 8509
leeds@curtins.com

Liverpool

Curtin House
Columbus Quay
Riverside Drive
Liverpool
L3 4DB
T. 0151 726 2000
liverpool@curtins.com

London

40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester

Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham

56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com