

**PROPOSED RESIDENTIAL DEVELOPMENT
LAND AT QUEEN VICTORIA HOSPITAL
HOLTYE ROAD
EAST GRINSTEAD
WEST SUSSEX
RH19 3DZ**

FLOOD RISK ASSESSMENT & DEVELOPMENT DRAINAGE STRATEGY

MACAR DEVELOPMENTS

**REV B
DECEMBER 2025**
REF: SS/24/0802/7252



DOCUMENT CONTROL RECORD

Document Control:

	<i>Name and Position</i>	<i>Signature</i>	<i>Date</i>
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Document Issue:

Rev	Date	Issue Status	Prepared by	Checked by
-	31.10.24	First Issue for comment	S. Smith	C. Pendle
A	29.01.25	Updated drainage design and water quality assessment	S. Smith	C. Pendle
B	16.12.25	Updated drainage design	C. Pendle	C. Pendle



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REFERENCES

Environment Agency Flood Map Information © and database right www.environment_agency.gov.uk

Technical Guidance to the National Planning Policy Framework - NPPF (2012)
Department for Communities and Local Government ISBN: 978-1-4098-3410-6

Contains British Geological Survey materials © NERC (2014)

West Sussex County Council Preliminary Flood Risk Assessment (PRFA) (May 2011).

Mid Sussex District Council Level 1 SFRA Final Report (JBA, June 2015)

1 Introduction

1.1 Scope

Macar Developments is seeking planning permission for the construction of 36No. residential dwellings including access, parking and landscaping at land at Queen Victoria Hospital in East Grinstead, West Sussex.

1.2 A previous application for the site was granted planning permission for 30No. units in February 2024. Mid Sussex District Council referenced this application by Brookworth Homes as DM/21/1842.

1.2 MJA Consulting has been appointed to undertake a Flood Risk Assessment and Development Drainage Strategy to determine the potential flood risks associated with the site and to provide a suitable strategy for the disposal of surface and foul water from the proposed development.

1.3 Report Structure

The National Planning Policy Framework (NPPF) and the Flood Risk and Coastal Planning Practice Guidance (PPG) are the current guidance on development and flood risk in England and Wales. The flood risk technical guidance for the National Planning Policy Framework requires a Flood Risk Assessment (FRA) to be carried out on all sites over 1ha or within flood zone 2/3 to consider all potential forms of flooding to both the development site and to offsite parties and land.

1.4 This report will take the structure of a 'Flood Risk Assessment' in accordance with the National Planning Policy Framework (NPPF), the Flood Risk and Coastal Planning Practice Guidance, Environment Agency's Flood Risk Assessment Guidance and CIRIA Report 624 'Development and Flood Risk'.

1.5 The objective of this report is:

- To confirm whether the site is affected by a current or anticipated future risk of flooding from all sources for the lifetime of the development.
- To confirm that this development will not increase the risk of flooding to any offsite properties and land.
- To undertake calculations to establish the foul and surface water runoff rates from the existing site and to assess the potential foul and surface water runoff from the proposed development.
- To detail a suitable strategy for the management of foul and surface water generated from the proposed development allowing for future climate change.
- To satisfy the approving planning authority that the most sustainable foul and surface water drainage solutions have been considered, in line with Environment Agency guidance, The Building Regulations (Document H 2002) and government legislation such as the Flood and Water Management Act 2010 (Defra) and The National Planning Policy Framework (NPPF & PPG).

2 The Development Site

2.1 The application site is centred on National Grid Reference TQ 39701 39315 and is situated to the northeast of East Grinstead within the grounds of the Queen Victoria Hospital. The 1.7ha greenfield site is currently comprised of heavy woodland and vegetation separated by a single track running through the middle of the site. A large pond is present to the south of the site, potentially associated with historic quarrying activities in the area. No buildings are present within the site.

2.3 Topography

The existing site is relatively flat across most of its extent but falls from south to north with levels ranging from 124.0 to 116.5mAOD.

2.4 Geology

Information published by the British Geological Survey (BGS), indicates that the site is anticipated to be underlain by the Grinstead Clay Member overlaying the Ardingly Sandstone Member at depth. No superficial deposits are indicated to be present.

2.5 An intrusive site investigation carried out by BRD Environmental Ltd (Phase 2 Geo-Environmental Site Investigation Queen Victoria Hospital, East Grinstead BRD3591-OR2-A East Grinstead, January 2020) confirms the presence of Topsoil and Made Ground overlying the Grinstead Clay Member to a depth of circa 10mBGL, which in turn overlies the Ardingly Sandstone Member at depth.

2.7 Groundwater, Hydrogeology and Hydrology

The onsite investigations did not encounter groundwater to depths of circa 5mBGL.

2.8 The Grinstead Clay Member is classified as an 'unproductive' aquifer with very low groundwater vulnerability. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

2.9 The Environment Agency has classified the site as not being located within a Groundwater Source Protection Zone for groundwater abstractions.

2.10 It would be expected that groundwater is confined to the Ardingly Sandstone Member at depth, with the hydraulic flow of groundwater beneath the site consistent with the local surface topography, with flows generally in a northerly direction.

2.11 No drainage ditches or formal watercourses have been identified at or within the immediate vicinity of the site. The nearest formal watercourse is located 150m north of the site. This ditch flows in a westerly direction where it is culverted under the railway embankment. This ditch continues in a northerly direction where it joins the Eden Brook approximately 4km north of the site.

2.12 The site is within the immediate hydrological catchment of the Eden Brook, a tributary of the River Eden, (Kent).

2.13 Existing site drainage characteristics

The site in its current woodland state drains to the pond in the south of the site as well as to the northern boundary.

- 2.14 The greenfield site primarily comprises vegetated covered woodland and as such rainfall that lands on this site firstly infiltrates directly at source into the unsaturated layer of topsoils and head deposits. It would be expected that the underlying and relatively impervious clay soils to limit infiltration further into the bedrock. When the capacity of the upper soils is exceeded and can no longer accept further rainfall, temporary areas of ponding and overland surface water runoff may occur.

- 2.15 Due to the impermeable nature of the soils at this site, the SPR rate (standard percentage runoff) and the rate and volume of greenfield runoff from the site is expected to be relatively high.

2.16 Soil Permeability and Infiltration SuDS

Infiltration testing has not been carried out at the site due to the relatively impermeable Grinstead Clay geology. Infiltration is unlikely to be a feasible strategy for managing surface water runoff from the proposed development.

- 2.17 Groundwater was not encountered during exploratory holes as part of the site investigation.

Figure 1: Site Location



Image courtesy of: @2025 Microsoft Corporation Image courtesy of Ordnance Survey

Figure 2: Development site boundary



Image courtesy of: Map data @2025 Microsoft Corporation

3 Flood Risk Assessment

3.1 A Flood Risk Assessment requires that an evaluation of all potential forms of flood risk to the site are considered. In accordance with the Environment Agency's Flood Risk Assessment Guidance, NPPF, PPG and CIRIA Report 624, sources of flooding to be assessed include tidal, fluvial (rivers, streams and watercourses), pluvial (overland rainfall runoff), groundwater, artificial sources (canals and reservoirs) and existing/proposed sewerage and water mains infrastructure.

3.2 History of Flooding

The primary sources of data for flood risk and recorded incidents of flooding for this site are as follows:

- West Sussex County Council Preliminary Flood Risk Assessment (PRFA) (May 2011).
- Mid Sussex District Council Level 1 SFRA (JBA, June 2015)

3.3 Additional information has been obtained from the Environment Agency (historic flood extents map), British Society Chronology of Extreme Hydrological Events, and local news and media archives.

3.4 Within the PRFS/SFRA studies, consultation was carried out with all relevant authorities and organisations including the Environment Agency, Southern Water, West Sussex County Council, Mid Sussex District Council, and local community stakeholders to identify known or perceived problem areas with respect to flooding.

3.5 Within the context of the site, the information presented within the SFRA and all other applicable resources has concluded that there is no historic flooding to the site from the following sources:

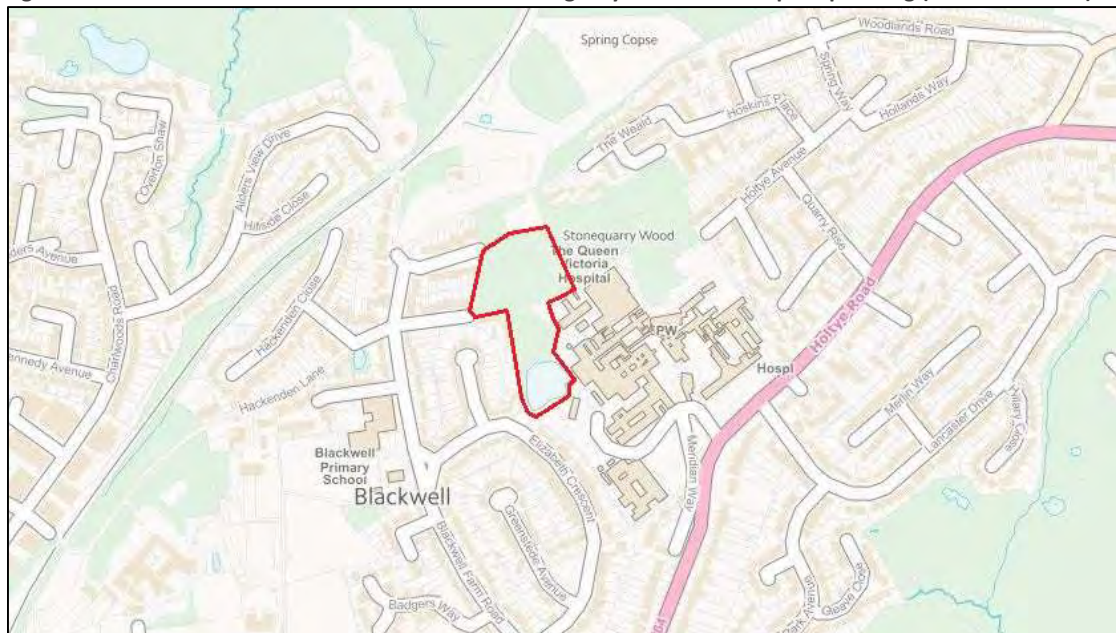
- Tidal
- Fluvial (Rivers and Watercourses)
- Pluvial (Surface Water)
- Groundwater
- Existing foul and storm sewers or potable water main infrastructure
- Artificial infrastructure including reservoirs and sewerage works

3.6 Fluvial

The Environment Agency confirms that no incidents of flooding from main rivers or ordinary watercourses have been recorded within the site boundary.

3.7 The Environment Agency (EA) is the principal flood risk management operating authority in England. The EA has carried out a national flood risk assessment (NaFRA) which assesses the probability of flooding to land from all main rivers in England. The results of this modelling are combined and calibrated against data from recorded flood events to produce the Environment Agency's Flood Zone Map (Figure 3).

Figure 3: Fluvial Flood Risk - Extract from Environment Agency Flood Zone Map for planning (December 2025)



Contains Environment Agency information © Environment Agency 2025

Dark Blue ■ (Flood Zone 3)

Shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded: from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light Blue ■ (Flood Zone 2)

Shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year. These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

Clear ■ (Flood Zone 1)

Shows the area where flooding from rivers and the sea is very unlikely. There is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

- 3.8 The latest Environment Agency 'Flood Zone Map' (December 2025) indicates the entire site is located within the lowest risk category - Flood Zone 1. 'Flood Zone 1' is land assessed as having a less than 1 in 1000 (<0.1%) annual probability of flooding from a main river in each year and is not within an area of recorded river flooding.
- 3.9 West Sussex County Council as the Lead Local Flood Authority (LLFA) are responsible for assessing the flood risk from all other ordinary watercourses (non-main rivers) in the area, with this information detailed in the PFRA/SFRA reports. These studies have concluded that the site is not at risk of flooding from all ordinary watercourses within the locality of the development.
- 3.10 It is demonstrated that safe and dry access and egress at the site is achievable to a publicly accessible location outside the 1:100 year (plus climate change) fluvial flood event extent, in accordance with DEFRA Report FD2320/TR2 - 'Flood Risk Assessment Guidance for New Developments'

3.11 Surface Water (Pluvial)

The Environment Agency's 'uFMfSW' (updated Flood Map for Surface Water) is a theoretical indication of where there is a potential for surface water flooding to occur on land.

This nationally produced model is a broadscale assessment of potential overland surface water flow paths based upon local rainfall data and topography.

- 3.12 An extract of this map (Figure 4) indicates that the entire site is identified as having a 'Very Low' (less than 1:1000) 0.1% annual risk of flooding from surface water runoff. The area of low to medium risk is correlated over the existing pond which does not appear to flood the developable area of the site.

Figure 5: Extract from Environment Agency Surface Water Flood Map (December 2025)



Contains Environment Agency information © Environment Agency 2025

Key:

-  High (Greater than 1:30(3.3%) chance of flooding)
-  Medium (Between 1:100(1%) and 1:30(3.3%) chance of flooding)
-  Low (Between 1:1000 (0.1%) and 1:100 (1%) chance of flooding)
-  Very Low (Less than 1:1000 (0.1%) chance of flooding)

- 3.13 All potential flood risk areas in the post-development state will be mitigated through the implementation of a positive surface water drainage system incorporating the use of SuDS to collect, attenuate and dispose of surface water runoff generated from the site. This would provide a level of betterment over current conditions by preventing areas of ponding and preventing the rapid and uncontrolled runoff of surface water across the site during intense rainfall events.
- 3.14 It is considered that the above measures and the development of the site will not result in any significant loss of floodplain storage and will not increase the risk of surface water flooding to existing parties within the vicinity of the site or downstream.

3.15 Tidal

There is no risk of tidal flooding to the development.

3.16 Groundwater

With reference to the PRFA/SRFA studies, there have been no recorded events of groundwater emergence at the site or surrounding area.

- 3.17 Intrusive geological site investigations found no presence of any perched groundwater or groundwater, and due to the geology of the site, groundwater is likely to be found at great depths.
- 3.18 To mitigate the effect of groundwater or ingress within excavations during the site construction phase, a dewatering system will remove unwanted groundwater to ensure construction is carried out in dry and stable conditions. Prior to any dewatering, the ground worker will prepare and submit a method statement for the local authority and Environment Agency sign-off before the operation of any pumping.
- 3.19 The proposed development is unlikely to have any significant impact upon natural groundwater flows beneath the site either during or after completion of the proposed works and therefore is unlikely to create an increased risk of flooding on or off the site. If groundwater levels were to rise above the base of proposed foundations during winter months, groundwater would be able to flow laterally around these obstructions without any major increase in local groundwater levels and consequently will have a negligible effect on the site-wide and offsite groundwater flow regime and overall flood risk from groundwater.

3.20 Existing Sewers and Water Mains

With reference to Southern Water records, there are no public sewers or water mains within the site. There is no existing private foul and surface water drainage infrastructure and potable water supplies with the site.

- 3.21 There are no recorded incidents of flooding to the site from existing sewers or potable water mains within the vicinity of the site. The nearest surface water sewer is to the north east of the site within The Weald.
- 3.22 The nearest foul sewer to the site is a DN225 located approximately 50m beyond the northern boundary.
- 3.23 Under the development proposals all existing public sewers and potable water infrastructure within the vicinity of the development will be suitably protected during all construction activities and afforded the required easements specified by the water authority. This will prevent the risk of flooding and allow unrestricted access for any future maintenance and repairs.

3.24 Artificial Sources

With reference to the PFRA / SFRA, there have been no recorded incidents of flooding to the site or surrounding areas from artificial sources. The Environment Agency has assessed that the site is not at risk from reservoir flooding.

3.25 An ornamental lake is located within the site, with the flood risk from this surface water fed pond assessed as very low.

3.26 There are no other sources of artificial flooding within 500m of the site.

3.27 Sequential Test

The flood risk technical guidance to the National Planning Policy Framework (NPPF) categorises residential developments as 'More Vulnerable' within the risk classification. 'More vulnerable' developments located within Flood Zone 1 are considered appropriate under the NPPF.

3.28 The NPPF guidance states that planning authorities should complete a risk-based 'Sequential Test' at all stages of the planning process, to steer new development to areas with the lowest probability of flooding. Under the requirements of the 'Sequential Test' and as the proposed development is already located within Flood Zone 1 (lowest risk), there are no more suitable, developable and deliverable alternative sites, better located from a flood risk perspective which could accommodate the proposed development.

3.29 Proposed Site Drainage

A Flood Risk Assessment requires that an evaluation of all proposed artificial drainage systems and infrastructure within, or in close proximity to the site is carried out. In the context of this development, the following systems are to be installed which need to be assessed in terms of potential flooding through the capacity of the systems being exceeded or the structural, hydraulic, mechanical or operational failure of the system occurring during the lifetime of the development:

- Piped foul and surface water sewers, manholes and potable water mains.
- SuDS for the conveyance and attenuation of surface water.
- Foul water pumping station.

3.30 All adoptable foul and surface water drains, sewers and manholes will be designed and constructed to the Sewers for Adoption 7th edition including specific Southern Water addendums and the Design and Construction Guidance (CDG) (March 2020) with all private drainage constructed in accordance with *The Building Regulations Part H, BS EN 752 or BS EN 12056-2* as appropriate, ensuring adequate design capacity and robust structural integrity for the lifetime of the development.

3.31 Surface water sewers will be designed to the Sewers for Adoption / CDG requirement of 'no surcharge of pipes up to the 1 year event' and 'no flooding up to the 30 year event'.

3.32 All SuDS within the drainage system will be sized to manage the runoff from the exceptionally rare 1 in 100 storm event (1% AEP), plus an additional 45% allowance for predicted future climate change effects (in accordance with EA recommendations up to the year 2115).



- 3.33 If a foul water pumping station and rising main is required, this will be designed and installed in accordance with SFA 7th and DCG including Southern Water Addendums and *The Building Regulations Documentation H1 Foul Drainage*, *BS EN 12050-1:2001 wastewater pumping stations for buildings and sites* and *BS EN 752-6:1998 drain and sewer pumping stations outside buildings and sewage pump stations*. Any pumping station compound will be located within Flood Zone 1.
- 3.34 Any pumping station will be fully automatic with provision for remote monitoring by telemetry. To ensure that sewage flooding does not occur at or upstream of the pumping station during plant or power failure, additional 24hr storage will be provided within the pumping station wet well. This storage will be above the high-level alarm and below the lowest connected lateral drain or private sewer invert.

4 Existing and Proposed Site Runoff

- 4.1 This section aims to calculate the estimated peak rate and volume of surface water runoff from the existing site. These existing discharge figures are then used to establish the post-development constraints to inform the preliminary design of the surface water drainage strategy.

4.2 Catchment Areas

The existing and proposed permeable and impermeable areas are listed in the table below. Of the total 1.7ha site, 0.581ha will be developed. Therefore, the greenfield runoff rate for this development has been calculated on the 5810m² developable area.

Site Catchment	Impermeable	Permeable	Total
Existing Site Area	0 m ²	17,000 m ²	17,000 m ²
Proposed Site Area	5810m ²	11,190 m ²	17,000 m ²

- 4.3 This development results in an increase of approximately 5810m² in total impermeable area. An allowance of 10% for urban creep has been applied to private areas to account for the potential increase in impermeable surfacing over the lifetime of the development.

4.4 Existing Surface Water Runoff Peak Runoff Rate & Volume (Greenfield)

An assessment of the estimated current greenfield runoff rate has been carried out using the Institute of Hydrology Report 124 (QBar) methodology.

Catchment: 0.581ha (FSR)

1 in 1 year	2.9 l/s
QBAR	3.4 l/s
1 in 30 year	7.8 l/s
1 in 100 year	10.9 l/s
Volume 100y 6hr	198 m ³

In addition to the FSR method, the FEH statistical equation predicts the median annual flood Q_{med} (1:2y return period).
Q_{med} (FEH) – 6.4 l/s.

4.5 Post Development Surface Water Runoff Peak Runoff Rate & Volume

The procedure for surface water management in accordance within 'Rainfall runoff management for developments' (DEFRA/EA Report – SC030219 E, 2013) states; *"For the range of annual flow rate probabilities up to and including the 1% (1 in 100 year) annual exceedance probability event including an appropriate allowance for climate change, the post-developed rate of run-off into a watercourse, sewer, or other receiving water body, should be no greater than the existing pre-developed rate of run-off for the same event"*.

- 4.6 The NPPF requires that consideration is given to the effect of climate change on the surface water flows generated by any new development. Table 2 of *the NPPF - Flood Risk Assessments: Climate Change Allowances – Detailed Guidance (Feb 2016)*, specifies that an assessment of a 45% increase in rainfall intensity allowance is made when calculating post-development runoff rates for residential developments.
- 4.7 The additional volume of runoff generated from a site should also be limited to the greenfield runoff volume where possible. Where infiltration cannot be utilised to dispose of the additional volume; *"The limiting discharge for any return period up to the 1% AEP (1 in 100 year) event including climate change, shall not be greater than the mean annual peak rate of runoff for the greenfield site – QBar or 2 l/s/ha, whichever is the greatest"*.
- 4.8 As a result of this development and the increase in impermeable areas, the peak rate and volume of surface water that could potentially runoff the proposed site if not effectively managed, could be greater than in its current undeveloped state.
- 4.9 To mitigate this potential increase, it is proposed that all surface water runoff from impermeable areas on the proposed residential development will be attenuated on-site via the use of SuDS and discharged into the existing surface water sewer located in St Margarets Road to the south west of the site at a rate of 4.0 l/s for up to the 100year +45%cc rainfall event.
- 4.11 Southern Water has confirmed that the downstream storm network can accommodate a rate of up to 4.0 l/s.

5 Surface Water Drainage Strategy

- 5.1 The National Planning Policy Framework (NPPF) requires that developments do not exacerbate flood risks both to the development site and to offsite parties and land, which means there is a need to control surface water drainage and overland runoff to ensure there are no increases in peak rates and volumes of runoff as a result of the development.
- 5.2 Environment Agency guidance and government legislation such as the Flood and Water Management Act (Defra 2010) requires surface water drainage strategies for new developments to be in accordance with the ideals of 'sustainable development' via the provision of Sustainable Drainage Systems (SuDS).
- 5.3 The Building Regulations Document H (2015) and The SuDS Manual CIRIA 753 (2015) details the appropriate hierarchy of potential methods for disposing of surface water from a development:
1. Discharge to ground via infiltration.
 2. Discharge to a surface water body such as a watercourse.
 3. Discharge to a surface water sewer.
 4. Discharge to a combined sewer.
- 5.4 Following a review of the site, impermeable geology and low soil permeability mean infiltration as a method of disposing of the surface water runoff generated from the proposed development is unfeasible.
- 5.5 There are no suitable watercourses within the vicinity of the site to discharge runoff to.
- 5.6 Therefore, it is proposed that all surface water runoff from impermeable areas at the development is attenuated on-site via SuDS and discharged into the existing Southern Water surface water sewer located in St. Margarets Road beyond the southwestern boundary of the site.
Due to levels, a package pump station is required to connect the site's drainage network into the existing offsite network.
- 5.7 The peak rate of pumped flow will be restricted to a maximum of 4.0 l/s up to the 1:100y+45%cc rainfall event.
- 5.8 All SuDS will be sized to manage the runoff from the 1 in 100 rainfall event (1% AEP), plus an additional 45% allowance for predicted future effects of climate change (in accordance with EA recommendations up to the year 2115).
- 5.9 For the proposed impermeable site area of 5810m², the volume required within the two attenuation tanks to store the 1:100y+45% rainfall event, discharging at a maximum rate of 4.0 l/s is 578 m³.
- 5.10 Roof runoff will be collected by a conventional system of guttering and downpipes where it will be discharged into the surface water network. Runoff from driveways, parking courts and the main site roads will also drain via the surface water network. Private and shared drives / parking bays are to be constructed with a permeable sub-base, under-drained into the storm system.

- 5.11 The proposed surface water drainage strategy offers a sustainable, safe and robust system that will afford complete flood risk protection to the occupants of the proposed dwellings and the existing properties and land within the vicinity of the site and existing surrounding properties.

6 Water Quality and Pollution Prevention

- 6.1 The proposed SuDS scheme has been designed to mitigate against the contamination of the receiving watercourse. The CIRIA SuDS Manual 2015 details an approach for establishing the hazard posed by the intended land use activates and the extent to which the proposed SuDS components can reduce and mitigate the contamination risk to the receiving waterbody.
- 6.2 Referring to Table 1 – ‘Pollution hazard indices for different land use classifications’ the proposed development and land use results in a low pollution hazard, therefore a ‘Simple Index’ method can be used to make a qualitative assessment of the proposed SuDS management.

Table 1: Table 26.2 – ‘Pollution hazard indices for different land use classifications’ CIRIA C753, 2015

TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4

Roof Runoff:

Total SuDS mitigation index $\geq$ pollution hazard index (for each contaminant type)

For the development site: TSS = 0.2, Metals = 0.2, Hydrocarbons = 0.05

Driveway / Parking / Road Runoff:

Total SuDS mitigation index $\geq$ pollution hazard index (for each contaminant type)

For the development site: TSS = 0.5, Metals = 0.4, Hydrocarbons = 0.4

Table 2 - Table 26.3 – ‘Indicative SuDS mitigation indices for discharge to surface waters’ CIRIA C753, 2015

TABLE 26.3 Indicative SuDS mitigation Indices for discharges to surface waters			
Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 3 – ‘Downstream Defender Mitigation Indices’ Hydro-International, 2023.

Model	Downstream Defender® Select Mitigation Indices (a)(b)		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons (Oils)
Vortex	0.3	0.2	0.2
Vortex Plus	0.5	0.4	0.5
Advanced Vortex	0.5	0.4	0.5

Notes:

(a) All mitigation indices supplied by Hydro International Ltd are calculated using the methods laid out in the British Water-How To Guide: Applying the CIRIA SuDS Manual Simple Index Approach to Proprietary / Manufactured Stormwater Treatment Devices. The Advanced Vortex and Vortex Plus models have also been independently verified by the WRc, with the WRc Performance Declaration available on request.

(b) Mitigation indices quoted for the Downstream Defender® Select are valid when the unit is designed according to the Treatment Flow Rate (see Table 3).

SuDS Mitigation Indices for Downstream Defender® Select

- 6.3 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type). Where the mitigation index of an individual component is insufficient, two or more components in a series is required, where:

Total SuDS mitigation index = mitigation index₁ + 0.5 (mitigation index₂)

- 6.4 The proposed development surface water drainage system consists of the following SuDS component:

Roof Runoff:

Primary Treatment – Downstream Defender

Using table 2 and 3 – Mitigation Indices

TSS = 0.5 which is > 0.2 therefore ok.

Metals = 0.4 which is > 0.2 therefore ok.

Hydrocarbons = 0.5 which is > 0.05 therefore ok.

Driveway / Parking / Road Runoff:

Primary Treatment – Downstream Defender

Using table 26.3/26.4 – Mitigation Indices:

TSS = 0.5 which is ≥ 0.5 therefore ok.

Metals = 0.4 which is ≥ 0.4 therefore ok.

Hydrocarbons = 0.5 which is > 0.4 therefore ok.

- 6.5 The downstream defender will meet the water quality and silt removal requirements. The total mitigation level exceeds the development pollution risk and would be suitable for both medium and high-risk developments.

7 Foul Water Drainage Strategy

- 7.1 The foul water flows from each property will drain to a new gravity foul sewer located within the development road network. This proposed system will connect via an onsite pumping station and rising main into the existing Southern Water public foul network located to the southwest of the site.
- 7.2 The previous pre-development enquiry with Southern Water for the old application will have expired. It was also for 30 units and not 36. Southern Water will have to re-confirm that there is capacity at the proposed point of connection to the existing network to accommodate the development. If required, reinforcement of the existing local sewer network will be carried out by Southern Water. This will ensure that the proposed development has a 'no detriment' impact on the foul sewer system within East Grinstead and does not create a flood risk.

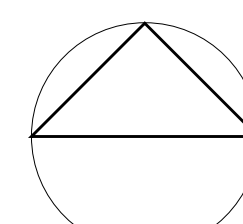


APPENDIX A

PROPOSED SITE LAYOUT

Contractor to check all dimensions on site and report any discrepancies before proceeding

All relevant British standards and Codes of Practices to be complied with



LEGEND	
	SITE BOUNDARY Application Site Boundary
	Line of retaining wall. Refer to civil engineers drawings for details
	1.1m Timber Morticed Post and Rail Fence
	Line of gravel boards. Refer to civil engineers drawings for details
	1.8m High Timber Close Board Fence
ELECTRIC CAR CHARGING POINT	
	Data 'EDOCK' wall mounted EV charger
	Data 'EDOCK' post mounted EV charger powered by 'Doncaster' cables, EV-ULTRA with integrated ethernet cable
	100mm TWINWALL DUCT CONTAINING POWER CABLE
EXTERNAL WORKS	
	Location of external taps
	1800mm x 900mm timber gate and latch
	7' x 5' garden shed (cycle storage) Base to be constructed using patio slabs
	Mitsubishi Ecodan R32 (or similar) Monobloc ASHP
	270lt wheelie bins
SURFACE MATERIALS	
	Impermeable Macadam carriageway and footpaths.
	60mm Private drive permeable block paving. Priora paving in brindle laid in herringbone pattern with white blocks to demarcate parking spaces from Marshalls or similar.
	80mm Shared drive permeable block paving. Priora paving charcoal laid in herringbone pattern from Marshalls or similar.
	200x100x100 Concrete sets (x4)
	Saxon concrete paving slabs 450x450mm in buff laid in stack bond from Marshalls or similar.
	No-dig hogglin footway
	5m Private Street Light Post
	For tree and landscaping information refer to Landscape Architects drawings
Root Protection Zone	
	Existing Trees and root protection
ECOLOGY	
	Hedgehog Highway Route
	Vivara Pro Build-In Woodstone bat box
	Manthorpe Swift bird box
Flush Threshold	
Stepped Threshold	
HIGH VOLTAGE CABLE	
	XIV
INDICATES ROUTE OF HIGH VOLTAGE UNDERGROUND ELECTRIC CABLE. ALL SITE WORKERS TO BE MADE AWARE OF ANY UNDERGROUND CABLES	

A	Garden patios updated	16/12/23
Rev:		Date:
Revisions:		

macar.

PARTNERSHIPS					
	A	B	P	T	V
Drawing Status:				X	

ama
CHARTERED ARCHITECTS

Suite 30, Sheraton House, Castle
Cambridge. CB3 0AX tel. 01223

Project Title:
LAND AT QVH
HOLTYE ROAD
EAST GRINSTEAD

Client:
MACAR DEVELOPMENTS
CITY HOUSE, SUTTON PARK ROAD
SUTTON, SM1 2AE

Drawing Title:
PROPOSED SITE PLAN
(REVISED SCHEME)
36 UNIT SCHEME

36 UNIT SCHEME

Dwg No: QVH-AMA-RS-X-DR-A-91-010	Rev: A
----------------------------------	--------

Scale @ A1: 1:250	Date: JUNE 2024
C:\Users\User\AMA Architects\Communication site -	

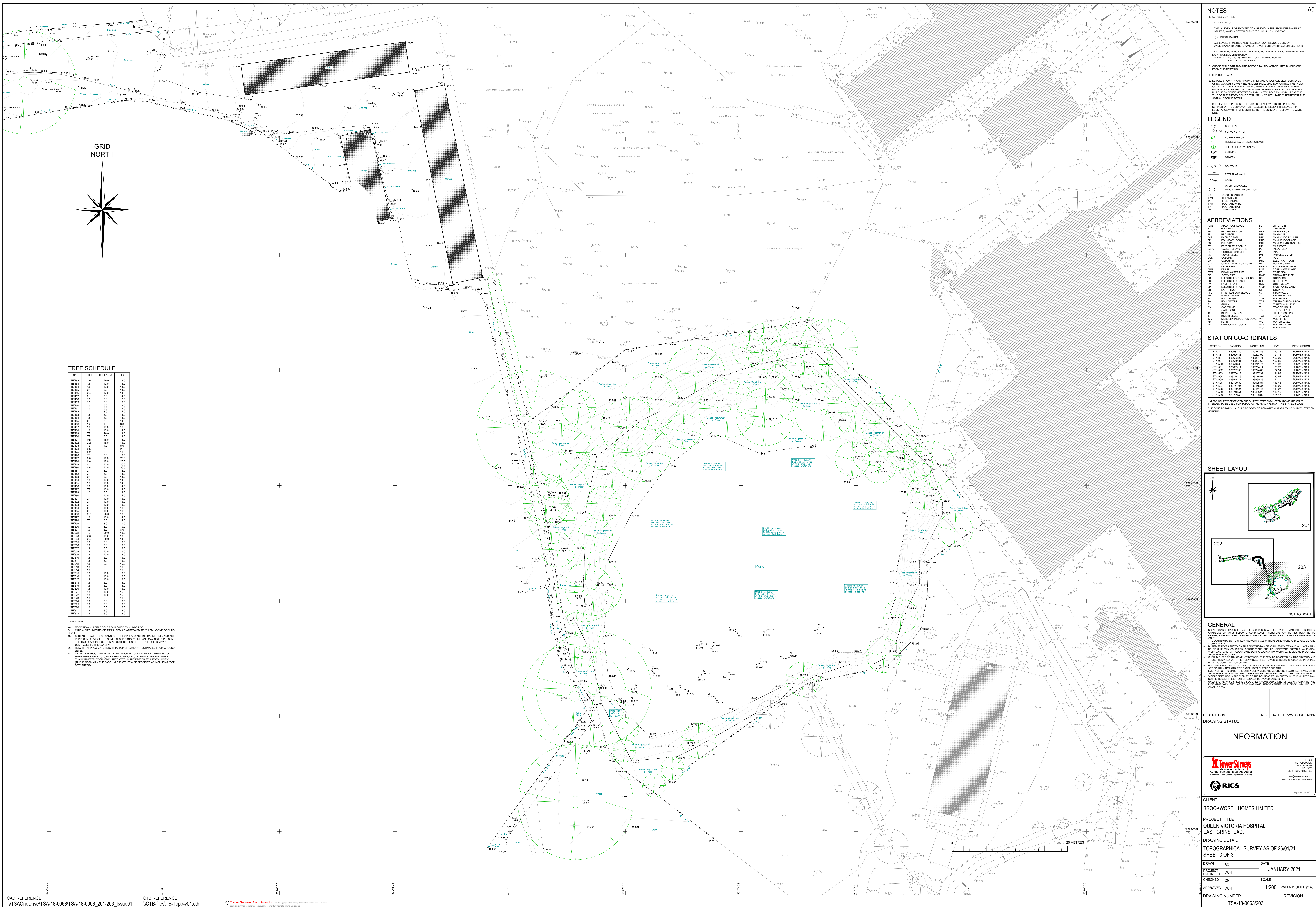
Documents\PROJECTS\Macar\East Grinstead\Drawings\PLANNING\98
UNIT SCHEME
All dimensions are to be checked on
site. Do not scale from this drawing.

Copyright remains with AMA



APPENDIX B

TOPOGRAPHICAL SURVEY





APPENDIX C

FOUL AND SURFACE WATER DRAINAGE STRATEGY

KEY:

Proposed Adoptable Sewers:

Foul sewer

Storm sewer

Highway Gully

Surface Water Rising Main

Rising Main

Adoptable Lateral (150mm dia)

Adoptable Access Chamber

Proposed Private Drainage:

Foul drain

Storm drain

Rodding eye

Yard gully

Linear drain Aco drain or similar approved

PCC 900x450mm Gully

Permavoid – Surface Water Collector & Distribution Cell

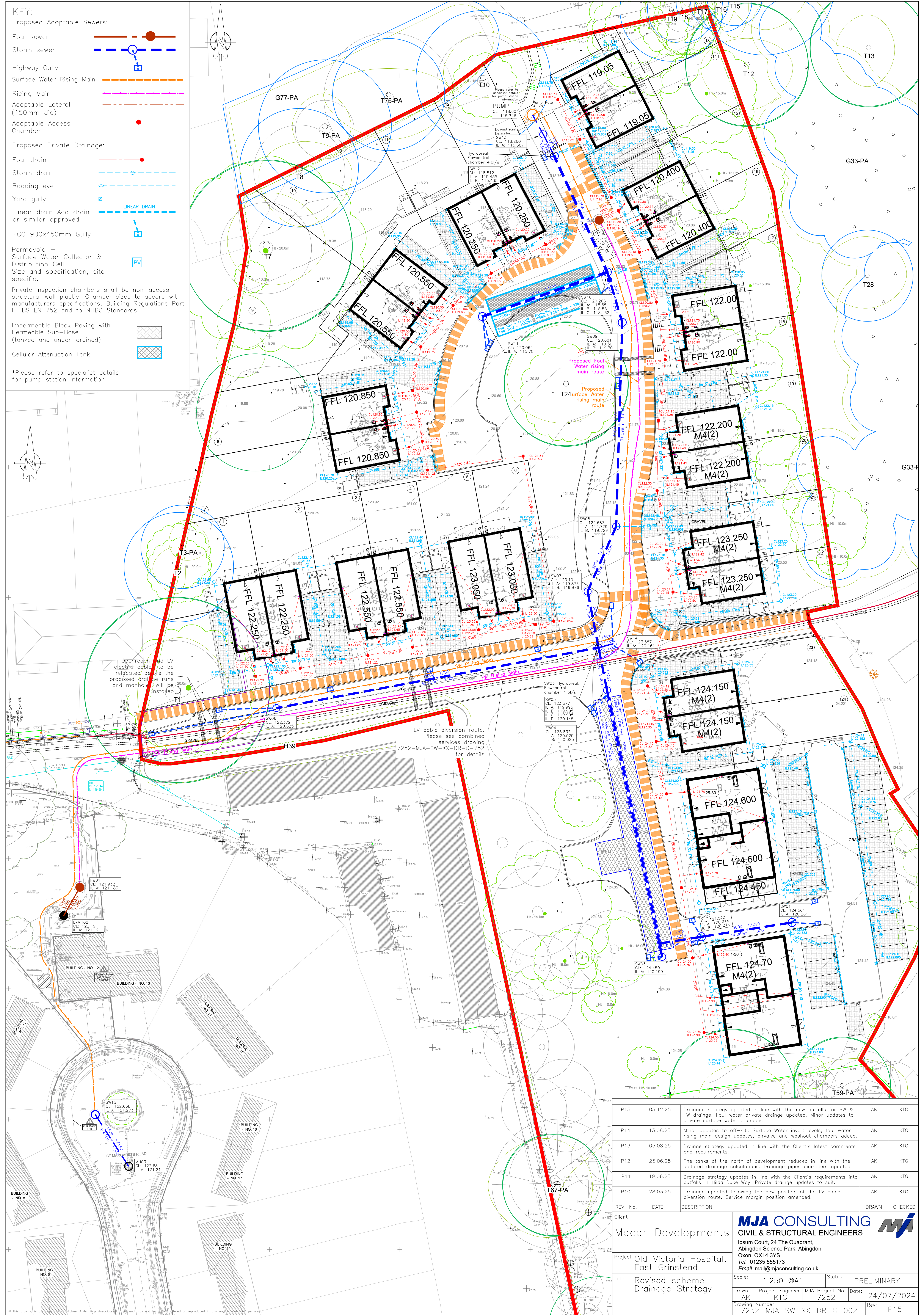
Size and specification, site specific.

Private inspection chambers shall be non-access structural wall plastic. Chamber sizes to accord with manufacturers specifications, Building Regulations Part H, BS EN 752 and to NHBC Standards.

Impermeable Block Paving with Permeable Sub-Base (tanked and under-drained)

Cellular Attenuation Tank

*Please refer to specialist details for pump station information



P15	05.12.25	Drainage strategy updated in line with the new outfalls for SW & FW drains. Foul water private drainage updated. Minor updates to private surface water drainage.	AK	KTG
P14	13.08.25	Minor updates to off-site Surface Water invert levels; foul water rising main design updates, airvalve and washout chambers added.	AK	KTG
P13	05.08.25	Drainage strategy updated in line with the Client's latest comments and requirements.	AK	KTG
P12	25.06.25	The tanks at the north of development reduced in line with the updated drainage calculations. Drainage pipes diameters updated.	AK	KTG
P11	19.06.25	Drainage strategy updates in line with the Client's requirements into outfalls in Hilda Duke Way. Private drainage updates to suit.	AK	KTG
P10	28.03.25	Drainage updated following the new position of the LV cable diversion route. Service margin position amended.	AK	KTG
REV. No.	DATE	DESCRIPTION	DRAWN	CHECKED

Client

Macar Developments

Project

Old Victoria Hospital, East Grinstead

Title

Revised scheme Drainage Strategy

Scale:

1:250 @A1

Status:

PRELIMINARY

Drawn:

AK

Project Engineer:

KTG

MJA Project No:

7252

Date:

24/07/2024

Drawing Number:

7252-MJA-SW-XX-DR-C-002

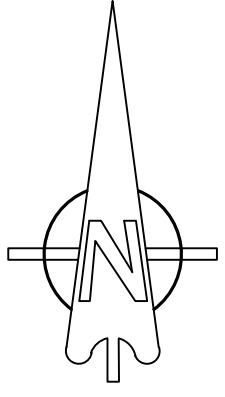
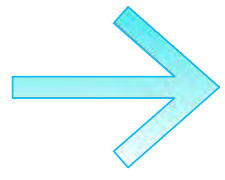
Rev:

P15

MJA CONSULTING
CIVIL & STRUCTURAL ENGINEERS
Ipsium Court, 24 The Quadrant,
Abingdon Science Park, Abingdon
Oxon, OX14 3YS
Tel: 01235 555173
Email: mail@mjaconsulting.co.uk

KEY:

Exceedance Flow Path:



P5	23.10.25	Updated drainage design.	CP	KTG
P4	23.10.25	Updated drainage design.	CP	KTG
P3	21.02.25	Updated drainage design.	SS	KTG
P2	13.02.25	Updated tank design.	SS	KTG
P1	29.01.25	First issue.	SS	KTG
REV. No.	DATE	DESCRIPTION	DRAWN	CHECKED

Client
Macar Developments

Project
Old Victoria Hospital,
East Grinstead

Title
Revised scheme
Flood Exceedance
Plan

MJA CONSULTING
CIVIL & STRUCTURAL ENGINEERS

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Oxon, OX14 3YS
Tel: 01235 555173
Email: mail@mjaconsulting.co.uk

Scale: 1:250 @A1
Status: PRELIMINARY
Drawn: AK
Project Engineer: KTG
MJA Project No: 7252
Date: 24/07/2024
Drawing Number: 7252-MJA-SW-XX-DR-C-006
Rev: P5



APPENDIX D

GREENFIELD RUNOFF & ATTENUATION CALCULATIONS

MJA Consulting		Page 1
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Greenfield Q	
Date 16/12/2025 File	Designed by C.Pendle Checked by	
Innovyze	Source Control 2020.1	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	0.581	Urban	0.000
SAAR (mm)	900	Region Number	Region 7

Results 1/s

QBAR Rural	3.4
QBAR Urban	3.4
Q1 year	2.9
Q1 year	2.9
Q30 years	7.8
Q100 years	10.9

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MJA Consulting		Page 1																
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Greenfield Q FEH																	
Date 16/12/2025 File	Designed by C.Pendle Checked by																	
Innovyze	Source Control 2020.1																	
<u>FEH Mean Annual Flood</u> Input <table> <tr> <td>QMED Method</td> <td>2008</td> </tr> <tr> <td>Site Location GB 535450 137800 TQ 35450 37800</td> <td></td> </tr> <tr> <td>Area (ha)</td> <td>0.581</td> </tr> <tr> <td>SAAR (mm)</td> <td>900</td> </tr> <tr> <td>URBEXT (2000)</td> <td>0.3329</td> </tr> <tr> <td>SPRHOST</td> <td>41.770</td> </tr> <tr> <td>BFIHOST</td> <td>0.478</td> </tr> <tr> <td>FARL</td> <td>1.000</td> </tr> </table> Results QMED Rural (l/s) 6.4 QMED Urban (l/s) 8.6			QMED Method	2008	Site Location GB 535450 137800 TQ 35450 37800		Area (ha)	0.581	SAAR (mm)	900	URBEXT (2000)	0.3329	SPRHOST	41.770	BFIHOST	0.478	FARL	1.000
QMED Method	2008																	
Site Location GB 535450 137800 TQ 35450 37800																		
Area (ha)	0.581																	
SAAR (mm)	900																	
URBEXT (2000)	0.3329																	
SPRHOST	41.770																	
BFIHOST	0.478																	
FARL	1.000																	
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MJA Consulting		Page 1
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Greenfield Volume	
Date 16/12/2025 File	Designed by C.Pendle Checked by	
Innovyze Source Control 2020.1		

Greenfield Runoff Volume

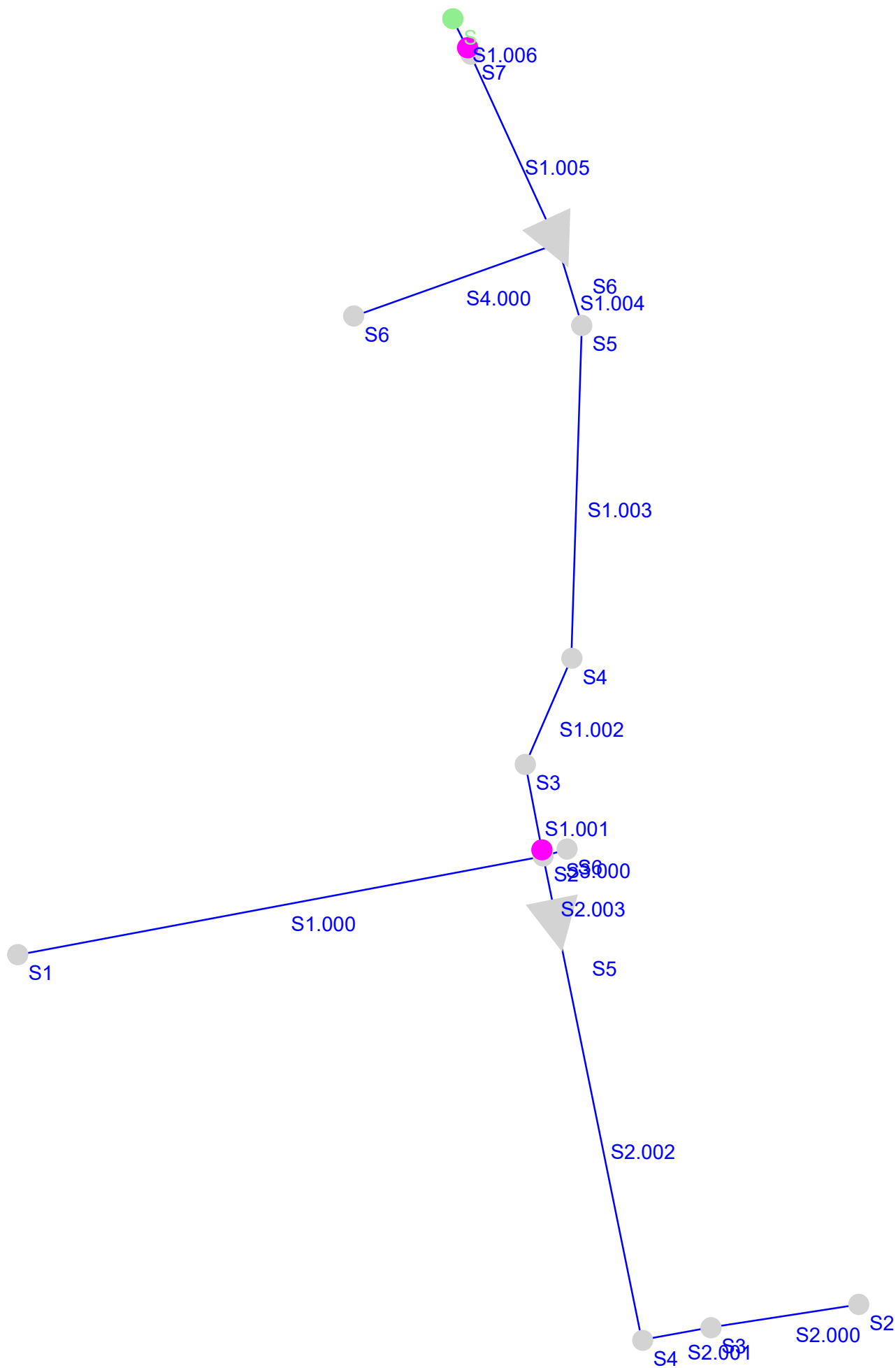
FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.000
Ratio R	0.332
Areal Reduction Factor	1.00
Area (ha)	0.581
SAAR (mm)	900
CWI	121.952
Urban	0.000
SPR	47.000

Results

Percentage Runoff (%)	50.78
Greenfield Runoff Volume (m³)	198.318

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MJA Consulting

Page 1

Ipsum Court, 24 The Quadrant
Abingdon Science Park
Abingdon, OX14 3YS

QVH
Surface Water Network

Date 16/12/2025
File SWS 161225.MDX

Designed by C.Pendle
Checked by

Innovyze

Network 2020.1

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
* S1.000	50.259	0.630	79.8	0.130	5.00	0.600	o	300	Pipe/Conduit
* S2.000	14.069	0.047	299.3	0.102	5.00	0.600	o	300	Pipe/Conduit
* S2.001	6.530	0.015	435.3	0.029	0.00	0.600	o	300	Pipe/Conduit
* S2.002	39.805	0.174	228.8	0.022	0.00	0.600	o	300	Pipe/Conduit
* S2.003	6.673	0.030	222.4	0.016	0.00	0.600	o	300	Pipe/Conduit
* S3.000	2.346	0.016	146.6	0.018	5.00	0.600	o	150	Pipe/Conduit
* S1.001	8.776	0.119	73.7	0.000	0.00	0.600	o	300	Pipe/Conduit
* S1.002	10.901	0.147	74.2	0.000	0.00	0.600	o	300	Pipe/Conduit
* S1.003	31.299	0.429	73.0	0.070	0.00	0.600	o	300	Pipe/Conduit
* S1.004	8.048	1.138	7.1	0.048	0.00	0.600	o	300	Pipe/Conduit
* S4.000	20.321	0.150	135.5	0.102	5.00	0.600	o	375	Pipe/Conduit
* S1.005	19.561	0.115	170.1	0.000	0.00	0.600	o	375	Pipe/Conduit
* S1.006	3.733	0.048	77.8	0.044	0.00	0.600	o	150	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
* S1.000	1	122.372	120.625	1.447	123.577	119.995	3.282		1200
* S2.000	2	124.661	120.261	4.100	124.523	120.214	4.009		1200
* S2.001	3	124.523	120.214	4.009	124.450	120.199	3.951		1200
* S2.002	4	124.450	120.199	3.951	123.832	120.025	3.507		1200
* S2.003	5	123.832	120.025	3.507	123.577	119.995	3.282		1200
* S3.000	6	123.587	120.161	3.276	123.577	120.145	3.282		1200
* S1.001	2	123.577	119.995	3.282	123.100	119.876	2.924	Hydro-Brake®	1200
* S1.002	3	123.100	119.876	2.924	122.683	119.729	2.654		1200
* S1.003	4	122.683	119.729	2.654	120.881	119.300	1.281		1200
* S1.004	5	120.881	119.300	1.281	120.226	118.162	1.764		1200
* S4.000	6	120.064	115.700	3.989	120.226	115.550	4.301		1350
* S1.005	6	120.226	115.550	4.301	118.812	115.435	3.002		1350
* S1.006	7	118.812	115.435	3.227	118.260	115.387	2.723	Hydro-Brake®	1350

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Ipsum Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Surface Water Network	
Date 16/12/2025 File SWS 161225.MDX	Designed by C.Pendle Checked by	
Innovyze	Network 2020.1	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	122.372	1.747	Open Manhole	1200	S1.000	120.625	300				
S2	124.661	4.400	Open Manhole	1200	S2.000	120.261	300				
S3	124.523	4.309	Open Manhole	1200	S2.001	120.214	300	S2.000	120.214	300	
S4	124.450	4.251	Open Manhole	1200	S2.002	120.199	300	S2.001	120.199	300	
S5	123.832	3.807	Open Manhole	1200	S2.003	120.025	300	S2.002	120.025	300	
S6	123.587	3.426	Open Manhole	1200	S3.000	120.161	150				
S2	123.577	3.582	Open Manhole	1200	S1.001	119.995	300	S1.000	119.995	300	
								S2.003	119.995	300	
								S3.000	120.145	150	
S3	123.100	3.224	Open Manhole	1200	S1.002	119.876	300	S1.001	119.876	300	
S4	122.683	2.954	Open Manhole	1200	S1.003	119.729	300	S1.002	119.729	300	
S5	120.881	1.581	Open Manhole	1200	S1.004	119.300	300	S1.003	119.300	300	
S6	120.064	4.364	Open Manhole	1350	S4.000	115.700	375				
S6	120.226	4.676	Open Manhole	1350	S1.005	115.550	375	S1.004	118.162	300	2537
								S4.000	115.550	375	
S7	118.812	3.377	Open Manhole	1350	S1.006	115.435	150	S1.005	115.435	375	
S	118.260	2.873	Open Manhole	1350		OUTFALL		S1.006	115.387	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
---------	---------------------	----------------------	--------------------------	---------------------------	----------------	----------------

S1	539661.082	139303.045	539661.082	139303.045	Required	
----	------------	------------	------------	------------	----------	--

S2	539740.160	139270.162	539740.160	139270.162	Required	
----	------------	------------	------------	------------	----------	--

S3	539726.262	139267.970	539726.262	139267.970	Required	
----	------------	------------	------------	------------	----------	--

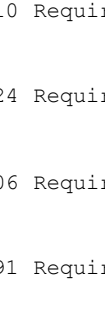
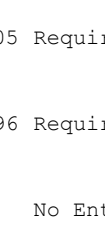
S4	539719.841	139266.784	539719.841	139266.784	Required	
----	------------	------------	------------	------------	----------	--

S5	539711.779	139305.765	539711.779	139305.765	Required	
----	------------	------------	------------	------------	----------	--

S6	539712.729	139312.976	539712.729	139312.976	Required	
----	------------	------------	------------	------------	----------	--



Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S2	539710.480	139312.310	539710.480	139312.310	Required	
S3	539708.803	139320.924	539708.803	139320.924	Required	
S4	539713.184	139330.906	539713.184	139330.906	Required	
S5	539714.114	139362.191	539714.114	139362.191	Required	
S6	539692.678	139363.081	539692.678	139363.081	Required	
S6	539711.818	139369.905	539711.818	139369.905	Required	
S7	539703.690	139387.696	539703.690	139387.696	Required	
S	539701.994	139391.022			No Entry	

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Date 16/12/2025 File SWS 161225.MDX	Designed by C.Pendle Checked by	
Innovyze	Network 2020.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S1	122.372	120.625	1.447	Open Manhole	1200
S2.000	o	300	S2	124.661	120.261	4.100	Open Manhole	1200
S2.001	o	300	S3	124.523	120.214	4.009	Open Manhole	1200
S2.002	o	300	S4	124.450	120.199	3.951	Open Manhole	1200
S2.003	o	300	S5	123.832	120.025	3.507	Open Manhole	1200
S3.000	o	150	S6	123.587	120.161	3.276	Open Manhole	1200
S1.001	o	300	S2	123.577	119.995	3.282	Open Manhole	1200
S1.002	o	300	S3	123.100	119.876	2.924	Open Manhole	1200
S1.003	o	300	S4	122.683	119.729	2.654	Open Manhole	1200
S1.004	o	300	S5	120.881	119.300	1.281	Open Manhole	1200
S4.000	o	375	S6	120.064	115.700	3.989	Open Manhole	1350
S1.005	o	375	S6	120.226	115.550	4.301	Open Manhole	1350
S1.006	o	150	S7	118.812	115.435	3.227	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	50.259	79.8	S2	123.577	119.995	3.282	Open Manhole	1200
S2.000	14.069	299.3	S3	124.523	120.214	4.009	Open Manhole	1200
S2.001	6.530	435.3	S4	124.450	120.199	3.951	Open Manhole	1200
S2.002	39.805	228.8	S5	123.832	120.025	3.507	Open Manhole	1200
S2.003	6.673	222.4	S2	123.577	119.995	3.282	Open Manhole	1200
S3.000	2.346	146.6	S2	123.577	120.145	3.282	Open Manhole	1200
S1.001	8.776	73.7	S3	123.100	119.876	2.924	Open Manhole	1200
S1.002	10.901	74.2	S4	122.683	119.729	2.654	Open Manhole	1200
S1.003	31.299	73.0	S5	120.881	119.300	1.281	Open Manhole	1200
S1.004	8.048	7.1	S6	120.226	118.162	1.764	Open Manhole	1350
S4.000	20.321	135.5	S6	120.226	115.550	4.301	Open Manhole	1350
S1.005	19.561	170.1	S7	118.812	115.435	3.002	Open Manhole	1350
S1.006	3.733	77.8	S	118.260	115.387	2.723	Open Manhole	1350

MJA Consulting		Page 5
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Surface Water Network	
Date 16/12/2025 File SWS 161225.MDX	Designed by C.Pendle Checked by	
Innovyze	Network 2020.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S2, DS/PN: S1.001, Volume (m³): 7.9

Unit Reference	MD-SHE-0048-1500-2250-1500
Design Head (m)	2.250
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	48
Invert Level (m)	119.995
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.250	1.5
Flush-Flo™	0.208	0.9
Kick-Flo®	0.427	0.7
Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	1.200	1.1	3.000	1.7	7.000	2.5
0.200	0.9	1.400	1.2	3.500	1.8	7.500	2.6
0.300	0.8	1.600	1.3	4.000	1.9	8.000	2.7
0.400	0.8	1.800	1.4	4.500	2.1	8.500	2.8
0.500	0.8	2.000	1.4	5.000	2.2	9.000	2.8
0.600	0.8	2.200	1.5	5.500	2.3	9.500	2.9
0.800	0.9	2.400	1.5	6.000	2.3		
1.000	1.0	2.600	1.6	6.500	2.4		

Hydro-Brake® Optimum Manhole: S7, DS/PN: S1.006, Volume (m³): 6.8

Unit Reference	MD-SHE-0078-4000-2400-4000
Design Head (m)	2.400
Design Flow (l/s)	4.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	78
Invert Level (m)	115.435
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

MJA Consulting		Page 6																																																																								
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Surface Water Network																																																																									
Date 16/12/2025 File SWS 161225.MDX	Designed by C.Pendle Checked by																																																																									
Innovyze	Network 2020.1																																																																									
<u>Hydro-Brake® Optimum Manhole: S7, DS/PN: S1.006, Volume (m³): 6.8</u>																																																																										
<table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>2.400</td><td>4.0</td></tr><tr><td>Flush-Flo™</td><td>0.344</td><td>2.8</td></tr><tr><td>Kick-Flo®</td><td>0.697</td><td>2.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>3.0</td></tr></table>			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	2.400	4.0	Flush-Flo™	0.344	2.8	Kick-Flo®	0.697	2.3	Mean Flow over Head Range	-	3.0																																																									
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MJA Consulting		Page 7
Ipsium Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS	QVH Surface Water Network	
Date 16/12/2025 File SWS 161225.MDX	Designed by C.Pendle Checked by	
Innovyze	Network 2020.1	

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S2.003

Invert Level (m) 119.990 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	180.0	180.0	2.251	0.0	405.4
2.250	180.0	405.4			

Cellular Storage Manhole: S6, DS/PN: S1.005

Invert Level (m) 115.565 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	100.0	100.0	2.251	0.0	215.0
2.250	100.0	215.0			

MJA Consulting		Page 8	
Ipsum Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS		QVH Surface Water Network	
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Innovyze		Network 2020.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000	Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0	MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0	Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500	Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000	

Number of Input Hydrographs 0	Number of Storage Structures 2
Number of Online Controls 2	Number of Time/Area Diagrams 0
Number of Offline Controls 0	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location GB 535450 137800 TQ 35450 37800	
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep 2.5 Second Increment (Extended)	
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	45, 45, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Pipe Flow (l/s)	Status
S1.000	S1	4320 minute 2 year Summer I+45%	122.372	120.751	0.000	1.8	OK
S2.000	S2	4320 minute 2 year Summer I+45%	124.661	120.751	0.000	1.4	SURCHARGED
S2.001	S3	4320 minute 2 year Summer I+45%	124.523	120.751	0.000	1.7	SURCHARGED
S2.002	S4	4320 minute 2 year Summer I+45%	124.450	120.751	0.000	2.0	SURCHARGED
S2.003	S5	4320 minute 2 year Summer I+45%	123.832	120.751	0.000	0.8	SURCHARGED
S3.000	S6	4320 minute 2 year Summer I+45%	123.587	120.751	0.000	0.2	SURCHARGED
S1.001	S2	4320 minute 2 year Summer I+45%	123.577	120.751	0.000	0.9	SURCHARGED
S1.002	S3	4320 minute 2 year Summer I+45%	123.100	119.890	0.000	0.9	OK
S1.003	S4	15 minute 2 year Summer I+45%	122.683	119.809	0.000	19.0	OK
S1.004	S5	15 minute 2 year Summer I+45%	120.881	119.369	0.000	31.5	OK
S4.000	S6	360 minute 2 year Winter I+45%	120.064	116.308	0.000	4.9	SURCHARGED
S1.005	S6	360 minute 2 year Winter I+45%	120.226	116.308	0.000	2.9	SURCHARGED
S1.006	S7	360 minute 2 year Winter I+45%	118.812	116.308	0.000	2.8	SURCHARGED

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Ipsum Court, 24 The Quadrant Abingdon Science Park Abingdon, OX14 3YS		QVH Surface Water Network	
Date 16/12/2025 File SWS 161225.MDX		Designed by C.Pendle Checked by	
Innovyze		Network 2020.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 535450 137800 TQ 35450 37800
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	45, 45, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Pipe Flow (l/s)	Status
S1.000	S1 2880 minute	100 year Winter I+45%	122.372	122.107	0.000	3.3	SURCHARGED
S2.000	S2 2880 minute	100 year Winter I+45%	124.661	122.100	0.000	2.6	SURCHARGED
S2.001	S3 2880 minute	100 year Winter I+45%	124.523	122.100	0.000	3.3	SURCHARGED
S2.002	S4 2880 minute	100 year Winter I+45%	124.450	122.100	0.000	3.8	SURCHARGED
S2.003	S5 2880 minute	100 year Winter I+45%	123.832	122.099	0.000	1.6	SURCHARGED
S3.000	S6 2880 minute	100 year Winter I+45%	123.587	122.107	0.000	0.4	SURCHARGED
S1.001	S2 4320 minute	100 year Winter I+45%	123.577	122.138	0.000	1.4	SURCHARGED
S1.002	S3 15 minute	100 year Summer I+45%	123.100	119.903	0.000	1.0	OK
S1.003	S4 15 minute	100 year Summer I+45%	122.683	119.896	0.000	70.9	OK
S1.004	S5 15 minute	100 year Summer I+45%	120.881	119.440	0.000	119.0	OK
S4.000	S6 720 minute	100 year Winter I+45%	120.064	117.739	0.000	6.7	SURCHARGED
S1.005	S6 720 minute	100 year Winter I+45%	120.226	117.738	0.000	4.1	SURCHARGED
S1.006	S7 600 minute	100 year Winter I+45%	118.812	117.739	0.000	3.9	SURCHARGED

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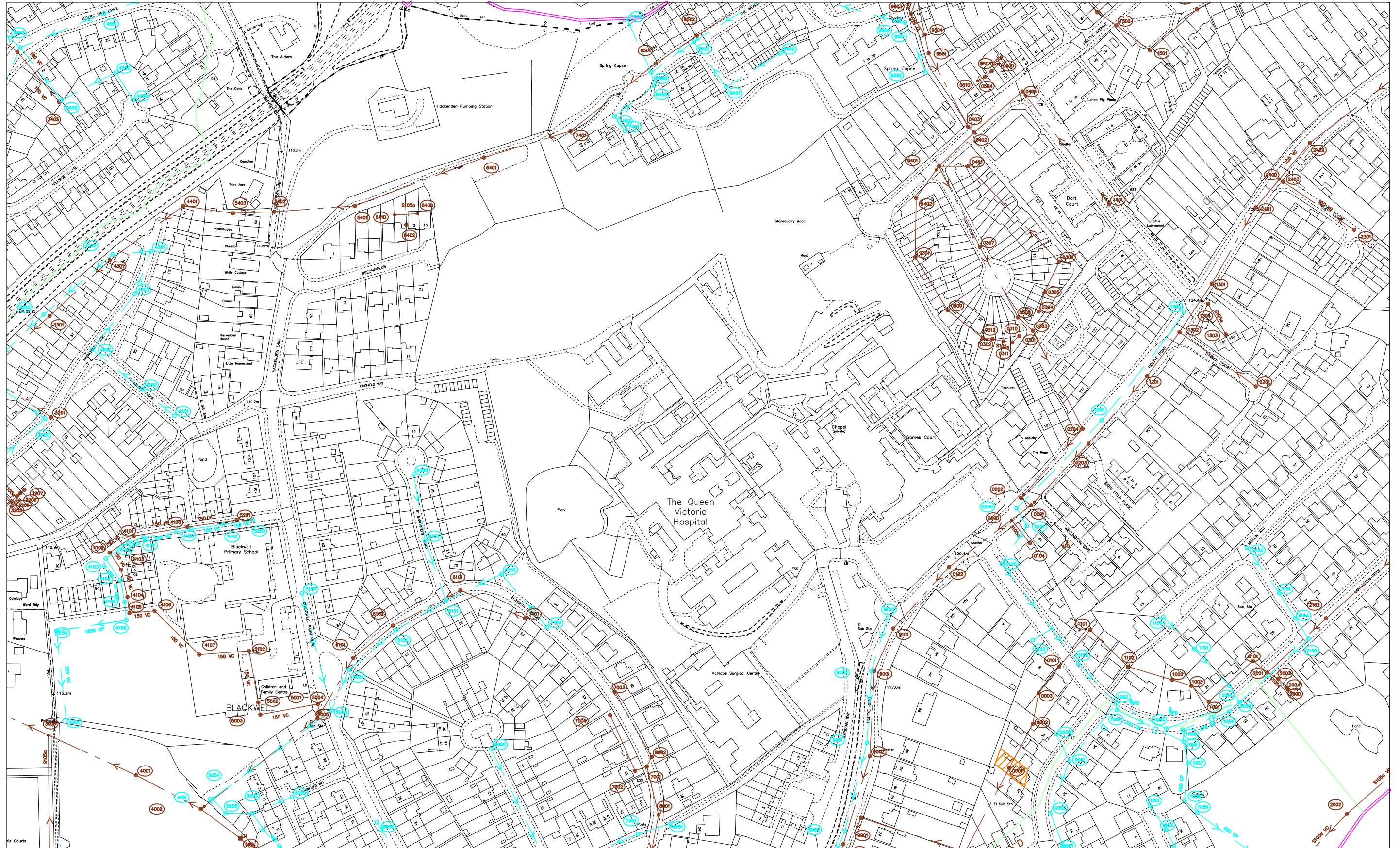


APPENDIX E

PUBLIC SEWER RECORDS

SEWER RECORDS PAGE 1 OF 2

139554



138976

539363

O.S. REF

TQ3939SE

Title: 363882 Land at Queen Victoria

Drawn by: rohandas

Scale: 1:2500

Date: 13/12/2019

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy.
The actual positions should be determined on site.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cemen

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APPENDIX F

SUDS MANAGEMENT AND MAINTENANCE PLAN

**PROPOSED RESIDENTIAL DEVELOPMENT
LAND AT QUEEN VICTORIA HOSPITAL
HOLTYE ROAD
EAST GRINSTEAD
WEST SUSSEX
RH19 3DZ**

SUDS MANAGEMENT & MAINTENANCE PLAN

MACAR DEVELOPMENTS

JANUARY 2025

REF: SS/24/0802/7252



DOCUMENT CONTROL RECORD

Document Issue:

Rev	Date	Issue Status	Prepared by	Checked by
-	31.10.24	First Issue	S. Smith	C. Pendle
A	29.01.25	Updated to include Downstream Defender	S. Smith	C. Pendle

References:

The SUDS manual – CIRIA C753 (2015) ISBN 9780-86017-760-9
 National Planning Policy Framework (NPPF) – Communities and Local Government
 Technical Guidance - Flood Risk & Coastal Change (March 2012)



1 Introduction

- 1.1 This document sets out the principles for the long term management and maintenance of the proposed surface water Sustainable Drainage Systems (SuDS) installed at the residential development at land associated with the Queen Victoria Hospital in East Grinstead, West Sussex.
- 1.2 The purpose of this document is to set out the basis of the development SuDS Maintenance Plan and to ensure that the adopting management company is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and off site in accordance with the National Planning Policy Framework (NPPF).
- 1.3 The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, however additional tasks or varied maintenance frequency may be instructed by the maintenance company as required. Specific maintenance needs of the SuDS elements should be monitored and maintenance schedules adjusted to suit requirements.
- 1.4 The installed SuDS system at this development are the initial responsibility of Brookworth Homes. Following installation and after an initial period (TBC) of operation, all SuDS are to be transferred to an appointed Management Company. An agreement shall be set up by Brookworth Homes, who shall confirm in writing to the Principle Planning Officer at West Sussex County Council when the maintenance agreement is completed and is operative.
- 1.5 The Management Company will then be responsible for maintaining the surface water system including all SuDS in perpetuity. All property owners should be advised that an annual management fee will need to be paid to the management company for this service.
- 1.6 All those responsible for maintenance should follow relevant Health and Safety legislation (Health and Safety at Work Regulations, 1999) for all activities listed within this report including lone working, if relevant) and risk assessments should always be undertaken.
- 1.7 Any contractor employed by the Management Company shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.
- 1.8 This report is to read in conjunction with MJA drawing '6275-MJA-SW-XX-DR-C-080 *'Drainage Strategy'* for the location of all SuDS elements present within the development. Reference should also be made to the detailed landscape proposals for the proposed treatment / maintenance regime for all landscape features. The operations contained within this plan shall (where feasible) be in conjunction with routine grounds maintenance operations to the surrounding landscape.

2 SuDS Layout & Design

- 2.1 The storm water drainage strategy for the proposed development is to utilise a range of SuDS features to attenuate all surface water runoff from impermeable areas, with a restricted discharge via flow controls and pumped rising main into the existing surface water sewer that runs north east of the site to 'The Weald'.
- 2.2 The proposed storm water system consists of the following SuDS components:
- Permeable block paving (under-drained)
 - Attenuation tank (cellular polypropylene cells)
 - Storm water pipe work and road gullies
 - Flow control chambers
 - Pump station
- 2.3 There are three categories of maintenance activities referred to in this report:
- **Regular maintenance** (including inspections and monitoring).
Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
 - **Occasional maintenance**
Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).
 - **Remedial maintenance**
Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design.
Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.
- 2.4 It is also important that measures are taken to protect and ensure continued operation of drainage features during the construction phase. All road gullies will be blocked until the site is complete. Any permeable paving will be capped with a layer of concrete during construction and cored through once the majority of the construction is complete.

3 SUDS Management & Maintenance

Permeable Block Paving

- 3.1 Note: Loose materials such as sand, cement soil or other loose substances should not be stored directly on top of the permeable blocks without the use of an impenetrable sheet. To ensure the continual optimal performance of the permeable paving, it is recommended that the following maintenance should be carried out. The following guidelines are offered as an initial regime, but maybe either increased or decreased by the management company depending on the local environment and any external contributing factors.
- 3.2 Permeable pavements should be visually inspected a minimum of monthly for the first three months after installation and then a minimum of three times a year, preferably during and after heavy rainfall to check effective operation and identify areas of ponding. These inspections should occur close to the end of winter (March), mid-summer (July) and after the autumn (November).
- 3.3 During this inspection identify any areas that require remedial maintenance such as topping up of jointing grit or removal of vegetation, weeds, silts and sediments that may be clogging the joints between the blocks. Small areas such as driveways can be swept with a hand bristle broom, for larger areas such as parking courts a lorry mounted rotary brush and vacuum sweeper device can be used. Weeds can be removed from the surface through the controlled application of proprietary non-persistent contact herbicides. Those containing Glyphosate are the most suitable.
- 3.4 Care should be taken to ensure that only the detritus is removed from the joints and avoid removal of the jointing material. If required, joints should be replenished with aggregate material to lip of paver using specific 6-2mm single size grit using a stiff brush to sweep the material in ensuring joints are filled. Do not replace the jointing grit with sand as this will stop the permeable system from working.
- 3.5 For winter maintenance, the controlled use of de-icing may be used without causing significant detrimental effects towards the permeable pavements performance. When used carefully, the use of these chlorides will not result in an increase in the chloride levels in the local ground.
- 3.6 Contamination of the permeable block paving from routine landscape maintenance such as grass clippings from mowing, hedge trimming, mulching plant beds etc. should be prevented. If contamination occurs the debris should be immediately swept, collected and removed by the homeowner or landscape operative.
- 3.7 Depending on the amount of usage and the environment the permeable pavement has received and been exposed to, the sub base laying course material including geotextile membranes/ grids may require either replacement or cleaning after a 25 to 30 year period. This would be evident if the infiltration rate of the paving became prolonged, allowing ponding to develop. Should this occur, the uplifting and cleaning or replacing of the laying course maybe considered. The laying course material, jointing and blocks can be reused once cleaned, minimising costs.

- 3.8 Replacement sub-base material to be used should be a clean 4/20mm coarse graded aggregate to BS EN13242:2002. Jointing material between the blocks should be 6-2mm single size grit to the joints. Refer to MJA Consulting construction detail drawing for type of geotextile membrane/ geogrids to be used.
- 3.9 Materials removed from the voids or the layers below the surface may contain heavy metals and hydrocarbons and may need to be disposed of as controlled waste. Sediment testing should be carried out before disposal to confirm its classification and appropriate disposal methods.

Permeable Paving Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Brushing and vacuuming.	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weed.	As required.
Remedial actions	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 to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration performance is reduced as a result of significant clogging).
Monitoring	Initial inspection.	Monthly for 3 months after installation
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	3-monthly, 48 h after large storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chambers.	Annually.

Storm water pipe work and road gullies

- 3.10 The key maintenance requirement for the upstream surface water drainage system includes the removal of sediments and debris from the system as required.
- 3.11 All storm water pipe work should be visually inspected a minimum of monthly for the first three months after installation and then a minimum of once year. As road gullies are the first on the treatment train and susceptible to higher silt loadings, these will need to be inspected a minimum of monthly for the first three months after installation and then a minimum of every four months.

- 3.12 During this inspection identify any gully pots or pipes that require remedial maintenance such removal of sediment, debris, leaves and litter as required. This involves the removal all protective covers and grids and the cleaning out of channels or gully pots by hand or with suitable jetting equipment.
- 3.13 During the inspections the general operation and structural integrity of all components should be recorded and repaired as required.

Flow Control Chamber

- 3.14 The key maintenance requirement for the flow control chambers will be the inspection of the units for blockages of the vortex flow control unit and silt removal from sump of chamber.
- 3.15 The hydraulic vortex flow control unit has no moving parts and is self-activating, requiring minimal maintenance. After initial installation, it is recommended that the unit be inspected monthly for three months.
- 3.16 Thereafter the manhole chamber and control device should be inspected at least every six months to verify the condition and operation of the unit and check for blockages within the inlet of the chamber and of the flow control device. During these inspections, accumulated silts should be removed and the sump cleaned out using a conventional sump vacuum cleaner. Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

Cellular Attenuation Tank

- 3.17 The key maintenance requirement for the cellular attenuation tank will be the visual inspection of the internal units via built in access chambers and integral maintenance tunnel for the removal of sediment and jetting as required. A visual inspection of the impermeable geomembrane that envelopes the structure should also be carried out to check for structural integrity.
- 3.18 The attenuation tank is to be constructed from cellular units that allow internal CCTV and jetting access for inspection and maintenance (Stormbloc® by Hydro International or similar approved). The built in modular inspection unit and maintenance tunnels within the attenuation tank allow almost the entire volume of the structure to be inspected via CCTV camera and flushed through. A catchpit chamber is to be installed immediately upstream of the attenuation tank to reduce the amount of silt entering the tank and it will generally only be necessary to ensure that the upstream catchpits / silt traps are free from debris such as leaves or sediment.
- 3.19 It is recommended that the attenuation tank system be inspected no less frequently than at monthly intervals for the first 3 months and thereafter at 6 monthly intervals. In addition, it is suggested that the installation is inspected immediately following the first storm event, whenever this should occur post installation.
- 3.20 It should also be noted that more regular inspections may be required should the catchpit(s) fill more frequently and/or if the initial inspections reveal that maintenance / cleaning will be required more regularly than at six month intervals.

- 3.21 Flushing of the system can be achieved using a jetting system with a 150 bar pump pressure (ie. approximately 80 bar at the nozzle) at a discharge flow of 300 l/min. The jet nozzle should be introduced to the system via the Inspection manhole and the integral inspection / maintenance tunnel.
- 3.22 Any silt & debris should be flushed to the inspection or catchpit manhole and removed in accordance with the Management Company policy for waste management.

Cellular Systems - Operation and Maintenance Requirements

Maintenance schedule	Required action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	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.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually, or as required
Remedial actions	Repair/rehabilitation of 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 and after large storms

Pump Station

- 3.23 The management company should have a maintenance contract with the pump manufacturer to ensure that the pump equipment is continuously in optimal working conditions. The manufacturer can recommend a maintenance schedule for the installed pump to help avoid unexpected and costly breakdowns.
- 3.24 An emergency pump arrangement should be agreed with the manufacturer. Should the pump fail and is unrepairable it is important that a temporary arrangement or new pump is installed immediately.

Downstream Defender® (by Hydro International)

- 3.25 The Downstream Defender is a hydrodynamic vortex separator device. The frequency of the maintenance interval can be site specific and generally the first year of inspections and monitoring of pollutant accumulations will determine the required future maintenance intervals.
- 3.26 The inspection of the device is a simple process that requires monitoring of pollutant accumulations. The key maintenance activities include floatable, oil and sediment removal. No internal components require removal. Maintenance consists of removing sediments, floatable trash, oils, and other debris from the sump with a standard vacuum tanker.

3.27 Recommended Equipment

- Safety Equipment and Personal Protective Equipment
- Tools to remove grate or cover
- Pole with skimmer or net
- Sediment probe
- Hydro International Downstream Defender® Maintenance Log
- Rubbish bags for removed floatables

3.28 Inspection Procedures

1. Set up any necessary safety equipment to provide access to the Downstream Defender®. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or cover to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the chamber.
5. Using a sediment probe measure the depth of sediment that has collected.
6. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.
8. Securely replace the grate or lid.
9. Remove safety equipment.
10. Contact Hydro International on 01275 878371 to discuss any irregularities noted during inspection or for further information.

3.29 First-Year Monitoring

Hydro International recommends that inspections be performed at least every six months during the first year of operation. The rate of floatables and oil accumulation can be estimated by dividing the surface area covered by floatables and/or oil by the number of months since the Downstream Defender® was installed.

• Sediment Monitoring:

A simple probe should be used to determine the depth of sediment in the sump. Sediment removal is not required unless sediment depths exceed 75% of the maximum clean-out depths stated in Table 1.

Table 1. Downstream Defender® Pollutant Storage Capacities and Max. Cleanout Depths.

Unit Diameter	Total Oil Storage	Oil Clean-out Depth	Total Sediment Storage	Sediment Clean-out Depth	Max. Liquid Volume Removed
(feet)	(gallons)	(inches)	(gallons)	(inches)	(gallons)
4	70	<16	141	<18	384
6	216	<23	424	<24	1,239
8	540	<33	939	<30	2,884
10	1,050	<42	1,757	<36	5,546
12	1,770	<49	2,970	<42	9,460

NOTES

1. Refer to Downstream Defender® Clean-out Detail (Fig. 1) for measurement of depths.
2. Oil accumulation is typically less than sediment, however, removal of oil and sediment during the same service is recommended.
3. Remove floatables first, then remove sediment storage volume.
4. Sediment removal is not required unless sediment depths exceed 75% of maximum clean-out depths stated in Table 1.

3.30 **Floatables, Oil, and Sump Cleanout**

A commercially or council owned vac-truck is used to remove captured sediment, oil and floatables. Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vac-truck hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump cleanout may typically be done during any season of the year.
- Floatables and sump cleanout should occur as soon as possible following a contaminated spill in the contributing drainage area.

Procedures

1. Set up any necessary safety equipment around the access of the Downstream Defender®. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. Remove all floatables with skimmer net or drop the vactruck hose to the base of the sump. Vac-truck out the sediment and gross debris from the sump floor.
5. Retract the vac-truck hose from the vessel.
6. Inspect the Angled Screens for blockages and ragging. If present, remove the obstruction or ragged materials from the surface using a hose or other screen-cleaning device.
7. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Note any apparent irregularities such as damaged components or blockages.
8. Securely replace the grate or lid.
9. Remove safety equipment.
10. Contact Hydro International on 01275 878371 to discuss any irregularities noted during cleanout.

Contact Information

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