



Surface Water Drainage Strategy

March 2019

www.phlorum.com

367 Wilmslow Road, M14 6AH

March 2019

Architecture Design

Architecture Design

11-23 Bridgewater Place

Manchester

M4 1QF

	Name	Date
Written By	David Hall	18 March 2019
Checked By	Glen Parker	18 March 2019
Authorised By	Glen Parker	18 March 2019

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1. Introduction

- 1.1 Phlorum has been appointed by Architecture Design to undertake a National Planning Policy Framework (NPPF) compliant Surface Water Drainage Strategy (SWDS) for the proposed development at 367 Wilmslow Road, Manchester, M14 6AH.
- 1.2 The purpose of this assessment is to address condition 15 (drainage) of the planning application approval notice (119180/OO/2018) issued by Manchester City Council, which states:

The Reserved Matters application shall include a scheme for surface water drainage works, designed in accordance with Non_statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards.

Reason To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution. This policy is imposed in light of national policies within the NPPF and NPPG and local policies EN08 and EN14.

- 1.3 This assessment would aim to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the NPPF.

Phlorum Limited

Southern Office: Unit 12, Hunns Mere Way, Woodingdean, Brighton, East Sussex, BN2 6AH

T: 01273 307 167 E: info@phlorum.com

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2. Site Overview

- 2.1 The site is shown outlined in red within Figure 1. It is partially a brownfield site and partially a greenfield site with a total surface area of approximately 1414m². The site comprises of a semi-detached house (367 Wilmslow Road), a parking area and a soft landscape area.

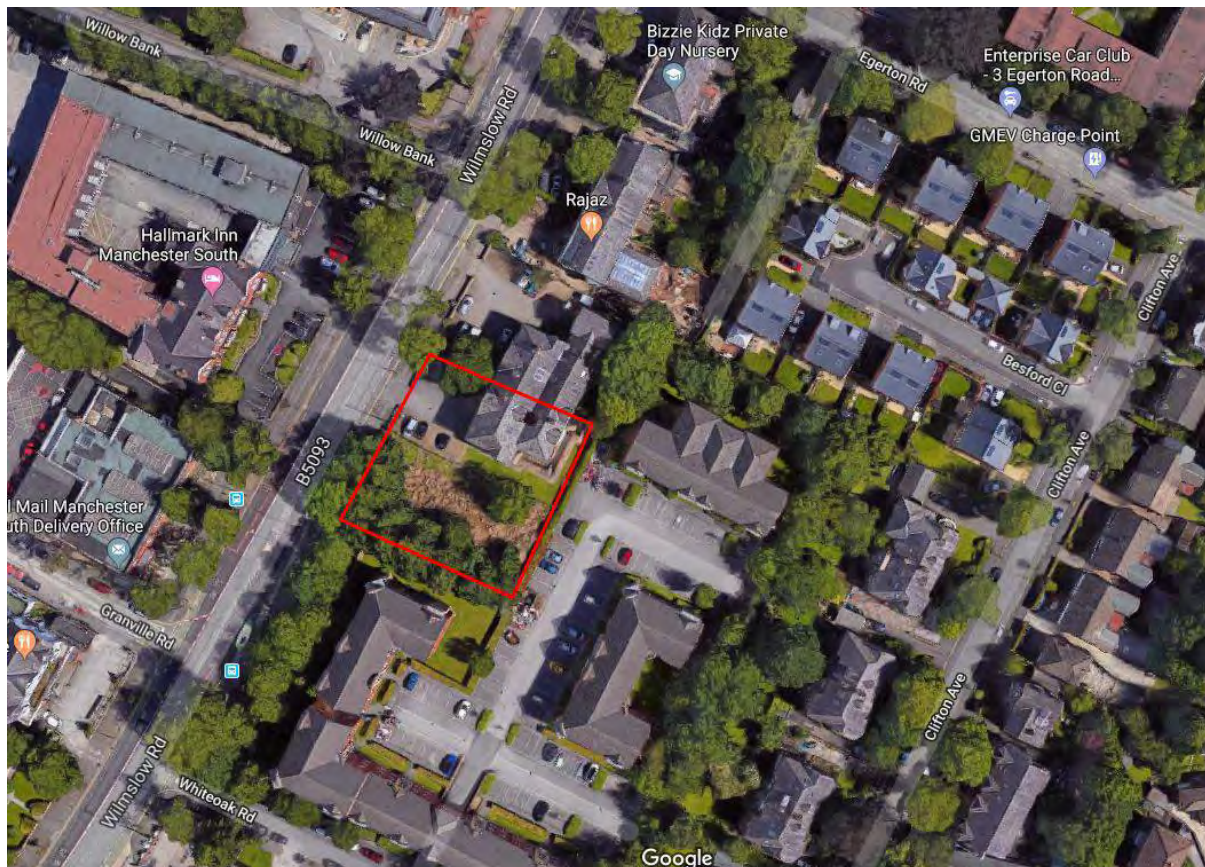


Figure 1: Location Map (Site boundary in red)

- 2.2 The proposal is for an extension of the existing low-rise apartment block (367 Wilmslow Road) and the construction of 3x3 bedroom houses adjacent in the greenfield area. See proposed plans in Appendix 1.
- 2.3 A topographic survey has not been provided at the time of writing. As such, 1m LiDAR data has been used for this assessment. Levels are shown in Figure 2. The levels on site are shown to vary from 38.48mAOD to 39.72mAOD based on 1m LiDAR data. However, it is noted that the location of the new site is significantly overgrown, and the LiDAR is not deemed reliable at this area.
- 2.4 A section through the site levels (see Figure 2) shows that the levels at the entrance and the back of the site differ by approximately 200mm.

- 2.5 The site also appears to have a slight drop of levels of approximately 300mm at the entrance to the car park.

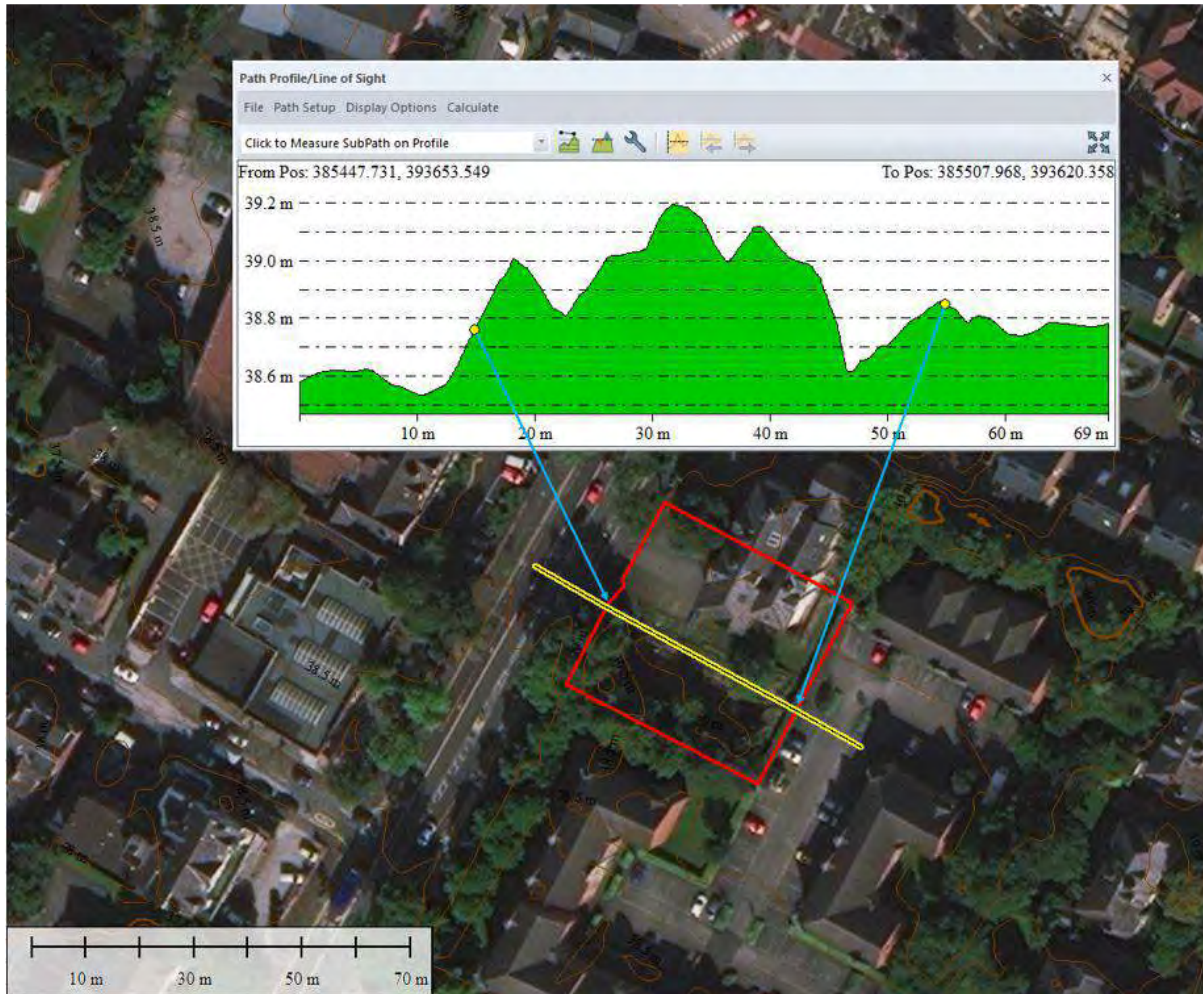


Figure 2: Topography on Site. (Source: 1m LiDAR)

- 2.6 From the existing and proposed site layouts provided by the client, the existing roof of 367 Wilmslow Road is 224m² and the hardstanding areas around the building (within the redline boundary) have an area of 402m² for a total of 626m² of existing roof and hardstanding areas. The proposed roof extension is 85m² and the new roof is 117m². The hardstanding areas would increase by 370m². In accordance with The SuDS Manual, an urban creep factor of 10% is applied, to give a total catchment for the post development attenuated area of 630m². The existing roof and hardstanding would drain as existing.

- 2.7 In order to mitigate flood risk posed by the proposed development, adequate control measures are required to be considered. This will ensure that surface water runoff can be managed at source and the flood risk off site is not increased. All proposed on-site storm drainage should be designed to accommodate a 1 in 100yr rainfall event including the appropriate allowance for climate change at 40%.

Geology and Infiltration Potential

- 2.8 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is sandstone with superficial deposits of diamicton. Nearby boreholes from the BGS database suggest that water level could be deeper than 6m bgl.
- 2.9 Site specific infiltration tests have been conducted by Your Environment Limited and these demonstrate that the ground is not suitable for infiltration. The test failed to record sufficient water drop within the testing period of 220min and as such infiltration rates are deemed too low for infiltration.
- 2.10 The conclusion from the report is that “in this instance, it is considered that soakaways could not be utilised at this site”. The report is appended in Appendix 1.

Nearby Watercourses and Existing Drainage Infrastructure

- 2.11 The closest watercourse to the site is the river Leigh, an EA Main River. It is culverted and is shown to go under Brook Road with its closest proximity being 140m south of the site.
- 2.12 Sewer records provided by United Utilities show that there are two combined sewers under Wilmslow Road. The records show the sewer closer to the site to be a 450mm pipe with an invert level of 32.54mAOD at the closest upstream manhole, which is approximately 4m deep. The sewer records also show that a combined adopted sewer runs from the back of 367 Wilmslow Road towards Wilmslow Road.
- 2.13 A CCTV survey provided by the client confirms the existence of a combined drain around the back of 367 Wilmslow Road. Details of the sewer (depth and exact location) are to be confirmed.

- 2.14 The proposed extension of 367 Wilmslow Road could potentially clash with the existing adopted sewer on site (this is to be confirmed pending information of the existing sewer location and depth). As such, a diversion may be required. This diversion would need to be designed and agreed with United Utilities pending survey information of the sewer.

Flood Zone and Vulnerability

- 2.15 The site proposed development can be seen to be within Flood Zone 1 as per the EA Flood Maps for Planning extract in Figure 3.
- 2.16 The proposed residential use of the site is deemed “More Vulnerable” under the vulnerability classifications within the NPPF.

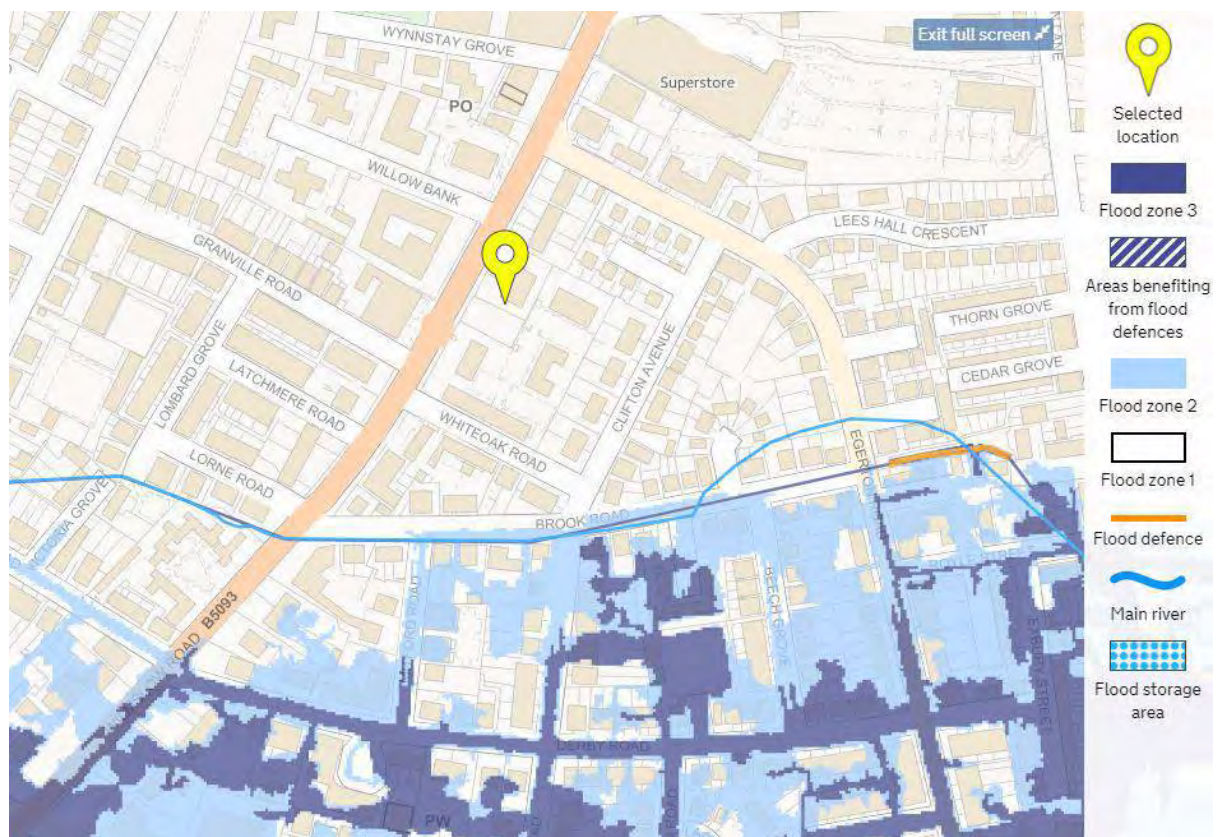


Figure 3: Flood Map for Planning

Surface Water Risk

- 2.17 The Long-Term Flood Risk Maps published by the EA show the site to be within an area of “Very Low” risk of surface water flooding, see Figure 4. This means that the annual exceedance probability of pluvial flooding is deemed less than 0.1%.

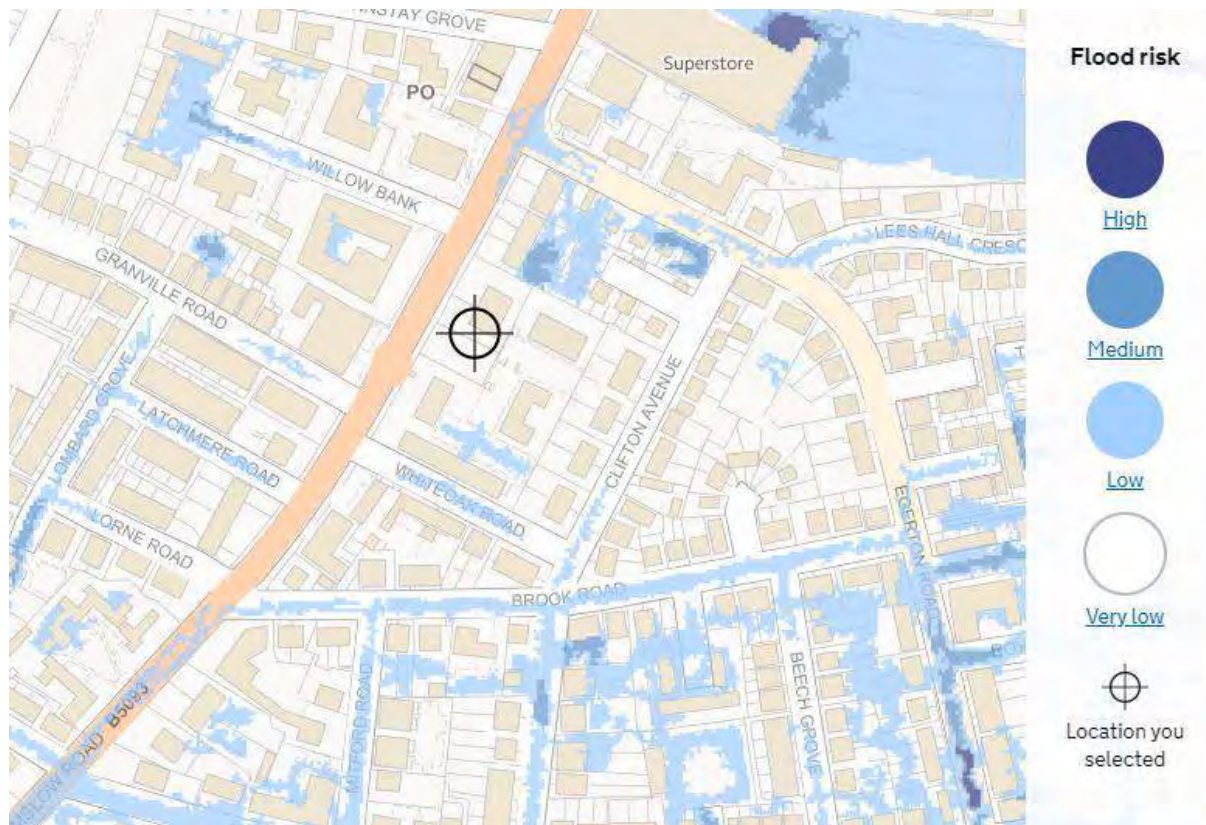


Figure 4: EA Long Term Flood Map, Surface Water Flood Extents

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Southern Office: Unit 12, Hunns Mere Way, Woodingdean, Brighton, East Sussex, BN2 6AH

T: 01273 307 167 E: info@phlorum.com

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3. SUDS Assessment

- 3.1 In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.
- 3.2 The management of surface water has been considered in respect to the SuDS hierarchy (below) (as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3):

SuDS Drainage Hierarchy				
			Suitability	Comment
	1.	Infiltration	x	Very low infiltration rates
	2.	Discharge to Surface Water	x	No watercourse in proximity
	3.	Discharge to Surface Water Sewer, Highway Drain or another Drainage System	x	No surface water sewer in proximity
	4.	Discharge to Combined Sewer	✓	
	5.	Discharge to a foul sewer (should not be considered as a possible option)	-	

Table 1: SuDS Hierarchy.

- 3.3 Following the SuDS drainage hierarchy, given infiltration is not viable and no surface water body or sewer is available for connection, the only feasible option at the site is to discharge the surface water runoff into the existing combined sewer on site as per the existing drainage arrangement on site.
- 3.4 The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in the table:

Suitability of SuDS Components		
SuDS Component	Description	Suitability
Infiltrating SuDS	Infiltration can contribute to reducing runoff rates and volumes while supporting baseflow and groundwater recharge processes. The suitability and infiltration rate depend on the permeability of the surrounding soils	x
Permeable Pavement	Pervious surfaces can be used in combination with aggregate sub-base and/or geocellular/modular storage to attenuate and/or infiltrate runoff from surrounding surfaces and roofs. Liners can be used where ground conditions are not suitable for infiltration	✓
Green / Blue Roofs	Green Roofs provide areas of visual benefit, ecological value, enhanced building performance and the reduction of surface water runoff. They are generally more costly to install and maintain than conventional roofs but can provide many long-term benefits and reduce the on-site storage volumes. Blue roofs provide additional attenuation by storing the rainwater in crates located in the roof structure. Runoff from these structures can be reduced significantly using small orifice devices due to the low risk of blockage.	x
Rainwater Harvesting	Rainwater Harvesting is the collection of rainwater runoff for use. It can be collected from roofs or other impermeable area, stored, treated (where required) and then used as a supply of water for domestic, commercial and industrial properties	✓
Swales	Swales are designed to convey, treat and attenuate surface water runoff and provide aesthetic and biodiversity benefits. They can replace conventional pipework as a means of conveying runoff, however space constraints of some sites can make it difficult incorporating them into the design	x
Rills and Channels	Rills and Channels keep runoff on the surface and convey runoff along the surface to downstream SuDS components. They can be incorporated into the design to provide a visually appealing method of conveyance, they also provide effectiveness in pre-treatment removal of silts	x
Bioretention Systems	Bioretention systems can reduce runoff rates and volumes and treat pollution through the use of engineer soils and vegetation. They are particularly effective in delivering interception, but can also be an attractive landscape feature whilst providing habitat and biodiversity	x
Retention Ponds and Wetlands	Ponds and Wetlands are features with a permanent pool of water that provide both attenuation and treatment of surface water runoff. They enhance treatment processes and have great amenity and biodiversity benefits. Often a flow control system at the outfall controls the rates of discharge for a range of water levels during storm events	x
Detention Basins	Detention Basins are landscaped depressions that are usually dry except during and immediately following storm events, and can be used as a recreational or other amenity facility. They are generally appropriate to manage high volumes of surface water from larger sites such as a neighbourhood	x
Geocellular Systems	Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before infiltration, controlled release or use. The inherent flexibility in size and shape means they can be tailored to suit the specific characteristics and requirements of any site	x
Proprietary Treatment Systems	Proprietary treatment systems are manufactured products that remove specific pollutants from surface water runoff. They are especially useful where site constraints preclude the use of other methods and can be useful in reducing the maintenance requirements of downstream SuDS	✓
Filter Drains and Filter Strips	Filter drains are shallow trenches filled with stone, gravel that create temporary subsurface storage for the attenuation, conveyance and filtration of surface water runoff. Filter strips are uniformly graded and gently sloping strips of grass or dense vegetation, designed to treat runoff from adjacent impermeable areas by promoting sedimentation, filtration and infiltration	x

Table 2: Suitability of SuDS Components

- 3.5 It is proposed that the main SUDs device to be used for the site is Type C permeable pavement. Additionally, rainwater harvesting should be considered by the developer.

Permeable Pavement

- 3.6 The Permeable Paving would be a Type C (no infiltration) as infiltration is deemed not feasible as per the infiltration tests conducted for the site.
- 3.7 The paving would be formed by the following layers:
- Permeable Concrete blocks.
 - Laying Course Material.
 - Geotextile filter.
 - Sub-Base: Clean Stone (Depth: 350mm for cell 1 and cell 3 and 600mm for cell 2 – subject to CBR testing).
 - Geotextile filter.
 - Impermeable geomembrane.

Rainwater Harvesting

- 3.8 Rainwater harvesting systems should be considered for rainwater re-use. Rainwater harvesting can take various forms including simple water butts to utilise runoff for watering and irrigation, to more complex pumped RWH systems to be used in grey water uses.
- 3.9 Water Butts are considered suitable for this site to reduce peak discharges and downstream flood risk. Water butts often have limited storage capacity, given that when a catchment is in flood, water butts are often full and have no spare capacity for flood waters. However, it is still considered that they have an important role to play in the sustainable use of water.
- 3.10 As such, downpipes could be routed through a water butt prior to overflow discharge to the underground system.

4. Surface Water Drainage Strategy

- 4.1 In order to mitigate flood risk posed by the proposed development, adequate control measures are required to be considered. This will ensure that surface water runoff is dealt with at source and the flood risk on/off site is not increased over the lifetime of the development.

Drainage Strategy

- 4.2 The existing site is drained to a combined public sewer on site. It is proposed to utilise this sewer for draining the proposed development.
- 4.3 The proposed extension of 367 Wilmslow Road may potentially clash with the existing adopted sewer on site (this is to be confirmed pending information of the existing sewer location and depth). As such, a diversion may be required. This diversion would need to be designed and agreed with United Utilities pending survey information of the sewer. A minimum clearance of 1.2m would be required between existing or proposed structures and extent of adoptable sewer and/or inspection chamber.
- 4.4 The areas of the existing roof, hardstanding to the rear of the existing building, and existing car park to the front of the existing building (total of 550m²) are to be drained as the existing situation as these would not be changed significantly as part of the proposals.
- 4.5 Runoff from the extension to the roof is to be managed by new rainwater pipes, the location of which is to be confirmed by the architect.
- 4.6 Runoff from the extension to the roof, the new roof, the new access road, the 10 new parking spaces, the foot access to the apartments, and the public footpath to the front of the new houses (total of 630m²) is to be managed as part of this drainage proposal.
- 4.7 Sediment traps are to be installed on the drainage network to reduce the risk of blockage from the roof runoff.
- 4.8 All runoff from the newly managed areas are to be conveyed to Type C permeable pavement sub-base located under the new access road, the 10 new parking spaces, and the foot access to the apartments.
- 4.9 A Hydrobrake or similar vortex flow control is proposed to limit the flow from the managed areas to 1.0l/s. A minimum opening for the flow control of 50mm is proposed to minimise the risk of blockage. Additionally, the risk of blockage is reduced through sediment traps.

- 4.10 The proposal includes a new drainage connection to the existing public combined sewer on site. As it can be seen in Table 3, there is a reduction over the existing situation in terms of surface water runoff rates therefore there should be adequate capacity for the proposed drainage scheme. This connection should be agreed with the United Utilities.
- 4.11 A proposed strategy plan has been included in Appendix 2.

Runoff rates

- 4.12 Greenfield runoff rates have been calculated using Micro Drainage Software and applying the *Institute of Hydrology Report 124* (Marshall and Bayliss, 1994), as recommended in the CIRIA 753 'The SUDS Manual' for calculating the greenfield runoff rates. *Calculations are included in Appendix 3.*
- 4.13 In addition, the existing brownfield runoff rates and the proposed unattenuated runoff rates have also been calculated (see Table 3 and Appendix 3).

SURFACE WATER DISCHARGE RATES SUMMARY.					
Impermeable Area (m ²)		Discharge Rates (l/s)			
		Q _{BAR}	1 year	30 year	100 year
Greenfield	1180	0.3	0.2	0.5	0.6
Existing	630		8.2	20.3	26.1
Proposed (unchanged part of site) – unattenuated	550		7.2	17.6	22.8
Proposed (new or changed surfaces or roofs) – attenuated	630		1.0	1.0	1.0
Total proposed	1180		8.2	18.6	23.8
Betterment over Existing			0	2.7	3.3

Table 3: Runoff rates

- 4.14 As DEFRA Report 'Rainfall runoff management for Developments' recommends, the design principle is to limit the runoff for events of similar frequency of occurrence to the same peak rate of run as that which takes place from greenfield sites. However, there are two situations where the greenfield flow rate is not actually applied to define the limiting discharge rates:

- The limit of discharges based on QBAR that are less than 1 l/s/ha for permeable sites as this is seen as being an unreasonable requirement (producing very large storage volumes). QBAR is then set to 1 l/s/ha;
- Small sites would require impractically small controls to achieve the required flow rates where these are calculated to be less than 5 l/s. In this case a minimum flow of 1 l/s is used as a practical minimum for flow control devices without causing blockage risks Using Hydrobrake or similar vortex control devices.

- 4.15 It can be seen that the proposal provides betterment over the existing situation effectively decreasing the flood risk as a result of the development. This is in line with the Non-statutory Technical Standards for Sustainable Drainage Systems (March 2015), which states:

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

Long Term Storage

- 4.16 Long-term storage is usually required to address the additional runoff caused by the development compared to the volume that would be contributed from the site in its Greenfield state. The specialised literature CIRIA 753 'The SUDS Manual' provides two approaches guidance for the rates of discharge in relation to runoff mitigation:

- 4.17 Approach 1:

"Where there is extra volume generated by the development that has to be discharged (because there are no opportunities for it to be infiltrated and/or used on site), this volume should be released at a very low rate (e.g. <2 l/s/ha or as agreed with the local drainage approving body and/or environmental regulator) and the 1:100 year greenfield allowable runoff rate reduced to take account of this extra discharge." (Kellagher, 2002).

- 4.18 Approach 2

"An alternative approach to managing the extra runoff volumes from extreme events separately from the main drainage system is to release all runoff (above the 1-year event) from the site at a maximum rate of 2 l/s/ha or QBAR, whichever is the higher value (or as agreed with the drainage approving body and/or environmental regulator). This avoids the need to undertake more detailed calculations and modelling."

- 4.19 For the purposes of this report, Approach 2 is adopted as the proposal is to limit the offsite flows for proposed development areas to a value as close as feasible to greenfield Qbar rates.

Attenuation Storage

- 4.20 Attenuation storage is needed to temporarily store water during periods when the runoff rates from the development site exceed the infiltration rates or the allowable discharge rates from the site.

- 4.21 Rainfall depths for the 1 in 100 years return period plus 40% of CC were produced using Micro Drainage software to estimate the largest volume, critical storm for typical storm durations.
- 4.22 The **Total Attenuation Storage Volume required for the site is 26.5 m³**. The critical storm duration is 180min and the half drain time is 242min. See Appendix 3, calculations.

Design Exceedance

- 4.23 In the event of drainage system failure under extreme rainfall events or blockage, flooding may occur within the site. In the event of the development's drainage system failure, the runoff flow will be dictated by topography on site.
- 4.24 A nominal fall of the access road is proposed to be adopted towards Wilmslow Road to provide an overland flow route.
- 4.25 In terms of drainage mechanisms to mitigate the impacts of exceedance events on the site, it is advised that non-return valves should be provided to prevent the ingress/egress of surface and foul waters should the sewer become surcharged.
- 4.26 It is proposed that the new houses are raised 150mm above surrounding ground levels to minimise the risk of surface water flooding.

Water Quality

- 4.27 Adequate treatment must be delivered to the water runoff to remove pollutants through SuDS devices, which are able to provide pollution mitigation. Pollution Hazards and the SuDS Mitigation have been indexed in the specialized literature CIRIA 753 *'The SUDS Manual'*.

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	Pollution Hazard Level	Total suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4

Table 4: Summary of Pollution hazard Indices for different Land Use

- 4.28 Runoff from roof and footpath areas is considered to generally be uncontaminated. However, to prevent any potential sediment from impacting on the storage structure, sediments traps should be provided at suitable locations to prevent sedimentation.

- 4.29 The runoff from all the remaining hardstanding trafficked areas is to be treated through the permeable pavement. The Mitigation Indices of the proposed SuDS techniques are summarized in Table 5 below. It can be seen the water treatment provided by this SuDS train is enough to remove the pollutants.

INDICATIVE SuDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER			
SuDS Component	Total suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

. Table 5: Indicative SuDS Mitigation Indices

Adoption and Maintenance

- 4.30 All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owners before adoption. In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post construction and monthly for the first quarter following construction, see Appendix 4.

5. Conclusion

- 5.1 Phlorum has been appointed by Architecture Design to undertake a National Planning Policy Framework (NPPF) compliant Surface Water Drainage Strategy (SWDS) for the proposed development at 367 Wilmslow Road, Manchester, M14 6AH. The aim of the study is to address condition 15 of the planning application notice (119180/OO/2018).
- 5.2 The proposal is for an extension of the existing low-rise apartment block (367 Wilmslow Road) and the construction of 3x3 bedroom houses adjacent in the greenfield area.
- 5.3 The site is shown within Flood Zone 1 as per the published Environment Agency Flood Map for Planning. The surface water risk to the site is deemed low.
- 5.4 Infiltration testing has demonstrated infiltration methods to be unfeasible for full infiltration at the site.
- 5.5 CCTV survey provided by the client confirms the existence of a combined drain around the back of 367 Wilmslow Road. Details of the sewer (depth and exact location) are to be confirmed.
- 5.6 The proposed extension of 367 Wilmslow Road may potentially clash with the existing adopted sewer on site (this is to be confirmed pending information of the existing sewer location and depth). As such, a diversion would be required. This diversion should be designed and agreed with United Utilities pending survey information of the sewer.
- 5.7 Following the SuDS drainage hierarchy, the highest-ranking feasible option is to discharge the surface water runoff into the existing public combined sewer on site.
- 5.8 The areas of the existing roof, existing hardstanding to the back of the existing building, and existing car park to the front (total of 550m²) are to be drained as existing as these would not be changed as part of the proposals.
- 5.9 Runoff from the extension to the roof, the new roof, the new access road, the 10 new parking spaces, the foot access to the apartments, and the public footpath to the front of the new houses (total of 630m²) is to be managed as part of this drainage proposal.
- 5.10 A Hydrobrake or similar vortex flow control is proposed to limit the flow from the managed areas to 1.0l/s while minimising the risk of blockage.
- 5.11 The proposal provides betterment over the existing situation effectively decreasing the flood risk as a result of the development. This is in line with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)

- 5.12 The **Total Attenuation Storage Volume required for the site is 26.5 m³**. The critical storm duration is 180min and the half drain time is 242min. See Appendix 3, calculations.
- 5.13 The treatment provided by the sediment traps and the permeable pavement is deemed sufficient for the level of anticipated pollution for the runoff from the site.
- 5.14 The findings and recommendations of this report are for the use of the client who commissioned the assessment, and no responsibility or liability can be accepted for the use of the report or its findings by any other person or for any other purpose.

Appendix 1

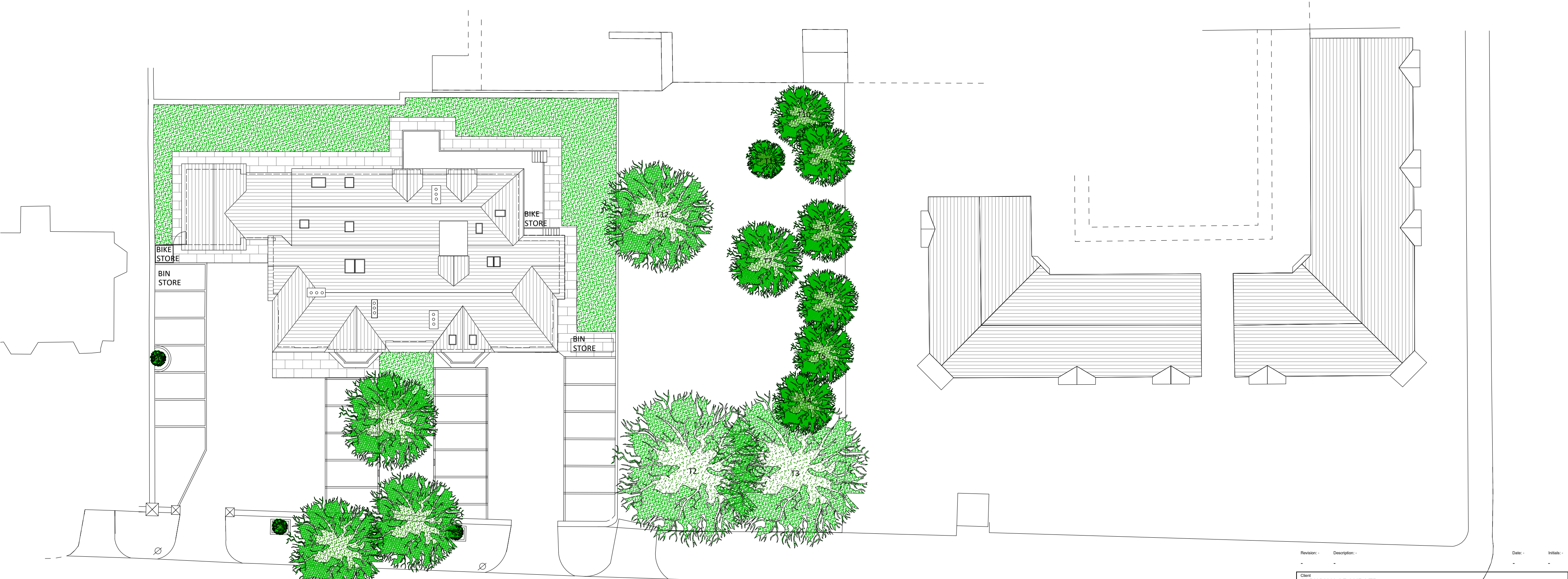
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Project: 162-367 WILMSLOW ROAD
Title: EXISTING SITE PLAN
Drawing No. PL 001
Revision: -
Scale: 1:250 @ A2
Drawn: LW
Date: 10.12.17

12/23
Architecture Design
Limited

11-23 Bridgewater Place
Manchester
M4 1QF

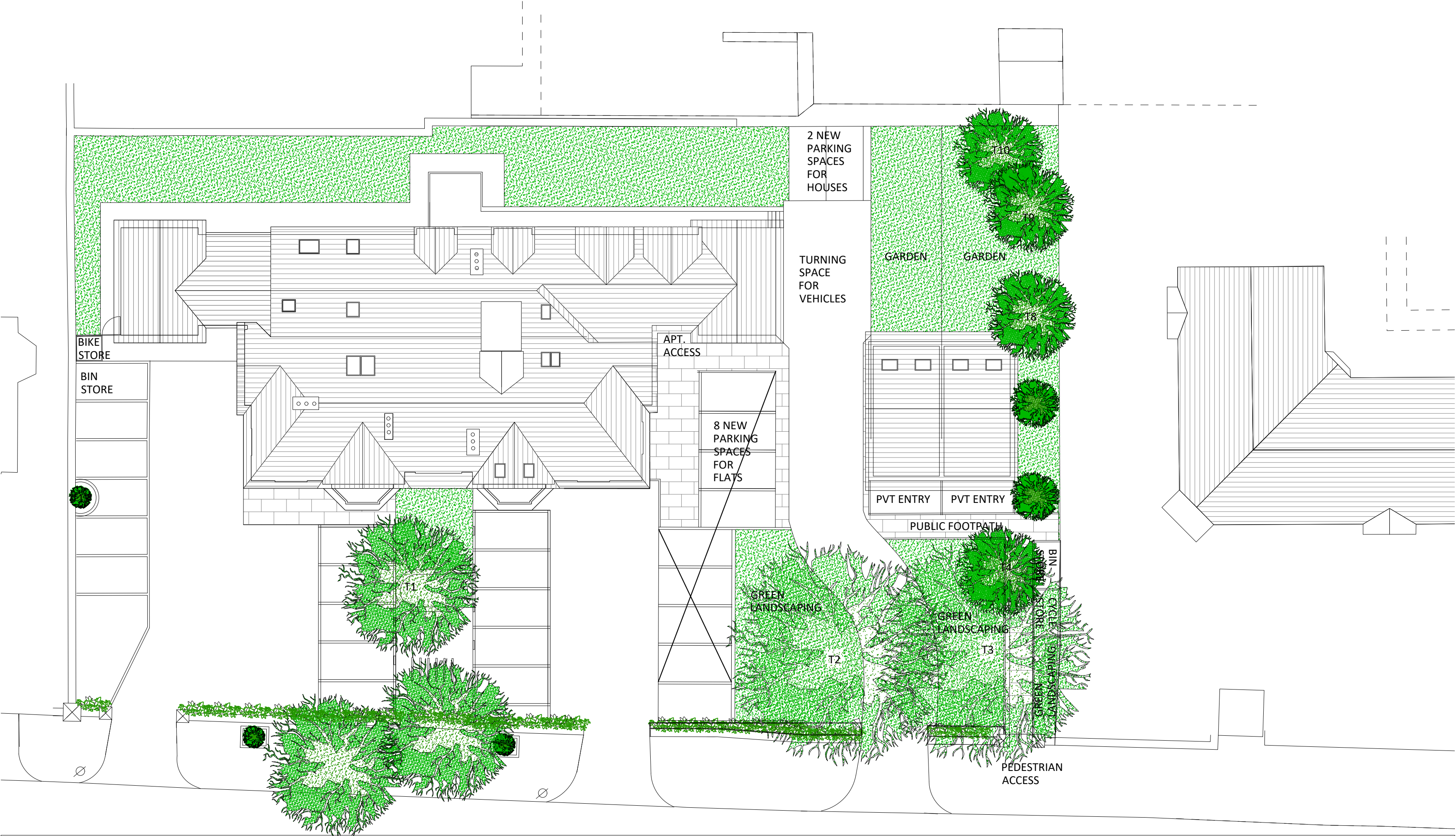
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Revision:	Description:	Date:	Initials:
A	AMENDED TO LA COMMENTS	15.08.18	LW
B	STREET SCENE UPDATED	05.08.18	LW
C	PARKING AMENDED	20.09.18	LW

Client: FELTHAM GROUP			
Project: 162 367 WILMSLOW ROAD			
Title: PROPOSED SITE PLAN			
Drawing No. PL 008	Revision C	Scale: 1:200 @ A2	Date: 10.12.17

12/23

Architecture Design

1223 ARCHITECTURE DESIGN LTD

11-23 Bridgewater Place
Manchester
M4 1QF



T: 0161 711 0584

E: lwalsh@1223arch.co.uk

W: www.1223arch.co.uk

Ambiental Environmental Assessment

Sussex innovation centre
Science Park Square,
Brighton,
BN1 9SB

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: 4330
Our Ref: UUPS-ORD-83504
Date: 07/02/2019**

Dear Sirs

Location: 367 WILMSLOW ROAD, MANCHESTER, M14 6AH

I acknowledge with thanks your request dated 05/02/2019 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

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- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
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- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
2826	37.3	CO	32.94	450			VC	7.87747	1 in 100
4802	37.3	CO	32.94	450			VC	34.36568	1 in 344
2714	38.33	CO	36.24	300			VC	15.24228	1 in 11
6502	36.06	CO	36.73	300			VC	29.29667	1 in 225
5913	37.71	CO	35.75	300			VC	130.2396	1 in 128
6609	39.28	CO	36.5	300			VC	60.87772	1 in 172
3301	37.15	CO	33.92	300			VC	36.29442	1 in 100
2901	37.15	CO	33.92	300			VC	69.12308	1 in 157
5802	37.7	CO	34.31	300			VC	116.277	1 in 141
2703	37.62	CO	36.89	225			VC	22.20762	1 in 344
3801	36.81	CO	34.48	225			VC	7.28011	1 in 243
3409	39.28	CO	36.63	100			VC	6.679519	1 in 251
4905	38.63	CO	36.15	300			VC	32.62695	1 in 251
7505	38.63	CO	36.15	300			VC	69.85699	1 in 241
4701	38.67	CO	37.48	225			VC	35.20265	1 in 117
5918	37.94	SW	35.48	225			VC	29.42788	1 in 155
6803	39.68	CO	37.88	300			VC	83.03085	1 in 98
4803	37.44	SW	36.72	1050			VC	6.348555	1 in 100
4905	37.95	CO	35.98	300			VC	11.13435	1 in 100
5806	36.35	CO	35.84	100			VC	15.13435	1 in 80
2303	35.77	CO	33.86	600			VC	125.9697	1 in 60
7600	39.71	CO	38.86	600			VC	19.10497	1 in 60
2506	36.01	CO	34.83	375			VC	25.94224	1 in 105
4801	37.08	CO	34.25	225			VC	116.3205	1 in 295
5801	37.89	SW	36.08	150			VC	29.68256	1 in 76
2900	36.08	CO	34.55	225			VC	39.81206	1 in 150
3600	37.49	CO	32.91	375			VC	28.96174	1 in 47
7615	39.75	CO	38.84	100			VC	74.1485	1 in 122
3603	37.18	CO	35.13	225			VC	5.952972	1 in 105
6800	39.82	CO	37.78	225			VC	36.76955	1 in 101
6906	39.48	CO	37.48	225			VC	8.151933	1 in 101
7903	39.32	SW	37.48	225			VC	58.6856	1 in 101
5917	37.89	FO	35	225			VC	26.3984	1 in 101
6901	38.53	CO	34.99	225			VC	52.5362	1 in 62
3668	38.53	CO	34.99	225			VC	11.8034	1 in 20
6400	38.21	CO	35.5	300			VC	49.35598	1 in 62
4900	37.45	CO	34.57	225			VC	8.571	1 in 20
3703	37.56	CO	0	225			VC	52.81179	1 in 164
4609	37.56	CO	0	225			VC	73.82417	1 in 164
5401	37.41	CO	34.7	300			VC	3.407655	1 in 164
7601	40.11	CO	34.1	525			VC	104.0048	1 in 104
4501	38.26	CO	35.73	225			VC	34	1 in 142
6800	37.85	CO	32.82	450			VC	8.395629	1 in 104
4700	38.67	CO	35.42	450			VC	72.75049	1 in 182
6809	39.64	CO	32.71	375			VC	11.13119	1 in 121
6335	38.67	CO	35.15	150			VC	26.8619	1 in 121
4301	38.67	CO	35.15	150			VC	6.673374	1 in 121
4812	38.67	CO	35.15	150			VC	5.535554	1 in 121
3638	37.88	CO	36.03	225			VC	0.9822067	1 in 60
3901	37.88	CO	36.03	225			VC	53.1073	1 in 60
4311	37.88	CO	36.03	225			VC	6.459469	1 in 60
2302	36.62	CO	33.38	100			VC	13.78879	1 in 271
4402	36.62	CO	33.38	100			VC	70.45566	1 in 271
5908	38.48	CO	31.91	525			VC	13.78879	1 in 271
2904	37.23	CO	34.27	300			VC	14.45339	1 in 47
2300	36.07	CO	32.41	600			VC	21.77854	1 in 57
2625	36.07	CO	32.41	600			VC	1.787094	1 in 57
3309	39.84	CO	38.34	225			VC	3.605551	1 in 180
7500	39.84	CO	38.34	225			VC	3.605551	1 in 180
2502	36.25	CO	34.47	375			VC	55.01278	1 in 125
2902	38.37	CO	36.34	225			VC	18.72845	1 in 125
2400	36.07	CO	32.41	600			VC	10.00735	1 in 181
4505	38.11	CO	35.61	225			VC	26.07681	1 in 81
7415	38.11	CO	35.61	225			VC	30.14963	1 in 59
2501	36.48	CO	34.93	225			VC	16.13452	1 in 107
5909	37.87	CO	34.63	225			VC	16.27882	1 in 107
3800	37.87	CO	34.63	225			VC	47.01984	1 in 107
4703	38.67	CO	35.49	300			VC	38.62842	1 in 107
6900	39.65	CO	35.16	300			VC	135.1237	1 in 107
3701	37.55	CO	35.16	300			VC	8.728784	1 in 196
4605	37.99	CO	35.32	1400			VC	3.162278	1 in 16
3310	38.64	CO	32.55	450			VC	7.21102	1 in 16
4601	38.64	CO	32.55	450			VC	33.82626	1 in 16
6803	38.6	CO	32.55	450			VC	2.65016	1 in 16
7615	39.68	CO	37.45	225			VC	44.81102	1 in 139
7615	39.68	CO	37.45	225			VC	37.64308	1 in 139
4605	37.96	CO	34.36	225			VC	10.28665	1 in 139
2504	36.3	CO	34.6	225			VC	22.84058	1 in 139
3501	36.3	CO	34.6	225			VC	36.87818	1 in 49
3843	36.3	CO	34.6	225			VC	63.85311	1 in 1
4300	36.47	CO	33.09	375			VC	55.10886	1 in 384
2508	35.58	CO	33.83	300			VC	28.44202	1 in 237
2715	36.07	CO	32.41	600			VC	4.54611	1 in 237
3607	36.07	CO	32.41	600			VC	9.303135	1 in 237
6500	38.69	CO	37.11	375			VC	6.316703	1 in 237
5784	38.69	CO	37.11	375			VC	11.79558	1 in 237
7605	39.31	CO	36.68	300			VC	10.7176	1 in 237
3802	36.99	CO	33.28	450			VC	6.20912	1 in 237
5514	36.99	CO	33.28	450			VC	3.162278	1 in 237
7421	36.99	CO	33.28	450			VC	17	1 in 237
7405	36.99	CO	33.28	450			VC	99.03333	1 in 206
7405	36.99	CO	33.28	450			VC	29.41988	1 in 45
3666	36.99	CO	33.28	450			VC	2.073792	1 in 45
2601	37.27	CO	32.74	300			VC	9.587264	1 in 85
4604	37.9	CO	32.74	300			VC	85.64583	1 in 85
7801	40.07	CO	33.39	375			VC	28.16811	1 in 224
4700	38.47	CO	34.85	150			VC	78.26238	1 in 45
4401	37.03	CO	34.85	150			VC	27.29469	1 in 245
4401	37.03	CO	34.85	150			VC	9.18364	1 in 245
5602	38.76	CO	36.36	300			VC	36.67857	1 in 245
3702	37.74	CO	34.85	300			VC	12	1 in 38
4609	38.76	CO	34.85	300			VC	15.24147	1 in 123
5705	39.84	CO	33.22	525			VC	73.79025	1 in 168
4811	37.18	CO	34.36	300			VC	57.07889	1 in 168
5511	37.18	CO	34.36	300			VC	19.07643	1 in 168
7602	40.42	CO	38.5	225			VC	140.8028	1 in 168
5901	38.65	CO	32.15	375			VC	6.305644	1 in 180
4808	38.65	CO	32.15	375			VC	53.37335	1 in 180
2803	36.74	CO	34.82	225			VC	53.94159	1 in 674
7616	38.04	CO	34.86	300			VC	11.82277	1 in 65
7616	38.04	CO	34.86	300			VC	22.2036	1 in 65
2507	36.11	SW	33.71	1350			VC	5.05386	1 in 43
4606	37.68	CO	35.82	225			VC	116.9017	1 in 346
4800	37.68	CO	35.82	225			VC	90.01413	1 in 134
6501	38.02	CO	35.18	225			VC	62.75451	1 in 134
5500	37.71	CO	35.68	300			VC	61.2848280	1 in 134
5502	37.65	CO	35	300			VC	48.01041	1 in 883
5900	38.44	CO	0	525			VC	26.4764	1 in 883
4903	37.33	SW	36.36	300			VC	5.026335	1 in 158
7914	38.44	CO	31.99	225			VC	14.76462	1 in 158
5805	39.35	CO	31.99	225			VC	32.69965	1 in 158
3410	37.62	CO	36.03	150			VC	13.52955	1 in 158
5919	37.62	CO	36.03	150			VC	5.09902	1 in 105
6301	37.64	CO	34.4	225			VC	3.162278	1 in 105
5911	38.2	CO	34.1	300			VC	107.5407	1 in 105
4502	37.62	CO	32.54	450			VC	20.22401	1 in 174
4908	37.79	SW	35.64	1050			VC	47.04253	1 in 174
5300	37.01	CO	34.9	300			VC	11.19006	1 in 117
2713	37.01	CO	34.9	300			VC	6.809552	1 in 117
5804	39.21	CO	32.47	300			VC	10.5672	1 in 78
3302	36.28	CO	33.61	225			VC	70.5165	1 in 78
4902	37.29	CO	35.4	225			VC	11.40175	1 in 78
3300	36.19	CO	32.78	375			VC	7.368841	1 in 4
5914	37.97	SW	34.69	375			VC	135.0221	1 in 540
3502	36.85	CO	35.56	1400			VC	19.25338	1 in 31
2801	38.9	CO	32.72	225			VC	1.801454	1 in 25
4402	37.29	CO	35.4	225			VC	55.57877	1 in 25
7302	40.01	CO	36.88	100			VC	12.04729	1 in 25
7913	37.01	CO	34.28	300			VC	5	1 in 228
3500	36.05	CO	34.28	300			VC	9.728857	1 in 228
4400	37.02	CO	33.69	300			VC	88.2419	1 in 228
5641	37.02	CO	33.69	300			VC	4.848899	1 in 228
4403	37.87	SW	36.47	150			VC	13.50332	1 in 42
5916	37.87	SW	36.47	150			VC	2.859477	1 in 35
6908	39.58	CO	38.29	225</					



Happy Drains Ltd

Unit 12A Chalex Industrial Estate, Manor Hall Road, Southwick, BN42 4NH

Tel: 0800 849 8099 Email: service@happydrains.co.uk

Ref C0009805

Date 26/02/2019

Phlorum Limited
Ground Floor, Adamson House
Towers Business Park
Wilmslow Road
Didsbury
M20 YY

Re: 367 Wilmslow Road, Manchester, M14 6AH

Dear Sir/Madam

1. DESCRIPTION OF PROPERTY

Residential Properties

2. DRAINAGE SYSTEM

This is a combined drainage system accessible by 4 Manholes. The pipework is circular in shape, 100mm in diameter and vitrified clay and polyvinyl Chloride material. Further specific variations can be found in the report content.

3. SHARED

The sections identified within the property boundary are for the sole use of this property and therefore the responsibility of the site owner to maintain.

The sections as shared or beyond the property boundary generally are the legal responsibility of the local water company to maintain.

4. CIRCUMSTANCES

- General CCTV Survey

5. SUMMARY

The defects are fully noted in the attached report. We have surveyed as much as possible , but some sections were un-surveyable due (without further time and safety equipment)due to the depth of the manhole. so we have put a price in for this, this is a day rate price plus confined space entry as this will take us a day to complete, we have also put the price for the localised liners there is 7 in total but we believe we will find more on site.

6. Quotation and Specification of Repairs

Company No: 08267396
Registered office:
100 Church Street
Brighton, East Sussex
BN1 1UJ





Happy Drains Ltd

Unit 12A Chalex Industrial Estate, Manor Hall Road, Southwick, BN42 4NH

Tel: 0800 849 8099 Email: service@happydrains.co.uk

Repair 1) - To return to site with confined space safety equipment. To facilitate man entry into the 3m deep manhole to survey and complete the full site survey (Additional day @ £895.00 + VAT)

Repair 2) - High pressure jet the drainage system in preparation

Repair 3) - Carry out a pre-and post-installation CCTV inspection

Repair 4) – Section 1,2,3,5 and 6 To install 7 x 600mm long 100mm diameter 'Silicate Repair Patch' repair (cost items @ £2450.00 +_ VAT)

- 1.91m and 3.46m upstream of MH between MH 1 to SVP,
- 0.40m downstream of MH between MH1 and Carrier,
- 0.70m upstream of MH between MH4 and SVP, 4.49m and 6.49m downstream of MH between MH3 and MH2,
- 1.22m upstream of MH between MH2 to SVP.

The following method will be applied: -

To high pressure jet the system, to clean and remove all debris for lining acceptance. To carry out CCTV survey to ensure the systems are clear of obstructions to control lining. To install lining process. Inspect & test on completion.

Water Supply and access to be provided by the client for the installation purposes.

We will be pleased to carry out the above works for the sum of £3325.00 + VAT.

7. COST SAVINGS

The proposed repair methods have been specifically selected as the most cost-effective method and expedient to rectify the defects noted.

8. GUARANTEE

Please note that all repair works proposed are guaranteed for up to 5 years for repairs and our guarantee does not affect your statutory rights.

Due to the nature of working underground it is not possible to state conclusively that there will be no further damage discovered once the repairs are commenced, if this occurs, we will make all efforts to mitigate the costs and seek the authority through the proper channels before carrying out additional repairs.

Please ensure that appropriate access to water and electricity are provided on site to complete the repair (the engineer will confirm these details with you) If you require more information or wish to discuss this matter, please contact us.

Yours sincerely

Happy Drains Ltd

Company No: 08267396
Registered office:
100 Church Street
Brighton, East Sussex
BN1 1UJ





Project

Project Name: 367 Wilmslow Road-Manchester-M14 6AH
Project Date: 23/02/2019
Project Standard: MSCC4 Sewers & Drainage GB (SRM4 Scoring)



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367 Wilmslow Road-Manchester-M14 6AH		23/02/2019

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Scoring Summary

Project Name	Project Number	Project Date
367 Wilmslow Road-Manchester-M14 6AH		23/02/2019

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
5	SVPX	4	Broken pipe at joint from 9 o'clock to 1 o'clock ,

Service / Operational Condition

Section	PLR	Grade	Description
All inspected pipes are in an acceptable service condition (< grade 3).			

Abandoned Surveys

Section	PLR	Description
All inspections complete, none are abandoned.		

Information

These scoring summaries are based on the SRM grading from the WRC.

**Happy Drains**

12A Chalex Industrial Estate, Southwiche Manor Hall Road
Tel. 0800 849 8099
Reports@happydrains.co.uk

Project Information

Project Name	Project Number	Project Date
367 Wilmslow Road-Manchester-M14 6AH		23/02/2019

Contractor

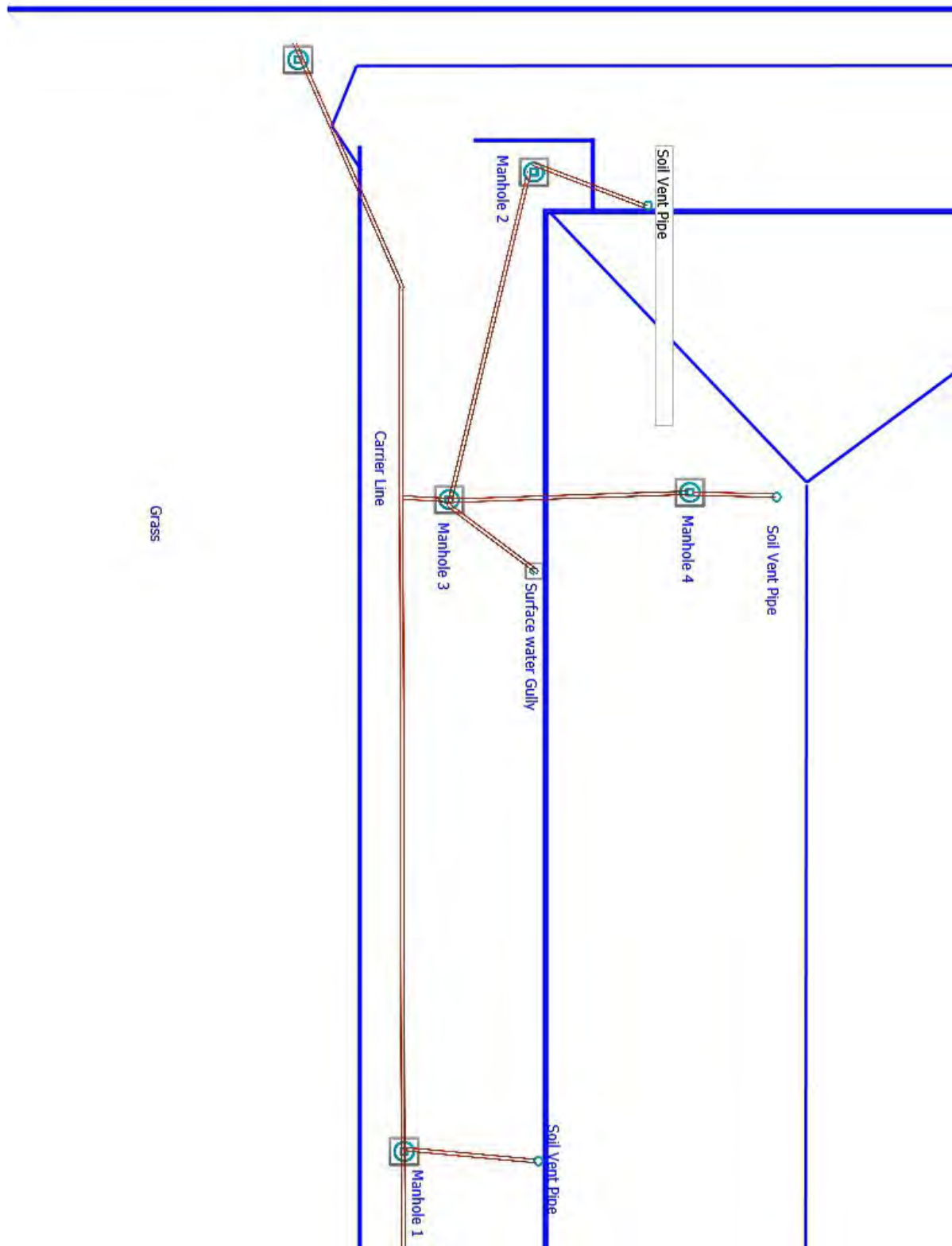
Company: Happy Drains
Description: CCTV Survey
Street: 12A Chalex Industrial Estate
Town or City: Southwiche Manor Hall Road
County: Sussex
Post Code: BN43 4HN
Phone: 0800 849 8099
Mobile: 07824 757572
Email: Reports@happydrains.co.uk



Project Information

Project Name	Project Number	Project Date
367 Wilmslow Road-Manchester-M14 6AH		23/02/2019

Project Drawing





Section Profile

Project Name

367 Wilmslow Road-Manchester-M14 6AH

Project Number**Project Date**

23/02/2019

Circular, 100 mm, 100 mm

Section	Upstream Node	Downstream Node	Date	Road	Pipe Material	Total Length	Inspected Length
1	SVP	Manhole 1	23/02/2019	367 Wilmslow Road	Vitrified clay pipe (i.e. all clayware)	3.71 m	3.71 m
2	Manhole 3	carrier	23/02/2019	367 Wilmslow Road	Vitrified clay pipe (i.e. all clayware)	0.40 m	0.40 m
3	SVP	Manhole 4	23/02/2019	367 Wilmslow Road	Polyvinyl chloride	1.15 m	1.15 m
4	manhole 4	Manhole 3	23/02/2019	367 Wilmslow Road	Vitrified clay pipe (i.e. all clayware)	7.43 m	7.43 m
5	SVP	Manhole 2	23/02/2019	367 Wilmslow Road	Vitrified clay pipe (i.e. all clayware)	3.04 m	3.04 m
6	Manhole 3	Manhole 2	23/02/2019	367 Wilmslow Road	Polyvinyl chloride	9.98 m	9.98 m
7	Swg	manhole 3	23/02/2019	367 Wilmslow Road	Polyvinyl chloride	1.30 m	1.30 m

Total: 7 Sections x Circular 100 mm, 100 mm = 27.01 m Total Length and 27.01 m Inspected Length

Total: 7 Sections = 27.01 m Total Length and 27.01 m Inspected Length



Section Summary

Project Name 367 Wilmslow Road-Manchester-M14 6AH	Project Number	Project Date 23/02/2019
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Number of sections	7
Total length of sewer network	27.01 m
Inspected length of sewer network	27.01 m
Not inspected length of sewer network	0.00 m
Total abandoned inspections	0
Number of section inspection photos	30
Number of section inspection videos	7
Number of section inspection scans	0
Number of section inclination measurements	0

PLR:	SVPX	Upstream Node:	SVP
Inspection Direction:	Upstream	Downstream Node:	Manhole 1
Inspected Length:	3.71 m	Dia/Height:	100 mm
Total Length:	3.71 m	Pipe Material:	Vitrified clay pipe (i.e. all clayware)

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: Manhole 1
3	0.37	JN	Junction at 2 o'clock, diameter: 100mm
4	1.91	JDM	Joint displaced, medium
5	3.46	JDM	Joint displaced, medium
6	3.71	BRF	Finish node type, major connection without manhole, reference number: SVP, Soil Vent Pipe

PLR:	Manhole 3X	Upstream Node:	Manhole 3
Inspection Direction:	Downstream	Downstream Node:	carrier
Inspected Length:	0.40 m	Dia/Height:	100 mm
Total Length:	0.40 m	Pipe Material:	Vitrified clay pipe (i.e. all clayware)

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: Manhole 3
3	0.40	CC	Crack, circumferential from 9 o'clock to 3 o'clock
4	0.40	BRF	Finish node type, major connection without manhole, reference number: carrier, carrier line

PLR:	SVPX	Upstream Node:	SVP
Inspection Direction:	Upstream	Downstream Node:	Manhole 4
Inspected Length:	1.15 m	Dia/Height:	100 mm
Total Length:	1.15 m	Pipe Material:	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension



Section Summary

Project Name	Project Number	Project Date
367 Wilmslow Road-Manchester-M14 6AH		23/02/2019

No.	m+	Code	Observation
2	0.00	MH	Start node type, manhole, reference number: Manhole 4
3	0.52	JN	Junction at 3 o'clock, diameter: 100mm
4	0.73	JDM	Joint displaced, medium
5	1.15	BRF	Finish node type, major connection without manhole, reference number: SVP, soil vent pipe

PLR:	manhole 4X	Upstream Node:	manhole 4
Inspection Direction:	Upstream	Downstream Node:	Manhole 3
Inspected Length:	7.43 m	Dia/Height:	100 mm
Total Length:	7.43 m	Pipe Material:	Vitrified clay pipe (i.e. all clayware)

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: Manhole 3
3	7.43	MHF	Finish node type, manhole, reference number: manhole 4, internal manhole

PLR:	SVPX	Upstream Node:	SVP
Inspection Direction:	Upstream	Downstream Node:	Manhole 2
Inspected Length:	3.04 m	Dia/Height:	100 mm
Total Length:	3.04 m	Pipe Material:	Vitrified clay pipe (i.e. all clayware)

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: Manhole 3
3	0.19	JN	Junction at 3 o'clock, diameter: 100mm
4	1.22	BJ	Broken pipe at joint from 9 o'clock to 1 o'clock ,
5	3.04	BRF	Finish node type, major connection without manhole, reference number: SVP, soil vent pipe

PLR:	Manhole 3X	Upstream Node:	Manhole 3
Inspection Direction:	Downstream	Downstream Node:	Manhole 2
Inspected Length:	9.98 m	Dia/Height:	100 mm
Total Length:	9.98 m	Pipe Material:	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: Manhole 3
3	4.49	CC	Crack, circumferential from 8 o'clock to 3 o'clock
4	6.49	CC	Crack, circumferential from 12 o'clock to 4 o'clock
5	9.98	MHF	Finish node type, manhole, reference number: Manhole 2

PLR:	SwgX	Upstream Node:	Swg
Inspection Direction:	Upstream	Downstream Node:	manhole 3
Inspected Length:	1.30 m	Dia/Height:	100 mm
Total Length:	1.30 m	Pipe Material:	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	WL	Water level, 0% of the vertical dimension
2	0.00	MH	Start node type, manhole, reference number: manhole 3
3	1.30	GYF	Finish node type, gully, reference number: Swg, surface water gully



Section Inspection - 23/02/2019 - SVPX

Section 1	Inspection 1	Date 23/02/19	Time 14:40	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SVPX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SVP
Road:	367 Wilmslow Road	Inspected Length:	3.71 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	3.71 m	Downstream Node:	MANHOLE 1
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50 Position [m] Code Observation MPEG Photo Grade

Depth: m
Manhole 1



0.00

WL

Water level, 0% of the vertical dimension

0.00

MH

Start node type, manhole, reference number: Manhole 1

00:00:00

0.37

JN

Junction at 2 o'clock, diameter: 100mm

00:00:20

1.91

JDM

Joint displaced, medium

00:00:49

1

3.46

JDM

Joint displaced, medium

00:01:17

1

3.71

BRF

Finish node type, major connection without manhole, reference number: SVP: Soil Vent Pipe

00:01:35

SVP
Depth: m

Structural Defects

Construction Features

Service & Operational Observations

Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	1.0	0.5	2.0	1.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - SVPX

Section 1	Inspection Direction Upstream	PLR SVPX	Client's Job Ref	Contractor's Job Ref
--------------	----------------------------------	-------------	------------------	----------------------



, 0.00 m
Water level, 0% of the vertical dimension



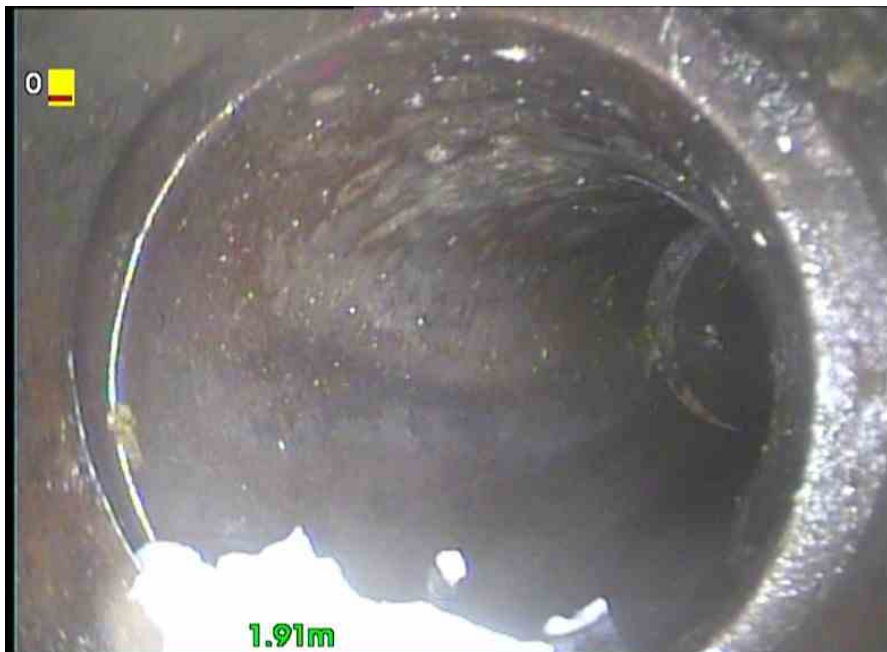
, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 1

Section Pictures - 23/02/2019 - SVPX

Section 1	Inspection Direction Upstream	PLR SVPX	Client's Job Ref	Contractor's Job Ref
--------------	----------------------------------	-------------	------------------	----------------------



, 00:00:20, 0.37 m
 Junction at 2 o'clock, diameter: 100mm



, 00:00:49, 1.91 m
 Joint displaced, medium

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Upstream	SVPX		



, 00:01:17, 3.46 m
 Joint displaced, medium



, 00:01:35, 3.71 m
 Finish node type, major connection without manhole, reference number: SVP, Soil Vent Pipe



Section Inspection - 23/02/2019 - Manhole 3X

Section 2	Inspection 2	Date 23/02/19	Time 14:54	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR MANHOLE 3X
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MANHOLE 3
Road:	367 Wilmslow Road	Inspected Length:	0.40 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	0.40 m	Downstream Node:	CARRIER
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m	0.00	WL	Water level, 0% of the vertical dimension			
Manhole 3	0.00	MH	Start node type, manhole, reference number: Manhole 3	00:00:00		
carrier	0.40	CC	Crack, circumferential from 9 o'clock to 3 o'clock	00:00:11		2
Depth: m	0.40	BRF	Finish node type, major connection without manhole, reference number: carrier: carrier line	00:00:14		

Structural Defects

Construction Features

Service & Operational Observations

Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	10.0	25.0	10.0	2.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - Manhole 3X

Section 2	Inspection Direction Downstream	PLR MANHOLE 3X	Client's Job Ref	Contractor's Job Ref
--------------	------------------------------------	-------------------	------------------	----------------------



, 0.00 m
Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 3

Section Pictures - 23/02/2019 - Manhole 3X

Section 2	Inspection Direction Downstream	PLR MANHOLE 3X	Client's Job Ref	Contractor's Job Ref
--------------	------------------------------------	-------------------	------------------	----------------------



, 00:00:11, 0.40 m
 Crack, circumferential from 9 o'clock to 3 o'clock



, 00:00:14, 0.40 m
 Finish node type, major connection without manhole, reference number: carrier, carrier line



Section Inspection - 23/02/2019 - SVPX

Section 3	Inspection 3	Date 23/02/19	Time 15:00	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SVPX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SVP
Road:	367 Wilmslow Road	Inspected Length:	1.15 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	1.15 m	Downstream Node:	MANHOLE 4
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
	0.00	WL	Water level, 0% of the vertical dimension			
	0.00	MH	Start node type, manhole, reference number: Manhole 4	00:00:00		
	0.52	JN	Junction at 3 o'clock, diameter: 100mm	00:00:10		
	0.73	JDM	Joint displaced, medium	00:00:14		1
	1.15	BRF	Finish node type, major connection without manhole, reference number: SVP: soil vent pipe	00:00:23		

Structural Defects

Construction Features

Service & Operational Observations

Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	1.0	0.9	1.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	SVPX		



, 0.00 m
 Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
 Start node type, manhole, reference number: Manhole 4

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	SVPX		



, 00:00:10, 0.52 m
 Junction at 3 o'clock, diameter: 100mm



, 00:00:14, 0.73 m
 Joint displaced, medium



Section Inspection - 23/02/2019 - manhole 4X

Section 4	Inspection 4	Date 23/02/19	Time 15:11	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR MANHOLE 4X
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	MANHOLE 4
Road:	367 Wilmslow Road	Inspected Length:	7.43 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	7.43 m	Downstream Node:	MANHOLE 3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:65 Position [m] Code Observation MPEG Photo Grade

Depth: m
Manhole 3



0.00

WL

Water level, 0% of the vertical dimension

0.00

MH

Start node type, manhole, reference number: Manhole 3

00:00:00

7.43

MHF

Finish node type, manhole, reference number: manhole 4:
internal manhole

00:00:43

manhole 4
Depth: m

Structural Defects

Construction Features

Service & Operational Observations

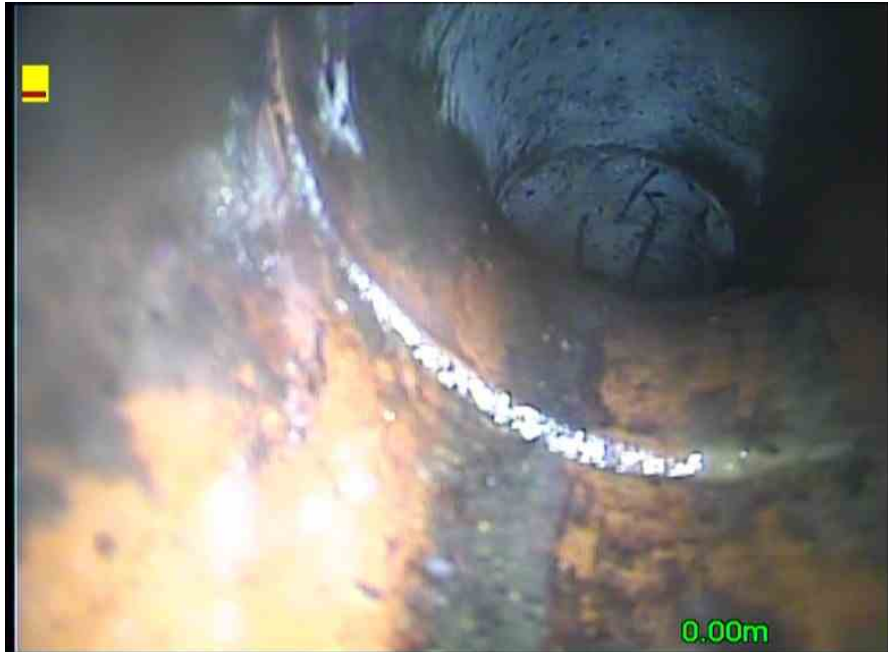
Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - manhole 4X

Section 4	Inspection Direction Upstream	PLR MANHOLE 4X	Client's Job Ref	Contractor's Job Ref
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, 0.00 m
Water level, 0% of the vertical dimension

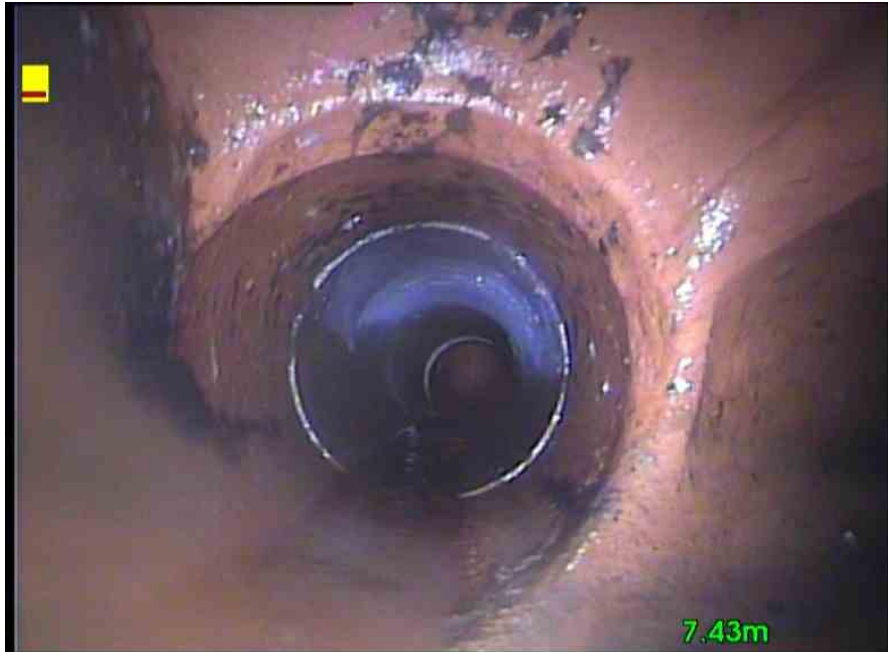


, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 3



Section Pictures - 23/02/2019 - manhole 4X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
4	Upstream	MANHOLE 4X		



, 00:00:43, 7.43 m
Finish node type, manhole, reference number: manhole 4, internal manhole



Section Inspection - 23/02/2019 - SVPX

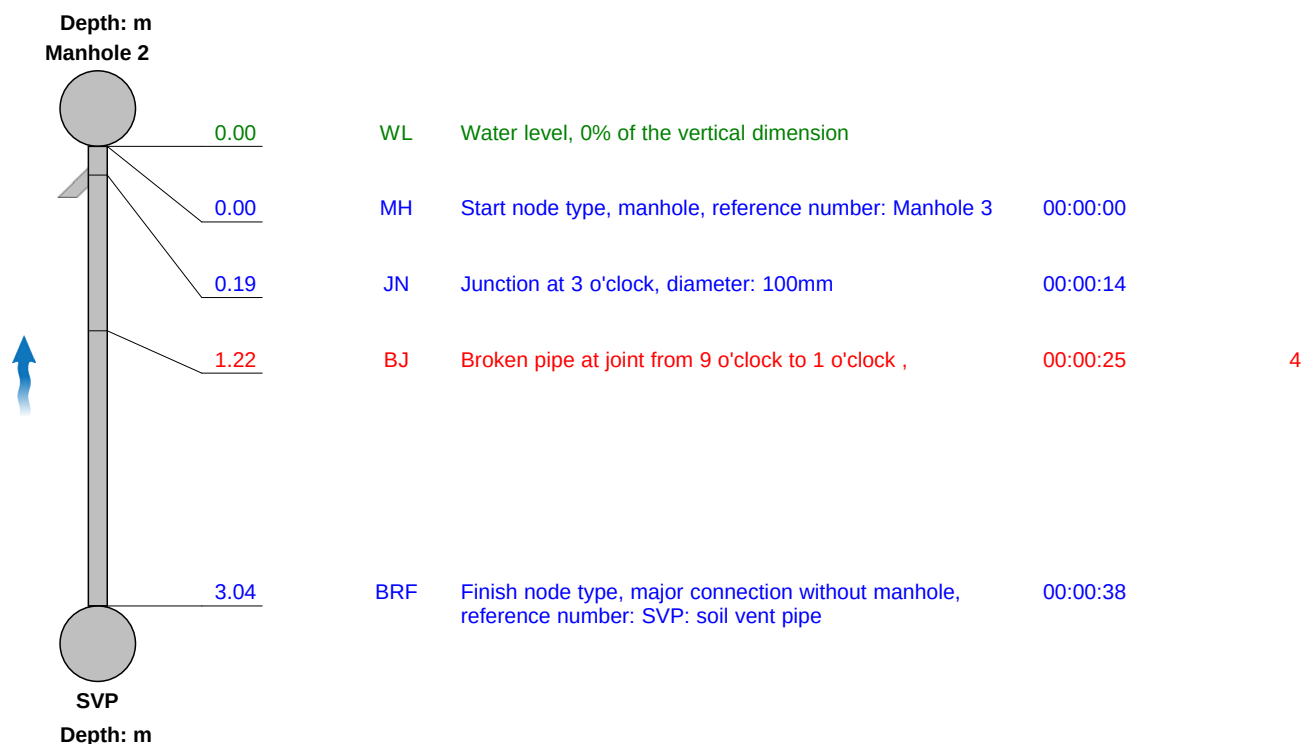
Section 5	Inspection 5	Date 23/02/19	Time 15:20	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SVPX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SVP
Road:	367 Wilmslow Road	Inspected Length:	3.04 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	3.04 m	Downstream Node:	MANHOLE 2
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50 Position [m] Code Observation MPEG Photo Grade



Structural Defects					Construction Features				
Service & Operational Observations					Miscellaneous Features				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	80.0	26.3	80.0	4.0	0	0.0	0.0	0.0	1.0

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 0.00 m
 Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
 Start node type, manhole, reference number: Manhole 3

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 00:00:14, 0.19 m
 Junction at 3 o'clock, diameter: 100mm



, 00:00:25, 1.22 m
 Broken pipe at joint from 9 o'clock to 1 o'clock ,



Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 00:00:38, 3.04 m
Finish node type, major connection without manhole, reference number: SVP, soil vent pipe



Section Inspection - 23/02/2019 - Manhole 3X

Section 6	Inspection 6	Date 23/02/19	Time 15:42	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR MANHOLE 3X
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MANHOLE 3
Road:	367 Wilmslow Road	Inspected Length:	9.98 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	9.98 m	Downstream Node:	MANHOLE 2
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:87	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m Manhole 3 Manhole 2 Depth: m						
0.00	WL	Water level, 0% of the vertical dimension				
0.00	MH	Start node type, manhole, reference number: Manhole 3 00:00:00				
4.49	CC	Crack, circumferential from 8 o'clock to 3 o'clock			00:00:50	2
6.49	CC	Crack, circumferential from 12 o'clock to 4 o'clock			00:01:10	2
9.98	MHF	Finish node type, manhole, reference number: Manhole 2 00:02:02				

Structural Defects					Construction Features				
Service & Operational Observations					Miscellaneous Features				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	10.0	2.0	20.0	2.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - Manhole 3X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Downstream	MANHOLE 3X		



, 0.00 m
Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 3

Section Pictures - 23/02/2019 - Manhole 3X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Downstream	MANHOLE 3X		



, 00:00:50, 4.49 m
 Crack, circumferential from 8 o'clock to 3 o'clock



, 00:01:10, 6.49 m
 Crack, circumferential from 12 o'clock to 4 o'clock



Section Pictures - 23/02/2019 - Manhole 3X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Downstream	MANHOLE 3X		



, 00:01:10, 6.49 m
Crack, circumferential from 12 o'clock to 4 o'clock



Section Inspection - 23/02/2019 - SwgX

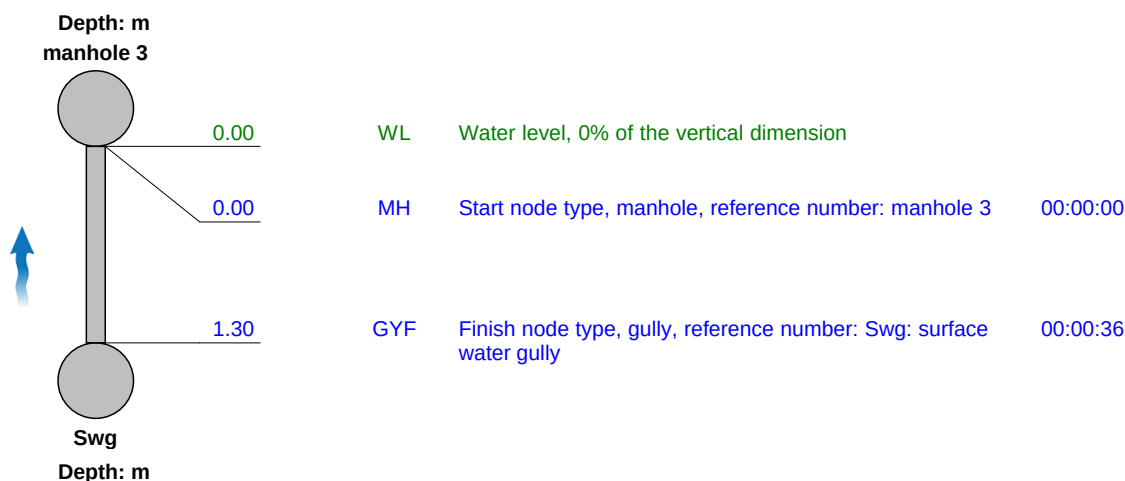
Section 7	Inspection 7	Date 23/02/19	Time 15:57	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SWGX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SWG
Road:	367 Wilmslow Road	Inspected Length:	1.30 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	1.30 m	Downstream Node:	MANHOLE 3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50 Position [m] Code Observation MPEG Photo Grade



Structural Defects

Construction Features

Service & Operational Observations

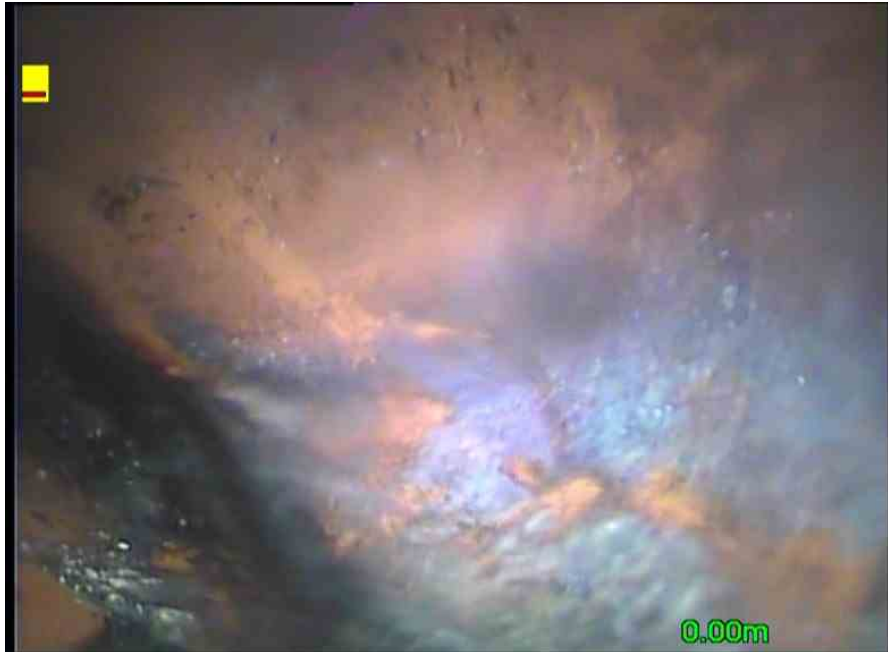
Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

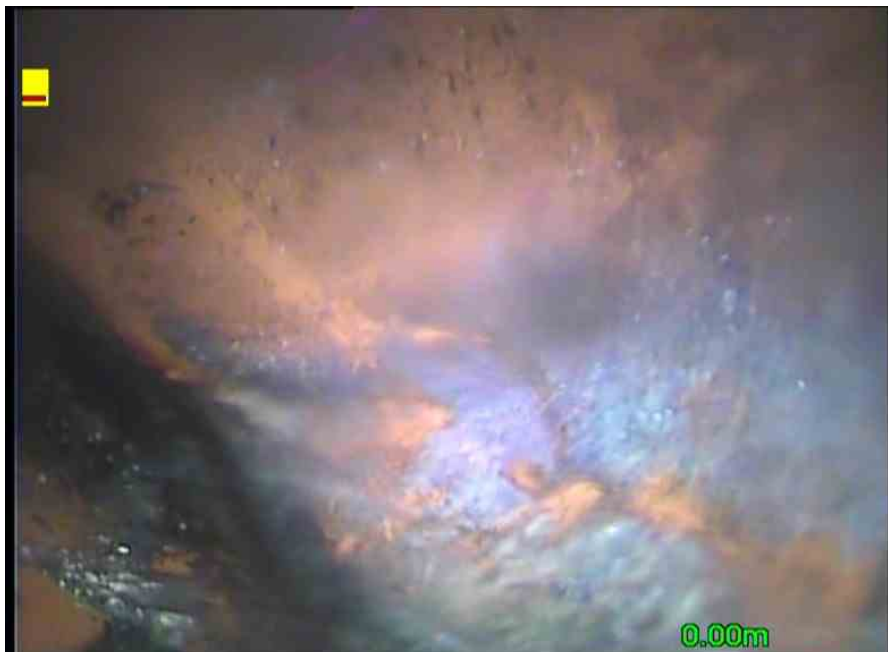


Section Pictures - 23/02/2019 - SwgX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
7	Upstream	SWGX		



, 0.00 m
Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
Start node type, manhole, reference number: manhole 3



Section Pictures - 23/02/2019 - SwgX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
7	Upstream	SWGX		



, 00:00:36, 1.30 m
Finish node type, gully, reference number: Swg, surface water gully

Our Ref: YE6723

28th February 2019

Phlorum Limited,
Unit 12,
Hunns Mere Way,
Brighton,
East Sussex,
BN2 6AH

Ref: 169-367 Wilmslow Road, Manchester.

We thank you for your request to undertake permeability testing at the above-mentioned site and take pleasure in enclosing the results of this work. The investigation was undertaken on the 26th February 2019 in accordance with your instruction to proceed. This letter describes the work undertaken, presents the data obtained and discusses the results of the tests.

Geology

An examination of the available British Geological Survey data of the area for the site has been examined and indicates that the site is underlain by Till superficial deposits. Underlying this, solid geology deposits are noted as the Chester Formation, which comprise variable sandstones with occasional conglomerates.

Fieldworks

The programme of this investigation included the excavation of One trial pit, with One test undertaken in the pit. The locations of soakaway tests were positioned where access was achievable and where water could be pumped. Operatives on site were instructed by the representative on site, that one trial pit in the location selected would be sufficient. Due to the very low soakage encountered within the first test, it was deemed that further testing was not required. Weather on the day was good, with no precipitation.

During this work, the soils encountered were logged in general accordance with BS 5930: 1990, as amended in 2007, and full descriptions are given on the borehole records, which are also appended to this letter.

Soakaway Tests

During the soakaway test the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume. The results obtained from the soakaway tests are summarised below:

Table 1: Soakaway Test Results

TP	Soakage Area Dimensions (m)	Depth (m)	Soil Description (Base of TP)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 Test 1	2.40 x 0.80	2.125m	Grey mottled brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is	Unable to reliably determine	N/A

			fine to medium, angular to sub-rounded of mixed lithology.	soil infiltration rate.	
--	--	--	--	-------------------------	--

Discussion

The soils encountered the trial pit were found to be sandy gravelly Clays, considered likely to be representative of Till superficial deposits. The tests did not achieve a drop between 25% and 75% of the storage volume of the pit and therefore could provide us with an infiltration rate. In this instance, it is considered that soakaways could not be utilised at this site.

References

Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.

British Standards Institution (1999) BS5930: *Code of practice for site investigations*, B.S.I., London.

British Standards Institution (2007), Amendment No 1, BS5930: *Code of practice for site investigations*, B.S.I., London.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For and on behalf of

YourEnvironment

Yours Faithfully,



Daniel Speight BSc(Hons)

Graduate Engineer

Enc.

Appendix A: Site Investigation Plan

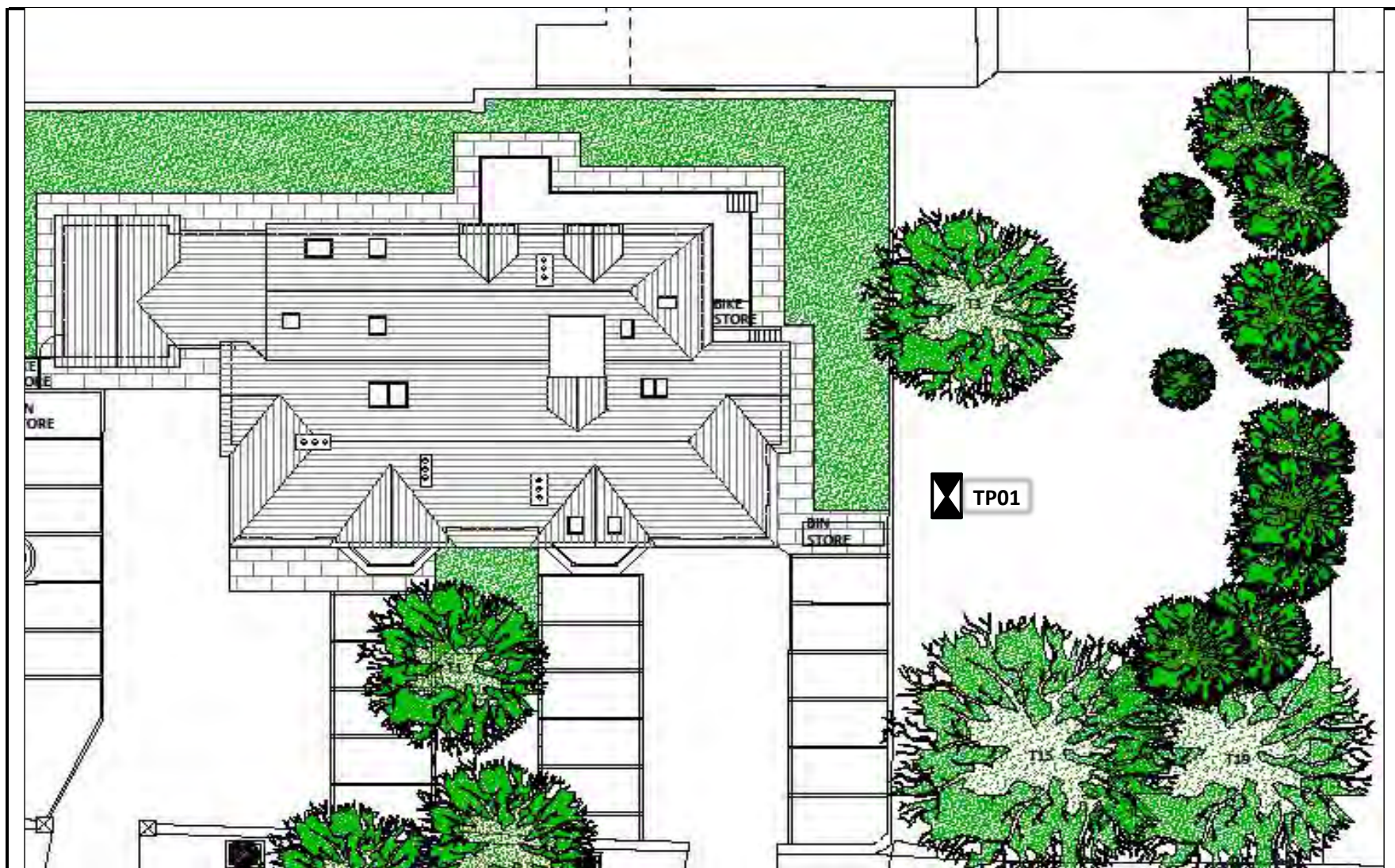
Appendix B: Trial Pit Logs

Appendix C: Soakaway Test Results

Appendix D: Photographs

APPENDIX A: Site Investigation Plan





Site Investigation Location Plan - Not to Scale

YourEnvironment
 Chilgrove Business Centre, Chilgrove, Nr Chichester, PO18 9HU
 Tel: 01243 787150
 Email: info@yourenvironment.org

Site Name:
 169-367 Wilmslow Road, Manchester

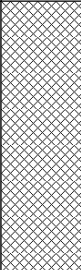
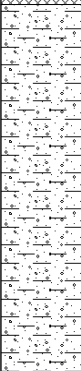
Client:
 Phlorum Ltd.

Date:
 Feb-19

Job No:
 YE6723

APPENDIX B: Trial Pit Logs



				Trial Pit Log			TrialPit No TP01 Sheet 1 of 1	
Project Name: 169-367 Wilmslow Road				Project No. YE6723		Co-ords: - Level:		Date 26/02/2019
Location: Manchester, M14 6AH						Dimensions (m): 2.40		Scale 1:25
Client: Phlorum Limited.						Depth 0.80		Logged RE
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.90			MADEGROUND: Dark brown, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to medium, angular to sub-rounded of brick, concrete and mixed lithology. Rootlets noted.	
				2.13			Grey mottled brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, angular to sub-rounded of mixed lithology.	
							1 2 3 4 5	
Remarks:								
Stability:								



APPENDIX C: Soakaway Test Results

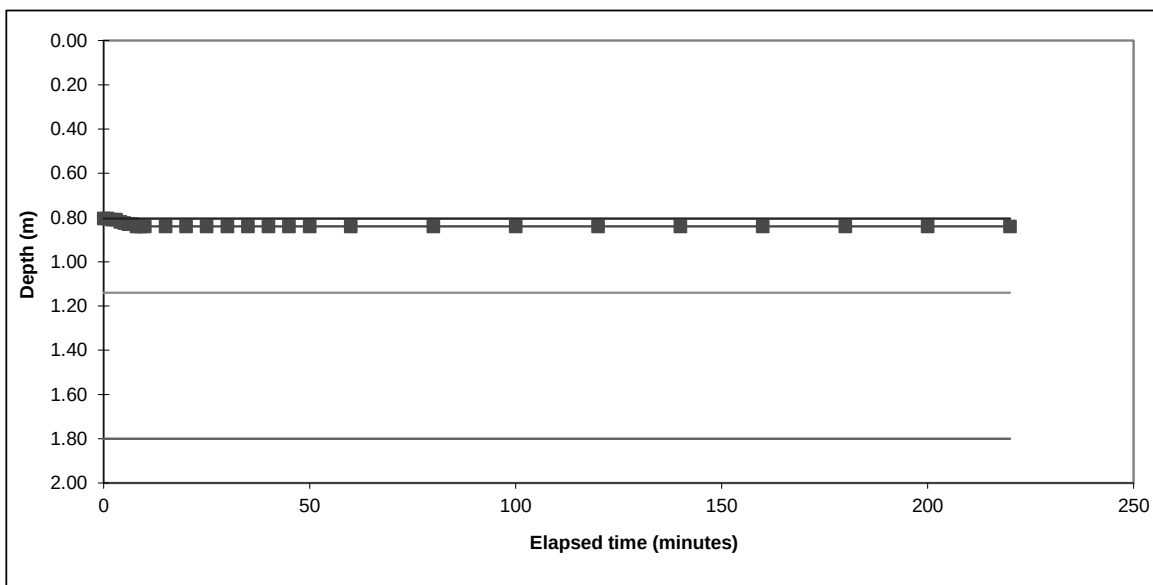


Your Environment

Soakaway Test

Trial Pit No:	TP01	Test No:	1	Date:	26/02/2019
Length (m):	2.400	Datum Height:	0.00 m agl		
Width (m):	0.80	Granular infill:	None		
Depth (m):	2.13	Porosity of infill:	0	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.805	30	0.840
1	0.805	35	0.840
2	0.810	40	0.840
3	0.810	45	0.840
4	0.820	50	0.840
5	0.825	60	0.840
6	0.830	80	0.840
7	0.830	100	0.840
8	0.840	120	0.840
9	0.840	140	0.840
10	0.840	160	0.840
15	0.840	180	0.840
20	0.840	200	0.840
25	0.840	220	0.840



Start water depth for analysis (mbgl):	0.81		
75% effective depth (mbgl):	1.14	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.47		
25% effective depth (mbgl):	1.80	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	2.13		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			6.11
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks Results processed following BRE 365 (2007).	

Client:	Phlorum Limited.	YE6723
Site:	Wilmslow Road , Manchester	

APPENDIX D: Photographs



A.



B.



C.



D.



Your Environment

A. Showing trial pit.

B. Showing trial pit.

C. Showing trial pit.

D. Site boundary.



Your Environment

E.



F.



G.



H.



*Your*Environment

E. Plant used - JCB 3CX

F. Vegetation on Site.

G. Vegetation on Site

H. Plant used - JCB 3CX



*Your*Environment

I.



J.



K.



L.



*Your*Environment

I. Vegetation on Site

J. Vegetation on Site

K. Vegetation on Site

L. Vegetation on Site



*Your*Environment

M.



N.



O.



P.



*Your*Environment

M. Vegetation on Site

N. Vegetation on Site

O. On site fencing.

P. On site fencing



*Your*Environment

Q.



R.



S.



T.



Your Environment

Q. Vegetation on Site

R. Trial pit infilled

S. Vegetation on Site

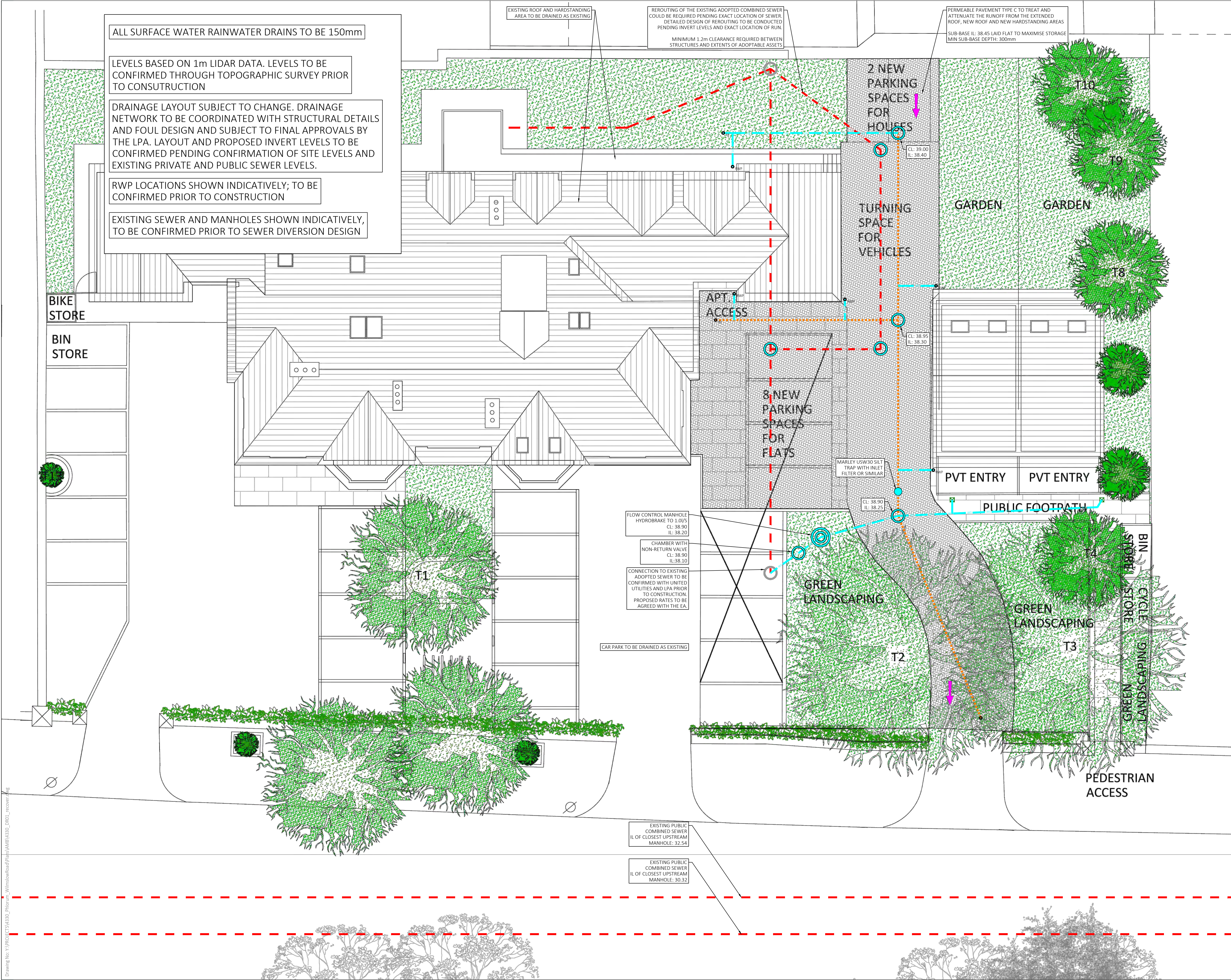
T. Trial pit infilled.



Your Environment

Appendix 2

Drainage Strategy Plans



1. GENERAL

a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.

b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.

c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.

d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.

e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, LIDAR SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.

f. CDM REGULATIONS 2015. FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL FOR PROPRIETARY SYSTEMS. SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE

a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.

b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.

c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY. HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.

d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.

e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY AMBIENTAL DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED.

3. BELOW GROUND DRAINAGE

a. PIPEWORK TO BE UPVC-U PIPES TO BS 4660 : 2000 AND INSPECTION CHAMBERS TO BS 7158 : 2001.

b. ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION AND THE RELEVANT COUNCIL DESIGN GUIDE.

c. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.

d. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.

e. ALL PRIVATE FOUL SEWER PIPES TO BE 150MM DIAMETER UNLESS OTHERWISE STATED ON THE DRAWING. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100MM DIAMETER FROM DOWNPIPES AND 150MM DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.

f. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.

g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.

h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES

a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.

b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

LEGEND

- PRIVATE SURFACE WATER DRAIN
- PERFORATED SURFACE WATER DRAIN
- PUBLIC COMBINED DRAIN
- PROPOSED REROUTE OF COMBINED DRAIN
- FLOW CONTROL MANHOLE
- TYPE 3 INSPECTION CHAMBER
- SILT TRAP
- TYPE 3 INSPECTION CHAMBER
- RODDING EYE
- RAIN WATER PIPE
- BOTTLE GULLY
- PERMEABLE PAVING
- OVERLAND FLOWROUTE

000000

REV	DATE	CKD	APPD	BY	DESCRIPTION
PRELIMINARY DRAWING FOR INFORMATION ONLY. NOT FOR CONSTRUCTION.					
Client PHLORUM					
Project 367 WILMSLOW ROAD MANCHESTER, M14 6AH					
Drawing SURFACE WATER DRAINAGE DRAINAGE LAYOUT					
Drawn by: BB Drawing No. 4330 - DR01 Date: 13/03/2019					
Revision					
Drawing Scale: 1:100 @ A1 0 1m 2m 3m 4m 5m					

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PHLORUM

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367 WILMSLOW ROAD
MANCHESTER, M14 6AH

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0 1m 2m 3m 4m 5m

Client
PHLORUM

Project
367 WILMSLOW ROAD
MANCHESTER, M14 6AH

Drawing
SURFACE WATER DRAINAGE
DRAINAGE LAYOUT

Drawn by: BB
Drawing No. 4330 - DR01
Date: 13/03/2019

Revision

Drawing Scale: 1:100 @ A1
0 1m 2m 3m 4m 5m

Client
PHLORUM

Project
367 WILMSLOW ROAD
MANCHESTER, M14 6AH

Drawing
SURFACE WATER DRAINAGE
DRAINAGE LAYOUT

Drawn by: BB
Drawing No. 4330 - DR01
Date: 13/03/2019

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367 WILMSLOW ROAD
MANCHESTER, M14 6AH

Drawing
SURFACE WATER DRAINAGE
DRAINAGE LAYOUT

Drawn by: BB
Drawing No. 4330 - DR01
Date: 13/03/2019

Revision

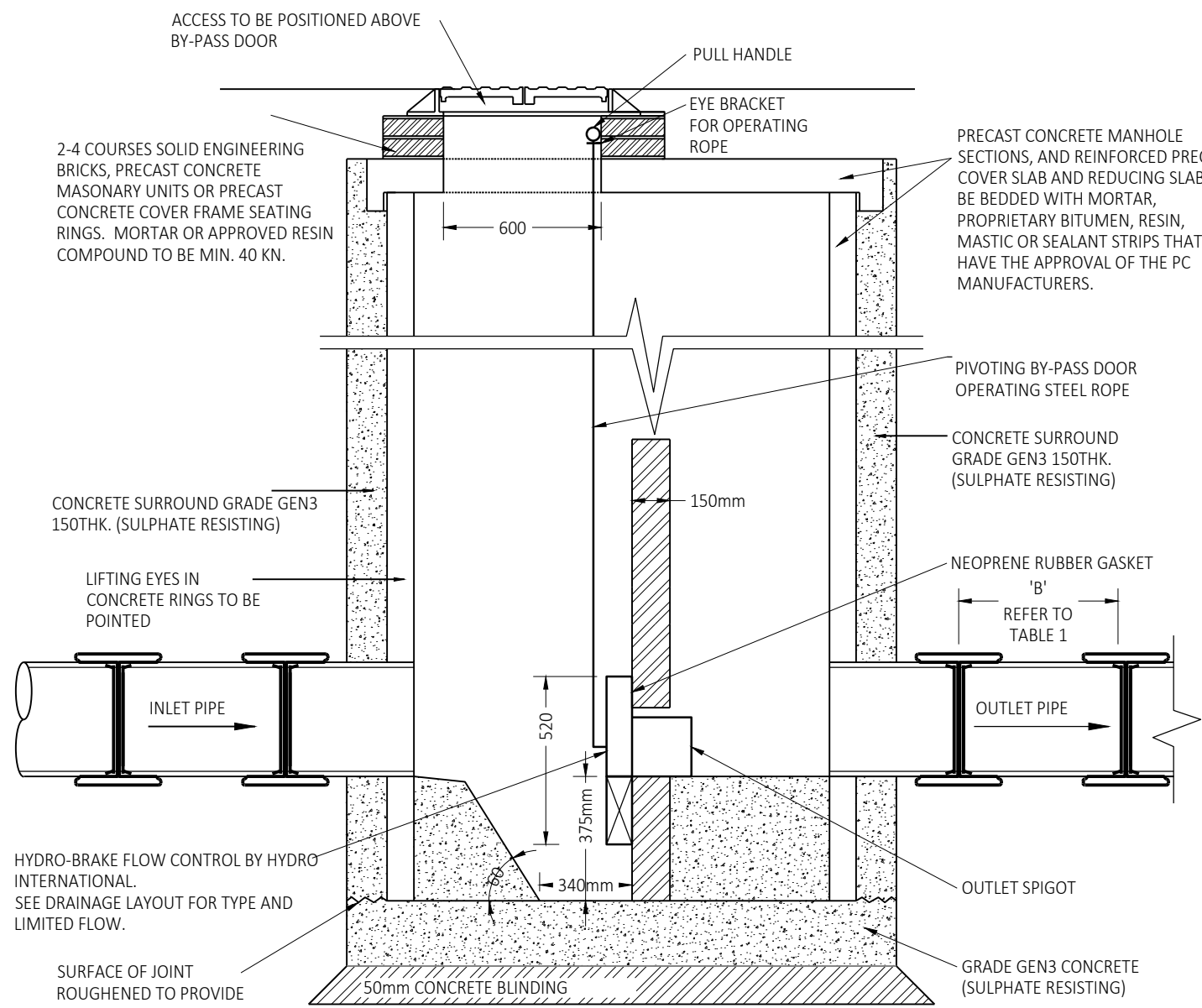
Drawing Scale: 1:100 @ A1
0 1m 2m 3m 4m 5m

Client
PHLORUM

Project
367 WILMSLOW ROAD
MANCHESTER, M14 6AH

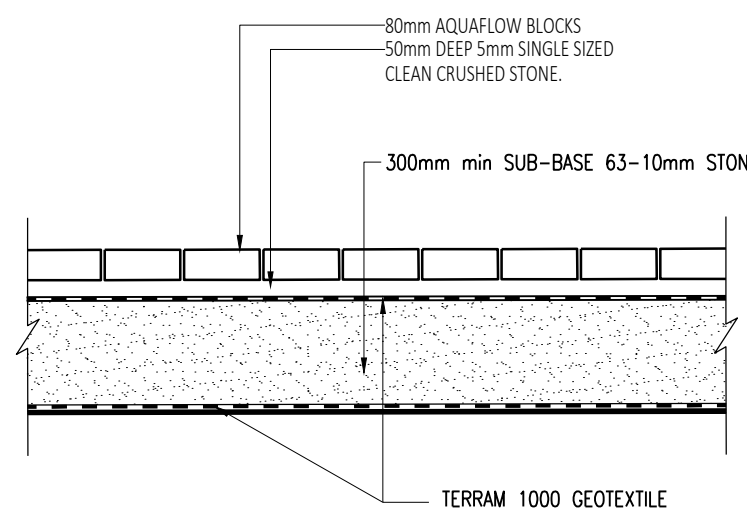
Drawing
SURFACE WATER DRAINAGE
DRAINAGE LAYOUT

Drawing No: Y:\PROJECTS\4330_Philorum_MilnslowRoad\Drawings\4330_DRO2_01.dwg



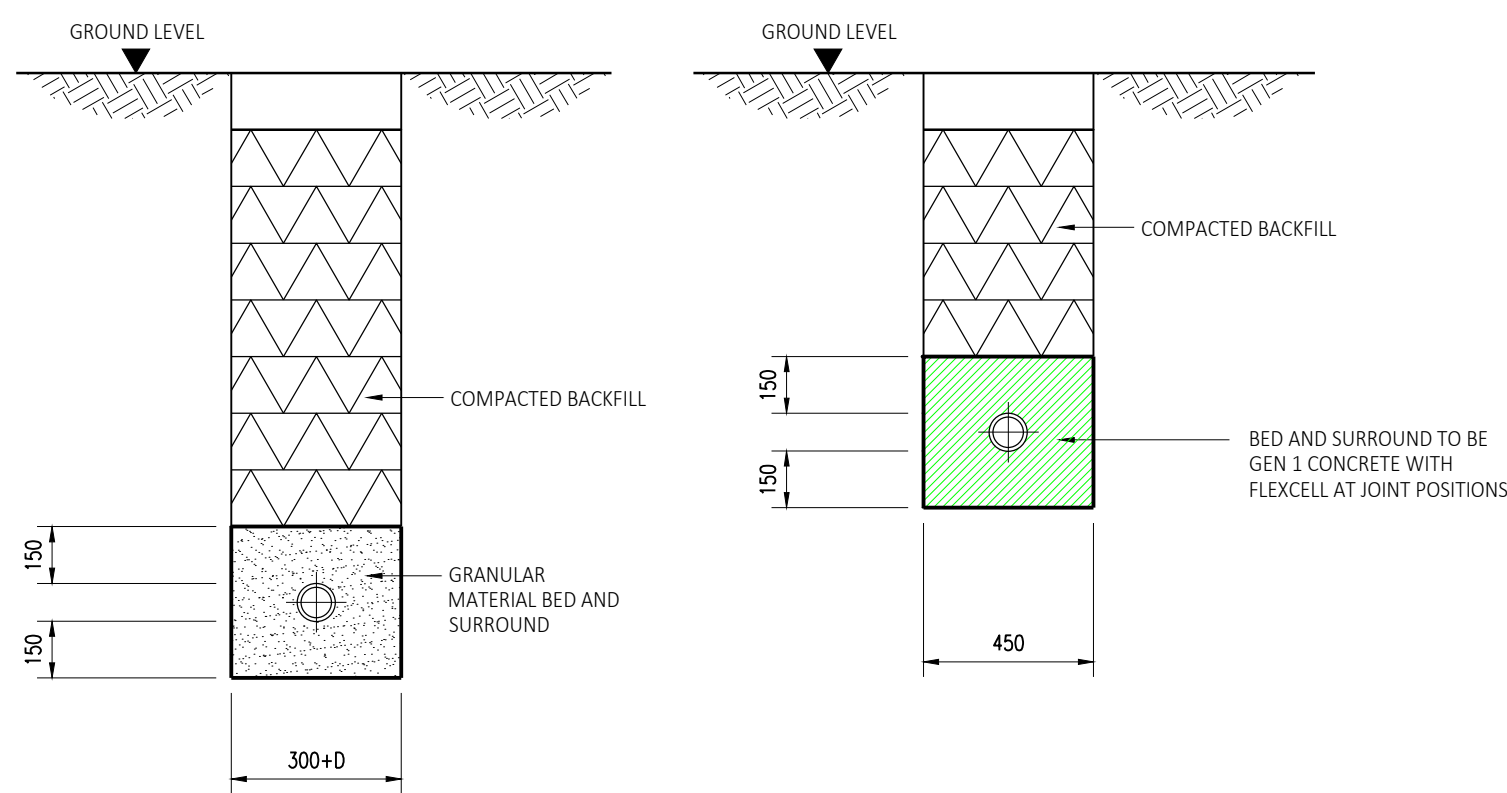
MANHOLE CONTROL
(HYDROBRAKE) SECTION

N.T.S.



PERMEABLE PAVEMENT TYPICAL DETAIL.

(1:20)



GRANULAR BEDDING DETAIL
FOR NON-FLEXIBLE PIPES.

(WHERE COVER >600mm)

(1:20)

CONCRETE BEDDING DETAIL
FOR NON-FLEXIBLE PIPES.

(WHERE COVER <600mm)

(1:20)

NOTE
ALL BACKFILLING AND REINSTATEMENT WITHIN ROADS AND STREETS TO BE
IN ACCORDANCE WITH THE HIGHWAY AUTHORITY AND HAUC SPECIFICATION.

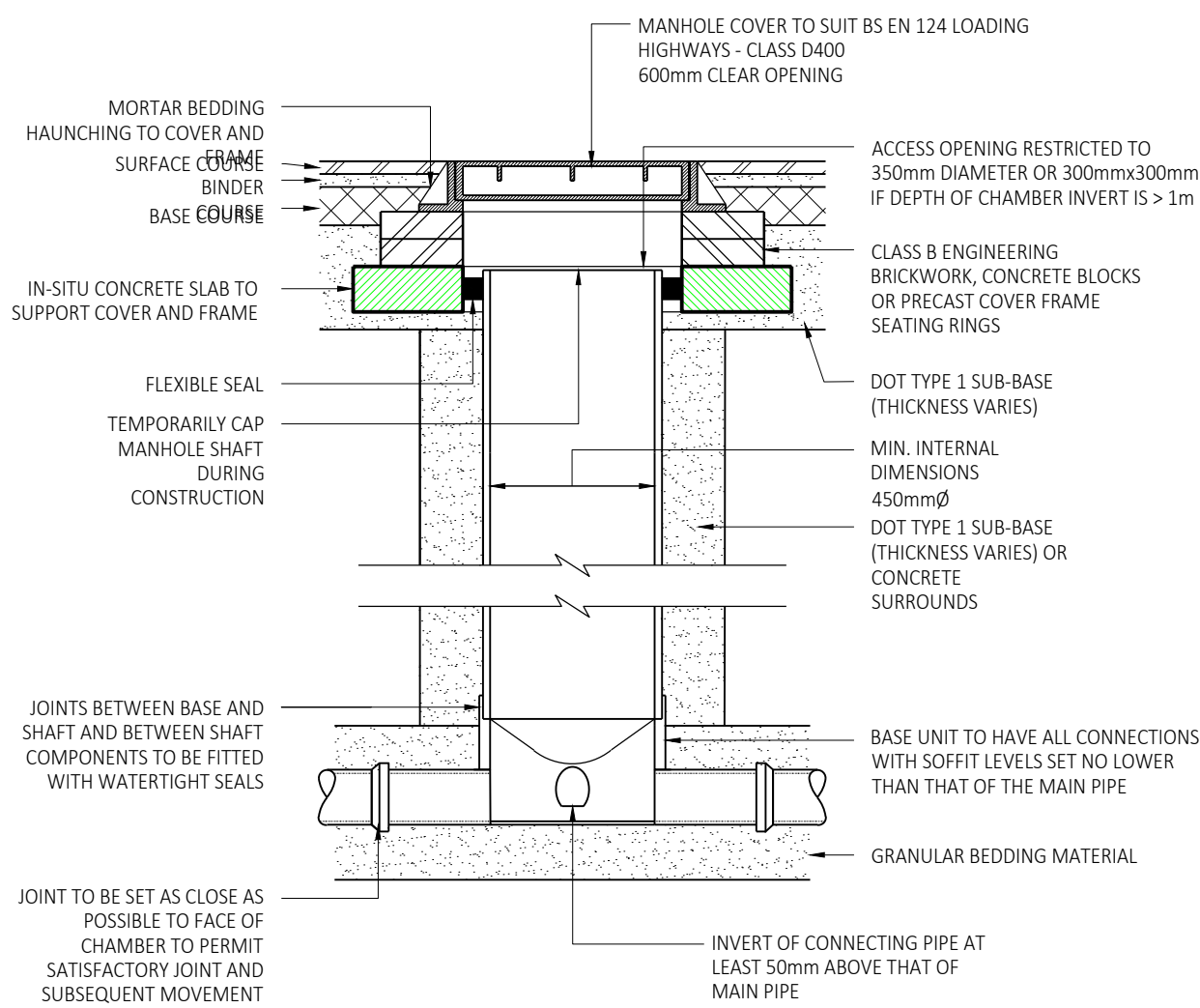
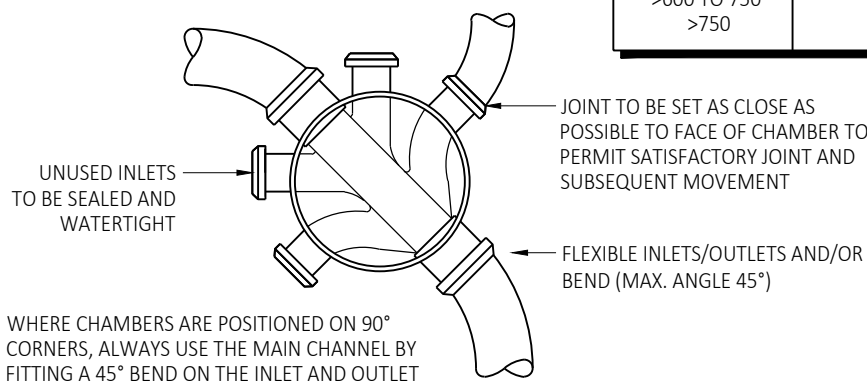


TABLE 1

NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH OF ROCKER PIPE (m)
150 TO 400	0.6
>400 TO 750	1.0
>750	1.2

ALTERNATIVE BASE INVERT LAYOUTS
ALL CONNECTIONS TO BE MIN. SOFFIT TO SOFFIT

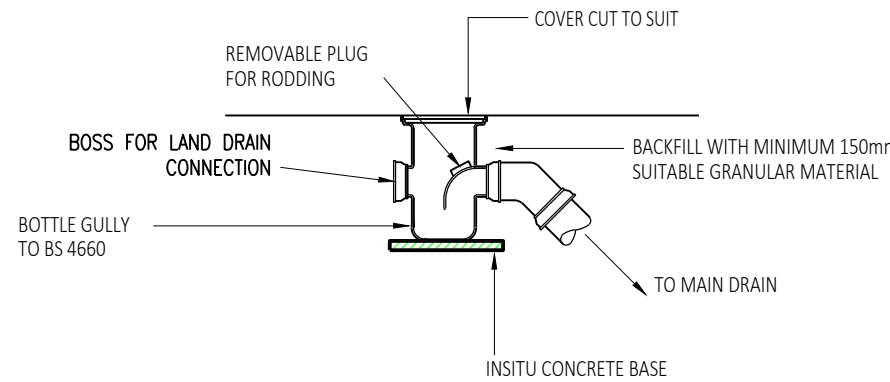


WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS, ALWAYS USE THE MAIN CHANNEL BY FITTING A 45° BEND ON THE INLET AND OUTLET

TYPE 3 ACCESS CHAMBER - FLEXIBLE MATERIAL.

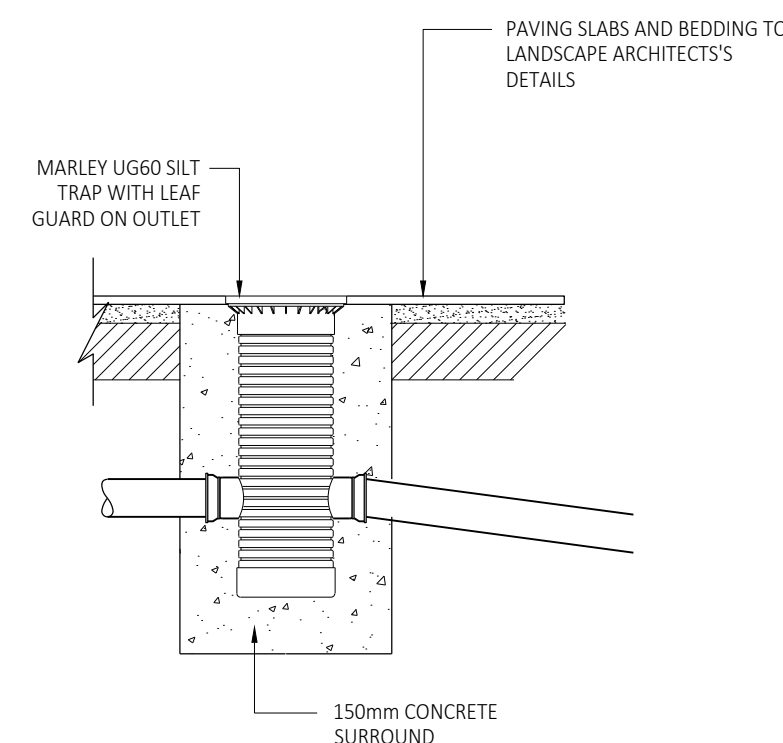
(SUBJECT TO VEHICLE LOADING,
MAX. DEPTH 3m, NON-ENTRY)

(1:20)



BOTTLE GULLY CONNECTION.

(1:20)



MARLEY WATERLOC TYPE
UG60 SILT TRAP

(1:20)

- GENERAL
a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, LIDAR SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015. FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL FOR PROPRIETARY SYSTEMS. SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.
- CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY AMBIENTAL DRAWINGS, THE MANUFACTURER'S INSTRUCTIONS MUST BE USED.
- BELOW GROUND DRAINAGE
a. PIPEWORK TO BE UPVC/CLP PIPES TO BS 4660 : 2000 AND INSPECTION CHAMBERS TO BS 7158 : 2001.
b. ALL ADAPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
d. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
e. ALL PRIVATE FOUL SEWER PIPES TO BE 150MM DIAMETER UNLESS OTHERWISE STATED ON THE DRAWING. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100MM DIAMETER FROM DOWNPIPES AND 150MM DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.
f. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.
- MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

#	000000				
REV	DATE	CKD	APPD	BY	DESCRIPTION
PRELIMINARY DRAWING FOR INFORMATION ONLY. NOT FOR CONSTRUCTION.					
Client PHLORUM					
Project 367 WILMSLOW ROAD MANCHESTER, M14 6AH					
Drawing SURFACE WATER DRAINAGE STANDARD DETAILS					
Drawn by: BB Drawing No. 4330 - DRO2 Revision -					
Drawing Scale: 1:20 @ A1 0 200 400 600 800 1000mm					
Date: 14/03/2019					

Appendix 3

Calculations

AEA - Ambienta		Page 1
Science Park Square Brighton East Sussex	367 Wilmslow Road Greenfield rates	
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze		
Source Control 2018.1		
ICP SUDS Mean Annual Flood Input Return Period (years) 100 Soil 0.300 Area (ha) 0.063 Urban 0.000 SAAR (mm) 839 Region Number Region 10 Results 1/s QBAR Rural 0.1 QBAR Urban 0.1 Q100 years 0.3 Q1 year 0.1 Q30 years 0.2 Q100 years 0.3		
©1982-2018 Innovyze		

AEA - Ambiental					Page 1
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:1 year event			
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.109	0.109	8.2	0.2	O K
30 min Summer	38.103	0.103	7.1	0.2	O K
60 min Summer	38.086	0.086	5.2	0.1	O K
120 min Summer	38.071	0.071	3.5	0.1	O K
180 min Summer	38.062	0.062	2.8	0.1	O K
240 min Summer	38.056	0.056	2.3	0.1	O K
360 min Summer	38.049	0.049	1.7	0.1	O K
480 min Summer	38.045	0.045	1.5	0.1	O K
600 min Summer	38.041	0.041	1.2	0.0	O K
720 min Summer	38.038	0.038	1.1	0.0	O K
960 min Summer	38.035	0.035	0.9	0.0	O K
1440 min Summer	38.029	0.029	0.7	0.0	O K
2160 min Summer	38.024	0.024	0.5	0.0	O K
2880 min Summer	38.022	0.022	0.4	0.0	O K
4320 min Summer	38.019	0.019	0.3	0.0	O K
5760 min Summer	38.017	0.017	0.3	0.0	O K
7200 min Summer	38.016	0.016	0.2	0.0	O K
8640 min Summer	38.016	0.016	0.2	0.0	O K
10080 min Summer	38.015	0.015	0.2	0.0	O K
15 min Winter	38.109	0.109	8.2	0.2	O K
30 min Winter	38.094	0.094	6.1	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	27.046	0.0	3.2	10	
30 min Summer	17.779	0.0	4.2	17	
60 min Summer	11.376	0.0	5.4	32	
120 min Summer	7.155	0.0	6.8	62	
180 min Summer	5.432	0.0	7.7	92	
240 min Summer	4.463	0.0	8.4	122	
360 min Summer	3.382	0.0	9.6	182	
480 min Summer	2.760	0.0	10.4	240	
600 min Summer	2.356	0.0	11.1	306	
720 min Summer	2.071	0.0	11.7	358	
960 min Summer	1.690	0.0	12.8	484	
1440 min Summer	1.269	0.0	14.4	716	
2160 min Summer	0.954	0.0	16.2	1068	
2880 min Summer	0.779	0.0	17.7	1456	
4320 min Summer	0.584	0.0	19.9	2184	
5760 min Summer	0.477	0.0	21.6	2896	
7200 min Summer	0.408	0.0	23.1	3608	
8640 min Summer	0.359	0.0	24.4	4304	
10080 min Summer	0.322	0.0	25.6	4968	
15 min Winter	27.046	0.0	3.6	10	
30 min Winter	17.779	0.0	4.7	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:1 year event			
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.076	0.076	4.1	0.1	O K
120 min Winter	38.061	0.061	2.7	0.1	O K
180 min Winter	38.053	0.053	2.0	0.1	O K
240 min Winter	38.049	0.049	1.7	0.1	O K
360 min Winter	38.042	0.042	1.3	0.0	O K
480 min Winter	38.037	0.037	1.0	0.0	O K
600 min Winter	38.035	0.035	0.9	0.0	O K
720 min Winter	38.032	0.032	0.8	0.0	O K
960 min Winter	38.028	0.028	0.6	0.0	O K
1440 min Winter	38.024	0.024	0.5	0.0	O K
2160 min Winter	38.020	0.020	0.4	0.0	O K
2880 min Winter	38.019	0.019	0.3	0.0	O K
4320 min Winter	38.016	0.016	0.2	0.0	O K
5760 min Winter	38.015	0.015	0.2	0.0	O K
7200 min Winter	38.014	0.014	0.2	0.0	O K
8640 min Winter	38.014	0.014	0.1	0.0	O K
10080 min Winter	38.013	0.013	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	11.376	0.0	6.0	32	
120 min Winter	7.155	0.0	7.6	62	
180 min Winter	5.432	0.0	8.6	90	
240 min Winter	4.463	0.0	9.4	120	
360 min Winter	3.382	0.0	10.7	182	
480 min Winter	2.760	0.0	11.7	236	
600 min Winter	2.356	0.0	12.5	302	
720 min Winter	2.071	0.0	13.2	368	
960 min Winter	1.690	0.0	14.3	484	
1440 min Winter	1.269	0.0	16.1	724	
2160 min Winter	0.954	0.0	18.2	1120	
2880 min Winter	0.779	0.0	19.8	1408	
4320 min Winter	0.584	0.0	22.3	2084	
5760 min Winter	0.477	0.0	24.2	2848	
7200 min Winter	0.408	0.0	25.9	3696	
8640 min Winter	0.359	0.0	27.3	4320	
10080 min Winter	0.322	0.0	28.6	5152	
©1982-2018 Innovyze					

367 Wilmslow Road
Existing rates
1:1 year event

Designed by BB
Checked by MN



Source Control 2018.1

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

```

Total Area (ha) 0.063

Time (mins) Area
From:   To:   (ha)
0       4 0.063

```

```

Total Area (ha) 0.000

Time (mins) Area
From: To: (ha)

0 4 0.000

```

AEA - Ambiental		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:1 year event	
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
©1982-2018 Innovyze		

AEA - Ambiental					Page 1
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:30 year event			
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.184	0.184	20.4	0.4	O K
30 min Summer	38.166	0.166	17.5	0.3	O K
60 min Summer	38.133	0.133	12.7	0.2	O K
120 min Summer	38.110	0.110	8.4	0.2	O K
180 min Summer	38.097	0.097	6.4	0.2	O K
240 min Summer	38.087	0.087	5.3	0.1	O K
360 min Summer	38.074	0.074	3.9	0.1	O K
480 min Summer	38.067	0.067	3.1	0.1	O K
600 min Summer	38.061	0.061	2.7	0.1	O K
720 min Summer	38.056	0.056	2.3	0.1	O K
960 min Summer	38.051	0.051	1.9	0.1	O K
1440 min Summer	38.043	0.043	1.4	0.1	O K
2160 min Summer	38.037	0.037	1.0	0.0	O K
2880 min Summer	38.033	0.033	0.8	0.0	O K
4320 min Summer	38.027	0.027	0.6	0.0	O K
5760 min Summer	38.024	0.024	0.5	0.0	O K
7200 min Summer	38.021	0.021	0.4	0.0	O K
8640 min Summer	38.020	0.020	0.4	0.0	O K
10080 min Summer	38.019	0.019	0.3	0.0	O K
15 min Winter	38.184	0.184	20.3	0.4	O K
30 min Winter	38.150	0.150	15.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	66.174	0.0	7.8	10	
30 min Summer	43.695	0.0	10.3	17	
60 min Summer	27.653	0.0	13.1	32	
120 min Summer	17.016	0.0	16.1	62	
180 min Summer	12.680	0.0	18.0	92	
240 min Summer	10.248	0.0	19.4	122	
360 min Summer	7.545	0.0	21.4	184	
480 min Summer	6.072	0.0	23.0	242	
600 min Summer	5.128	0.0	24.2	306	
720 min Summer	4.465	0.0	25.3	358	
960 min Summer	3.586	0.0	27.1	480	
1440 min Summer	2.630	0.0	29.8	734	
2160 min Summer	1.926	0.0	32.8	1092	
2880 min Summer	1.543	0.0	35.0	1416	
4320 min Summer	1.128	0.0	38.4	2192	
5760 min Summer	0.902	0.0	40.9	2888	
7200 min Summer	0.758	0.0	43.0	3616	
8640 min Summer	0.658	0.0	44.8	4296	
10080 min Summer	0.583	0.0	46.3	5040	
15 min Winter	66.174	0.0	8.8	10	
30 min Winter	43.695	0.0	11.6	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:30 year event			
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.119	0.119	10.0	0.2	O K
120 min Winter	38.096	0.096	6.3	0.1	O K
180 min Winter	38.081	0.081	4.7	0.1	O K
240 min Winter	38.074	0.074	3.9	0.1	O K
360 min Winter	38.063	0.063	2.8	0.1	O K
480 min Winter	38.056	0.056	2.3	0.1	O K
600 min Winter	38.051	0.051	1.9	0.1	O K
720 min Winter	38.049	0.049	1.7	0.1	O K
960 min Winter	38.043	0.043	1.4	0.1	O K
1440 min Winter	38.037	0.037	1.0	0.0	O K
2160 min Winter	38.031	0.031	0.7	0.0	O K
2880 min Winter	38.027	0.027	0.6	0.0	O K
4320 min Winter	38.022	0.022	0.4	0.0	O K
5760 min Winter	38.020	0.020	0.3	0.0	O K
7200 min Winter	38.019	0.019	0.3	0.0	O K
8640 min Winter	38.017	0.017	0.3	0.0	O K
10080 min Winter	38.017	0.017	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	27.653	0.0	14.6	32	
120 min Winter	17.016	0.0	18.0	60	
180 min Winter	12.680	0.0	20.1	88	
240 min Winter	10.248	0.0	21.7	118	
360 min Winter	7.545	0.0	24.0	184	
480 min Winter	6.072	0.0	25.7	244	
600 min Winter	5.128	0.0	27.1	290	
720 min Winter	4.465	0.0	28.4	368	
960 min Winter	3.586	0.0	30.4	476	
1440 min Winter	2.630	0.0	33.4	732	
2160 min Winter	1.926	0.0	36.7	1092	
2880 min Winter	1.543	0.0	39.2	1436	
4320 min Winter	1.128	0.0	43.0	2144	
5760 min Winter	0.902	0.0	45.8	2744	
7200 min Winter	0.758	0.0	48.2	3640	
8640 min Winter	0.658	0.0	50.1	4400	
10080 min Winter	0.583	0.0	51.9	5392	
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367 Wilmslow Road
Existing rates
1:30 year event

Designed by BB
Checked by MN



Source Control 2018.1

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

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Total Area (ha) 0.063

Time (mins) Area
From: To: (ha)

0 4 0.063

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Total Area (ha) 0.000

Time (mins) Area
From: To: (ha)

0 4 0.000

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AEA - Ambiental		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:30 year event	
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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AEA - Ambiantal					Page 1
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:100 year event			
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.213	0.213	26.1	0.5	O K
30 min Summer	38.198	0.198	23.0	0.4	O K
60 min Summer	38.160	0.160	16.6	0.3	O K
120 min Summer	38.124	0.124	11.1	0.2	O K
180 min Summer	38.111	0.111	8.5	0.2	O K
240 min Summer	38.101	0.101	6.9	0.2	O K
360 min Summer	38.084	0.084	5.0	0.1	O K
480 min Summer	38.076	0.076	4.1	0.1	O K
600 min Summer	38.070	0.070	3.4	0.1	O K
720 min Summer	38.065	0.065	3.0	0.1	O K
960 min Summer	38.057	0.057	2.4	0.1	O K
1440 min Summer	38.049	0.049	1.7	0.1	O K
2160 min Summer	38.042	0.042	1.3	0.0	O K
2880 min Summer	38.037	0.037	1.0	0.0	O K
4320 min Summer	38.031	0.031	0.7	0.0	O K
5760 min Summer	38.027	0.027	0.6	0.0	O K
7200 min Summer	38.025	0.025	0.5	0.0	O K
8640 min Summer	38.022	0.022	0.4	0.0	O K
10080 min Summer	38.021	0.021	0.4	0.0	O K
15 min Winter	38.213	0.213	26.1	0.5	O K
30 min Winter	38.181	0.181	19.8	0.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	85.460	0.0	10.1	10	
30 min Summer	56.977	0.0	13.5	17	
60 min Summer	36.294	0.0	17.1	32	
120 min Summer	22.382	0.0	21.2	62	
180 min Summer	16.654	0.0	23.6	92	
240 min Summer	13.425	0.0	25.4	122	
360 min Summer	9.818	0.0	27.8	184	
480 min Summer	7.870	0.0	29.7	244	
600 min Summer	6.624	0.0	31.3	306	
720 min Summer	5.750	0.0	32.6	362	
960 min Summer	4.597	0.0	34.8	476	
1440 min Summer	3.347	0.0	38.0	722	
2160 min Summer	2.432	0.0	41.4	1092	
2880 min Summer	1.937	0.0	43.9	1428	
4320 min Summer	1.403	0.0	47.7	2140	
5760 min Summer	1.115	0.0	50.6	2856	
7200 min Summer	0.932	0.0	52.9	3560	
8640 min Summer	0.805	0.0	54.8	4352	
10080 min Summer	0.711	0.0	56.4	5024	
15 min Winter	85.460	0.0	11.3	10	
30 min Winter	56.977	0.0	15.1	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:100 year event			
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.137	0.137	13.3	0.3	O K
120 min Winter	38.109	0.109	8.2	0.2	O K
180 min Winter	38.095	0.095	6.2	0.1	O K
240 min Winter	38.084	0.084	5.0	0.1	O K
360 min Winter	38.072	0.072	3.7	0.1	O K
480 min Winter	38.064	0.064	2.9	0.1	O K
600 min Winter	38.059	0.059	2.5	0.1	O K
720 min Winter	38.054	0.054	2.1	0.1	O K
960 min Winter	38.049	0.049	1.7	0.1	O K
1440 min Winter	38.041	0.041	1.3	0.0	O K
2160 min Winter	38.036	0.036	0.9	0.0	O K
2880 min Winter	38.031	0.031	0.7	0.0	O K
4320 min Winter	38.025	0.025	0.5	0.0	O K
5760 min Winter	38.022	0.022	0.4	0.0	O K
7200 min Winter	38.020	0.020	0.4	0.0	O K
8640 min Winter	38.019	0.019	0.3	0.0	O K
10080 min Winter	38.018	0.018	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	36.294	0.0	19.2	32	
120 min Winter	22.382	0.0	23.7	60	
180 min Winter	16.654	0.0	26.4	92	
240 min Winter	13.425	0.0	28.4	122	
360 min Winter	9.818	0.0	31.2	182	
480 min Winter	7.870	0.0	33.3	246	
600 min Winter	6.624	0.0	35.1	306	
720 min Winter	5.750	0.0	36.5	358	
960 min Winter	4.597	0.0	38.9	494	
1440 min Winter	3.347	0.0	42.5	712	
2160 min Winter	2.432	0.0	46.3	1068	
2880 min Winter	1.937	0.0	49.2	1444	
4320 min Winter	1.403	0.0	53.5	2180	
5760 min Winter	1.115	0.0	56.7	2968	
7200 min Winter	0.932	0.0	59.2	3696	
8640 min Winter	0.805	0.0	61.4	4792	
10080 min Winter	0.711	0.0	63.2	5056	
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367 Wilmslow Road
Existing rates
1:100 year event

Designed by BB
Checked by MN



Source Control 2018.1

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.063

Time (mins)	Area
From: To:	(ha)
0 4	0.063

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To:	(ha)
0 4	0.000

AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:100 year event	
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:1 year event			
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.104	0.104	7.2	0.2	O K
30 min Summer	38.095	0.095	6.2	0.1	O K
60 min Summer	38.080	0.080	4.5	0.1	O K
120 min Summer	38.066	0.066	3.1	0.1	O K
180 min Summer	38.058	0.058	2.4	0.1	O K
240 min Summer	38.052	0.052	2.0	0.1	O K
360 min Summer	38.046	0.046	1.5	0.1	O K
480 min Summer	38.041	0.041	1.3	0.0	O K
600 min Summer	38.038	0.038	1.1	0.0	O K
720 min Summer	38.036	0.036	0.9	0.0	O K
960 min Summer	38.032	0.032	0.8	0.0	O K
1440 min Summer	38.027	0.027	0.6	0.0	O K
2160 min Summer	38.022	0.022	0.4	0.0	O K
2880 min Summer	38.020	0.020	0.4	0.0	O K
4320 min Summer	38.018	0.018	0.3	0.0	O K
5760 min Summer	38.017	0.017	0.2	0.0	O K
7200 min Summer	38.016	0.016	0.2	0.0	O K
8640 min Summer	38.015	0.015	0.2	0.0	O K
10080 min Summer	38.014	0.014	0.2	0.0	O K
15 min Winter	38.104	0.104	7.2	0.2	O K
30 min Winter	38.088	0.088	5.4	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	27.046	0.0	2.8	10	
30 min Summer	17.779	0.0	3.7	17	
60 min Summer	11.376	0.0	4.7	32	
120 min Summer	7.155	0.0	5.9	62	
180 min Summer	5.432	0.0	6.7	92	
240 min Summer	4.463	0.0	7.4	122	
360 min Summer	3.382	0.0	8.4	184	
480 min Summer	2.760	0.0	9.1	244	
600 min Summer	2.356	0.0	9.7	302	
720 min Summer	2.071	0.0	10.3	360	
960 min Summer	1.690	0.0	11.2	490	
1440 min Summer	1.269	0.0	12.6	728	
2160 min Summer	0.954	0.0	14.2	1092	
2880 min Summer	0.779	0.0	15.4	1464	
4320 min Summer	0.584	0.0	17.4	2184	
5760 min Summer	0.477	0.0	18.9	2928	
7200 min Summer	0.408	0.0	20.2	3744	
8640 min Summer	0.359	0.0	21.3	4272	
10080 min Summer	0.322	0.0	22.3	5112	
15 min Winter	27.046	0.0	3.1	10	
30 min Winter	17.779	0.0	4.1	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:1 year event			
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.072	0.072	3.7	0.1	O K
120 min Winter	38.057	0.057	2.3	0.1	O K
180 min Winter	38.050	0.050	1.8	0.1	O K
240 min Winter	38.045	0.045	1.5	0.1	O K
360 min Winter	38.039	0.039	1.1	0.0	O K
480 min Winter	38.035	0.035	0.9	0.0	O K
600 min Winter	38.032	0.032	0.8	0.0	O K
720 min Winter	38.030	0.030	0.7	0.0	O K
960 min Winter	38.026	0.026	0.6	0.0	O K
1440 min Winter	38.022	0.022	0.4	0.0	O K
2160 min Winter	38.019	0.019	0.3	0.0	O K
2880 min Winter	38.017	0.017	0.3	0.0	O K
4320 min Winter	38.016	0.016	0.2	0.0	O K
5760 min Winter	38.015	0.015	0.2	0.0	O K
7200 min Winter	38.014	0.014	0.1	0.0	O K
8640 min Winter	38.013	0.013	0.1	0.0	O K
10080 min Winter	38.012	0.012	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	11.376	0.0	5.3	32	
120 min Winter	7.155	0.0	6.6	60	
180 min Winter	5.432	0.0	7.5	92	
240 min Winter	4.463	0.0	8.2	122	
360 min Winter	3.382	0.0	9.4	182	
480 min Winter	2.760	0.0	10.2	234	
600 min Winter	2.356	0.0	10.9	304	
720 min Winter	2.071	0.0	11.5	364	
960 min Winter	1.690	0.0	12.5	480	
1440 min Winter	1.269	0.0	14.1	710	
2160 min Winter	0.954	0.0	15.9	1144	
2880 min Winter	0.779	0.0	17.3	1356	
4320 min Winter	0.584	0.0	19.4	2016	
5760 min Winter	0.477	0.0	21.2	2768	
7200 min Winter	0.408	0.0	22.6	3808	
8640 min Winter	0.359	0.0	23.9	4440	
10080 min Winter	0.322	0.0	25.0	4984	
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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:1 year event	
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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AEA - Ambiental					Page 1
Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:30 year event			
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.167	0.167	17.6	0.4	O K
30 min Summer	38.150	0.150	15.2	0.3	O K
60 min Summer	38.124	0.124	11.1	0.2	O K
120 min Summer	38.105	0.105	7.4	0.2	O K
180 min Summer	38.090	0.090	5.6	0.1	O K
240 min Summer	38.081	0.081	4.6	0.1	O K
360 min Summer	38.070	0.070	3.4	0.1	O K
480 min Summer	38.062	0.062	2.7	0.1	O K
600 min Summer	38.057	0.057	2.3	0.1	O K
720 min Summer	38.053	0.053	2.0	0.1	O K
960 min Summer	38.048	0.048	1.6	0.1	O K
1440 min Summer	38.040	0.040	1.2	0.0	O K
2160 min Summer	38.035	0.035	0.9	0.0	O K
2880 min Summer	38.030	0.030	0.7	0.0	O K
4320 min Summer	38.025	0.025	0.5	0.0	O K
5760 min Summer	38.022	0.022	0.4	0.0	O K
7200 min Summer	38.020	0.020	0.4	0.0	O K
8640 min Summer	38.019	0.019	0.3	0.0	O K
10080 min Summer	38.018	0.018	0.3	0.0	O K
15 min Winter	38.167	0.167	17.6	0.3	O K
30 min Winter	38.136	0.136	13.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	66.174	0.0	6.8	10	
30 min Summer	43.695	0.0	9.0	17	
60 min Summer	27.653	0.0	11.4	32	
120 min Summer	17.016	0.0	14.0	62	
180 min Summer	12.680	0.0	15.7	92	
240 min Summer	10.248	0.0	16.9	122	
360 min Summer	7.545	0.0	18.7	182	
480 min Summer	6.072	0.0	20.0	244	
600 min Summer	5.128	0.0	21.2	302	
720 min Summer	4.465	0.0	22.1	360	
960 min Summer	3.586	0.0	23.7	490	
1440 min Summer	2.630	0.0	26.0	712	
2160 min Summer	1.926	0.0	28.6	1084	
2880 min Summer	1.543	0.0	30.6	1444	
4320 min Summer	1.128	0.0	33.5	2176	
5760 min Summer	0.902	0.0	35.7	2912	
7200 min Summer	0.758	0.0	37.5	3616	
8640 min Summer	0.658	0.0	39.1	4272	
10080 min Summer	0.583	0.0	40.4	5208	
15 min Winter	66.174	0.0	7.6	10	
30 min Winter	43.695	0.0	10.1	17	
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:30 year event			
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
<u>Summary of Results for 30 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.112	0.112	8.8	0.2	O K
120 min Winter	38.089	0.089	5.5	0.1	O K
180 min Winter	38.076	0.076	4.1	0.1	O K
240 min Winter	38.069	0.069	3.4	0.1	O K
360 min Winter	38.058	0.058	2.5	0.1	O K
480 min Winter	38.052	0.052	2.0	0.1	O K
600 min Winter	38.048	0.048	1.7	0.1	O K
720 min Winter	38.045	0.045	1.5	0.1	O K
960 min Winter	38.040	0.040	1.2	0.0	O K
1440 min Winter	38.035	0.035	0.9	0.0	O K
2160 min Winter	38.028	0.028	0.6	0.0	O K
2880 min Winter	38.025	0.025	0.5	0.0	O K
4320 min Winter	38.021	0.021	0.4	0.0	O K
5760 min Winter	38.019	0.019	0.3	0.0	O K
7200 min Winter	38.018	0.018	0.3	0.0	O K
8640 min Winter	38.017	0.017	0.2	0.0	O K
10080 min Winter	38.016	0.016	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	27.653	0.0	12.8	32	
120 min Winter	17.016	0.0	15.7	62	
180 min Winter	12.680	0.0	17.6	92	
240 min Winter	10.248	0.0	18.9	122	
360 min Winter	7.545	0.0	20.9	182	
480 min Winter	6.072	0.0	22.4	246	
600 min Winter	5.128	0.0	23.7	298	
720 min Winter	4.465	0.0	24.8	356	
960 min Winter	3.586	0.0	26.5	474	
1440 min Winter	2.630	0.0	29.2	726	
2160 min Winter	1.926	0.0	32.0	1088	
2880 min Winter	1.543	0.0	34.2	1412	
4320 min Winter	1.128	0.0	37.5	2196	
5760 min Winter	0.902	0.0	40.0	2880	
7200 min Winter	0.758	0.0	42.0	3592	
8640 min Winter	0.658	0.0	43.8	4336	
10080 min Winter	0.583	0.0	45.3	4936	
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:30 year event	
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:100 year event			
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.197	0.197	22.8	0.4	O K
30 min Summer	38.182	0.182	19.9	0.4	O K
60 min Summer	38.145	0.145	14.5	0.3	O K
120 min Summer	38.117	0.117	9.7	0.2	O K
180 min Summer	38.105	0.105	7.4	0.2	O K
240 min Summer	38.094	0.094	6.1	0.1	O K
360 min Summer	38.079	0.079	4.4	0.1	O K
480 min Summer	38.071	0.071	3.6	0.1	O K
600 min Summer	38.065	0.065	3.0	0.1	O K
720 min Summer	38.060	0.060	2.6	0.1	O K
960 min Summer	38.054	0.054	2.1	0.1	O K
1440 min Summer	38.046	0.046	1.5	0.1	O K
2160 min Summer	38.039	0.039	1.1	0.0	O K
2880 min Summer	38.035	0.035	0.9	0.0	O K
4320 min Summer	38.028	0.028	0.6	0.0	O K
5760 min Summer	38.025	0.025	0.5	0.0	O K
7200 min Summer	38.022	0.022	0.4	0.0	O K
8640 min Summer	38.021	0.021	0.4	0.0	O K
10080 min Summer	38.020	0.020	0.3	0.0	O K
15 min Winter	38.197	0.197	22.8	0.4	O K
30 min Winter	38.164	0.164	17.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	85.460	0.0	8.8	10	
30 min Summer	56.977	0.0	11.8	17	
60 min Summer	36.294	0.0	15.0	32	
120 min Summer	22.382	0.0	18.5	62	
180 min Summer	16.654	0.0	20.6	92	
240 min Summer	13.425	0.0	22.2	122	
360 min Summer	9.818	0.0	24.3	184	
480 min Summer	7.870	0.0	26.0	244	
600 min Summer	6.624	0.0	27.3	306	
720 min Summer	5.750	0.0	28.5	358	
960 min Summer	4.597	0.0	30.3	478	
1440 min Summer	3.347	0.0	33.1	724	
2160 min Summer	2.432	0.0	36.1	1076	
2880 min Summer	1.937	0.0	38.4	1440	
4320 min Summer	1.403	0.0	41.7	2124	
5760 min Summer	1.115	0.0	44.2	2904	
7200 min Summer	0.932	0.0	46.2	3568	
8640 min Summer	0.805	0.0	47.8	4248	
10080 min Summer	0.711	0.0	49.3	4960	
15 min Winter	85.460	0.0	9.9	10	
30 min Winter	56.977	0.0	13.2	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:100 year event			
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.127	0.127	11.6	0.2	O K
120 min Winter	38.104	0.104	7.2	0.2	O K
180 min Winter	38.088	0.088	5.4	0.1	O K
240 min Winter	38.079	0.079	4.4	0.1	O K
360 min Winter	38.068	0.068	3.2	0.1	O K
480 min Winter	38.060	0.060	2.6	0.1	O K
600 min Winter	38.055	0.055	2.2	0.1	O K
720 min Winter	38.051	0.051	1.9	0.1	O K
960 min Winter	38.046	0.046	1.5	0.1	O K
1440 min Winter	38.039	0.039	1.1	0.0	O K
2160 min Winter	38.033	0.033	0.8	0.0	O K
2880 min Winter	38.028	0.028	0.6	0.0	O K
4320 min Winter	38.023	0.023	0.5	0.0	O K
5760 min Winter	38.021	0.021	0.4	0.0	O K
7200 min Winter	38.019	0.019	0.3	0.0	O K
8640 min Winter	38.018	0.018	0.3	0.0	O K
10080 min Winter	38.017	0.017	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	36.294	0.0	16.8	32	
120 min Winter	22.382	0.0	20.7	62	
180 min Winter	16.654	0.0	23.1	90	
240 min Winter	13.425	0.0	24.8	118	
360 min Winter	9.818	0.0	27.2	182	
480 min Winter	7.870	0.0	29.1	238	
600 min Winter	6.624	0.0	30.6	304	
720 min Winter	5.750	0.0	31.9	358	
960 min Winter	4.597	0.0	34.0	486	
1440 min Winter	3.347	0.0	37.1	730	
2160 min Winter	2.432	0.0	40.5	1076	
2880 min Winter	1.937	0.0	43.0	1416	
4320 min Winter	1.403	0.0	46.7	2076	
5760 min Winter	1.115	0.0	49.5	3024	
7200 min Winter	0.932	0.0	51.7	3504	
8640 min Winter	0.805	0.0	53.6	4296	
10080 min Winter	0.711	0.0	55.2	5088	
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AEA - Ambiental		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:100 year event	
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
©1982-2018 Innovyze		

AEA - Ambient		Page 1																																																																																																																																																																																																																																																																																		
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:1 year event																																																																																																																																																																																																																																																																																			
Date 14/03/2019 10:31 File 4330_PP.SRCX	Designed by BB Checked by MN																																																																																																																																																																																																																																																																																			
Innovyze	Source Control 2018.1																																																																																																																																																																																																																																																																																			
Summary of Results for 1 year Return Period (+40%) Half Drain Time : 43 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (1/s)</th><th>Max Control (1/s)</th><th>Max Σ Outflow (1/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>38.476</td><td>0.026</td><td>0.0</td><td>1.0</td><td>1.0</td><td>2.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>38.485</td><td>0.035</td><td>0.0</td><td>1.0</td><td>1.0</td><td>3.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>38.493</td><td>0.043</td><td>0.0</td><td>1.0</td><td>1.0</td><td>3.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>38.496</td><td>0.046</td><td>0.0</td><td>1.0</td><td>1.0</td><td>4.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>38.493</td><td>0.043</td><td>0.0</td><td>1.0</td><td>1.0</td><td>4.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>38.490</td><td>0.040</td><td>0.0</td><td>1.0</td><td>1.0</td><td>3.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>38.483</td><td>0.033</td><td>0.0</td><td>1.0</td><td>1.0</td><td>3.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>38.475</td><td>0.025</td><td>0.0</td><td>1.0</td><td>1.0</td><td>2.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>38.469</td><td>0.019</td><td>0.0</td><td>1.0</td><td>1.0</td><td>1.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>38.463</td><td>0.013</td><td>0.0</td><td>1.0</td><td>1.0</td><td>1.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>38.455</td><td>0.005</td><td>0.0</td><td>1.0</td><td>1.0</td><td>0.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.9</td><td>0.9</td><td>0.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.7</td><td>0.7</td><td>0.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.2</td><td>0.2</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.2</td><td>0.2</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>38.481</td><td>0.031</td><td>0.0</td><td>1.0</td><td>1.0</td><td>2.9</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>37.865</td><td>0.0</td><td>2.9</td><td>17</td></tr><tr><td>30 min Summer</td><td>24.891</td><td>0.0</td><td>4.3</td><td>31</td></tr><tr><td>60 min Summer</td><td>15.926</td><td>0.0</td><td>5.9</td><td>50</td></tr><tr><td>120 min Summer</td><td>10.018</td><td>0.0</td><td>7.8</td><td>84</td></tr><tr><td>180 min Summer</td><td>7.605</td><td>0.0</td><td>9.1</td><td>118</td></tr><tr><td>240 min Summer</td><td>6.248</td><td>0.0</td><td>10.1</td><td>154</td></tr><tr><td>360 min Summer</td><td>4.735</td><td>0.0</td><td>11.6</td><td>220</td></tr><tr><td>480 min Summer</td><td>3.864</td><td>0.0</td><td>12.7</td><td>282</td></tr><tr><td>600 min Summer</td><td>3.299</td><td>0.0</td><td>13.7</td><td>342</td></tr><tr><td>720 min Summer</td><td>2.900</td><td>0.0</td><td>14.4</td><td>398</td></tr><tr><td>960 min Summer</td><td>2.366</td><td>0.0</td><td>15.7</td><td>510</td></tr><tr><td>1440 min Summer</td><td>1.776</td><td>0.0</td><td>17.7</td><td>0</td></tr><tr><td>2160 min Summer</td><td>1.335</td><td>0.0</td><td>19.8</td><td>0</td></tr><tr><td>2880 min Summer</td><td>1.090</td><td>0.0</td><td>21.4</td><td>0</td></tr><tr><td>4320 min Summer</td><td>0.818</td><td>0.0</td><td>23.5</td><td>0</td></tr><tr><td>5760 min Summer</td><td>0.668</td><td>0.0</td><td>25.1</td><td>0</td></tr><tr><td>7200 min Summer</td><td>0.571</td><td>0.0</td><td>26.3</td><td>0</td></tr><tr><td>8640 min Summer</td><td>0.502</td><td>0.0</td><td>27.1</td><td>0</td></tr><tr><td>10080 min Summer</td><td>0.451</td><td>0.0</td><td>27.8</td><td>0</td></tr><tr><td>15 min Winter</td><td>37.865</td><td>0.0</td><td>3.4</td><td>17</td></tr></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status	15 min Summer	38.476	0.026	0.0	1.0	1.0	2.4	O K	30 min Summer	38.485	0.035	0.0	1.0	1.0	3.2	O K	60 min Summer	38.493	0.043	0.0	1.0	1.0	3.9	O K	120 min Summer	38.496	0.046	0.0	1.0	1.0	4.2	O K	180 min Summer	38.493	0.043	0.0	1.0	1.0	4.0	O K	240 min Summer	38.490	0.040	0.0	1.0	1.0	3.7	O K	360 min Summer	38.483	0.033	0.0	1.0	1.0	3.0	O K	480 min Summer	38.475	0.025	0.0	1.0	1.0	2.3	O K	600 min Summer	38.469	0.019	0.0	1.0	1.0	1.7	O K	720 min Summer	38.463	0.013	0.0	1.0	1.0	1.2	O K	960 min Summer	38.455	0.005	0.0	1.0	1.0	0.5	O K	1440 min Summer	38.450	0.000	0.0	0.9	0.9	0.0	O K	2160 min Summer	38.450	0.000	0.0	0.7	0.7	0.0	O K	2880 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K	4320 min Summer	38.450	0.000	0.0	0.4	0.4	0.0	O K	5760 min Summer	38.450	0.000	0.0	0.3	0.3	0.0	O K	7200 min Summer	38.450	0.000	0.0	0.3	0.3	0.0	O K	8640 min Summer	38.450	0.000	0.0	0.2	0.2	0.0	O K	10080 min Summer	38.450	0.000	0.0	0.2	0.2	0.0	O K	15 min Winter	38.481	0.031	0.0	1.0	1.0	2.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	37.865	0.0	2.9	17	30 min Summer	24.891	0.0	4.3	31	60 min Summer	15.926	0.0	5.9	50	120 min Summer	10.018	0.0	7.8	84	180 min Summer	7.605	0.0	9.1	118	240 min Summer	6.248	0.0	10.1	154	360 min Summer	4.735	0.0	11.6	220	480 min Summer	3.864	0.0	12.7	282	600 min Summer	3.299	0.0	13.7	342	720 min Summer	2.900	0.0	14.4	398	960 min Summer	2.366	0.0	15.7	510	1440 min Summer	1.776	0.0	17.7	0	2160 min Summer	1.335	0.0	19.8	0	2880 min Summer	1.090	0.0	21.4	0	4320 min Summer	0.818	0.0	23.5	0	5760 min Summer	0.668	0.0	25.1	0	7200 min Summer	0.571	0.0	26.3	0	8640 min Summer	0.502	0.0	27.1	0	10080 min Summer	0.451	0.0	27.8	0	15 min Winter	37.865	0.0	3.4	17
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status																																																																																																																																																																																																																																																																													
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15 min Winter	38.481	0.031	0.0	1.0	1.0	2.9	O K																																																																																																																																																																																																																																																																													
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240 min Summer	6.248	0.0	10.1	154																																																																																																																																																																																																																																																																																
360 min Summer	4.735	0.0	11.6	220																																																																																																																																																																																																																																																																																
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2880 min Summer	1.090	0.0	21.4	0																																																																																																																																																																																																																																																																																
4320 min Summer	0.818	0.0	23.5	0																																																																																																																																																																																																																																																																																
5760 min Summer	0.668	0.0	25.1	0																																																																																																																																																																																																																																																																																
7200 min Summer	0.571	0.0	26.3	0																																																																																																																																																																																																																																																																																
8640 min Summer	0.502	0.0	27.1	0																																																																																																																																																																																																																																																																																
10080 min Summer	0.451	0.0	27.8	0																																																																																																																																																																																																																																																																																
15 min Winter	37.865	0.0	3.4	17																																																																																																																																																																																																																																																																																
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:1 year event						
Date 14/03/2019 10:31 File 4330_PP.SRCX	Designed by BB Checked by MN						
Innovyze	Source Control 2018.1						
<u>Summary of Results for 1 year Return Period (+40%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	38.493	0.043	0.0	1.0	1.0	3.9	O K
60 min Winter	38.500	0.050	0.0	1.0	1.0	4.6	O K
120 min Winter	38.503	0.053	0.0	1.0	1.0	4.8	O K
180 min Winter	38.499	0.049	0.0	1.0	1.0	4.5	O K
240 min Winter	38.493	0.043	0.0	1.0	1.0	4.0	O K
360 min Winter	38.481	0.031	0.0	1.0	1.0	2.8	O K
480 min Winter	38.469	0.019	0.0	1.0	1.0	1.7	O K
600 min Winter	38.459	0.009	0.0	1.0	1.0	0.9	O K
720 min Winter	38.453	0.003	0.0	1.0	1.0	0.2	O K
960 min Winter	38.450	0.000	0.0	0.9	0.9	0.0	O K
1440 min Winter	38.450	0.000	0.0	0.6	0.6	0.0	O K
2160 min Winter	38.450	0.000	0.0	0.5	0.5	0.0	O K
2880 min Winter	38.450	0.000	0.0	0.4	0.4	0.0	O K
4320 min Winter	38.450	0.000	0.0	0.3	0.3	0.0	O K
5760 min Winter	38.450	0.000	0.0	0.2	0.2	0.0	O K
7200 min Winter	38.450	0.000	0.0	0.2	0.2	0.0	O K
8640 min Winter	38.450	0.000	0.0	0.2	0.2	0.0	O K
10080 min Winter	38.450	0.000	0.0	0.2	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	24.891	0.0	5.0	31			
60 min Winter	15.926	0.0	6.8	58			
120 min Winter	10.018	0.0	8.9	92			
180 min Winter	7.605	0.0	10.4	130			
240 min Winter	6.248	0.0	11.5	166			
360 min Winter	4.735	0.0	13.2	234			
480 min Winter	3.864	0.0	14.4	296			
600 min Winter	3.299	0.0	15.5	350			
720 min Winter	2.900	0.0	16.4	396			
960 min Winter	2.366	0.0	17.9	0			
1440 min Winter	1.776	0.0	20.1	0			
2160 min Winter	1.335	0.0	22.5	0			
2880 min Winter	1.090	0.0	24.3	0			
4320 min Winter	0.818	0.0	26.9	0			
5760 min Winter	0.668	0.0	28.8	0			
7200 min Winter	0.571	0.0	30.2	0			
8640 min Winter	0.502	0.0	31.3	0			
10080 min Winter	0.451	0.0	32.3	0			
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Date 14/03/2019 10:31 File 4330_PP.SRCX	Designed by BB Checked by MN																																					
Innovyze		Source Control 2018.1																																				
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>1</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.369</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.063 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.063</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.000 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.000</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	1	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	18.000	Shortest Storm (mins)	15	Ratio R	0.369	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	From:	To: (ha)	0	4 0.063	Time (mins)	Area	From:	To: (ha)	0	4 0.000
Rainfall Model	FSR	Winter Storms	Yes																																			
Return Period (years)	1	Cv (Summer)	0.750																																			
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0	4 0.063																																					
Time (mins)	Area																																					
From:	To: (ha)																																					
0	4 0.000																																					
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:1 year event	
Date 14/03/2019 10:31 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 38.900

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.8
Max Percolation (l/s)	85.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	38.450	Membrane Depth (m)	150

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1000-0550-1000		
Design Head (m)	0.550		
Design Flow (l/s)	1.0		
Flush-Flo™	Calculated		
Objective	Minimise upstream storage		
Application	Surface		
Sump Available	Yes		
Diameter (mm)	53		
Invert Level (m)	38.200		
Minimum Outlet Pipe Diameter (mm)	75		
Suggested Manhole Diameter (mm)	1200		

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	1.0
Flush-Flo™	0.166	1.0
Kick-Flo®	0.358	0.8
Mean Flow over Head Range	-	0.9

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	1.0	1.200	1.4	3.000	2.2	7.000	3.2
0.200	1.0	1.400	1.5	3.500	2.3	7.500	3.3
0.300	0.9	1.600	1.6	4.000	2.5	8.000	3.4
0.400	0.9	1.800	1.7	4.500	2.6	8.500	3.5
0.500	1.0	2.000	1.8	5.000	2.7	9.000	3.6
0.600	1.0	2.200	1.9	5.500	2.8	9.500	3.7
0.800	1.2	2.400	1.9	6.000	3.0		
1.000	1.3	2.600	2.0	6.500	3.1		

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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:30 year event						
Date 14/03/2019 10:28 File 4330_PP.SRCX	Designed by BB Checked by MN						
Innovyze	Source Control 2018.1						
<u>Summary of Results for 30 year Return Period (+40%)</u>							
Half Drain Time : 171 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	38.545	0.095	0.0	1.0	1.0	8.7	O K
30 min Summer	38.576	0.126	0.0	1.0	1.0	11.6	O K
60 min Summer	38.604	0.154	0.0	1.0	1.0	14.1	O K
120 min Summer	38.619	0.169	0.0	1.0	1.0	15.5	O K
180 min Summer	38.618	0.168	0.0	1.0	1.0	15.5	O K
240 min Summer	38.614	0.164	0.0	1.0	1.0	15.1	O K
360 min Summer	38.605	0.155	0.0	1.0	1.0	14.3	O K
480 min Summer	38.596	0.146	0.0	1.0	1.0	13.4	O K
600 min Summer	38.587	0.137	0.0	1.0	1.0	12.6	O K
720 min Summer	38.577	0.127	0.0	1.0	1.0	11.7	O K
960 min Summer	38.557	0.107	0.0	1.0	1.0	9.9	O K
1440 min Summer	38.518	0.068	0.0	1.0	1.0	6.3	O K
2160 min Summer	38.477	0.027	0.0	1.0	1.0	2.5	O K
2880 min Summer	38.456	0.006	0.0	1.0	1.0	0.6	O K
4320 min Summer	38.450	0.000	0.0	0.8	0.8	0.0	O K
5760 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K
7200 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K
8640 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K
10080 min Summer	38.450	0.000	0.0	0.4	0.4	0.0	O K
15 min Winter	38.559	0.109	0.0	1.0	1.0	10.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Summer	92.644	0.0	9.3	18			
30 min Summer	61.173	0.0	12.9	33			
60 min Summer	38.715	0.0	16.7	62			
120 min Summer	23.822	0.0	20.8	120			
180 min Summer	17.752	0.0	23.5	160			
240 min Summer	14.347	0.0	25.4	192			
360 min Summer	10.563	0.0	28.2	256			
480 min Summer	8.501	0.0	30.3	326			
600 min Summer	7.179	0.0	32.0	394			
720 min Summer	6.250	0.0	33.4	462			
960 min Summer	5.020	0.0	35.7	598			
1440 min Summer	3.682	0.0	39.3	838			
2160 min Summer	2.696	0.0	42.9	1188			
2880 min Summer	2.160	0.0	45.6	1500			
4320 min Summer	1.579	0.0	49.4	0			
5760 min Summer	1.263	0.0	52.1	0			
7200 min Summer	1.062	0.0	54.1	0			
8640 min Summer	0.921	0.0	55.6	0			
10080 min Summer	0.817	0.0	56.9	0			
15 min Winter	92.644	0.0	10.7	18			
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Science Park Square

Brighton

East Sussex

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File 4330_PP.SRCX

367 Wilmslow Road

Proposed attenuated

1:30 year event

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Innovyze

Source Control 2018.1

Summary of Results for 30 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	38.595	0.145	0.0	1.0	1.0	13.3	O K
60 min Winter	38.626	0.176	0.0	1.0	1.0	16.2	O K
120 min Winter	38.648	0.198	0.0	1.0	1.0	18.2	O K
180 min Winter	38.650	0.200	0.0	1.0	1.0	18.4	O K
240 min Winter	38.644	0.194	0.0	1.0	1.0	17.8	O K
360 min Winter	38.632	0.182	0.0	1.0	1.0	16.7	O K
480 min Winter	38.618	0.168	0.0	1.0	1.0	15.5	O K
600 min Winter	38.604	0.154	0.0	1.0	1.0	14.1	O K
720 min Winter	38.588	0.138	0.0	1.0	1.0	12.7	O K
960 min Winter	38.557	0.107	0.0	1.0	1.0	9.8	O K
1440 min Winter	38.497	0.047	0.0	1.0	1.0	4.3	O K
2160 min Winter	38.451	0.001	0.0	1.0	1.0	0.1	O K
2880 min Winter	38.450	0.000	0.0	0.8	0.8	0.0	O K
4320 min Winter	38.450	0.000	0.0	0.6	0.6	0.0	O K
5760 min Winter	38.450	0.000	0.0	0.5	0.5	0.0	O K
7200 min Winter	38.450	0.000	0.0	0.4	0.4	0.0	O K
8640 min Winter	38.450	0.000	0.0	0.3	0.3	0.0	O K
10080 min Winter	38.450	0.000	0.0	0.3	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	61.173	0.0	14.6	32			
60 min Winter	38.715	0.0	18.8	60			
120 min Winter	23.822	0.0	23.5	118			
180 min Winter	17.752	0.0	26.5	172			
240 min Winter	14.347	0.0	28.6	220			
360 min Winter	10.563	0.0	31.7	276			
480 min Winter	8.501	0.0	34.1	352			
600 min Winter	7.179	0.0	36.0	428			
720 min Winter	6.250	0.0	37.7	504			
960 min Winter	5.020	0.0	40.3	646			
1440 min Winter	3.682	0.0	44.2	880			
2160 min Winter	2.696	0.0	48.5	1124			
2880 min Winter	2.160	0.0	51.5	0			
4320 min Winter	1.579	0.0	55.9	0			
5760 min Winter	1.263	0.0	59.0	0			
7200 min Winter	1.062	0.0	61.4	0			
8640 min Winter	0.921	0.0	63.2	0			
10080 min Winter	0.817	0.0	64.7	0			

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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:30 year event																																					
Date 14/03/2019 10:28 File 4330_PP.SRCX	Designed by BB Checked by MN																																					
Innovyze		Source Control 2018.1																																				
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>30</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.369</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.063 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.063</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.000 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.000</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	18.000	Shortest Storm (mins)	15	Ratio R	0.369	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	From:	To: (ha)	0	4 0.063	Time (mins)	Area	From:	To: (ha)	0	4 0.000
Rainfall Model	FSR	Winter Storms	Yes																																			
Return Period (years)	30	Cv (Summer)	0.750																																			
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From:	To: (ha)																																					
0	4 0.000																																					
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:30 year event	
Date 14/03/2019 10:28 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		

Model Details

Storage is Online Cover Level (m) 38.900

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.8
Max Percolation (l/s)	85.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	38.450	Membrane Depth (m)	150

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1000-0550-1000
Design Head (m)	0.550
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	38.200
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	1.0
Flush-Flo™	0.166	1.0
Kick-Flo®	0.358	0.8
Mean Flow over Head Range	-	0.9

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	1.0	1.200	1.4	3.000	2.2	7.000	3.2
0.200	1.0	1.400	1.5	3.500	2.3	7.500	3.3
0.300	0.9	1.600	1.6	4.000	2.5	8.000	3.4
0.400	0.9	1.800	1.7	4.500	2.6	8.500	3.5
0.500	1.0	2.000	1.8	5.000	2.7	9.000	3.6
0.600	1.0	2.200	1.9	5.500	2.8	9.500	3.7
0.800	1.2	2.400	1.9	6.000	3.0		
1.000	1.3	2.600	2.0	6.500	3.1		

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Science Park Square
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367 Wilmslow Road
Proposed attenuated
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Innovyze

Source Control 2018.1

Micro Drainage

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 242 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	38.579	0.129	0.0	1.0	1.0	11.9	O K
30 min Summer	38.623	0.173	0.0	1.0	1.0	15.9	O K
60 min Summer	38.663	0.213	0.0	1.0	1.0	19.6	O K
120 min Summer	38.691	0.241	0.0	1.0	1.0	22.2	O K
180 min Summer	38.695	0.245	0.0	1.0	1.0	22.5	O K
240 min Summer	38.691	0.241	0.0	1.0	1.0	22.1	O K
360 min Summer	38.678	0.228	0.0	1.0	1.0	21.0	O K
480 min Summer	38.668	0.218	0.0	1.0	1.0	20.1	O K
600 min Summer	38.659	0.209	0.0	1.0	1.0	19.2	O K
720 min Summer	38.648	0.198	0.0	1.0	1.0	18.3	O K
960 min Summer	38.628	0.178	0.0	1.0	1.0	16.4	O K
1440 min Summer	38.589	0.139	0.0	1.0	1.0	12.8	O K
2160 min Summer	38.531	0.081	0.0	1.0	1.0	7.4	O K
2880 min Summer	38.488	0.038	0.0	1.0	1.0	3.5	O K
4320 min Summer	38.451	0.001	0.0	1.0	1.0	0.1	O K
5760 min Summer	38.450	0.000	0.0	0.8	0.8	0.0	O K
7200 min Summer	38.450	0.000	0.0	0.7	0.7	0.0	O K
8640 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K
10080 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K
15 min Winter	38.597	0.147	0.0	1.0	1.0	13.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	119.643	0.0	12.5	18
30 min Summer	79.768	0.0	17.3	33
60 min Summer	50.812	0.0	22.4	62
120 min Summer	31.335	0.0	28.0	122
180 min Summer	23.316	0.0	31.3	180
240 min Summer	18.795	0.0	33.8	210
360 min Summer	13.745	0.0	37.1	272
480 min Summer	11.018	0.0	39.8	338
600 min Summer	9.273	0.0	41.8	408
720 min Summer	8.051	0.0	43.7	478
960 min Summer	6.436	0.0	46.5	616
1440 min Summer	4.686	0.0	50.6	882
2160 min Summer	3.405	0.0	54.9	1252
2880 min Summer	2.712	0.0	58.1	1584
4320 min Summer	1.965	0.0	62.5	2204
5760 min Summer	1.561	0.0	65.6	0
7200 min Summer	1.305	0.0	67.9	0
8640 min Summer	1.127	0.0	69.7	0
10080 min Summer	0.996	0.0	71.1	0
15 min Winter	119.643	0.0	14.2	18

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AEA - Ambient

Science Park Square

Brighton

East Sussex

Date 14/03/2019 10:26

File 4330_PP.SRCX

Innovyze

367 Wilmslow Road

Proposed attenuated

1:100 year event

Designed by BB

Checked by MN

Source Control 2018.1

Page 2



Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	38.647	0.197	0.0	1.0	1.0	18.2	O K
60 min Winter	38.694	0.244	0.0	1.0	1.0	22.4	O K
120 min Winter	38.730	0.280	0.0	1.0	1.0	25.7	O K
180 min Winter	38.739	0.289	0.0	1.0	1.0	26.5	O K
240 min Winter	38.736	0.286	0.0	1.0	1.0	26.3	O K
360 min Winter	38.719	0.269	0.0	1.0	1.0	24.8	O K
480 min Winter	38.706	0.256	0.0	1.0	1.0	23.6	O K
600 min Winter	38.691	0.241	0.0	1.0	1.0	22.2	O K
720 min Winter	38.676	0.226	0.0	1.0	1.0	20.8	O K
960 min Winter	38.645	0.195	0.0	1.0	1.0	17.9	O K
1440 min Winter	38.584	0.134	0.0	1.0	1.0	12.4	O K
2160 min Winter	38.495	0.045	0.0	1.0	1.0	4.1	O K
2880 min Winter	38.451	0.001	0.0	1.0	1.0	0.1	O K
4320 min Winter	38.450	0.000	0.0	0.7	0.7	0.0	O K
5760 min Winter	38.450	0.000	0.0	0.6	0.6	0.0	O K
7200 min Winter	38.450	0.000	0.0	0.5	0.5	0.0	O K
8640 min Winter	38.450	0.000	0.0	0.4	0.4	0.0	O K
10080 min Winter	38.450	0.000	0.0	0.4	0.4	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	79.768	0.0	19.5	32
60 min Winter	50.812	0.0	25.2	62
120 min Winter	31.335	0.0	31.6	118
180 min Winter	23.316	0.0	35.3	174
240 min Winter	18.795	0.0	38.1	228
360 min Winter	13.745	0.0	41.8	288
480 min Winter	11.018	0.0	44.7	364
600 min Winter	9.273	0.0	47.1	442
720 min Winter	8.051	0.0	49.0	520
960 min Winter	6.436	0.0	52.3	666
1440 min Winter	4.686	0.0	57.0	952
2160 min Winter	3.405	0.0	62.0	1280
2880 min Winter	2.712	0.0	65.5	1500
4320 min Winter	1.965	0.0	70.6	0
5760 min Winter	1.561	0.0	74.1	0
7200 min Winter	1.305	0.0	76.8	0
8640 min Winter	1.127	0.0	78.9	0
10080 min Winter	0.996	0.0	80.6	0

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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:100 year event	
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	
Model Details Storage is Online Cover Level (m) 38.900 Porous Car Park Structure Infiltration Coefficient Base (m/hr)0.00000 Membrane Percolation (mm/hr)1000 Max Percolation (l/s)85.2 Safety Factor2.0 Porosity0.30 Invert Level (m)38.450 Width (m)7.0 Length (m)43.8 Slope (1:X)0.0 Depression Storage (mm)5 Evaporation (mm/day)3 Membrane Depth (m)150 Hydro-Brake® Optimum Outflow Control Unit ReferenceMD-SHE-0053-1000-0550-1000 Design Head (m)0.550 Design Flow (l/s)1.0 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)53 Invert Level (m)38.200 Minimum Outlet Pipe Diameter (mm)75 Suggested Manhole Diameter (mm)1200 Control Points Head (m) Flow (l/s) Design Point (Calculated) 0.550 1.0 Flush-Flo™ 0.166 1.0 Kick-Flo® 0.358 0.8 Mean Flow over Head Range - 0.9 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 1.0 1.200 1.4 3.000 2.2 7.000 3.2 0.200 1.0 1.400 1.5 3.500 2.3 7.500 3.3 0.300 0.9 1.600 1.6 4.000 2.5 8.000 3.4 0.400 0.9 1.800 1.7 4.500 2.6 8.500 3.5 0.500 1.0 2.000 1.8 5.000 2.7 9.000 3.6 0.600 1.0 2.200 1.9 5.500 2.8 9.500 3.7 0.800 1.2 2.400 1.9 6.000 3.0 1.000 1.3 2.600 2.0 6.500 3.1 ©1982-2018 Innovyze		

Appendix 4

General Requirements Maintenance

GENERAL MAINTENANCE MAINTENANCE	
Maintenance activities comprise Regular Maintenance Occasional Tasks Remedial Work	Frequency
Generally Litter Collect all litter or other debris and remove from site at each site visit. Avoid use of weedkillers and pesticides to prevent chemical pollution Avoid de-icing agents wherever possible to allow bio-remediation of pollutants in permeable surfaces. Protect all permeable, porous and infiltration surfaces from silt, sand, mulch and other fine particles.	Monthly
REGULAR MAINTENANCE	
LITTER MANAGEMENT	
Pick up all litter in SuDS and Landscape areas and remove from site	monthly
GRASS MAINTENANCE— all cuttings to wildlife piles	

Mow all grass verges, paths and amenity at 35-50mm with 75mm max. Leaving grass in situ	As required or monthly
Mow all dry swales, dry SuDS basins and margins to low flow channels and other SuDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas	4-8 visits as required Annually
Wildflower areas strimmed to 50mm in Sept or at end of school holidays Or Wildflower areas strimmed to 50mm on 3 year rotation 30% each year	1 visit annually 1 Visit Annually
Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	12 visits monthly
HARD SURFACES	
Sweep all paving regularly. Sweep and suction brush permeable paving in autumn after leaf fall.	1 visit
PERMEABLE AND POROUS SURFACES	
Regular Maintenance	Frequency
Cleaning	
Brush regularly and remove sweepings from all hard surfaces	Monthly

Occasional Tasks	Frequency
Permeable Pavements. Brush and vacuum surface once a year to prevent silt blockage and enhance design life.	Annually
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise Client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggests jet washing and suction cleaning will substantially reinstate pavement to 90% efficiency.	As required
OVERFLOWS AND FLOOD ROUTES	
Regular Maintenance	Frequency
Overflows. Jet pipes leading from overflow structures annually and check running water through the overflow. Check free flow at next SUDS feature inlet to basin or chamber.	Annually
Overflows. Remove any accumulated grass cuttings or other debris on top of grass weirs or stone filled baskets overflows.	Monthly
Flood Routes. Make visual inspection. Check route is not blocked by new fences, walls, soil or other rubbish. Remove as necessary.	Monthly
Remedial	Frequency
Overflows. If overflow is not clear then dismantle structure and reassemble to design detail.	

	As required
PLANTING AND EXISTING VEGETATION	
Regular Maintenance	Frequency
Grass maintenance	
Amenity Grass - Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. All cuttings to remain in situ 16 visits	
Rough grass – Mow at 75-100mm but not to exceed 150mm All cuttings to wildlife piles 4 – 8 visits	
Wildflower areas strimmed to 50mm in Sept-Oct or Wildflower areas strimmed to 50mm July and Sept or Wildflower areas strimmed to 50mm on 3 year rotation 30% each year All cuttings to wildlife piles 1 visit	
Ornamental tree & shrub planting. Weed all shrub beds as detailed spec as necessary. Cut back planting from lights, paths and visibility sight lines in late autumn and as necessary. Cut hedges slightly tapered back from base with flat top at specified height. 4 visits	

Do not mulch planting adjacent to permeable/ porous paving surfaces. Remove stakes and ties from trees when no longer needed for support and within 3 years of planting. Protect from strimmer damage and remove competitive growth until well established.	
Native trees & shrub planting. Prune to shape in year 1. Protect trees from strimmer damage and remove competitive growth until well established. Remove stakes and ties from trees when no longer needed for support and within 3 years from planting.	1 visit
Existing trees Check existing trees for safety.	1 visit
Remedial	Frequency
Replace trees and shrubs which fail in the first five years after planting. Carry out tree surgery as necessary.	As Required



Phlorum Limited

Head Office & Registered Office:

Unit 12
Hunns Mere Way
Woodingdean
Brighton
East Sussex
BN2 6AH
T: 01273 307 167

Northern Office:

Ground Floor
Adamson House
Towers Business Park
Wilmslow Road
Didsbury
Manchester
M20 2YY
T: 0161 955 4250

Western Office:

One Caspian Point
Pierhead Street
Cardiff Bay
Cardiff
CF10 4DQ
T: 029 2092 0820

Maidenhead Office:

Meliora
Briar Glen
Cookham
Maidenhead
Berkshire
SL6 9JP
M: 07736 292 106

info@phlorum.com
www.phlorum.com

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