Project Title

Drainage Strategy Report

At

Three Development Sites,

Whitworth Road,

Syke,

Rochdale,

OL12

For

Cornerstone Place Ltd

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Executive Summary

Figure 1: Flood Risk and Drainage Strategy Summary

Item	Brief Description
Development Proposed	The proposed construction of three adjacent sites encompassing a number of residential units, with associated gardens and landscaping.
Flood Zone Classification	Flood Zone 1 – Low Risk
Geology	No specific site investigation has been carried out at this time. BGS data and review of the Phase 1 Desk Study would show that the underlying ground is identified as made ground over clay.
Infiltration Rate	No specific Phase 2 intrusive site investigation has been carried out. BGS data would show that the underlying ground is cohesive and thus not suitable for infiltration-based options. The Phase 1 Desk Study has also confirmed this. Furthermore the enclosed development buildings and site boundaries will restrict the minimum offset distance from soakaways to foundations to be applied.
Nearest Watercourses	Hey Brook is located approximately 400m to the east.
Nearest Adopted Sewers and Culverts	A number of 225mm diameter combined public sewers adjoining the three sites within the adopted highways. Larger 450mm diameter combined sewer in Whitworth Road to the east.
Surface Water Drainage Outfall and SuDS Hierarchal Approach	Based on the cohesive ground conditions, the strategy is to connect each site to the combined water sewer at a peak restricted rate of 2l/s. This has been agreed with United Utilities.
Existing Discharge Rate	All three sites are currently unmade. As such they can be classed as greenfield for drainage purposes.
Proposed Discharge Rate	2l/s for each site as agreed with UU.
Allowance for Climate Change	40% - based on a residential > 50-year design life to 'the 2080's'.
Proposed Attenuation Method & Outline Volume	Geocellular Crates for Block A only – 10m^3 (100yr + 40% CC)
SuDS features	Water butts to rear rainwater pipes. Flow control with Geocellular Attenuation.
Maintenance Responsibility	Management company
Foul Drainage Outfall	Free discharge to public combined sewer bounding the sites.

1. Introduction

1.1 Paul Graveney Consulting Ltd (PGC) has been appointed by Cornerstone Place Ltd to prepare this Drainage & SuDS (Sustainable Drainage Systems) Strategy to support a full planning submission for a proposed development encompassing three residential housing schemes on three separate unmade sites with associated landscaping on land off Whitworth Road, Syke, Rochdale, OL12. The assessment has been undertaken in line with Section 10 of the 2021 'National Planning Policy Framework', plus the accompanying Technical Guidance on Flood Risk and any local policies.

1.2 This report has been commissioned by Cornerstone Place Ltd and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A.

1.3 The report has been commissioned to identify any drainage related issues associated with the proposed development and any likely constraints that could be imposed. The following issues have been addressed within this report;

- Determine the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
- Discuss Sustainable Drainage Systems (SUDS) as an option for reducing surface water flood risk and devise an outline Drainage layout.
- Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any potential increase in surface water runoff and include for climate change.
- Devise an appropriate outline foul water drainage strategy.

2. Development Description and Location

2.1 Site Location

The site is referenced in Figure 2, and a site location map is provided in Appendix A.

Item	Brief Description
Project name	Whitworth Road
Site address and location	Whitworth Road, Syke, Rochdale, Manchester, OL12.
Council Area	Rochdale Borough Council
Approximate Grid Reference	OS: 389790, 414327
General Locality	The three adjacent sites are located some 1km to the north of Rochdale Town Centre.

Figure 2: Site Referencing Information

2.2 Existing Site Description and Walk Over

2.2.1 The three development sites (Red Line Boundaries) are irregular in plan shapes and are situated within a largely residential area. A site visit was undertaken on Tuesday 8th February 2022. A summary of the three sites is identified below:

Block A – Currently encompasses a tarmac former children's play area on the western side with surrounding metal hand railings. Site bounds the rear yards of terraced properties to the south and west. Eastern area is grassed with a nominal fall down to Whitworth Road to the east. A medium sized tree was identified along the southern edge. A footpath passes between the two areas.

Block B – Currently encompasses a number of derelict garages. Identified to be in a poor condition and evidence of asbestos sheeting identified. Some fly tipping to the sides of the garages. A medium sized tree in poor condition is located in the NE corner.

Block C – Currently tarmac surfaced, with peripheral grassed areas. Used as car parking and evidence of fly tipping. Site immediately adjacent a sub-station.

2.2.2 Figure 2 identifies the overall site location details. Further details of the existing layout can be seen on the Red Line Plans in Appendix A.

Access to Block A will be from Derwent Street, whilst access to Blocks B & C will be off Grasmere Street.

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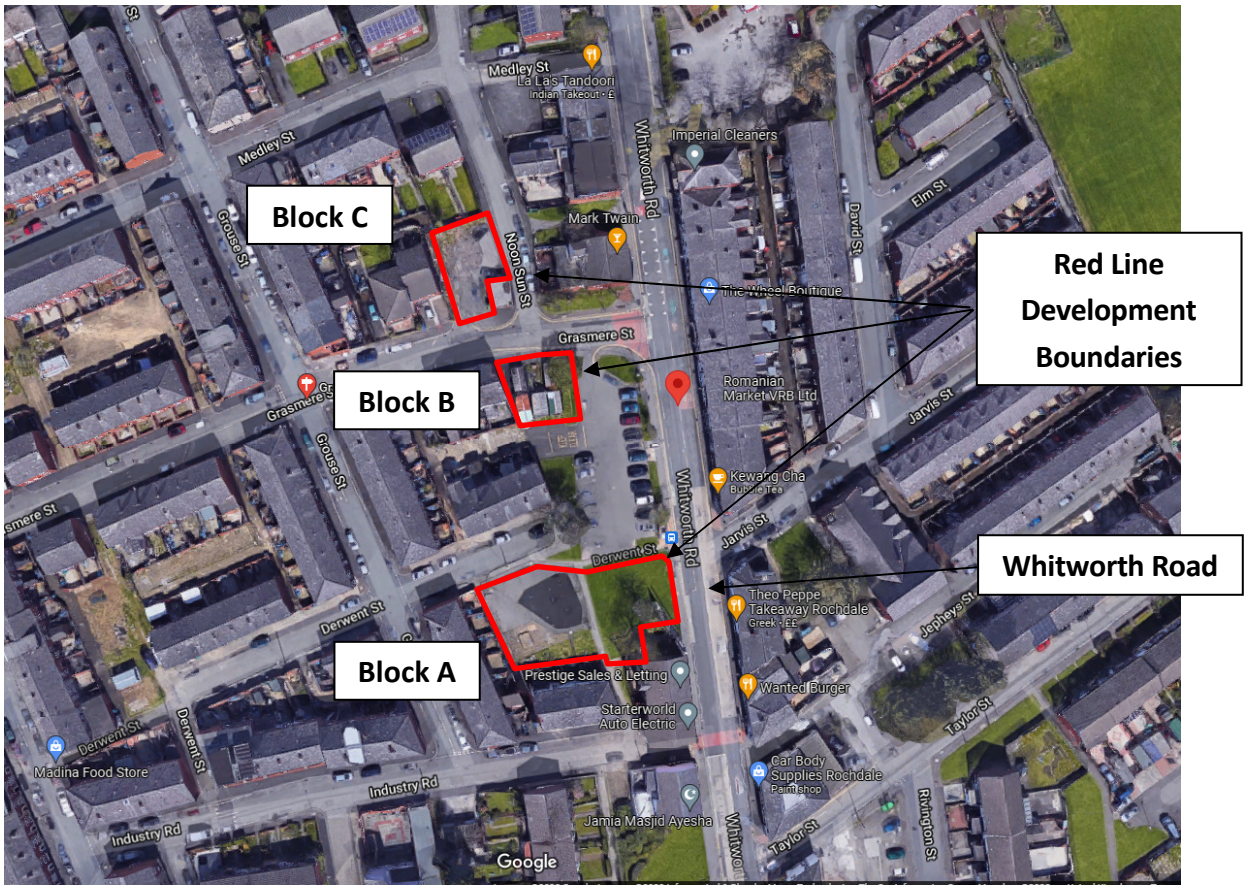

Figure 3: Site Location

2.3 Site Photographs

Block A – Former Play Ground to West

Block A – Open Grassed Area to the East

Block B – Existing Garages from the South

Block B – Existing Garages from the North

Block C – Un-made Land from the South

Block C – Sub Station with Site Beyond

2.4 Topography

2.4.1 All three sites are relatively flat and range in level from 155m AOD at Block A to the south up to 157m AOD at Block C at the north.

2.5 Hydrology

2.5.1 A review of local maps the closest identified watercourse is the Hey Brook, situated some 400m to the east, outfalling to the larger River Roch.

2.6 Development Proposals

2.6.1 As discussed in the earlier sections, this report has been prepared to support a planning application for the construction of three residential blocks of flats, totaling 14 units, with associated gardens and landscaping.

2.5.2 The outline Site Master Plan as indicated in Appendix A provides details of the proposed development intent.

3. Fluvial Flood Risk Review

3.1 Figure 4 below locates the site on the Environment Agency's indicative flood plain map. It is clear from this that the red line boundary sits outside of a fluvial generator of flood water from any identified water body or river. It is considered therefore that the site lays outside of the active 100-year and extreme event floodplains, thus lying within 'Flood Zone 1 Classification' in accordance with the 2021 National Planning Policy Framework (NPPF) Flood Risk Guidance Notes, i.e. probability of annual fluvial flooding significantly less than 1 in 1000 in any one year (<0.1%). The risk from fluvial flood water is diminished to acceptable levels, removing the requirement for further investigation and assessment of the fluvial flood regime.

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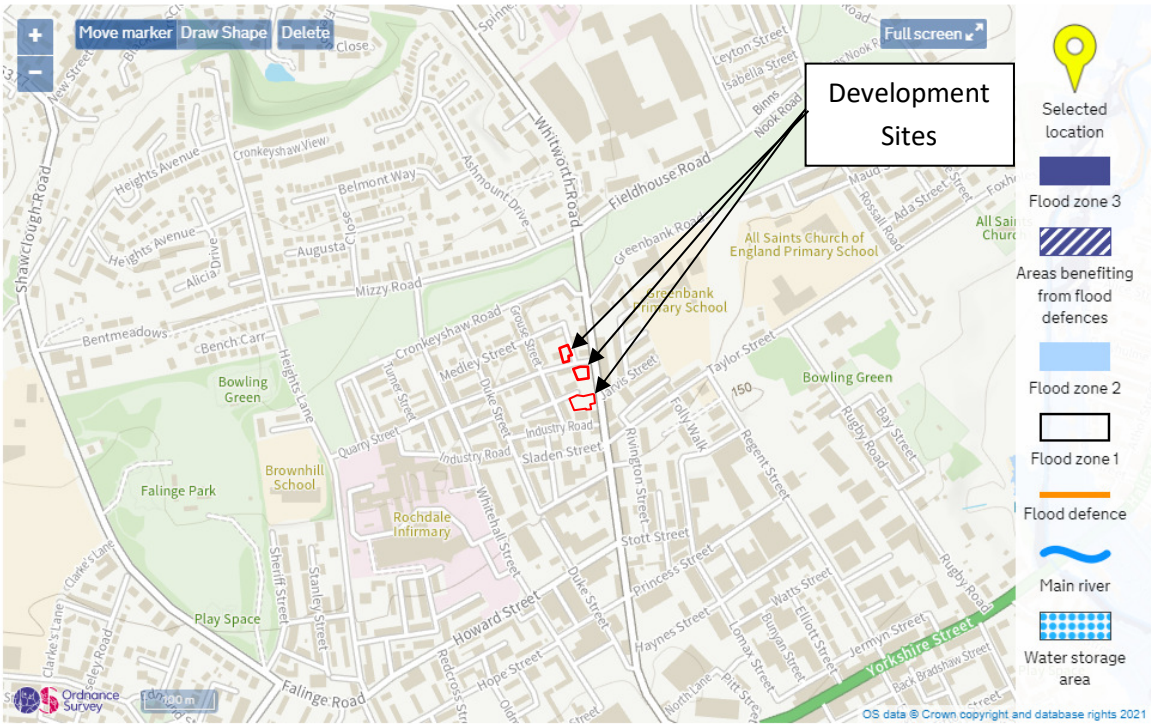

Figure 4: EA Indicative Flood Maps

3.2 In addition, the development application boundary is less that 1ha in plan area. In line with criteria set within the NPPF a Flood Risk Assessment is not required to support a planning application if the development is less that 1ha and in Flood Zone 1.

4. Outline Drainage Strategy

4.1 Correspondence

4.1.1 A Pre-development enquiry was submitted to United Utilities. Their response was received on the 7th February 2022 and can be found in Appendix D. In summary the foul water generated by the new development can discharge unrestricted to the combined sewer adjacent each of the sites. Surface water should follow the SuDS hierarchal approach. If infiltration is found not to be feasible, and it can be proved that connection to a watercourse is not feasible then UU will accept connection to the combined public sewers at a pass forward flow rate not exceeding 2l/s from each site.

4.2 Existing Drainage

4.2.1 The United Utilities sewer records have been reviewed (Figure 5 below) and confirm a number of 225mm diameter combined public sewers adjoining the sites in the adopted highways. A larger 450mm diameter combined sewer flows south in Whitworth Road to the east.

4.2.1 Following a site visit, it was determined that a 225mm diameter combined sewer is also located along both the southern and western boundaries of Block A, flowing generally in a southerly direction to Industry Road. No private drainage was identified on the other two blocks.

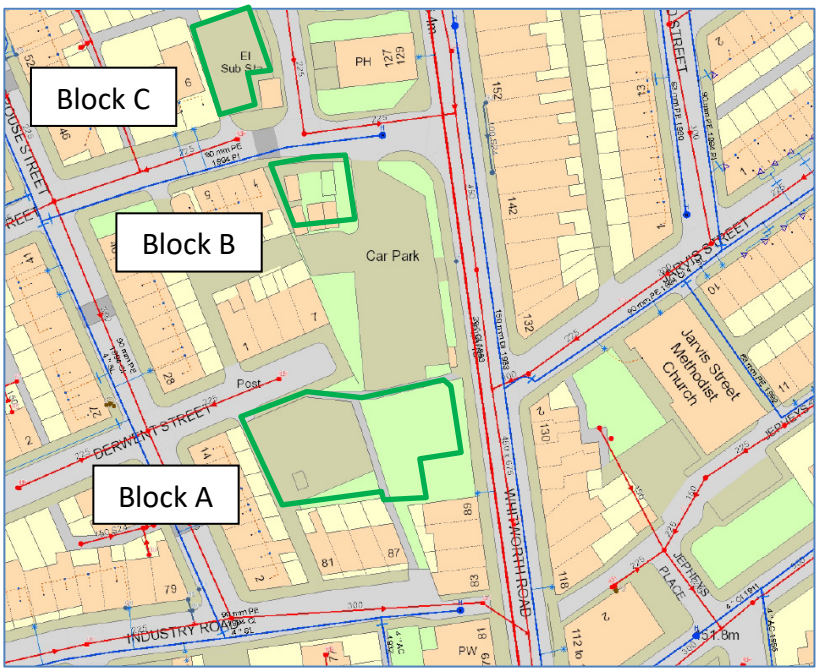

Figure 5: United Utilities Sewer Records

4.3 Existing Runoff

4.3.1 Based on the current use of the three sites, they can all be classed as 'Greenfield' with the greenfield runoff rates shown in Figure 6 below:

	Area (ha)	1 year	30 year	100 year
Block A	0.072	0.5 l/s	1.0 l/s	1.2 l/s
Block B	0.020	0.1 l/s	0.3 l/s	0.4 l/s
Block C	0.021	0.1 l/s	0.3 l/s	0.4 l/s

Figure 6: Existing Greenfield Discharge Rates

4.4 Geology

4.4.1 At the time of writing the report, no site-specific intrusive Phase 2 Site Investigation has been carried out at the site. Assessing the BGS ground data for the site and reviewing the Phase 1 desk study would indicate the underlying ground to encompass made ground over clays and therefore not suitable for infiltration-based options. This will be confirmed on completion of the Phase 2 site specific investigation.

4.5 Hydrological Assessment

4.5.1 As discussed in previous sections, a review of the topographical survey, OS Maps and Environment Agency maps would indicate the closest surface water feature to be Hey Brook, located some 400m to the east beyond a residential and commercial area.

4.6 Sustainable Drainage Systems (SuDS) Assessment

4.6.1 SuDS Objectives

4.6.1.1 Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

4.6.2 SuDS Design Themes

4.6.2.1 The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

i. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.

ii. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).

iii. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.

iv. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

4.6.3 SuDS Site Constraints

4.6.3.1 SuDS techniques are suitable for all sites; therefore an assessment of the existing site is required so that SuDS limitations can be determined.

- *Land Use Characteristics:* The type of development enables the opportunities on the use of prevention and site control SuDS devices to be considered.
- *Site Characteristics:* A Phase 2 intrusive site investigation has not been carried out at the site. Desk-based findings are that the ground is cohesive and thus infiltration techniques would not be suitable.
- *Catchment Characteristics:* The site is currently classed for drainage purposes as 'Greenfield'.
- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. Some types of SuDS will be considered and blended into the project where feasible. Maintenance plans will be prepared for all SuDS devices that are included.

4.6.4 SuDS Methods

4.6.4.1 Figure 7 and 8 on the following pages provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the residential development.

Method	Comment	Suitability for Development
Green Roofs	• Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.	*Not suitable*: • Not suitable due to the pitched roof of the residential dwellings.
Water Butts	• Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	*Suitable*: • To be placed at the base of the rear rainwater pipes.
Rainwater Harvesting	• Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	*Not Suitable*: • Additional costs of installation would have severe effect on viability of the development. • Running and maintenance costs would not be acceptable to our client and future occupiers. • The ability to restrict peak flow rates and short-term peak volumes is non-existent where a critical storm event occurs.
Infiltration Options	• Reduces total run off volume from the development.	*Not Suitable*: • Initial investigation would indicate that the underlying ground is unsuitable for infiltration.
Permeable Surfacing (Infiltration)	• Reduces total run off volume from the development. • Can be used to enhance water quality.	*Not Suitable*: • Initial investigation would indicate that the underlying ground is unsuitable for infiltration. • Limited areas of hard paving.
Permeable Surfacing (Standard)	• Can be used to enhance quality of runoff water. • Sub-base provides 'source' storage and reduces the volume of storage downstream. • The storage can be created with selection of the stone fill or plastic box stems. • Impermeable membrane at base of construction to prevent impact on pavement stability.	*Not Suitable*: • No parking is proposed for the development and so permeable surfacing would not be feasible.

Swales, basins and ponds	• Provide areas for above ground surface runoff storage. • Swales also allow filtering of particulate matter, improving water quality	*Not suitable:* • No space available in the site for any of these features to be incorporated.
Bio-Retention	• Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.	*Not suitable:* • No space available in the site for any of these features to be incorporated.

Figure 7: Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	• Suitable for sites with insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc.	*Suitable:* • Small Tanks to act as attenuation measures behind a flow control device, where required.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally be suitable for adoption by the statutory water company (e.g. United Utilities).	*Not suitable:* • More suited to larger residential schemes with adopted sewers.

Figure 8: Sub-Surface SuDS Methods

4.6.5 SuDS Hierarchal Approach

4.6.5.1 Based on the SuDS assessment in Figure 7 and 8, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	No	Desk based investigation would indicate that the underlying ground would not be suitable for infiltration-based options.
Connection to Watercourse	No	Watercourse too far from the development boundary.
Connection to Surface Water Sewer	No	No surface water sewers in close proximity to the site boundary.
Connection to a Combined Sewer	Yes	New connections to be made to the adjoining combined water sewers at restricted rates.

Figure 9: SuDS Hierarchal Approach

4.6.6 SuDS Design Philosophy

4.6.6.1 SuDS assessment and hierarchal approach discussed in Figure 7, 8 and 9 above has defined the overall SuDS strategy. Thus, the SuDS philosophy for the development site is the promotion of prevention and site control measures with discharge to the combined public sewer.

4.6.6.2 The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the existing drainage infrastructure.
- Water butts placed at base of rear rainwater pipes.
- Site control in the form of geocellular crates behind the flow control devices.
- Aim to reduce the impermeable footprint.

4.7 Outline Surface Water Drainage Strategy

4.7.1 The general principal of the surface water drainage strategy is to collect the runoff from the roof area of the each of the three residential units via the rainwater pipes. The networks then outfall to the combined water public sewer via a new connection from each site through a flow control device. The peak flow rate for the extreme 100yr + 40% CC will be set at 2l/s as agreed with United Utilities. This will reduce for the less intense storms. Due to the flow restriction attenuation will take the form of a geocellular crated tank, where required. The pathways adjoining the units will fall into the soft landscaping areas.

4.7.2 The proposed private drainage layout for the new development building will be designed in accordance with BS EN 752: 2008 and Building Regulations Part H guidance. This is to indicate no surcharge for the 2-year storm event and no flooding for up to the 30-year storm event.

4.7.3 A full hydraulic drainage model has been simulated for each Block based on the restricted discharge rate. Taking into account the reduced discharge rates the worst-case attenuation volumes are defined in the figures below. Note that as the areas for Blocks B & C are small, no additional attenuation measures are required. It is noted that these rates and volumes are preliminary for this outline assessment and are likely to alter at detailed design stage when more site-specific information is made available. Further details on the drainage strategy plan can be found in Appendix B with the hydraulic calculations in Appendix C.

Block	New Impermeable Area	Peak Post Development Peak Discharge Rate	Attenuation Volume for 30-year Event	Attenuation Volume for 100 year + 40% CC Event)
A	0.034 ha	2 l/s	6m^3	10m^3

Figure 10: Outline Attenuation Volumes

4.8 Maintenance

4.8.1 The long-term maintenance of the new drainage and SuDS infrastructure will be with the owners or a management company in line with best practice guidance. Annual inspections will need to be carried out and clearing of gullies and manholes.

Typically the maintenance regime will be in line with Figure 11 below.

Future Maintenance of the Drainage System			
Responsibility	**Feature**	**Maintenance**	**Frequency**
Management Company	Rainwater gutters, downpipes and above ground drainage.	Regular maintenance and inspections.	Ad-hoc sweeping and emptying of silt and debris required. Annual visual inspections to check for damage/leaks.
	Flow control chambers.	Regular maintenance / removal of blockages and debris.	Annual inspection and following significant rainfall events.
	Geocellular Attenuation / Attenuation Tanks	Regular maintenance / removal of blockages and debris.	Annual inspection and following significant rainfall events.
	Pipes, sewers, manholes	Regular maintenance / removal of blockages and debris.	Annual inspection and removal of silts if required.

Figure 11: Outline Management and Maintenance Strategy

4.9 Foul Water Drainage

4.9.1 Foul drainage generated from the new development will discharge to the existing combined water public sewers bounding each of the sites.

4.9.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2017 and Building Regulations Part H guidance.

Appendix A – Architects Drawings

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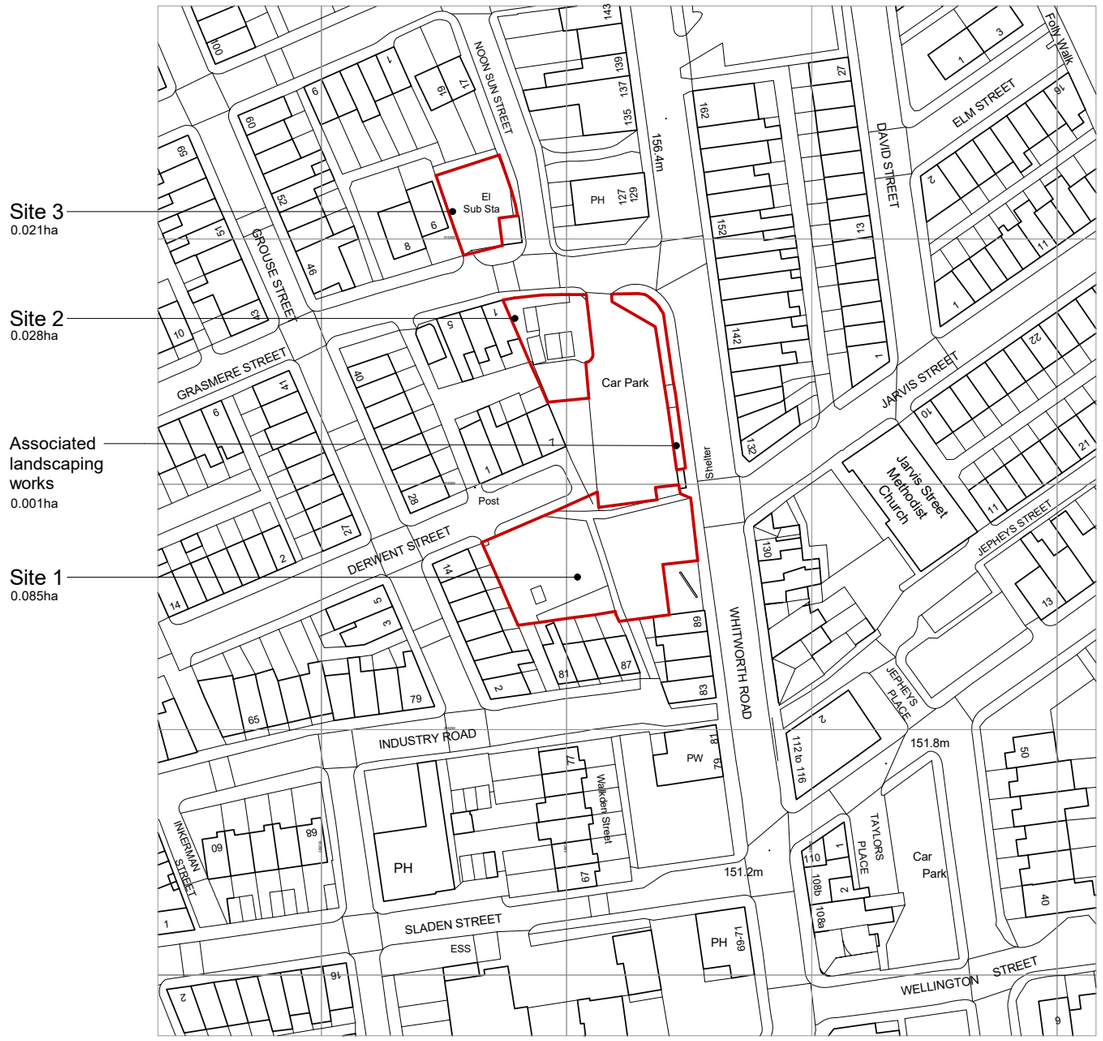

Total Site Area: (0.135Ha)

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Scale 1:1250

0m 10m 25m 50m

Revision:	Date:	By:	Remarks:
P01	22.03.22	JS	Issued for planning with updated redline boundary.

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Drawing Purpose:	Revision:	Scale @A3: 1 : 1250	Client:
PLANNING	**P01**	Date: Nov' 2021	Cornerstone Place
Project: Origin.: Vol/Sys: Level: Type: Role: Drg No.:		Drawn: JS	Project No. / Project Name: 21-032 / Whitworth Road, Rochdale
WHI - TRI - ZZ - ZZ - DR - A - 3000		Checked: AJD	Drawing Name: Site Location Plan

Proposed Site Plan
1 : 200

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Site Plan Legend

- Soft landscaping (details TBC by landscaping proposal)
- Hard landscaping (details TBC by landscaping proposal)
- Screening planting (details TBC by landscaping proposal)
- SP / LP / TP — Lampost / telegraph pole / signpost
- Existing tree replaced / removed
- New tree planting
- Existing tree retained

Tree Schedule

T1	Existing tree removed
T2	Existing tree retained
T3	Existing tree replaced by new tree
T4	Existing tree replaced by new tree
T5	Existing tree removed
T6	New tree
T7	New tree
T8	New tree

Total trees removed: 2no.
Total trees replaced: 2no.
Total trees planted: 5no.

Rev	Date	By	Remarks
P03	22.03.22	JS	Issued for planning with updated redline boundary.
P02	02.03.22	JS	Updated as engineer comments.
P01	20.01.22	JS	Issued for client comment.

Client:
Cornerstone Place

Project No. / Project Name:
21-032 / Whitworth Road, Rochdale

Drawing Name:
Proposed Site Plan

Drawing Purpose:
PLANNING

Project:	Origin.:	Vol/Sys:	Level:	Type:	Role:	Drg No.:	Revision
WHI - TRI - ZZ - ZZ - DR - A - 3010							**P03**

Status	Scale @ A1	Drawn	Check	Date
As indicated	JS	AJD		March 2022

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Scale 1:200
0m 2m 4m 10m

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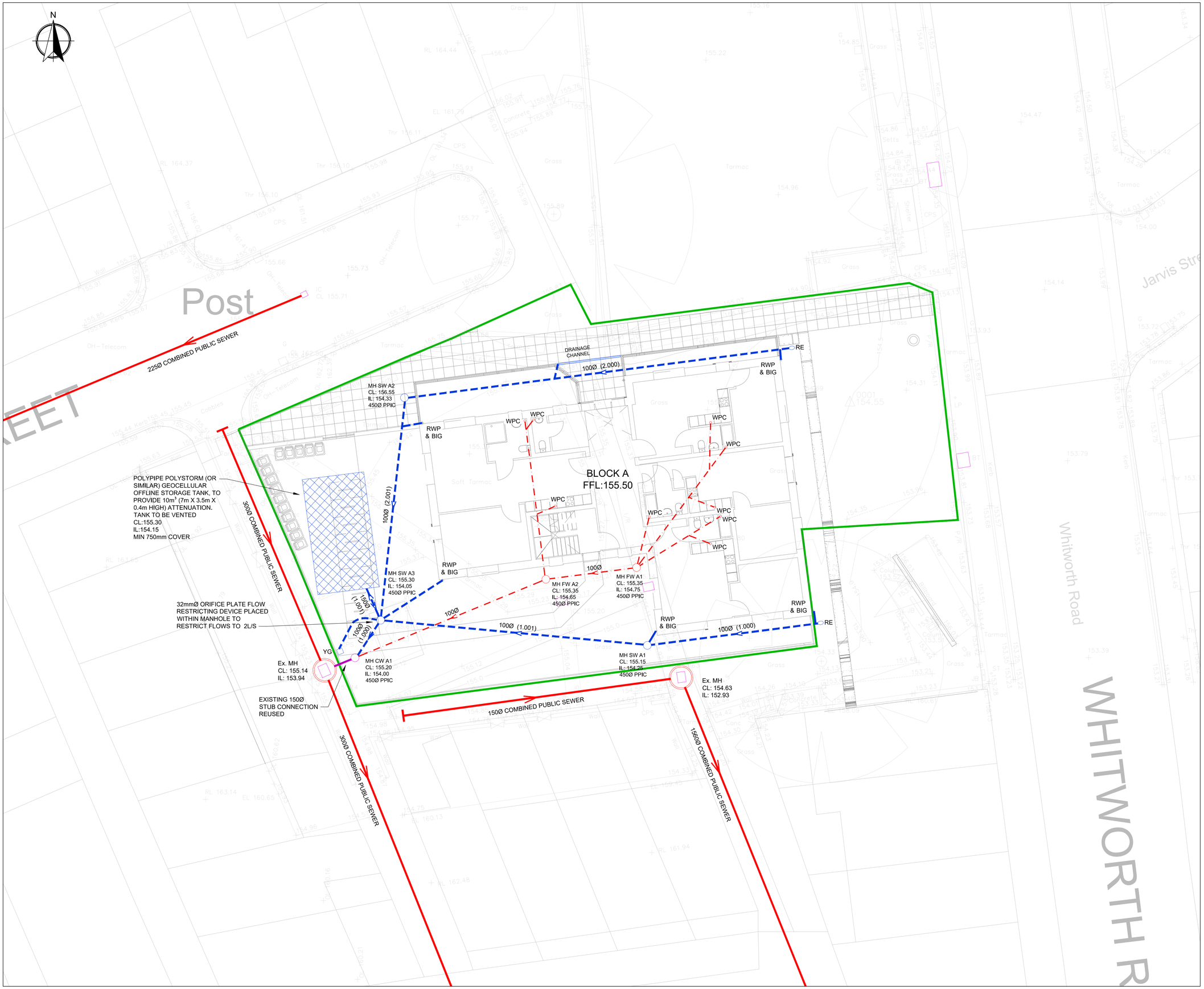
Appendix B – PGC Drawings



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KEY

	EXISTING COMBINED WATER SEWER
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED SURFACE WATER DRAINAGE
	SITE BOUNDARY
RWP	RAINWATER PIPE
WPC	WASTE POINT CONNECTION
YG	YARD GULLY
RE	RODDING EYE
SG	SUMP GULLY FOR DRAINAGE CHANNEL

ALL FINISHED LEVELS TO BE CONFIRMED TO SET COVER AND INVERT LEVELS

NOTE ALL RWP AND SVP LOCATIONS TO BE CONFIRMED BY OTHERS

ALL PIPEWORK TO BE 100Ø UNLESS NOTED OTHERWISE

REV	DATE	DRAWN	REV'D ENG.	NOTES
P1	02.03.22	PG	PG	PRELIMINARY ISSUE

CLIENT
CORNERSTONE PLACE

PROJECT
WHITWORTH ROAD, ROCHDALE

DRAWING TITLE
DRAINAGE STRATEGY PLAN (BLOCK A)

DRAWING STATUS
PRELIMINARY

SCALE	DRAWN BY	ENGINEER	SHEET
1:100	PG	PG	A1

DRAWING No	REVISION
PGC388-C-100	P1

PG Consulting
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SK8 7ES
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GENERAL NOTES

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. DETAILS OF EXISTING SEWERS SHALL BE CONFIRMED BY THE CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHOULD CHECK THE LEVELS OF ALL NEW OUT FALLS IN RELATION TO EXISTING SEWERS PRIOR TO ANY CONSTRUCTION TO ENSURE THE PROPOSED DESIGN CAN BE ACHIEVED.
4. DO NOT SCALE FROM THIS DRAWN, WORK TO DIMENSIONS OR COORDINATES PROVIDED. ALL LEVELS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

KEY

	EXISTING COMBINED WATER SEWER
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED COMBINED WATER DRAINAGE
	SITE BOUNDARY
RWP	RAINWATER PIPE
WPC	WASTE POINT CONNECTION
YG	YARD GULLY
RE	RODDING EYE
SG	SUMP GULLY FOR DRAINAGE CHANNEL

ALL FINISHED LEVELS TO BE CONFIRMED TO SET COVER AND INVERT LEVELS

NOTE ALL RWP AND SVP LOCATIONS TO BE CONFIRMED BY OTHERS

ALL PIPEWORK TO BE 100Ø UNLESS NOTED OTHERWISE

REV	DATE	DRAWN	REV'D ENG.	NOTES
P1	28.02.22	PG	PG	PRELIMINARY ISSUE

CLIENT
CORNERSTONE PLACE

PROJECT
WHITWORTH ROAD, ROCHDALE

DRAWING TITLE
DRAINAGE STRATEGY PLAN (BLOCKS B & C)

DRAWING STATUS
PRELIMINARY

SCALE	DRAWN BY	ENGINEER	SHEET
1:100	PG	PG	A1

DRAWING No	REVISION
PGC388-C-101	P1

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Appendix C – Outline Hydraulic Calculations

	Whitworth Road Block A - GR Rates	
Date 24/02/2022 File	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	0.072	Urban	0.000
SAAR (mm)	1169	Region Number	Region 10

Results	**l/s**
QBAR Rural	0.6
QBAR Urban	0.6
Q1 year	0.5
Q1 year	0.5
Q30 years	1.0
Q100 years	1.2

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	Whitworth Road Blocks B & C - GF Rates	
Date 24/02/2022 File	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	0.021	Urban	0.000
SAAR (mm)	1169	Region Number	Region 10

Results	**l/s**
QBAR Rural	0.2
QBAR Urban	0.2
Q1 year	0.1
Q1 year	0.1
Q30 years	0.3
Q100 years	0.3

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	Block A - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by
Innovyze	Network 2017.1.2

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.256	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.030	4-8	0.004

Total Area Contributing (ha) = 0.034

Total Pipe Volume (m³) = 0.595

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	10.000	0.100	100.0	0.009	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	15.000	0.150	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	22.000	0.220	100.0	0.009	4.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	13.000	0.230	56.5	0.008	0.00	0.0	0.600	o	100	Pipe/Conduit	
3.000	3.000	0.050	60.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.22	154.350	0.009	0.0	0.0	0.0	0.77	6.0	1.2
1.001	50.00	4.54	154.250	0.009	0.0	0.0	0.0	0.77	6.0	1.2
2.000	50.00	4.48	154.550	0.009	0.0	0.0	0.0	0.77	6.0	1.2
2.001	50.00	4.69	154.330	0.017	0.0	0.0	0.0	1.03	8.1	2.3
3.000	50.00	4.04	154.150	0.000	0.0	0.0	0.0	1.30	23.0	0.0

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	Block A - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by
Innovyze	Network 2017.1.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.002	4.000	0.040	100.0	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.002	50.00	4.75	154.050	0.034	0.0	0.0	0.0	1.00	17.8	4.6

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	Block A - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by
Innovyze	Network 2017.1.2

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE	154.850	154.350	0.400	Open Manhole	100
1.001	o	100	SW A1	155.150	154.250	0.800	Open Manhole	450
2.000	o	100	RE	155.150	154.550	0.500	Open Manhole	100
2.001	o	100	SW A2	155.550	154.330	1.120	Open Manhole	450
3.000	o	150	TANK	155.300	154.150	1.000	Open Manhole	1200
1.002	o	150	SW A3	155.300	154.050	1.100	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	10.000	100.0	SW A1	155.150	154.250	0.800	Open Manhole	450
1.001	15.000	100.0	SW A3	155.300	154.100	1.100	Open Manhole	450
2.000	22.000	100.0	SW A2	155.550	154.330	1.120	Open Manhole	450
2.001	13.000	56.5	SW A3	155.300	154.100	1.100	Open Manhole	450
3.000	3.000	60.0	SW A3	155.300	154.100	1.050	Open Manhole	450
1.002	4.000	100.0	sewer	155.140	154.010	0.980	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	sewer	155.140	154.010	153.940	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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	Block A - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

Simulation Criteria for Storm

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.256		

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Online Controls for Storm

Orifice Manhole: SW A3, DS/PN: 1.002, Volume (m³): 0.5

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 154.100

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	Block A - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 3.000

Invert Level (m) 154.150 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	25.0	25.0	2.600	0.0	33.0
0.200	25.0	29.0	2.800	0.0	33.0
0.400	25.0	33.0	3.000	0.0	33.0
0.401	0.0	33.0	3.200	0.0	33.0
0.800	0.0	33.0	3.400	0.0	33.0
1.000	0.0	33.0	3.600	0.0	33.0
1.200	0.0	33.0	3.800	0.0	33.0
1.400	0.0	33.0	4.000	0.0	33.0
1.600	0.0	33.0	4.200	0.0	33.0
1.800	0.0	33.0	4.400	0.0	33.0
2.000	0.0	33.0	4.600	0.0	33.0
2.200	0.0	33.0	4.800	0.0	33.0
2.400	0.0	33.0	5.000	0.0	33.0

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	Block A - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.256
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE	15 Winter	1	+0%	100/15 Summer	100/120 Winter		
1.001	SW A1	15 Winter	1	+0%	30/15 Summer			
2.000	RE	15 Winter	1	+0%	100/15 Summer			
2.001	SW A2	15 Winter	1	+0%	30/15 Summer			
3.000	TANK	60 Winter	1	+0%	30/30 Summer			
1.002	SW A3	15 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	154.380	-0.070	0.000	0.20		1.1	OK	3
1.001	SW A1	154.308	-0.042	0.000	0.17		1.0	OK	
2.000	RE	154.579	-0.071	0.000	0.19		1.1	OK	
2.001	SW A2	154.364	-0.066	0.000	0.24		1.9	OK	
3.000	TANK	154.207	-0.093	0.000	0.04		0.6	OK	
1.002	SW A3	154.298	0.098	0.000	0.07		0.9	SURCHARGED	

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	Block A - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.256
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE	15 Winter	30	+0%	100/15 Summer	100/120 Winter		
1.001	SW A1	120 Winter	30	+0%	30/15 Summer			
2.000	RE	15 Winter	30	+0%	100/15 Summer			
2.001	SW A2	15 Winter	30	+0%	30/15 Summer			
3.000	TANK	120 Winter	30	+0%	30/30 Summer			
1.002	SW A3	120 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	154.399	-0.051	0.000	0.48		2.7	OK	3
1.001	SW A1	154.366	0.016	0.000	0.18		1.0	SURCHARGED	
2.000	RE	154.597	-0.053	0.000	0.46		2.7	OK	
2.001	SW A2	154.434	0.004	0.000	0.65		4.9	SURCHARGED	
3.000	TANK	154.363	0.063	0.000	0.07		0.9	SURCHARGED	
1.002	SW A3	154.363	0.163	0.000	0.08		1.1	SURCHARGED	

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	Block A - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block A ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.256
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE	120 Winter	100	+40%	100/15 Summer	100/120 Winter		
1.001	SW A1	120 Winter	100	+40%	30/15 Summer			
2.000	RE	120 Winter	100	+40%	100/15 Summer			
2.001	SW A2	120 Winter	100	+40%	30/15 Summer			
3.000	TANK	120 Winter	100	+40%	30/30 Summer			
1.002	SW A3	120 Winter	100	+40%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	154.851	0.401	0.710	0.31		1.7	FLOOD	3
1.001	SW A1	154.864	0.514	0.000	0.30		1.7	FLOOD RISK	
2.000	RE	154.907	0.257	0.000	0.32		1.9	FLOOD RISK	
2.001	SW A2	154.896	0.466	0.000	0.43		3.3	SURCHARGED	
3.000	TANK	154.880	0.580	0.000	0.10		1.4	SURCHARGED	
1.002	SW A3	154.880	0.680	0.000	0.15		1.9	SURCHARGED	

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	Block B - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block B ...	Designed by paulg Checked by
Innovyze	Network 2017.1.2

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.258	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.008	4-8	0.001

Total Area Contributing (ha) = 0.009

Total Pipe Volume (m³) = 0.236

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.000	13.000	0.130	100.0	0.006	4.00	0.0	0.600	o	100	Pipe/Conduit	
10.001	10.000	0.100	100.0	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
10.002	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
10.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
10.000	50.00	4.28	155.450	0.006	0.0	0.0	0.0	0.77	6.0	0.8
10.001	50.00	4.50	155.320	0.009	0.0	0.0	0.0	0.77	6.0	1.2
10.002	50.00	4.61	155.220	0.009	0.0	0.0	0.0	0.77	6.0	1.2
10.003	50.00	4.65	155.170	0.009	0.0	0.0	0.0	0.77	6.0	1.2

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	Block B - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block B ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.000	o	100	RE	156.100	155.450	0.550	Open Manhole	100
10.001	o	100	SW B1	156.100	155.320	0.680	Open Manhole	450
10.002	o	100	SW B2	156.450	155.220	1.130	Open Manhole	450
10.003	o	100	SW B3	156.200	155.170	0.930	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.000	13.000	100.0	SW B1	156.100	155.320	0.680	Open Manhole	450
10.001	10.000	100.0	SW B2	156.450	155.220	1.130	Open Manhole	450
10.002	5.000	100.0	SW B3	156.200	155.170	0.930	Open Manhole	450
10.003	2.000	100.0	EX SEWER	156.170	155.150	0.920	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
10.003	EX SEWER	156.170	155.150	153.600	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.258		

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Online Controls for Storm

Orifice Manhole: SW B3, DS/PN: 10.003, Volume (m³): 0.2

Diameter (m) 0.032 Discharge Coefficient 0.600 Invert Level (m) 155.170

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	Block B - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block B ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.258
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
10.000	RE	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
10.001	SW B1	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
10.002	SW B2	15 Winter	1	+0%	1/15 Winter			
10.003	SW B3	15 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
10.000	RE	155.474	-0.076	0.000	0.13		0.7	OK	6
10.001	SW B1	155.349	-0.071	0.000	0.18		1.0	OK	6
10.002	SW B2	155.324	0.004	0.000	0.15		0.8	SURCHARGED	
10.003	SW B3	155.320	0.050	0.000	0.20		0.8	SURCHARGED	

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	Block B - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block B ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.258
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
10.000	RE	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
10.001	SW B1	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
10.002	SW B2	15 Winter	30	+0%	1/15 Winter			
10.003	SW B3	15 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
10.000	RE	155.663	0.113	0.000	0.30		1.7	SURCHARGED	6
10.001	SW B1	155.653	0.233	0.000	0.31		1.7	SURCHARGED	6
10.002	SW B2	155.641	0.321	0.000	0.29		1.5	SURCHARGED	
10.003	SW B3	155.632	0.362	0.000	0.36		1.4	SURCHARGED	

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	Block B - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block B ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.258
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
10.000	RE	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
10.001	SW B1	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
10.002	SW B2	30 Summer	100	+40%	1/15 Winter			
10.003	SW B3	30 Summer	100	+40%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
10.000	RE	156.100	0.550	0.271	0.35		2.0	FLOOD	6
10.001	SW B1	156.100	0.680	0.042	0.53		3.0	FLOOD	6
10.002	SW B2	156.104	0.784	0.000	0.45		2.4	SURCHARGED	
10.003	SW B3	156.097	0.827	0.000	0.51		2.0	FLOOD RISK	

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	Block C - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.257	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.010	4-8	0.000

Total Area Contributing (ha) = 0.010

Total Pipe Volume (m³) = 0.196

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
20.000	8.000	0.100	80.0	0.005	4.00	0.0	0.600	o	100	Pipe/Conduit	
20.001	2.000	0.025	80.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
20.002	4.000	0.200	20.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
21.000	9.000	0.325	27.7	0.005	4.00	0.0	0.600	o	100	Pipe/Conduit	
20.003	2.000	0.175	11.4	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
20.000	50.00	4.15	156.000	0.005	0.0	0.0	0.0	0.86	6.8	0.7
20.001	50.00	4.19	155.900	0.005	0.0	0.0	0.0	0.86	6.8	0.7
20.002	50.00	4.23	155.875	0.005	0.0	0.0	0.0	1.73	13.6	0.7
21.000	50.00	4.10	156.000	0.005	0.0	0.0	0.0	1.47	11.6	0.7
20.003	50.00	4.25	155.675	0.010	0.0	0.0	0.0	2.30	18.1	1.4

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	Block C - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by
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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
20.000	o	100	RE	156.700	156.000	0.600	Open Manhole	100
20.001	o	100	SW C1	156.700	155.900	0.700	Open Manhole	450
20.002	o	100	SW C2	156.700	155.875	0.725	Open Manhole	450
21.000	o	100	RE	156.700	156.000	0.600	Open Manhole	100
20.003	o	100	SW C3	156.700	155.675	0.925	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
20.000	8.000	80.0	SW C1	156.700	155.900	0.700	Open Manhole	450
20.001	2.000	80.0	SW C2	156.700	155.875	0.725	Open Manhole	450
20.002	4.000	20.0	SW C3	156.700	155.675	0.925	Open Manhole	600
21.000	9.000	27.7	SW C3	156.700	155.675	0.925	Open Manhole	600
20.003	2.000	11.4	SEWER	156.800	155.500	1.200	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
20.003	SEWER	156.800	155.500	155.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Region	England and Wales
Return Period (years)	2	M5-60 (mm)	19.000

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	Block C - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by
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Synthetic Rainfall Details

Ratio R	0.257	Cv (Winter)	0.840
Profile Type	Summer	Storm Duration (mins)	30
Cv (Summer)	0.750		

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Online Controls for Storm

Orifice Manhole: SW C3, DS/PN: 20.003, Volume (m³): 0.4

Diameter (m) 0.031 Discharge Coefficient 0.600 Invert Level (m) 155.675

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	Block C - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.257
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
20.000	RE	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
20.001	SW C1	15 Summer	1	+0%	30/15 Summer	100/15 Winter		
20.002	SW C2	15 Winter	1	+0%	30/15 Summer			
21.000	RE	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
20.003	SW C3	15 Winter	1	+0%	1/15 Summer	100/15 Summer		

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
20.000	RE	156.021	-0.079	0.000	0.10		0.6	OK	6
20.001	SW C1	155.925	-0.075	0.000	0.14		0.6	OK	
20.002	SW C2	155.899	-0.076	0.000	0.05		0.6	OK	
21.000	RE	156.015	-0.085	0.000	0.06		0.6	OK	6
20.003	SW C3	155.897	0.122	0.000	0.08		0.9	SURCHARGED	1

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	Block C - Whitworth Road SW Network	
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.257
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
20.000	RE	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
20.001	SW C1	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
20.002	SW C2	15 Winter	30	+0%	30/15 Summer			
21.000	RE	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
20.003	SW C3	15 Winter	30	+0%	1/15 Summer	100/15 Summer		

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
20.000	RE	156.263	0.163	0.000	0.22		1.3	SURCHARGED	6
20.001	SW C1	156.256	0.256	0.000	0.20		0.9	SURCHARGED	
20.002	SW C2	156.254	0.279	0.000	0.07		0.8	SURCHARGED	
21.000	RE	156.257	0.157	0.000	0.13		1.3	SURCHARGED	6
20.003	SW C3	156.251	0.476	0.000	0.13		1.5	SURCHARGED	1

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	Block C - Whitworth Road SW Network
Date 28/02/2022 File Whitworth Raod Block C ...	Designed by paulg Checked by
Innovyze	Network 2017.1.2

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.257
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
20.000	RE	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
20.001	SW C1	15 Summer	100	+40%	30/15 Summer	100/15 Winter		
20.002	SW C2	15 Winter	100	+40%	30/15 Summer			
21.000	RE	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
20.003	SW C3	30 Summer	100	+40%	1/15 Summer	100/15 Summer		

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
20.000	RE	156.700	0.600	0.264	0.31		1.9	FLOOD	6
20.001	SW C1	156.699	0.699	0.000	0.32		1.4	FLOOD RISK	
20.002	SW C2	156.695	0.720	0.000	0.17		1.9	FLOOD RISK	
21.000	RE	156.700	0.600	0.109	0.16		1.7	FLOOD	6
20.003	SW C3	156.700	0.925	0.002	0.17		2.0	FLOOD	1

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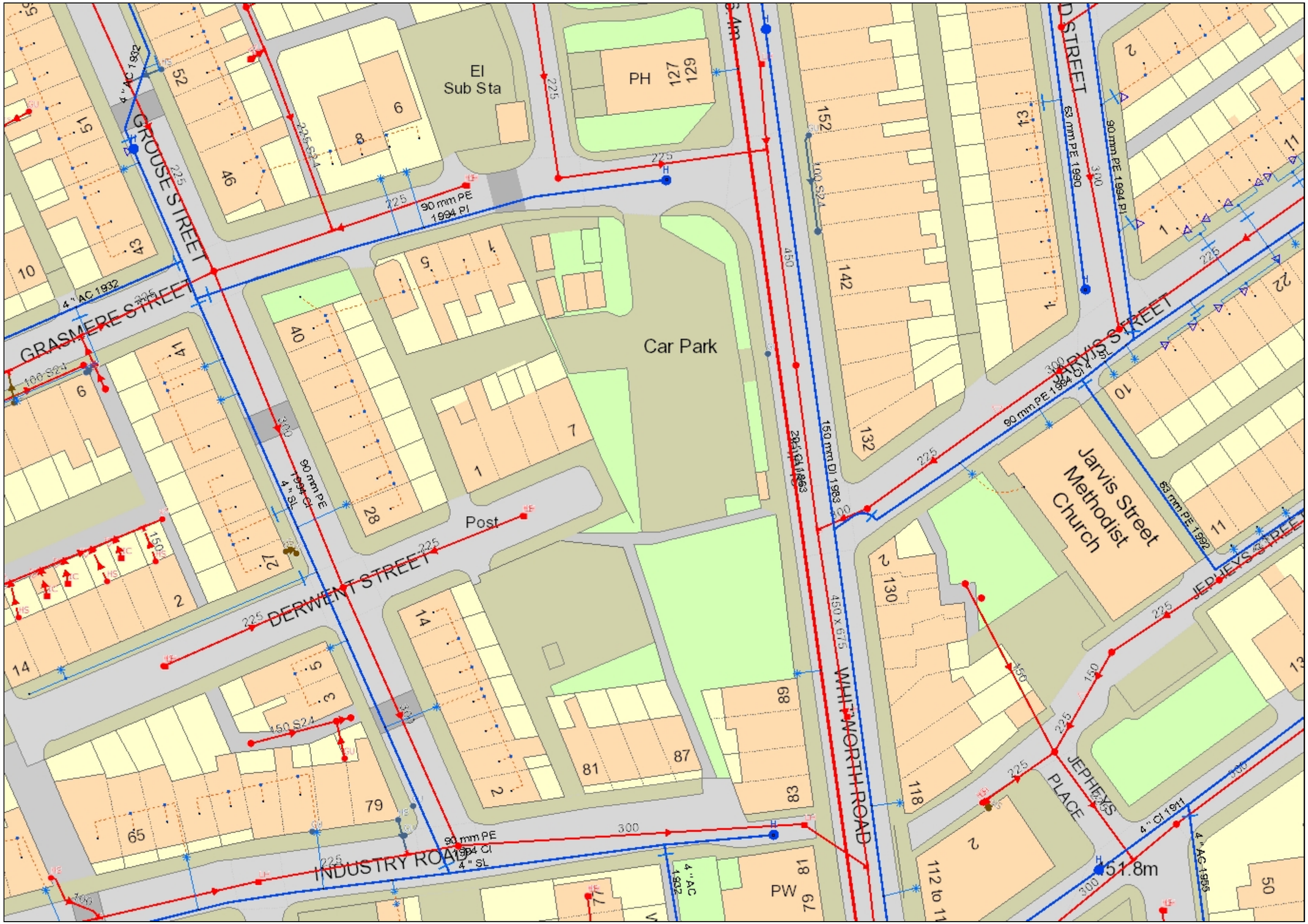
Appendix D – UU Sewer Records and Pre-Development Response



United Utilities Maps for SafeDig

Date :	01/07/2021 15:33:15
Centre X:	389758
Centre Y:	414304
Scale :	500
UserName:	G4LG72Y

Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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United Utilities
Water for the North West

Paul Graveney

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 08 February 2022 13:44
To: Paul Graveney
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for: Whitworth Road, Rochdale UU Reference Number : 4200046841

Good afternoon Paul ,

Pre Development Enquiry for: Whitworth Road, Rochdale UU Reference Number : 4200046841

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Site 1: Our preferred point of discharge would be to the 225mm diameter public combined sewer within Derwent Street located to the North of your proposed development at an unrestricted rate.

Site 2: Our preferred point of discharge would be to the 225mm diameter public combined sewer within Noon Sun Street located to the North of your proposed development at an unrestricted rate.

Site 3: Our preferred point of discharge would be to the 225mm diameter public combined sewer within Noon Sun Street located to the South of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Please ensure all proposed manhole chambers cover levels and finished floor levels are higher than the receiving public sewer.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

United Utilities acknowledge that the nearest watercourse is a significant distance off-site.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Site 1: Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer within Derwent Street located North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 2l/s.

Site 2: Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer within Noon Sun Street located North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 2l/s.

Site 3: Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer within Noon Sun Street located South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 2l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: **DeveloperServicesWater@uuplc.co.uk**. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

United Utilities
Water for the North West

Mohammed Aljafarawi
Developer Engineer
Developer Services & Metering
Customer Services
Email: Mohammed.Aljafarawi@uuplc.co.uk
unitedutilities.com

If you have received a great service today why not tell us?
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Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry https://www.unitedutilities.com/builders-developers/ or you can email us at developerserviceswater@uuplc.co.uk

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From: Paul Graveney [mailto:paul@pgcl.co.uk]
Sent: 28 January 2022 11:36
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: RE: Pre Development Enquiry - Whitworth Road, Rochdale

EXTERNAL EMAIL This email originated outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Morning,

Please find attached my pre development enquiry for a proposed residential scheme on land off Whitworth Road, Rochdale.

Regards

Paul

Paul Graveney
BEng(Hons) CEng MICE
Director

PG Consulting
Civil & Infrastructure Engineers

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