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**FLOOD RISK AND DRAINAGE
ASSESSMENT FOR A PROPOSED
RESIDENTIAL DEVELOPMENT AT
BARUGH GREEN ROAD,
BARNLEY, SOUTH YORKSHIRE**

**PROJECT NO. JAG/MS/JF/51335-
Rp001-REV D**

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RESIDENTIAL DEVELOPMENT AT BARUGH GREEN ROAD, BARNLSLEY,
SOUTH YORKSHIRE**

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Signed:

Date: 20th August 2025

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Signed:

Date: 6th December 2024

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D	Updated outfall location.	HD	JAG	03.09.25

For the avoidance of doubt, the parties confirm that these conditions of engagement shall not and the parties do not intend that these conditions of engagement shall confer on any party any rights to enforce any term of this Agreement pursuant of the Contracts (Rights of third Parties) Act 1999.

The Appointment of Alan Wood & Partners shall be governed by and construed in all respects in accordance with the laws of England & Wales and each party submits to the exclusive jurisdiction of the Courts of England & Wales.

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1.0 INTRODUCTION

1.1 **Background**

1.1.1 Alan Wood & Partners were commissioned by Avant Home Yorkshire to prepare a Flood Risk and Drainage Assessment for a proposed residential development on land to the south of Barugh Green Road, Barnsley, South Yorkshire in support of an application for full planning consent.

1.1.2 A Flood Risk and Drainage Assessment (FRDA) for the proposed development is required to assess the development's risk from flooding and the suitability of the site in terms of drainage.

1.2 **Layout of Report**

1.2.1 Section 1 provides an introduction to the FRDA, explains the layout of this FRDA and provides an introduction to flood risk and the latest guidance on development and flood risk in England.

1.2.2 Section 2 provides an introduction to the site. The site description is based upon a desktop study and information provided by the developer. In order to obtain further information on flood risk, consultation was undertaken with the Environment Agency.

1.2.3 Section 3 of this report details the information gathered through the consultation.

1.2.4 Section 4 of this report details the development proposals and considers the development proposals in relation to the current planning policy on development and flood risk in England (and what type of development is considered appropriate in different flood risk zones). National Planning Policy Framework (NPPF): and its associated Technical Guidance (Communities and Local Government, March 2012) is the current planning policy on flood risk in England, and an introduction to NPPF is provided below.

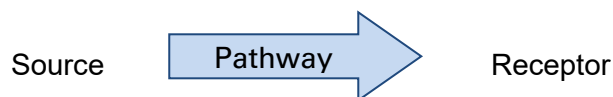
1.2.5 Section 5 considers the foul water drainage arrangements for the proposed development.

- 1.2.6 Section 6 considers the surface water drainage arrangements for the proposed development.
- 1.2.7 Section 7 of this report considers the flood risk to site, and the potential for the development proposals to impact on flood risk. The assessment of flood risk is based on the latest planning policy and utilises all the information gathered in the preparation of the report.
- 1.2.8 Section 8 of this report provides details of any recommendations for further work to mitigate against possible flooding.
- 1.2.9 Section 9 of this report provides a summary of the report.

1.3 Flood Risk

- 1.3.1 Flood risk takes account of both the probability and the consequences of flooding.
- 1.3.2 Flood risk = probability of flooding x consequences of flooding
- 1.3.3 Probability is usually interpreted in terms of the return period, e.g. 1 in 100 and 1 in 200-year event, etc. In terms of probability, there is a 1 in 100 (1%) chance of one or more 1 in 100-year floods occurring in a given year. The consequence of flooding depends on how vulnerable a receptor is to be flooded.

The components of flood risk can be considered using a source-pathway-receptor model.



- 1.3.4 Sources constitute flood hazards, which are anything with the potential to cause harm through flooding (e.g. rainfall extreme sea levels, river flows and canals). Pathways represent the mechanism by which the flood hazard would cause harm to a receptor (e.g. overtopping and failure of embankments and flood defences, inadequate drainage and inundation of floodplains). Receptors comprise the people, property, infrastructure and ecosystems that could potentially be affected should a flood occur.

1.4 National Planning Policy Framework

1.4.1 General

1.4.1.1 NPPF and its associated Technical Guidance replaces Planning Policy Statement 25 and provides guidance on how to evaluate sites with respect to flood risk.

1.4.1.2 A summary of the requirements of NPPF is provided below.

1.4.2 Sources of Flooding

1.4.2.1 NPPF requires an assessment to flood risk to consider all forms of flooding and lists six forms of flooding that should be considered as part of a flood risk assessment. These forms of flooding are listed in Table 1, along with an explanation of each form of flooding.

Table 1: Forms of flooding.

Flooding from Rivers (Fluvial Flooding)
Watercourses flood when the amount of water in them exceeds the flow capacity of the river channel. Flooding can either develop gradually or rapidly, depending on the characteristics of the catchment. Land use, topography and the development can have a strong influence on flooding from rivers.
Flooding from the Sea (Tidal Flooding)
Flooding to low-lying land from the sea and tidal estuaries is caused by storm surges and high tides. Where tidal defences exist, they can be overtopped or breached during a severe storm, which may be more likely with climate change.
Flooding from Land (Pluvial Flooding)
Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. In developed areas this flood water can be polluted with domestic sewage where foul sewers surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro-level can influence or exacerbate this. Overland flow paths should be taken into account in spatial planning for urban developments. Flooding can be exacerbated if development increases the percentage of impervious area.

Flooding from Groundwater
Groundwater flooding occurs when groundwater levels rise above ground levels (i.e. groundwater issues). Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). Chalk is the most extensive source of groundwater flooding.
Flooding from Sewers
In urban areas, rainwater is frequently drained into sewers. Flooding can occur when sewers are overwhelmed by heavy rainfall, and become blocked. Sewer flooding continues until the water drains away.
Flooding from Other Artificial Sources (i.e. reservoirs, canals, lakes and ponds)
Non-natural or artificial sources of flooding can include reservoirs, canals and lakes. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and /or as a result of dam or bank failure.

1.4.3 Flood Zones

1.4.3.1 For river and sea flooding, NPPF uses four Flood Zones to characterise flood risk. These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences, and are detailed in Table 2.

Table 2: Flood zones.

Flood Zone	Definition
1	Low probability (less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).
2	Medium probability (between 1 in 100 and 1 in 1,000 annual probability of river flooding (1%-0.1%) or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5%-0.1%) in any year).
3a	High probability (1 in 100 or greater annual probability of river flooding (>1%) in any year or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any given year).
3b	This zone comprises land where water has to flow or be stored in times flood. Land which would flood with an annual probability of 1 in 20 (5%), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

1.4.4 Vulnerability

1.4.4.1 NPPF classifies the vulnerability of developments to flooding into five categories. These categories are detailed in Table 3.

Table 3: Flood risk vulnerability classification.

Flood Risk Vulnerability Classification	Examples of Development Types
Essential Infrastructure	<ul style="list-style-type: none"> - Essential utility infrastructure including electricity generating power stations and grid and primary substations - Wind turbines
Highly Vulnerable	<ul style="list-style-type: none"> - Police stations, ambulance stations, fire stations, command centres and telecommunications installations required to be operational during flooding. - Emergency dispersal points. - Basement dwellings. - Caravans, mobile homes and park homes intended for permanent residential use.
More Vulnerable	<ul style="list-style-type: none"> - Hospitals. - Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. - Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. - Non-residential uses for health services, nurseries and educational establishments. - Sites used for holiday or short-let caravans and camping.
Less Vulnerable	<ul style="list-style-type: none"> - Building used for shops, financial, professional and other services, restaurants and cafes, hot foot takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable” and assembly and leisure. - Land and buildings used for agriculture and forestry.
Water Compatible	<ul style="list-style-type: none"> - Docks, marinas and wharves. - Water based recreation (excluding sleeping accommodation). - Lifeguard and coastguard stations. - Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.

1.4.4.2 Based on the vulnerability of a development, NPPF states within what Flood Zones(s) the development is appropriate. The flood risk vulnerability and Flood Zone ‘compatibility’ of developments is summarised in Table 4.

Table 4: Flood risk vulnerability and flood zone compatibility.

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	1	✓	✓	✓	✓	✓
	2	✓	✓	Exception Test	✓	✓
	3a	Exception Test	✓	x	Exception Test	✓
	3b	Exception Test	✓	x	x	x

1.4.5 The Sequential Test, Exception Test and Sequential Approach

1.4.5.1 The Sequential Test is a risk-based test that should be applied at all stages of development and aims to steer new development to areas with the lowest probability of flooding (Zone 1). This is applied by the Local Planning Authority by means of a Strategic Flood Assessment (SFRA).

1.4.5.2 The SFRA and NPPF may require the Exception Test to be applied to certain forms of new development. The test considers the vulnerability of the new development to flood risk and, to be passed, must demonstrate that:

- There are sustainability benefits that outweigh the flood risk and;
- The new development is safe and does not increase flood risk elsewhere.

1.4.5.3 The Sequential Approach is also a risk-based approach to development. In a development site located in several Flood Zones or with other flood risk, the sequential approach directs the most vulnerable types of development towards areas of least risk within the site.

1.4.6 Climate Change

1.4.6.1 This is a planning requirement to account for climate change in the proposed design. The recommended allowances should be based on the most relevant guidance from the Environment Agency and the Lead Local Flood Authority.

1.4.7 Sustainable Drainage

- 1.4.7.1 The key planning objectives in NPPF are to appraise, manage and where possible, reduce flood risk. Sustainable Drainage Systems (SuDS) provide an effective way of achieving some of these objectives, and NPPF and Part H of the Building Regulations 2015 direct developers towards the use of SuDS wherever possible.
- 1.4.7.2 The surface water drainage has been designed in accordance with current CIRIA C753 SuDS Manual guidelines.

2.0 EXISTING SITE DESCRIPTION

2.1 Location

2.1.1 The development site occupies land to the south of Barugh Green Road on the northwestern outskirts of Barnsley, South Yorkshire.

2.1.2 The Ordnance Survey grid reference for the centre of the site development is approximately 431806, 407843.

2.1.3 An aerial photograph and layout plan are included in Figures 1 and 2 below, which identify the location and layout of the development.

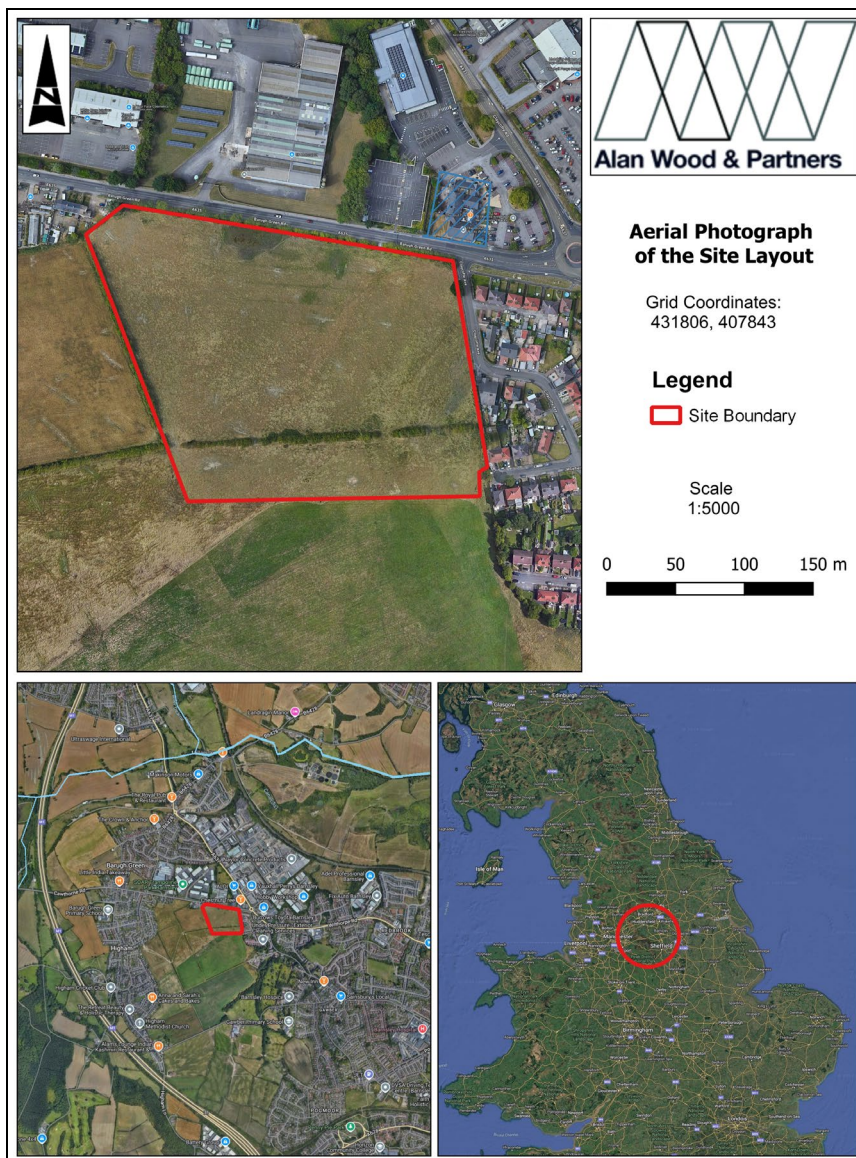


Figure 1: Aerial Overview of the proposed development boundary and regional location.

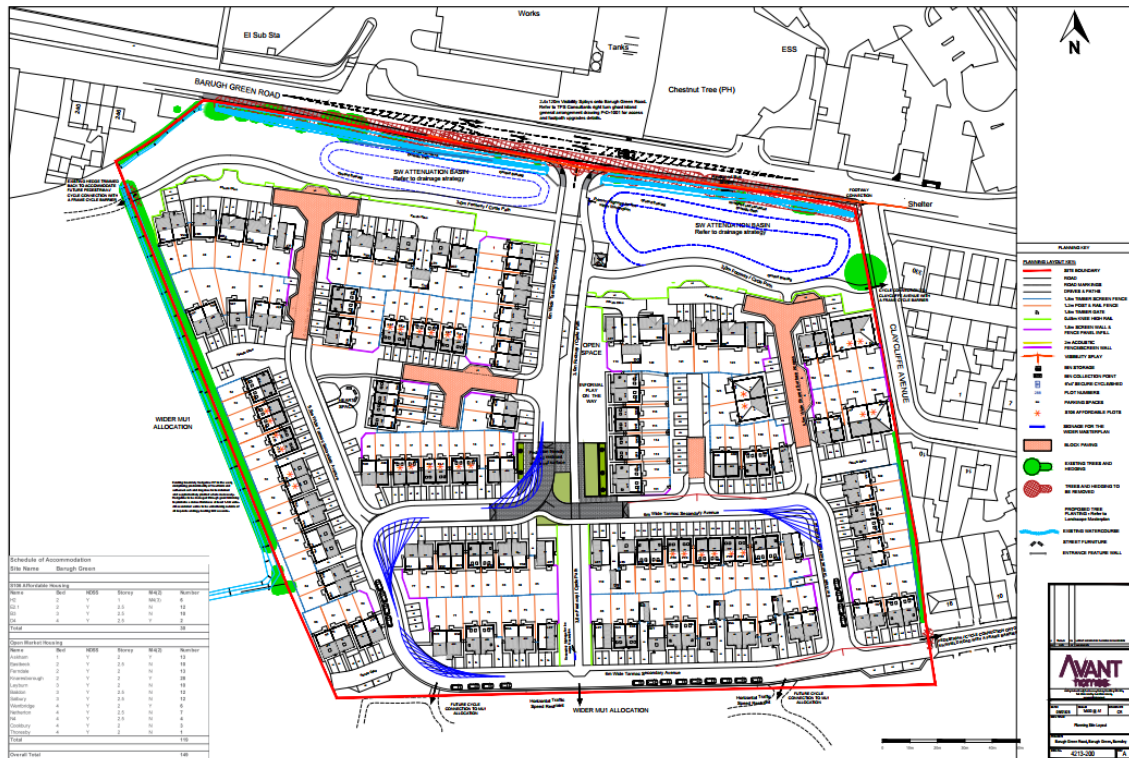


Figure 2: Site Layout Plan.

2.2 Site Description

2.2.1 The area of the development currently comprises agricultural land, extending to approximately 4.82 hectares.

2.5 Surrounding Features

2.3.1 Barugh Green Road bounds the site to the north, beyond which lie a number of light industrial and retail units.

2.3.2 To the east of the development site lies an existing residential development, with Claycliffe Avenue adjoining the site in the north.

2.3.3 To the south of the site is agricultural land extending southwards to the M1 Motorway.

2.3.4 To the west are agricultural fields extending to a large residential area of Barugh Green.

- 2.3.5 An existing horticultural nursery adjoins the northwestern corner of the site.
- 2.3.6 There is an open watercourse (Cawthorne Dike) situated approximately 1km to the northwest of the development site, which enters the River Dearne 1km to the north of the site.
- 2.3.7 There are open ponds located approximately 3km to the east and approximately 1km to the northeast of the site.

2.4 Topography

- 2.4.1 A topographic survey of the development site has been undertaken, which shows that the existing ground levels vary from approximately 78.87m to approximately 87.63m OD(N) across the site.
- 2.4.2 Existing carriageway levels on Barugh Green Road fronting the site are shown to vary from approximately 78.85m to approximately 81.53m OD(N).
- 2.4.3 Existing carriageway levels on Claycliffe Avenue adjoining the site are shown to vary from approximately 79.10m to approximately 80.51m OD(N).
- 2.4.4 A copy of the topographic survey drawing is included in Appendix A.

2.5 Ground Conditions

- 2.5.1 Ground investigation works have been carried out in relation to the proposed development.
- 2.5.2 The site lies on the footprint of a former opencast mine which has been backfilled to a significant depth.
- 2.5.3 An Exploratory Site Investigation was undertaken by Lithos Consulting (Job No 3407) whereby 7 trial pits and 3 trial trenches were excavated. A high-water table level was observed in these excavations indicating possible perched water table not conducive to a soakaway solution.
- 2.5.4 A desktop study of the British Geological Survey map reveals the local geology comprises bedrock of Pennine Middle Coal Measures Formation – Mudstone, Siltstone and Sandstone with no superficial deposits.

-
- 2.5.5 A study of the groundwater maps show that the site overlays a Secondary A Aquifer, with the Groundwater Vulnerability classified as 'Medium'.
- 2.5.6 Local borehole records in the vicinity of the development show there is a shallow depth of sandy clay directly overlaying shale/mudstone.
- 2.5.7 On this basis, the local ground conditions are therefore considered to be unsuitable for soakaways/infiltration methods to be used as a means for disposal of the surface water run-off from the development.

3.0 CONSULTATION

- 3.1 The developer has been consulted in order to obtain relevant information pertaining to the proposed development.
- 3.2 Barnsley Metropolitan Borough Council have been consulted in respect of the disposal of surface water run-off from the development and the use of SuDS techniques, details of which are incorporated within this report.
- 3.3 Yorkshire Water (YWS) have been consulted in respect of the disposal of the disposal of foul wastewater from the development. We are currently awaiting their pre-planning response.
- 3.4 Previous correspondence indicated it was acceptable to discharge foul water into the combined sewer to the north in Barugh Green Road, a copy of this correspondence can be found in Appendix B.
- 3.5 Formal application will need to be made to the lead Local Flood Authority for approval of surface water into the culvert that lies directly north of the site.
- 3.6 The Environment Agency have been consulted in respect of flood mapping, details of which are incorporated within this report.

4.0 PROPOSED DEVELOPMENT

4.1 **The Development**

4.1.1 The proposed development comprises the construction of a new residential development to include the following:-

- The construction of approximately 149 residential dwellings.
- Residential gardens.
- The construction of a new site access road with enlarged access onto Barugh Green Road.
- Car parking areas.
- Areas of public open space.
- New service supplies.

4.1.2 A copy of the indicative site layout drawing of the proposed development is included in Appendix C.

4.2 **Flood Risk**

4.2.1 In terms of flood risk vulnerability, the construction of residential development is classed as 'More Vulnerable' development in terms of flood risk vulnerability (Table 3).

4.2.2 In terms of flood zone compatibility, 'More Vulnerable' development is considered to be 'appropriate' in Flood Zone 1 (Table 4).

5.0 FOUL WATER DRAINAGE

5.1 Design Criteria

- 5.1.1 Based upon a development of approximately 149 dwellings and with an average flow rate of 4000 litres per dwelling per day, in accordance with Sewers for Adoption 7th Edition (Clause B5.1), the peak foul water flow from the development site would be approximately 7 l/s.
- 5.1.2 A separate foul sewer network will be designed and built to meet Building Regulations (private) and Sewers for Adoption (public) standards.
- 5.1.3 At this stage of the development, it is assumed that a gravity connection to the public sewer can be achieved.
- 5.1.4 It is envisaged that foul sewer pipe sizes will be 150mm in diameter with gradients not exceeding the design and manufacturers specification.
- 5.1.5 An indicative foul water drainage arrangement is shown on the Drainage Layout drawing included in Appendix D.

5.2 Run-off Destination

- 5.2.1 It is proposed that foul water domestic waste from the development will be discharged to the public sewer network, for which formal approval will be required from Yorkshire Water Services.
- 5.2.2 Yorkshire Water have been consulted in respect of this proposal; YW enquiries advised that foul wastewater run-off from the development should discharge to the existing 600mm diameter public combined sewer recorded in Barugh Green Road at a point to the north of the site, therefore under the same basis discharge is proposed via the same means. A copy of the previous Pre-Planning Enquiry response is included within Appendix B.
- 5.2.3 A formal section 106 agreement will be required for the connection into the public sewer.

6.0 SURFACE WATER DRAINAGE

6.1 General

6.1.1 The surface water drainage has been designed in accordance with current CIRIA C753 SuDS Manual guidelines.

6.2 Existing Site

6.2.1 From the aerial photograph included in Figure 1 above, it can be seen that the development area currently comprises an area of agricultural land.

6.3 Run-off Destination

6.3.1 Requirement H3 of the Building Regulations establishes a preferred hierarchy for disposal of surface water disposal. Consideration should firstly be given to soakaway, infiltration, watercourse, surface water sewer and combined sewer in that priority order.

6.3.2 Ground investigations have shown that the underlying strata is not suitable for soakaways/infiltration trenches to be used due to the extensive depth of made and perched ground over the site.

6.3.6 The proposed connection will discharge from a new concrete headwall sited on the northern bank of a new attenuation lagoon which will service the proposed site due to peak-flow calculation requirements. This will be connected into a new flow-control manhole with a discharge rate of 16.6l/s (see next section) before finally discharging into a proposed manhole formed onto the existing culvert.

6.3.7 The drainage ditch is shown to lie under the jurisdiction of the LLFA and consequently formal permission will need to be applied for and granted before discharge can be allowed.

6.3.9 The proposed solutions would avoid the requirement for an adoptable pumping station and the inherent servicing and power requirements and negative environmental factors associated.

6.4 Flood Risk

6.4.1 For new developments the current design criteria required for the surface water drainage will need to be based upon the critical 1 in 100-year storm event, with an additional allowance to account for climate change resulting from global warming. There should be no above ground flooding for the 1 in 30-year return period and with no flooding to the development or off-site flooding affecting other parties from the critical 1 in 100-year storm event, with an additional allowance to account for climate change.

6.5 Climate Change

6.5.1 An additional allowance of 40% to account for climate change has been included in the design of the surface water drainage network in accordance with Barnsley Metropolitan Borough Council SuDS guidelines.

6.6 Urban Creep

6.6.1 The project involves the construction of a residential development and consequently and as such an additional 10% has been accounted in the modelling to mitigate against future urban creep.

6.7 Peak Flow Control

6.7.1 We have calculated the impermeable area of the proposed development to be approximately 1.820 hectares based upon the appended layout drawing.

6.7.2 The remaining site area of approximately 3 Ha will remain permeable in the form of landscaping which will not require any positive drainage and will consequently discharge at greenfield run-off.

6.7.3 The uncontrolled surface water run-off from the new development could be approximately 253l/s, based on BS EN 752 calculations, using a rainfall intensity of 50mm/hour.

6.7.4 However, new developments are not permitted to discharge at an unrestricted rate and are normally limited to a “greenfield” discharge rate, which in this

- region has been determined at 28l/s, based upon the ICP SUDS calculated run-off rate.
- 6.7.5 A copy of the greenfield runoff rate calculation sheet is shown in Appendix E.
- 6.7.6 The impermeable area for design purposes will be 1.820Ha, the proposed discharge for the development has been reduced from the greenfield discharge rate to 16.6l/s which provides a real-world betterment of approximately 42%.
- 6.7.7 Formal permission will need to be sought from the Highways Officer to determine if this discharge rate is acceptable.
- 6.7.8 In order to ensure the discharge of surface water from the development will not increase the risk of flooding to other properties, it will be necessary to attenuate the drainage by restricting the discharge to the agreed rate and providing storage as required.
- 6.7.9 The design will need to be based upon the critical 100-year storm event with the required additional allowance of 40% for climate change, plus an additional 10% for urban creep.
- 6.7.10 Based upon the above design criteria storage, a hydraulic model study has been undertaken in order to assess the pipe sizes and gradients and the likely storage volumes required.
- 6.7.11 The results of this analysis are shown in Appendix F.
- 6.7.12 A summary of the storage volumes required is set out in Table 5 below.

Table 5: Volume of water storage required.

Storm Event	1 in 1 Probability Storm Event	1 in 30 Probability Storm Event	1 in 100 Probability Storm Event + 40%
Storage Volume Required Basin 01	210m ³	591m ³	1119m ³
Storage Volume Required Basin 02	48m ³	71m ³	294m ³

- 6.7.13 The calculated storage volumes set out above will be subject to detailed design and approval.

-
- 6.7.14 The drainage system must contain the storage volume for the 1-year storm event below ground within the drainage system with no surcharging of manholes in order to prevent flooding.
 - 6.7.15 The drainage system must also contain the storage volume for the 30-year storm event below ground within the drainage system.
 - 6.7.16 The additional storage required to accommodate the 100-year storm event plus 50% climate change can be stored above ground provided it is retained on site such that it cannot flood other developments beyond the site.
 - 6.7.17 Alternatively, it can be stored below ground within an adoptable storage tank which would form part of the Section 104 Agreement with the Water Authority.
 - 6.7.18 Drawings detailing the proposed drainage strategy are included within Appendix D, showing pipe sizes varying from 225mm to 600mm in diameter with gradients not exceeding design and manufacturers specifications.

6.8 Volume Control

- 6.8.1 SuDS guidelines advise that the run-off volume from the development site for the 1 in 100 year 6-hour rainfall event should not exceed the greenfield run-off volume for the same event.
- 6.8.2 The discharge rate has been based upon the greenfield run-off rate with an approximate 42% betterment and consequently this requirement has been satisfied.

6.9 Pollution Control

- 6.9.1 It is a requirement to ensure that the quality of any receiving body is not adversely affected by the development.
- 6.9.2 Investigations have revealed that the development site Overlays a Secondary A Aquifer, with the Groundwater Vulnerability classed as 'Medium'.
- 6.9.3 In order to minimise the risk of pollution to the watercourse, clean roof water drainage should discharge directly into the sealed drainage network (i.e. not

via gullies) and will then be stored below ground prior to discharge to the watercourse.

- 6.9.4 Silt traps should be provided on the outlets from any gullies or drainage channels, which should be maintained in accordance with Section 6.13 of this report.
- 6.9.5 On this basis, it is considered that the risk of pollution to the final receiving sewer/watercourse has been adequately addressed.

6.10 Water Quality

- 6.10.1 The water quality from the development via the surface water drainage system has been assessed in accordance with the simple index approach set out in Chapter 26 of the CIRIA SuDS Manual C753.
- 6.10.2 The output shows that the water quality from the roof, road and parking areas will be of a suitable quality.
- 6.10.3 Copies of the matrix outputs from the assessment are included in Appendix G.

6.11 Designing for Exceedance

- 6.11.1 Overland flood risk from exceedance flows and from off-site sources will be mitigated to a large extent by the creation of the new surface water sewerage system as described above. Where possible proposed ground levels will be set to channel flows away from the proposed building. Furthermore, the ground floor construction level for the building will be raised by a minimum of 150mm above the finished ground level in order to provide additional clearance above any likely flooding.
- 6.11.2 The existing overland flow routes should generally be maintained within the final layout of the development site without increasing the flood risk to off-site parties.
- 6.11.3 Any existing flood risk may reduce by the creation of a formal surface water drainage system but cannot be entirely removed.

6.11.4 Drawings showing the existing and proposed overland surface water flood routing is included in Appendix H.

6.12 Highways Drainage

6.12.1 Highways drainage from the proposed adoptable roads on site will be collected by trapped gullies prior to discharge into the below ground drainage network. The highway drainage will be offered for adoption to the Local Authority, via a formal Section 38 Agreement.

6.13 Operation and Maintenance

6.13.1 All pipework within the new drainage system is designed with self-cleansing gradients and consequently there should be little, or no maintenance required.

6.13.2 All road gullies or drainage channel systems serving areas of hardstanding will need to be regularly inspected to ensure the system remains operable see Table 6 below.

6.13.3 All inspection chambers should be regularly inspected to ensure the system is free flowing. See operation and maintenance requirements in Table 6 below.

Table 6: Operation and Maintenance Requirements for Silt Traps/Trapped Gullies (Based on CIRIA C753 Table 14.2).

Maintenance schedule	Required action	Typical frequency
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	6 monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	6 monthly
	Inspect filter media and establish appropriate replacement frequencies	6 monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every 6 months

*During the first year of operation, inspections should be carried out at least monthly (and after significant storm events) to ensure that the system is functioning as designed and that no damage is evident.

6.13.4 Operation and maintenance requirements for an attenuation lagoon are set out in Table 8 below.

Table 7: Showing operation and maintenance requirements for an attenuation lagoon.

Maintenance schedule	Required action	Typical frequency*
Routine maintenance	Remove litter and debris	6 monthly
	Vegetation management	As required
Occasional maintenance	Clean inlet/outlet pipe	As required
Remedial actions	Repair/re-construct damaged component/structure	As required
	Remove silt and debris	As required
Monitoring	Inspect for evidence of damage or erosion	6 monthly
	Inspect sediment accumulation	Yearly

*During the first year of operation, inspections should be carried out at least monthly (and after significant storm events) to ensure that the system is functioning as designed and that no damage is evident.

6.13.5 The main sewer network will be offered to YWS for formal adoption under a Section 104 Agreement and therefore YWS will be responsible for the operation, management and maintenance of the network in line with standard requirements and obligations.

6.13.6 The highway drainage will form part of the Section 38 Agreement with the Highway Authority who will be responsible for future maintenance works.

6.13.7 Operation and maintenance requirements of the drainage components, as listed above, should be undertaken in accordance with Chapter 32 of the CIRIA SuDS Manual and any relevant manufacturer's recommendations. See also BS 8582:2013 Code of Practice for Surface Water Management for Development Sites Section 11 and Susdrain Fact Sheet on SuDS Maintenance and Adoption Options (England) dated September 2015.

6.13.8 The personnel undertaking the maintenance should have appropriate experience of SuDS and drainage maintenance and should be capable of keeping sufficiently detailed records of any inspections. An example of a checklist for SuDS maintenance can be found within Appendix B of the CIRIA C753 SuDS Manual v2. If personnel do not have appropriate experience, then specific inspection visits may be necessary. During the first year of operations of SuDS, inspections should usually be carried out at monthly intervals (and after significant storm events).

6.13.9 The domestic drainage will remain the responsibility of the individual householders.

7.0 FLOOD RISK ASSESMENT

7.1 Flood Zone

7.1.1 A copy of the Environment Agency Flood Map for Planning is included in Figure 3 below, which identifies the development site to be located within an area designated as Flood Zone 1, (low probability of flooding), with a less than 1 in 1000 annual probability of flooding in any year.

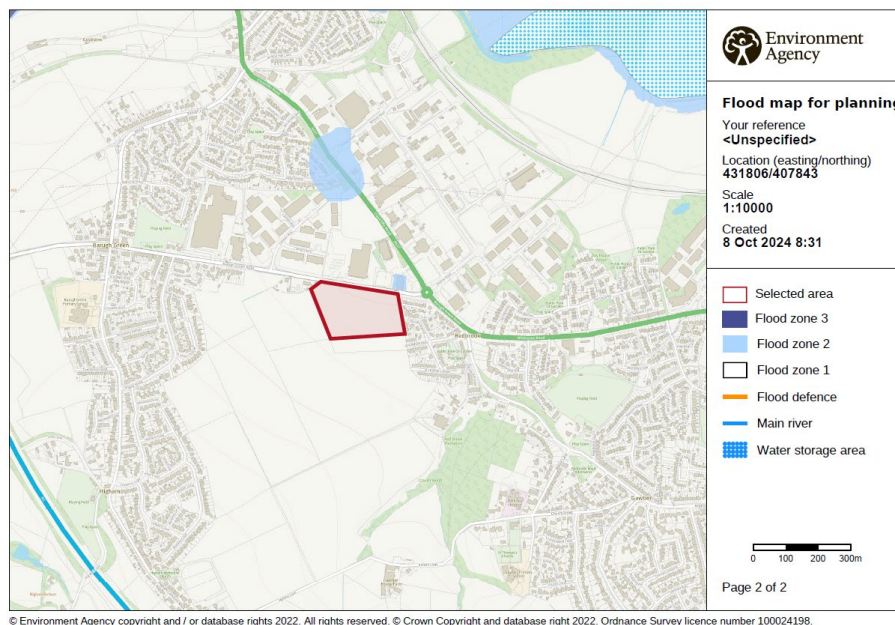


Figure 3: EA flood map for planning.

7.2 Historic Flooding

7.2.1 An abstract from the Environment Agency Recorded Flood Outlines dataset is shown in Figure 4. The dataset collates flood records of historic flooding from rivers, the sea, ground water and surface water since 1946. The proposed development area has not been recorded to have flooded in this time.

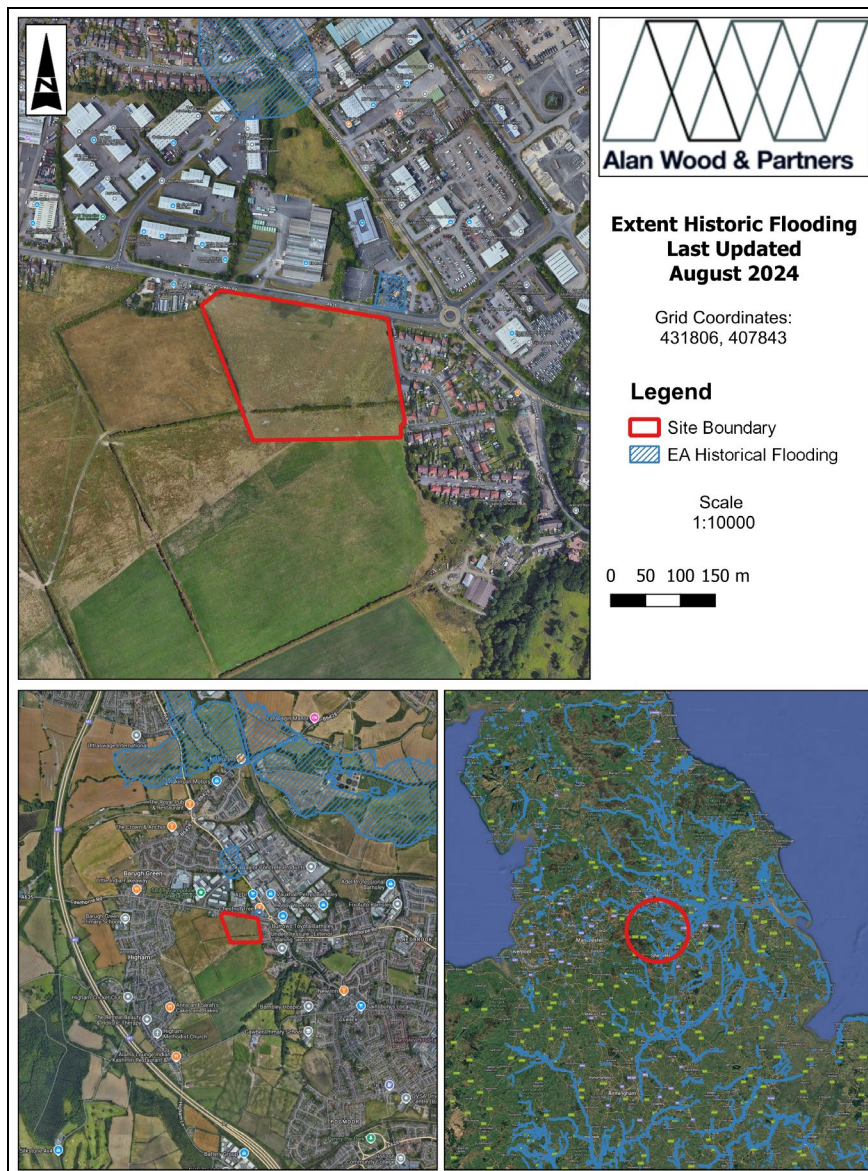


Figure 4: Showing EA historic flood data.

7.2.2 As can be seen in Figure 4 above, the proposed development does not show to have been susceptible to any recorded instances of historic flooding.

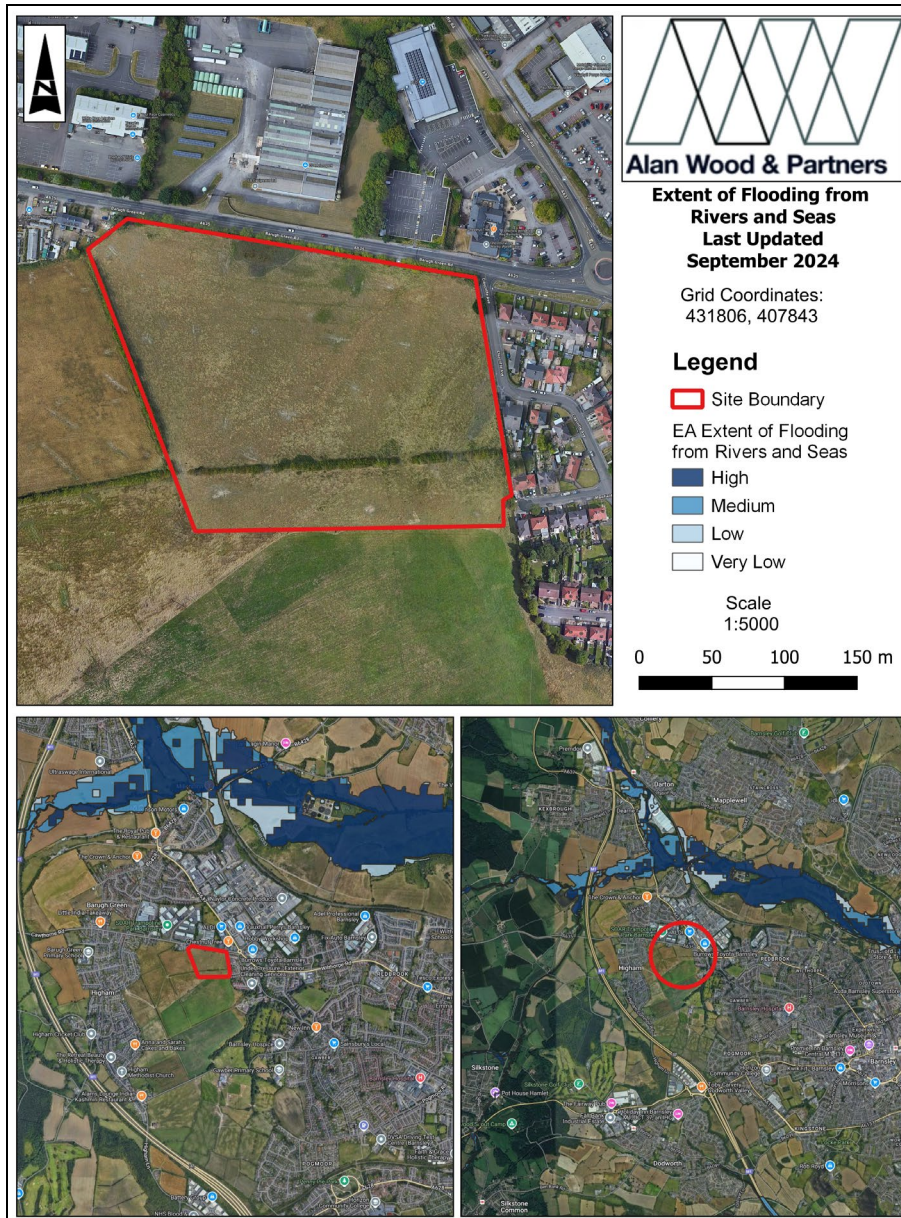
7.3 Fluvial Flooding

7.3.1 Figure 5 shows flood data for rivers and seas for the site and surrounding areas, with the risk broken up into different categories which are as follows:

- High – greater than 3.3% per annum
- Medium – Between 1% - 3.3% per annum
- Low – Between 0.1% and 1% per annum
- Very Low – less than 0.1% per annum

7.3.2 The site is located approximately 1km to the south of the River Dearne, which is the main potential source of flooding in the region.

7.3.3 The existing ground levels in proximity to the River Dearne are in the region of 52m OD(N), which is considerably lower than the ground levels over the area of the development site.



7.3.4 The risk to the development from fluvial flooding is therefore considered to be low and acceptable.

7.4 Flooding from Open Drainage Ditches

- 7.4.1 There is an open drainage ditch located along the northern boundary of the site which drains the surface water run-off from the agricultural field.
- 7.4.2 During periods of extreme rainfall, there is the potential risk that the ditch may overtop causing localised flooding.
- 7.4.3 However, as the site levels rise towards the south across the site, any such flooding would remain localised to the ditch.
- 7.4.4 This is reflected on the surface water flooding maps included in Section 7.4 below.
- 7.4.5 The entrance road will pass over this open ditch; however, the culvert will be sized appropriately to not increase the flood risk in this area.
- 7.4.6 We therefore consider the risk of flooding from this source to be low and acceptable.

7.5 Surface Water Flooding

- 7.5.1 Figure 6 (SW Extents) shows the EA's data for Surface water flooding with the site being shown to lie within the boundary of the surface water flood extents.
- 7.5.2 Figure 6 (3.3% AEP) shows that the surface water flood depths for 3.3% AEP (1 in 30 event) with the proposed development area shown to have the northern most boundary inside of an area susceptible to flooding of up to 150mm.
- 7.5.3 Figure 6 (1% AEP) shows that the surface water flood depths for 1% AEP (1 in 100 event) and highlights that localised areas within the northern most boundary line and along the southeastern boundary fall within the area of flooding from this source with depths of up to 150mm.

7.5.4 Figure 6 (0.1% AEP) shows that the surface water flood depths for 0.1% AEP (1 in 1000 event) and highlights a flood risk of up to 300mm of flooding from this source at small areas within the far northern most edge of the development and within the Eastern part of the development. The other portions of the development that fall within the 0.1% surface water flood extent scenario show depths of up to 150mm.



Figure 6: Showing EA surface water flood extents alongside surface water flood depths for varying scenarios.

7.5.5 Based on Figure 6 above, it shows that there is a risk of up to 300mm in some isolated areas of the development under the 0.1% AEP scenario with risk of up to 150mm during the 1% and 3.3% AEP scenarios. However, the portions within the north of the development which intersect with the site boundary are likely significantly reduced due to surface water drainage systems along the roadside which the EA data does not take into account.

7.5.6 In the event of exceedance, it is predicted that water will flood out of gullies and follow a flow path to the northeast corner of the site. There will be no changes made to the boundary levels as part of the development, and as such the existing flow paths will be maintained.

7.5.7 Overland flooding will be accommodated for by raising finished floor levels and allowing water to collect at lower points within the site (designed as such).

7.5.8 As a result of the proposed development, the overall risk of surface water flooding to the site area and residential properties on the eastern boundary will be reduced by the new drainage design to an acceptable level.

7.5.9 The risk of flooding to the development from this potential flood source is therefore considered to be low and acceptable.

7.6 Flood Risk from Existing Water Mains

7.6.1 There are likely be existing water mains present within the adjacent highways and serving the adjacent development sites.

7.6.2 There are no known issues regarding the condition of any such water mains.

7.6.3 The risk of flooding to the development from this potential flood source is therefore considered to be low and acceptable.

7.7 Flood Risk from Existing Drainage Services

7.7.1 There are likely to be existing drainage services present within the adjacent highways and serving the adjacent development sites.

7.7.2 There are no known issues regarding the condition or the capacity of any such drainage services.

7.7.3 The risk of flooding to the development from this potential flood source is therefore considered to be low and acceptable.

7.8 Groundwater Flooding

7.8.1 Groundwater flooding can occur when the sub-surface water levels are high and emerges above ground level.

7.8.2 There are no proposals to create any basements within the development.

7.8.3 The proposed development will not involve deep excavation works and consequently the risk to the development from this potential flood source is considered to be low and acceptable.

7.9 Flood Risk from Reservoirs, Canals and Other Artificial Sources

7.9.1 EA reservoir flood risk data shows the extent of flooding reservoirs under varying scenarios which are broken down below:

- Dry Day – showing the extent of flooding for reservoir overtopping during a dry day and considers reservoir bank failures for all large reservoirs when rivers are at their normal levels.
- Wet Day - shows the extent of flooding for reservoir overtopping when rivers are added to the model during a wet day scenario.
- Fluvial Contribution - shows the extent of flooding for reservoir overtopping during a wet day and considers reservoir bank failures for all large reservoirs when rivers have already overflowed their banks.

7.9.2 In addition to the various reservoir flood scenarios, the EA data also break down the risk of flooding from reservoirs into 3 designations in their reservoir flood maps guidance which are determined on their risk to life which are:

- High Risk – In the unlikely event that a reservoir fails and a breach from this means occurs then it is predicted that there is a risk to life.
- Not High Risk – In the unlikely event that a reservoir fails it is predicted that there would not be a risk to life.
- Not Determined Yet – A determination has not been made yet.

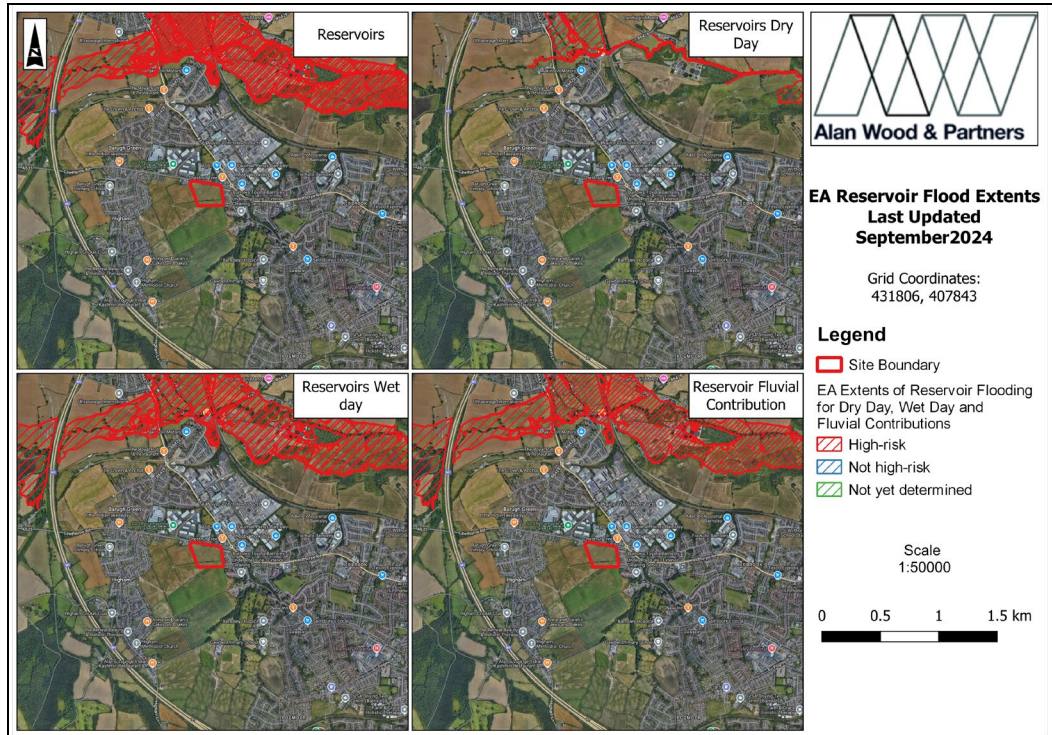


Figure 7: Showing EA flood extents for reservoirs under wet and dry days, with fluvial contributions.

7.9.3 As shown in Figure 7, there is no risk of flooding from reservoir flooding to the development, therefore, the requirement for mitigation against flooding from this source has been met.

8.0 FLOOD MITIGATION MEASURES

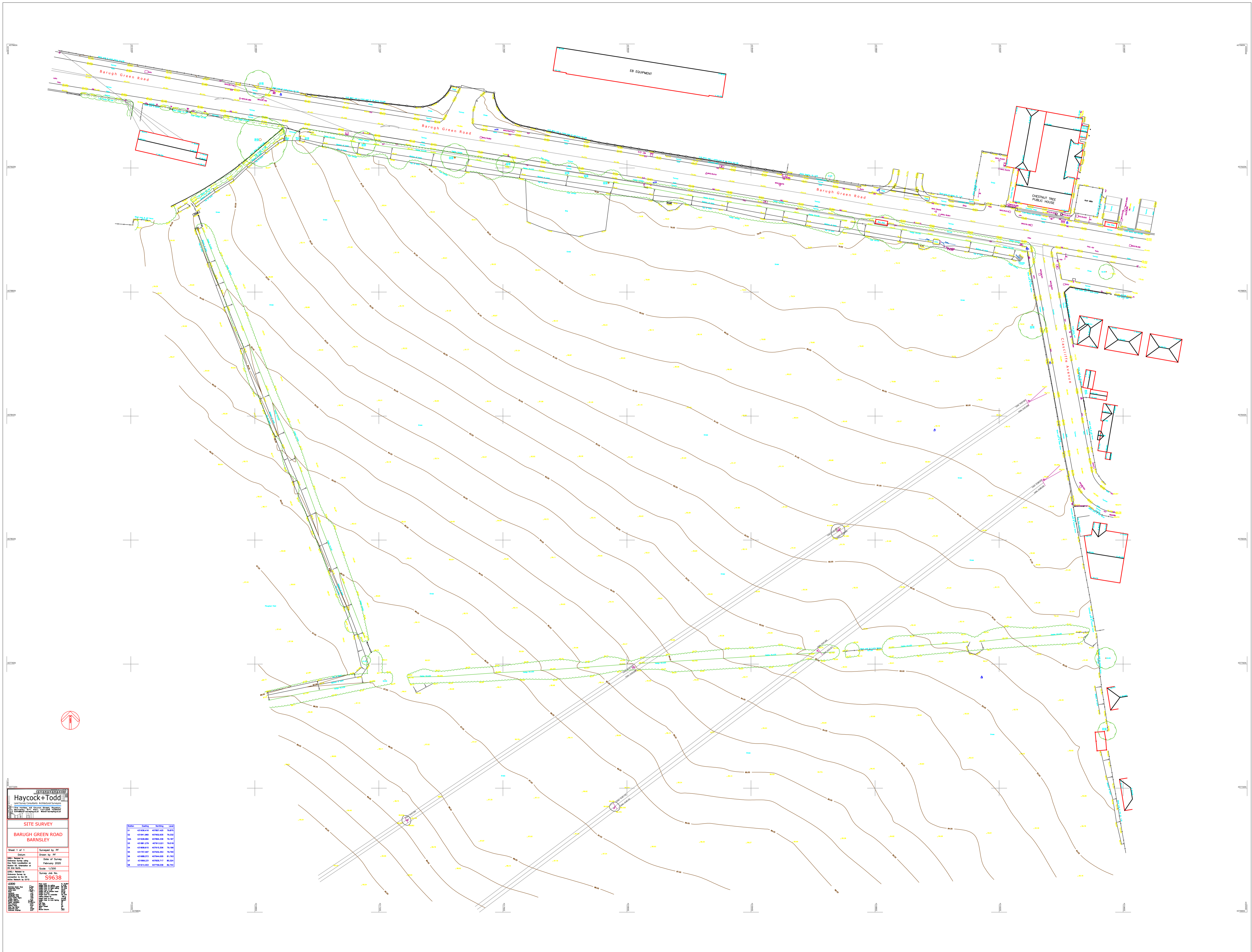
- 8.1 With the area of the new development site lying within Flood Zone 1 (low probability of flooding), there is no requirement to elevate the floor level of the buildings above traditional construction methods (normally 150mm above adjacent ground level).
- 8.2 As the development is not at risk from fluvial flooding, it is considered that there will be no requirement to incorporate any flood resilient construction measures within the design of the development.
- 8.3 Areas of the site are shown to be at minor risk from surface water flooding.
- 8.4 The finished ground levels over the full area of the development will be re-profiled to suit the new construction arrangement and any local depressions within the area of the development will be infilled. Developing the design to suit the required gradients and the introduction of the new drainage network should adequately address any localised risk of overland surface water flooding.
- 8.5 Finished external ground levels should also be designed to direct waters away from the buildings to ensure there is no localised risk of flooding to the buildings during an extreme rainfall event.
- 8.6 The surface water drainage should be designed in accordance with Section 6 of this report in order to ensure the development does not pose a risk of flooding to the new development or to other parties.
- 8.7 All approach roads to the development are shown to lie within Flood Zone 1 (low probability of flooding) and consequently safe access to and egress from the development should still be achievable should a flood situation arise.
- 8.8 The entrance road culvert over the open ditch will be sized sufficiently large enough to not become a restriction point for flooding in this area.
- 8.9 There should therefore be no requirements for evacuation of building occupants resulting from the development during an extreme flood event.
- 8.10 It is not considered that any other specific mitigation works will be required in respect of flood risk to the development.

9.0 SUMMARY

- 9.1 This report has been prepared to assess the flood risk and drainage implications for a proposed residential development to the south of Barugh Green Road, Barnsley, South Yorkshire.
- 9.2 The site falls in Flood Zone 1 (low probability of flooding) on the Environment Agency maps and the proposals are considered to be 'More Vulnerable' in terms of flood vulnerability (Table 3) which is compatible in Flood Zone 1 (Table 4).
- 9.3 No specific flood risk to the development has been identified in the preparation of this report, other than minor flood risk from overland surface water which will be addressed at the detailed design stage of the project.
- 9.4 Foul water will be discharged to the existing Yorkshire water 600mm diameter public combined sewer recorded in Barugh Green Road at a point to the north of the site via a gravity outfall at an approximate rate of 8l/s. The sewers will be designed and constructed to meet the requirements of the Building Regulations.
- 9.5 Surface water is proposed to be discharged to a existing culvert maintained by the lead local flood authority on the northern boundary of the site at a discharge rate of 16.6l/s and any excess flows balanced on site. The sewers will be designed and constructed to meet the requirements of the Local Water Authority for the adoptable drainage and the requirement of the Building Regulations for the domestic drainage.
- 9.6 The report's supporting calculations and sketches provide a robust case for justifying the means of foul and surface water drainage and that the site can be suitably, safely and sustainably drained.
- 9.7 Overall, this report demonstrates that the foul and surface water drainage systems for the new development can be designed and constructed to meet local and national planning and drainage policies. Suitably worded Conditions can be applied to the grant of planning permission to control the delivery of the development in the usual manner.

APPENDIX A

Topographic Survey Drawing



Haycock+Todd
 Land Surveyors, Chartered Surveyors
 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000

SITE SURVEY
BARUGH GREEN ROAD
BARNESLEY

Sheet 1 of 3
 Date: 10/10/2018
 Scale: 1:200
 Survey No: S9638

Point	Easting	Northing
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200	475000.00	575000.00

APPENDIX B

Yorkshire Water Services Pre-Plan Enquiry Response



YorkshireWater

Ms E Luckman
Alan Wood & Partners
341 Beverley Road
Hull
HU5 1LD

emma.luckman@alanwood.co.uk

Yorkshire Water Services
Developer Services
Sewerage Technical Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482
Fax: (01274) 372 834

Your Ref: HC03328/39
Our Ref: W002778

Email:
technical.sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

5th March 2020

Dear Ms Luckman,

Barugh Green, Yorkshire, S75 1JY - Pre-Planning Sewerage Enquiry T751508 (RESIDENTIAL)

Thank you for your recent enquiry. Our charge of £164.00 (plus VAT) will be added to your account with us, reference AWP054. You will receive an invoice for your account in due course.

Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

Foul Water

Foul water domestic waste can discharge to the 600 mm diameter public combined sewer recorded in Barugh Green Road, at a point to the north of the site.

Surface Water

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate authorities.

As the proposed site is currently undeveloped no surface water is known to have previously discharged to the public sewer network

As such, the local public sewer network does not have capacity to accept any surface water from the proposed site. If SuDS are not viable, the developer is advised to contact the Environment Agency/local Land Drainage Authority/Internal Drainage Board* with a view to establishing a suitable watercourse for discharge.





YorkshireWater

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Other Observations

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may apply on line or obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.


Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

All the above comments are based upon the information and records available at the present time and is subject to formal planning approval agreement. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith. Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours sincerely

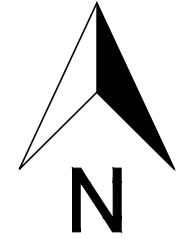
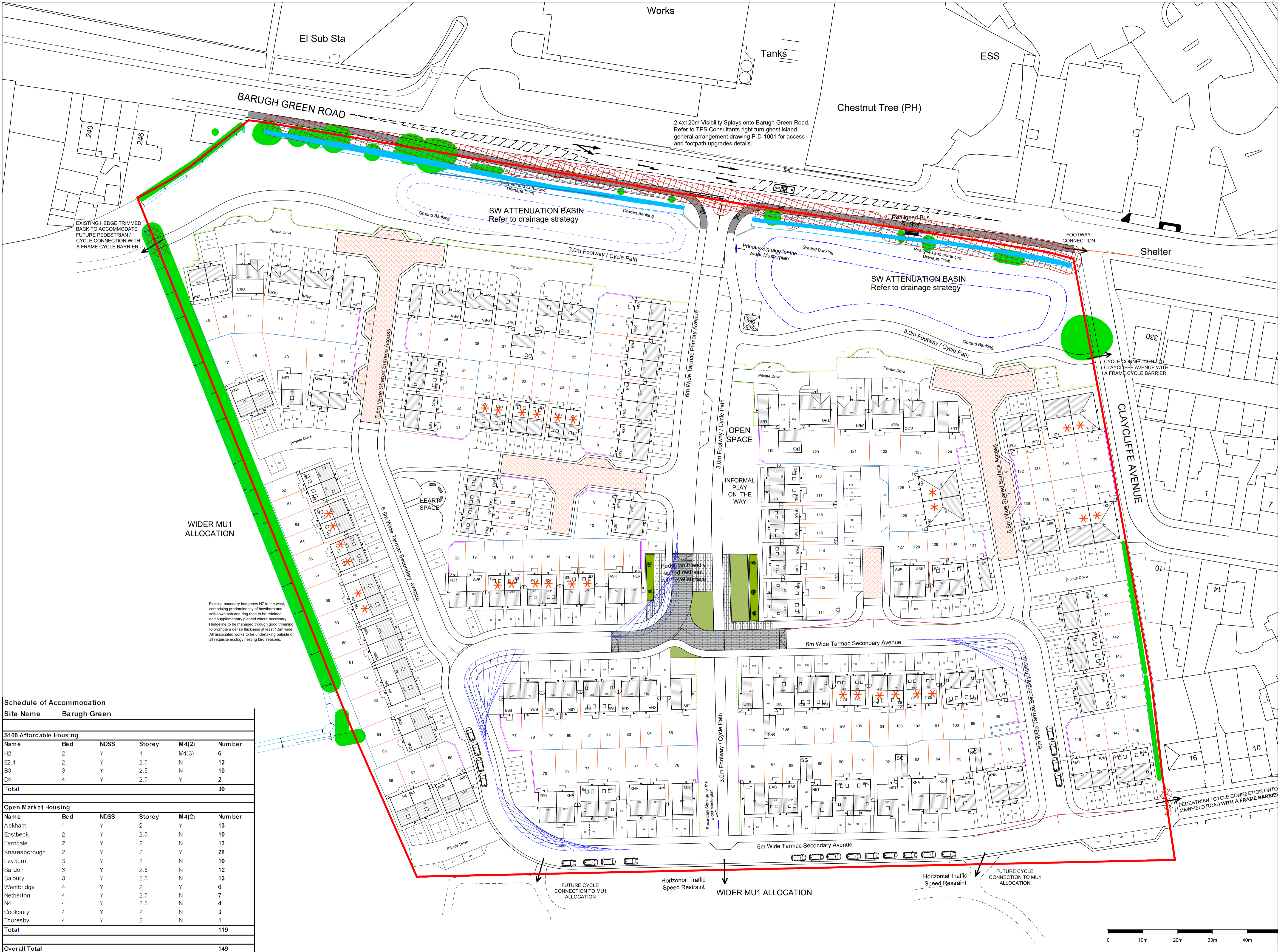
Chris Roberts
Development Services Technician



<p>431687 : 407828</p>  <p>YorkshireWater</p>	<p>Map Name : SE3107NE</p> <p>Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ</p> <p>Contact Name : Mr J McGlade</p> <p>Contact Tel : 70 4406</p>	<p>Title</p> <p>Notes</p> <p>(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2024. All rights reserved Ordnance Survey Licence number AC0000813445</p>	<p>Partial Key</p> <ul style="list-style-type: none"> Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS <p>Date Req : 13/08/2025, 09:23:15</p> <p>Source : Sewer Network Enquiry</p>	<p>This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.</p> <p>Date Gen : 13/08/2025, 09:23:16</p>
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APPENDIX C

Indicative Site Layout Drawing



- PLANNING KEY
- PLANNING LAYOUT KEY:**
- SITE BOUNDARY
 - ROAD
 - ROAD MARKINGS
 - DRIVES & PATHS
 - 1.8m TIMBER SCREEN FENCE
 - 1.2m POST & RAIL FENCE
 - 1.8m TIMBER GATE
 - 0.45m KNEE HIGH RAIL
 - 1.8m SCREEN WALL & FENCE PANEL INFILL
 - 2m ACOUSTIC FENCE/SCREEN WALL
 - VISIBILITY SPLAY
 - BIN STORAGE
 - BIN COLLECTION POINT
 - 6x4' SECURE CYCLE/SHED
 - PLOT NUMBERS
 - PARKING SPACES
 - S106 AFFORDABLE PLOTS
 - SIGNAGE FOR THE WIDER MASTERPLAN
 - BLOCK PAVING
 - EXISTING TREES AND HEDGING
 - TREES AND HEDGING TO BE REMOVED
 - PROPOSED TREE PLANTING - Refer to Landscape Masterplan
 - EXISTING WATERCOURSE
 - STREET FURNITURE
 - ENTRANCE FEATURE WALL

Schedule of Accommodation

Site Name	Barugh Green				
S106 Affordable Housing					
Name	Bed	NDSS	Storey	M4(2)	Number
H2	2	Y	1	M4(3)	6
E2.1	2	Y	2.5	N	12
B3	3	Y	2.5	N	10
D4	4	Y	2.5	Y	2
Total					30
Open Market Housing					
Name	Bed	NDSS	Storey	M4(2)	Number
Askham	1	Y	2	Y	13
Eastbeck	2	Y	2.5	N	10
Ferndale	2	Y	2	N	13
Knarborough	2	Y	2	Y	28
Leyburn	3	Y	2	N	10
Baldon	3	Y	2.5	N	12
Salbury	3	Y	2.5	N	12
Wentbridge	4	Y	2	Y	6
Netherton	4	Y	2.5	N	7
N4	4	Y	2.5	N	4
Cookbury	4	Y	2	N	3
Thoresby	4	Y	2	N	1
Total					119
Overall Total					149

A 11.08.25 04 LAYOUT AREAS FOR PLANNING RESUBMISSION
DATE: 09/01/25 SCALE: 1:500 @ A1 DRAWN BY: CR
DWG TITLE: Planning Site Layout
PROJECT: Barugh Green Road, Barugh Green, Barnsley
DWG No: 4213-200 REV: A

Unit 2, Market Court, Park Avenue, Cuckfield, Horsham, West Sussex, BN18 3JL
Tel: 01293 284115 Fax: 01293 284848
www.avanthomes.co.uk



APPENDIX D

Drainage Strategy Design Drawings



SURFACE WATER STRATEGY IS BASED ON 100% +40% CLIMATE CHANGE ALLOWANCE INCLUDING 10% URBAN CREEP ALLOWANCE.
 SECONDARY BASIN TO PROVIDE CIRCA 480M³ OF STORAGE ALTERNATIVELY TO BE PROVIDED IN UNDERGROUND CELLULAR CRATE SYSTEM
 FINAL SIZE OF ATTENUATION STORAGE AND MAXIMUM WATER LEVEL ARE SUBJECT TO DETAILED DESIGN.

INDICATIVE CONNECTION BETWEEN ATTENUATION BASIN STRUCTURES
 POSSIBILITY OF CULVERTED CONNECTION SUBJECT TO DETAILED DESIGN AND FURTHER INVESTIGATIONS

INDICATIVE CONNECTION POINT TO EXISTING YORKSHIRE WATER COMBINED PUBLIC SEWER. SUBJECT TO ACCEPTANCE AND APPROVAL FROM YORKSHIRE WATER. \$106 AGREEMENT AND DETAILED DESIGN.

SURFACE WATER STRATEGY IS BASED ON 100% +40% CLIMATE CHANGE ALLOWANCE INCLUDING 10% URBAN CREEP ALLOWANCE
 PRIMARY BASIN TO PROVIDE CIRCA 154 M³ OF STORAGE
 MAXIMUM WATER LEVEL ARE SUBJECT TO DETAILED DESIGN.

- NOTES:
1. THESE NOTES ARE INTENDED TO ALIGN DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
 3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK COMMENCED.
 4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE THE SECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF TEMPORARY BRACING, GUTTERS OR SCORING MEASURES WHERE NECESSARY. SUCH MATERIAL REMAINING THE PROPERTY OF THE CONTRACTOR ON COMPLETION AND FOR REMOVAL AT HIS OWN RISK AND AT HIS OWN COST. THE STRUCTURE IS TO BE SAFE IN THE TEMPORARY CONDITION.

1. DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING STANDARDS:
 - BS EN 12128:2006
 - BUILDING REGULATIONS APPROVED DOCUMENT PART H, 2015 EDITION
2. ALL COMPONENTS USED IN DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING: BS EN 475:2011
3. ALL DRAINAGE SYSTEMS AND COMPONENTS TO BE CONSTRUCTED AND TESTED TO THE FULL SATISFACTION OF THE BUILDING REGULATIONS INSPECTOR.
4. ALL DRAINAGE TO BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH BS EN 1610:2015.
5. PIPES UP TO 2250 TO BE VITRIFIED CLAY. VITRIFIED CLAY PIPES AND FITTINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1295-1:2013, 2:2013, 3:2012 AND BS 65 RESPECTIVELY AND BE TESTED TO THE FULL SATISFACTION OF THE BUILDING REGULATIONS INSPECTOR. ALL PIPES SHALL HAVE EXTRA STRENGTH TO BS-65 OR EQUIVALENT BS 65 CONCRETE PIPE CRUSHING STRENGTH.
6. PRECAST CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS EN 1295-1:2013, 2:2013, 3:2012 AND BS 65 RESPECTIVELY AND BE TESTED TO THE FULL SATISFACTION OF THE BUILDING REGULATIONS INSPECTOR. ALL MANHOLES SHALL BE CONSTRUCTED WITH CEMENT MORTAR UNLESS NOTED OTHERWISE. ALL MANHOLES SHALL HAVE EXTRA STRENGTH TO BS-65 OR EQUIVALENT BS 65 CONCRETE PIPE CRUSHING STRENGTH. ALL MANHOLES SHALL BE CONSTRUCTED WITH PORTLAND CEMENT TO BS EN 197-1:2011.
7. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1241:2015. MANHOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITH CUSHION INSERTS AND INTERLOCKED LONG CLASS DADO COVERS TO BE USED IN ALL LOCATIONS. ALL COVERS TO BE BAGED 'PW' OR 'DIP' AS APPROPRIATE. MANHOLE COVERS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS EN 197-1:2011.
8. CLASS 2 BEDDING DETAIL SHALL BE PROVIDED:
 - WHERE COVER TO PIPE BARREL IS:
 - 45° IN VEHICULAR TRAFFIC AREAS
 - 30° IN AREAS INACCESSIBLE TO VEHICLES
 - AT ALL ROAD GULLY, YARD GULLY, RWP, SWP AND DRAINAGE CHANNEL BRANCHES
 - AREAS OF DEEP ROOTING VEGETATION
 - PIPE RUNS NEAR BUILDINGS IN ACCORDANCE WITH TYPICAL SECTIONS ON AWP DRAWINGS
 - WHERE TWO PIPES CROSS WITH A CLEAR GAP OF >300MM, CLASS 2 SURROUND TO EXTEND A MINIMUM OF 1.0M FROM THE CENTRE OF THE CROSSING POINT EXTENDED TO WITHIN 150MM OF THE NEAREST FLEXIBLE JOINT, WHERE REQUIRED.
9. PIPE BEDDING MATERIALS TO COMPLY GENERALLY WITH SHW - SERIES 500 - CLASS 500 GRANULAR BEDDING MATERIALS TO ALL SO COMPLY WITH BS EN 12424 & THE GRANULAR BEDDING MATERIAL TABLE ON THIS DRAWING.
10. SELECTED BACKFILL MATERIAL TO BE PROVIDED ABOVE THE TOP OF THE PIPE. SELECTED BACKFILL MATERIAL TO BE CLASS 3 - LOWER TRENCH FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600 TABLE 014 TO COMPRISE OF UNIFORM SOIL, FREE FROM STONES, BRICKS, LIMESTONE LUMPS OF CLAY OVER 100MM, TWIGS, FROZEN MATERIAL AND VEGETABLE MATTER. SELECTED BACKFILL MATERIAL TO BE PLACED & COMPACTED IN LAYERS NOT EXCEEDING 150MM IN THICKNESS. SHOULD THE MATERIAL BE UNSUITABLE OR WEATHER CONDITIONING AFFECT THE MATERIALS STABILITY, THEN A SUITABLE HARD GRANULAR MATERIAL SHALL BE USED.
11. GENERAL BACKFILL TO DRAINAGE TRENCHES OTHER THAN FILTER DRAINS IN VEHICULAR TRAFFIC AREAS ABOVE THE PIPE BEDDING & SELECTED BACKFILL SHALL BE CLASS 3 - OR 3 GENERAL FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600.
12. GENERAL BACKFILL UNDER NON-VEHICULAR TRAFFIC AREAS TO BE SUITABLE AS-DUG MATERIAL COMPACTED IN ACCORDANCE WITH SHW - SERIES 600 LAYERS NOT EXCEEDING 200MM. EACH LAYER COMPACTED TO FORM A STABLE TRENCH BACKFILL SHOULD THE MATERIAL BE UNSUITABLE OR WEATHER CONDITIONS AFFECT THE MATERIALS STABILITY, THEN A HARD GRANULAR MATERIAL SHALL BE USED UP TO FORMATION LEVEL.
13. ALL CONCRETE TO BE DESIGNATED CONCRETE TO CONFORM TO BS 5500-2.
14. NO MECHANICAL COMPACTION OF FILL MATERIAL WITHIN 300MM OF THE CROWN OF ANY PIPE.
15. 150MM CLAY TO BE MINIMUM CRUSHING STRENGTH 400KNM. 225MM CLAY TO BE MINIMUM CRUSHING STRENGTH 400KNM. 300MM CLAY TO BE MINIMUM CRUSHING STRENGTH 400KNM. CONCRETE TO BE MINIMUM CRUSHING STRENGTH CLASS NO 120 (54KNM).
16. CLAY SEWERS TO COMPLY WITH BS 265-A:1991. CONCRETE SEWERS TO COMPLY WITH BS EN 1916:2002 AND BS EN 1917:2002.
17. SULPHATE RESISTANCE CEMENT (S00) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR LABORATORY REPORT PROVIDED PROVING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
18. ANY GRADIENTS OF DRAINS ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL DRAINS TO THE INVERT LEVELS SHOWN FOR EACH MANHOLE.
19. THE FIRST MANHOLE(S) UPSTREAM FROM THE CONNECTION TO THE EXISTING PUBLIC SEWER AND/OR WATERCOURSE SHOULD, WHEN CONSTRUCTED, BE FITTED WITH A SCREEN IN ORDER TO PREVENT DEBRIS ENTERING THE PUBLIC SEWER. THE SCREEN SHOULD NOT BE REMOVED UNTIL IMMEDIATELY PRIOR TO THE OCCUPATION OF PREMISES TO BE SERVED BY THE SEWER.

- KEY:
- Existing Surface Water Drainage
 - Existing Combined Water Drainage
 - Existing Surface Water Manhole
 - Existing Foul Water Manhole
 - Proposed Foul Water Drainage
 - Proposed Foul Water Manhole
 - Proposed Surface Water Drainage
 - Proposed Surface Water Manhole
 - Proposed Attenuation Basin
 - Existing Highway Drainage
 - Existing Highway Manhole

Rev	Description	Date	By	CHK
P7	UPDATED OUTFALL	03.09.25	HD	SC JAG
P6	UPDATED SITE PLAN	19.08.25	HD	SC JAG
P5	SITE PLAN UPDATE	16.01.25	DC	SC JAG
P4	UPDATED BASIN SIZE	08.01.24	HD	SC JAG
P3	AMENDED FOR TOP WATER LEVEL LESS THAN 1.0m	07.01.25	RP	SC JAG
P2	AMENDED AS PER LATEST LAYOUT	23.12.24	CM	SC JAG
P1	FIRST ISSUE	06.12.24	HD	SC --



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Project: Proposed Scheme at Barugh Green, Bamsley, South Yorkshire

Client: Avant Homes

Drawing: Proposed Drainage Strategy (Sheet 1 of 2)

Discipline: Civil Engineering

Drawing Status: FOR APPROVAL

Scale: As 1:250

Quality Code: S3

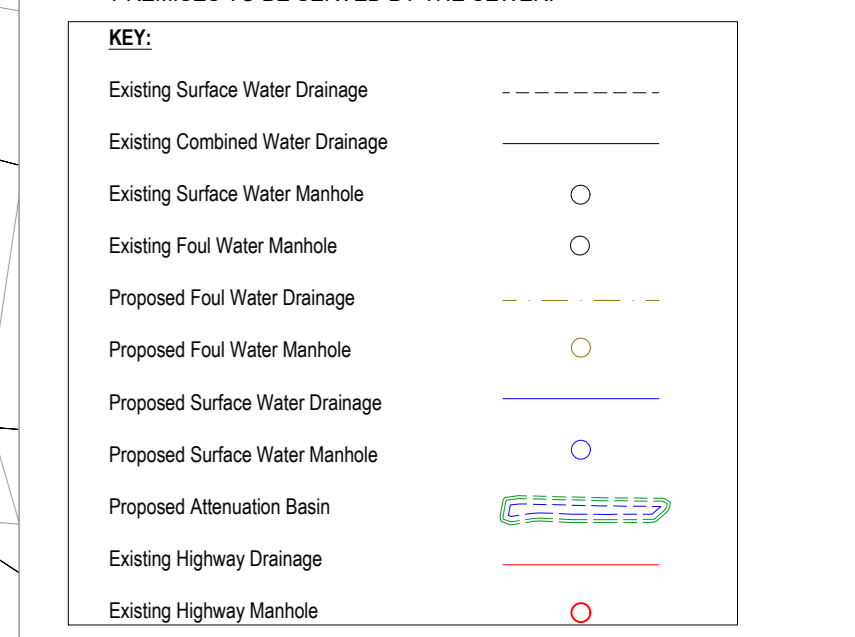
Job no: 51335

Project Originator: Value Level Type: Rev: P7

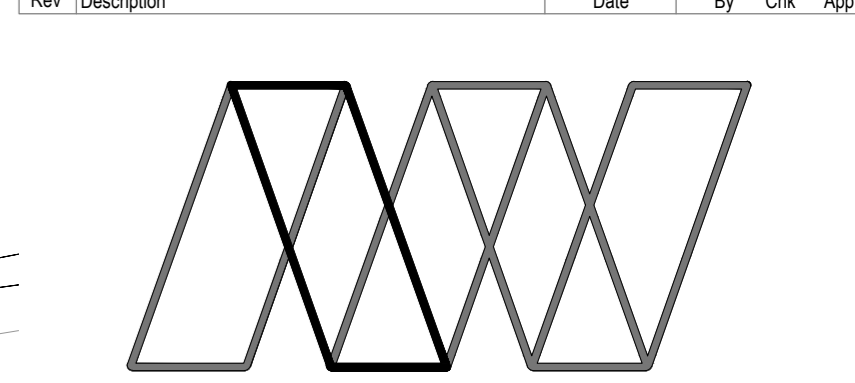
Project: BGB - AWP - ZZ - XX - DR - C - 3301



- NOTES:**
1. THESE NOTES ARE INTENDED TO ALIGN DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
 3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DIMENSIONS TO BE NOTED BY THE CONTRACTOR AND THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
 4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO OBTAIN THE NECESSARY APPROVALS AND PERMITS FROM THE LOCAL AUTHORITY. THE BUILDING AND ITS COMPONENTS ARE TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE BUILDING REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FROM THE LOCAL AUTHORITY. SUCH MATERIAL REMAINING THE PROPERTY OF THE CONTRACTOR ON COMPLETION AND FOR REPAIRING THAT THE WORKS ARE IN ANY UNDESIRABLE STATE.
- PRIVATE DRAINAGE NOTES:**
1. DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING STANDARDS:
 - BS EN 752:2008
 - BUILDING REGULATIONS APPROVED DOCUMENT PART H:2015
 2. ALL COMPONENTS USED IN DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING: BS EN 475:2011
 3. ALL DRAINAGE SYSTEMS AND COMPONENTS TO BE CONSTRUCTED AND TESTED TO THE FULL SATISFACTION OF THE BUILDING REGULATIONS INSPECTOR.
 4. ALL DRAINAGE TO BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH BS EN 1910:2015.
 5. PIPES UP TO 2250 TO BE VITRIFIED CLAY. VITRIFIED CLAY PIPES AND FITTINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 12050-1:2013-2:2013-3:2013 AND BS 65 RESPECTIVELY AND BE IDENTIFIED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT BS 6505 PIPE CRUSHING STRENGTH.
 6. PRECAST CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS EN 1917:2002 AND BS EN 13019-1:2002 AND TO BE IDENTIFIED. PRECAST CONCRETE RINGS AND COVER SLABS TO BE JOINTED WITH GENUINE PORTLAND CEMENT. PRECAST CONCRETE RINGS AND COVER SLABS TO BE JOINTED WITH GENUINE PORTLAND CEMENT TO BS EN 1917:2002.
 7. MANHOLE AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS EN 1917:2002.
 8. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1241-1 TO 4:2015. MANHOLE COVERS AND FRAMES TO BE OF A NON-SKIDDING DESIGN WITH CURBISH INSERTS AND ATTERMINATED LOW CLASS ROAD SURF TO BE USED AT ALL LOCATIONS. ALL COVERS TO BE ADGED 'FW' OR 'SW' AS APPROPRIATE. MANHOLE COVERS AND ACCESS TO BE IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION TECHNICAL BULLETIN ISSUED SEPTEMBER 2001.
 9. CLASS 2 BEDDING DETAIL SHALL BE PROVIDED:
 - WHERE COVER TO PIPE BARREL IS:
 - +1.2M IN VEHICULAR TRAFFICED AREAS
 - +0.9M IN AREAS INACCESSIBLE TO VEHICLES.
 - AT ALL ROAD GULLY YARDS SHALL BE RRP, SIP AND DRAINAGE CHANNEL BRANCHES.
 - AREAS OF DEEP ROOTING VEGETATION.
 - PIPE RUNS NEAR BUILDINGS IN ACCORDANCE WITH TYPICAL SECTIONS ON DRAWING.
 - WHERE TWO PIPES CROSS WITH A CLEAR GAP OF 300mm CLASS 2 SURROUND TO EXTEND A MINIMUM OF 1.0M FROM THE CENTRE OF THE CROSSING POINT & EXTEND TO WITHIN 150MM OF THE NEAREST FLEXIBLE JOINT, WHERE REQUIRED.
 10. PIPE BEDDING MATERIAL TO COMPLY GENERALLY WITH SHW - SERIES 600. CLASS 20 GRANULAR BEDDING MATERIALS TO ALL SO COMPLY WITH BS EN 1242 & THE GRANULAR BEDDING MATERIAL TABLE ON DRAWING.
 11. SELECTED BACKFILL MATERIAL TO BE PROVIDED ABOVE THE PIPE SURROUND TO A HEIGHT OF 300MM MINIMUM ABOVE THE TOP OF THE PIPE. SELECTED BACKFILL MATERIAL TO BE CLASS 1 - LOWER TRENCH FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600 TABLE 8 TO COMPRISE OF UNIFORM SOIL FREE FROM STONES LARGER THAN 40MM, LUMPS OF CLAY OVER 100MM, TIMBER, FROZEN MATERIAL & DEGRADABLE MATTER. SELECTED BACKFILL MATERIAL TO BE PLACED & COMPACTED IN LAYERS NOT EXCEEDING 100MM IN THICKNESS. SHOULD THE MATERIAL BE UNSTABLE OR WEATHER CONDITIONS AFFECT THE MATERIAL STABILITY, THEN A SUITABLE HARD GRANULAR MATERIAL SHALL BE USED.
 12. GENERAL BACKFILL TO DRAINAGE TRENCHES (OTHER THAN FILTER DRAINS) IN VEHICULAR TRAFFICED AREAS ABOVE THE PIPE BEDDING & SELECTED BACKFILL SHALL BE CLASS 2 OR 3 GENERAL FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600.
 13. GENERAL BACKFILL UNDER NON-VEHICULAR TRAFFICED AREAS TO BE SUITABLE AS-DUG MATERIAL COMPACTED IN ACCORDANCE WITH SHW - SERIES 600 TABLE 8. SHOULD EACH LAYER BE COMPACTED TO FORM A STABLE TRENCH BACKFILL, SHOULD THE MATERIAL BE UNSTABLE OR WEATHER CONDITIONS AFFECT THE MATERIAL STABILITY, THEN A HARD GRANULAR MATERIAL SHALL BE USED UP TO FORMATION LEVEL.
 14. ALL CONCRETE TO BE DESIGNATED CONCRETE TO CONFORM TO BS 8500-2.
 15. NO MECHANICAL COMPACTION OF FILL MATERIAL WITHIN 300MM OF THE CROWN OF ANY PIPE.
 16. 150MM CLAY TO BE MINIMUM CRUSHING STRENGTH 400KN/200MM CLAY TO BE MINIMUM CRUSHING STRENGTH 700KN/300MM CONCRETE TO BE MINIMUM CRUSHING STRENGTH CLASS NO 120 (54NM).
 17. CLAY SEWERS TO COMPLY WITH BS 2626:1991. CONCRETE SEWERS TO COMPLY WITH BS EN 1910:2002 AND BS EN 1917:2002.
 18. SULPHATE RESISTANCE CEMENT (SRCE) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
 19. ANY GRADIENTS OF DRAINS ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL DRAINS TO THE INVERT LEVELS SHOWN FOR EACH MANHOLE.
 20. THE FIRST MANHOLE(S) UPSTREAM FROM THE CONNECTION TO THE EXISTING PUBLIC SEWER AND/OR WATERCOURSE SHOULD, WHEN CONSTRUCTED, BE FITTED WITH A SCREEN IN ORDER TO PREVENT DEBRIS ENTERING THE PUBLIC SEWER. THE SCREEN SHOULD NOT BE REMOVED UNTIL IMMEDIATELY PRIOR TO THE OCCUPATION OF PREMISES TO BE SERVED BY THE SEWER.



Rev	Description	Date	By	CHK	APP
P7	UPDATED OUTFALL	03.09.25	HD	SC	JAG
P6	UPDATED SITE PLAN	19.08.25	HD	SC	JAG
P5	SITE PLAN UPDATE	16.01.25	DC	SC	JAG
P4	UPDATED BASIN SIZE	08.01.24	HD	SC	JAG
P3	AMENDED FOR TOP WATER LEVEL LESS THAN 1.2m	07.01.25	RP	SC	JAG
P2	AMENDED AS PER LATEST LAYOUT	23.12.24	CM	SC	JAG
-	FIRST ISSUE	06.12.24	HD	SC	-



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Project: Proposed Scheme at Barugh Green, Bamsley, South Yorkshire
 Client: Avant Homes
 Drawing: Proposed Drainage Strategy (Sheet 2 of 2)
 Rev: Civil Engineering
 Drawing Status: FOR APPROVAL
 Job no: 51335
 Scale: At 1:250
 Rev: P7
 Submittal Code: S3
 Project Originator: Volume Lead
 Project Name: BGB - AWP - ZZ - XX - DR - C - 3302

APPENDIX E

ICP SuDS Calculations

341 Beverley Road
Hull
HU5 1LD



Date 06/12/2024 11:22
File

Designed by msmith
Checked by

Innovyze

Source Control 2020.1.3

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	50.000	Urban	0.000
SAAR (mm)	781	Region Number	Region 3

Results 1/s

QBAR Rural 249.7
QBAR Urban 249.7

Q1 year 214.7

Q1 year 214.7
Q30 years 438.9
Q100 years 519.3

APPENDIX F

Hydraulic Calculations

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Junctions Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S20	Manhole	431825.682	407889.748	79.700	1.500	78.200	Circular	1.500
S22	Manhole	431723.792	407839.997	83.750	2.712	81.038	Circular	1.200
S16	Manhole	431814.738	407784.954	83.910	2.615	81.295	Circular	1.500
S2	Manhole	431814.939	407722.065	85.640	1.640	84.000	Circular	1.500
S23	Manhole	431731.034	407895.712	81.250	1.550	79.700	Circular	1.500
S8	Manhole	431911.889	407788.210	81.850	1.850	80.000	Circular	1.800
S17	Manhole	431816.955	407809.561	82.700	1.787	80.913	Circular	1.500
S18	Manhole	431817.941	407829.552	82.000	1.550	80.450	Circular	1.200
S19	Manhole	431820.499	407856.677	80.860	1.550	79.310	Circular	1.200
S9	Manhole	431904.148	407844.788	80.200	1.600	78.600	Circular	1.200
S10	Manhole	431902.286	407862.731	79.750	1.500	78.250	Circular	1.500
S15	Manhole	431751.480	407778.431	85.800	2.564	83.236	Circular	1.200
S4	Manhole	431896.157	407724.020	84.250	2.050	82.200	Circular	1.500
S3	Manhole	431855.682	407723.046	85.300	2.000	83.300	Circular	1.500
S24	Manhole	431783.659	407889.044	80.050	2.050	78.000	Circular	1.500
S1	Manhole	431778.935	407721.491	87.150	1.650	85.500	Circular	1.200
S7	Manhole	431918.518	407764.703	82.610	1.510	81.100	Circular	1.200
S14	Manhole	431733.421	407810.347	85.050	1.350	83.700	Circular	1.200
S25	Manhole	431694.512	407900.535	82.450	1.450	81.000	Circular	1.200
S11	Manhole	431843.312	407783.303	82.800	1.350	81.450	Circular	1.200
S12	Manhole	431887.064	407784.293	82.500	1.500	81.000	Circular	1.500
S6	Manhole	431922.559	407740.241	83.200	1.500	81.700	Circular	1.500
S21	Manhole	431762.177	407834.884	82.850	1.450	81.400	Circular	1.200
S13	Manhole	431870.158	407862.731	80.050	1.350	78.700	Circular	1.200
FC	Manhole	431893.019	407891.964	79.300	2.200	77.100	Circular	1.500
Existing SW4	Manhole	431900.888	407904.634	79.300	2.949	76.351	Circular	0.001
S5	Manhole	431924.382	407728.346	83.600	1.600	82.000	Circular	1.500

Name	Lock
S20	All
S22	All
S16	All
S2	All
S23	All
S8	All
S17	All
S18	All
S19	All
S9	All
S10	All
S15	All
S4	All
S3	All
S24	None
S1	All
S7	All
S14	None
S25	All
S11	All
S12	All
S6	All
S21	All
S13	All
FC	All
Existing SW4	None
S5	All

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Junctions Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S20	Outlet	2.006	Free Discharge
S22	Outlet	3.001	Free Discharge
S16	Outlet	2.002	Free Discharge
S2	Outlet	1.001	Free Discharge
S23	Outlet	3.002	Free Discharge
S8	Outlet	1.008	Free Discharge
S17	Outlet	2.003	Free Discharge
S18	Outlet	2.004	Free Discharge
S19	Outlet	2.005	Free Discharge
S9	Outlet	1.009	Free Discharge
S10	Outlet	1.010	Free Discharge
S15	Outlet	2.001	Free Discharge
S4	Outlet (1)	1.004	Free Discharge
S3	Outlet	1.003	Free Discharge
S24	Outlet	3.003	Free Discharge
S1	Outlet	1.000	Free Discharge
S7	Outlet	1.007	Free Discharge
S14	Outlet	2.000	Free Discharge
S25	Outlet	3.100	Free Discharge
S11	Outlet	1.100	Free Discharge
S12	Outlet	1.101	Free Discharge
S6	Outlet	1.006	Free Discharge
S21	Outlet	Pipe	Free Discharge
S13	Outlet	1.200	Free Discharge

FC	Outlet	1.012	Hydro-Brake®	
	Invert Level (m)		77.100	
	Design Depth (m)		1.250	
	Design Flow (L/s)		16.6	
	Objective	Minimise Upstream Storage Requirements		
	Application	Surface Water Only		
	Sump Available	<input checked="" type="checkbox"/>		
	Unit Reference	SHE-0180-1660-1250-1660		

S5	Outlet	1.005	Free Discharge
----	--------	-------	----------------

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Basin 01

Type : Pond

Dimensions

Exceedance Level (m)	79.000
Depth (m)	1.850
Base Level (m)	77.150
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	3.00
Total Volume (m³)	1547.453

Depth (m)	Area (m²)	Volume (m³)
0.000	750.00	0.000
1.800	1365.85	1876.780
1.850	1385.57	1945.565

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	2.006
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	1.010
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	3.004
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets


Outlet

Outgoing Connection	1.011
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	89.788
Friction Scheme	Manning's n
n	0.022

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		




Basin 02

Type : Pond

Dimensions

Exceedance Level (m)	79.000
Depth (m)	1.350
Base Level (m)	77.650
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	3.00
Total Volume (m³)	488.086

Depth (m)	Area (m²)	Volume (m³)
0.000	350.00	0.000
1.250	642.88	611.343
1.350	670.12	676.988

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	3.003
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	3.004
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	67.757
Friction Scheme	Manning's n
n	0.022

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Flow Options

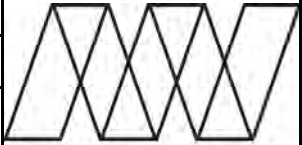
Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	<input type="checkbox"/>
Reduce Channel Depths	<input type="checkbox"/>

Manhole Options

Apply Offset	<input type="checkbox"/>
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Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025			 Alan Wood & Partners
	Designed by: HD	Checked by: SC	Approved By: SC	
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ			

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Existing SW4	Free Discharge			

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Title: Rainfall Analysis Criteria	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Rainfall

FSR Type: FSR

Region	England And Wales
M5-60 (mm)	19.0
Ratio R	0.351
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
CA 1	FSR: 1 years: +0 %: 15 mins: Winter	0.10	6.9	3.188
CA 2	FSR: 1 years: +0 %: 15 mins: Winter	0.17	11.9	5.531
CA 3	FSR: 1 years: +0 %: 15 mins: Winter	0.12	8.3	3.839
CA 4	FSR: 1 years: +0 %: 15 mins: Winter	0.16	11.2	5.177
CA 5	FSR: 1 years: +0 %: 15 mins: Winter	0.39	27.3	12.633
CA 6	FSR: 1 years: +0 %: 15 mins: Winter	0.27	19.1	8.830
CA 7	FSR: 1 years: +0 %: 15 mins: Winter	0.20	13.8	6.391
CA 8	FSR: 1 years: +0 %: 15 mins: Winter	0.33	23.2	10.752
CA 9	FSR: 1 years: +0 %: 15 mins: Winter	0.19	13.4	6.188
CA 10	FSR: 1 years: +0 %: 15 mins: Winter	0.20	14.4	6.652
CA 11	FSR: 1 years: +0 %: 15 mins: Winter	0.04	2.5	1.137
CA 12	FSR: 1 years: +0 %: 15 mins: Winter	0.21	15.0	6.928
CA 13	FSR: 1 years: +0 %: 15 mins: Winter	0.14	9.6	4.427
CA 14	FSR: 1 years: +0 %: 15 mins: Winter	0.13	9.1	4.223
CA 15	FSR: 1 years: +0 %: 15 mins: Winter	0.13	9.4	4.370
CA 16	FSR: 1 years: +0 %: 15 mins: Winter	0.15	10.8	4.985
CA 17	FSR: 1 years: +0 %: 15 mins: Winter	0.12	8.5	3.920
CA 18	FSR: 1 years: +0 %: 15 mins: Winter	0.25	17.6	8.146
CA 19	FSR: 1 years: +0 %: 15 mins: Winter	0.11	7.9	3.638
CA 20	FSR: 1 years: +0 %: 15 mins: Winter	0.10	6.7	3.122
CA 21	FSR: 1 years: +0 %: 15 mins: Winter	0.15	10.3	4.784

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



CA 22	FSR: 1 years: +0 %: 15 mins: Winter	0.24	16.6	7.711
CA 23	FSR: 1 years: +0 %: 15 mins: Winter	0.02	1.7	0.801
CA 24	FSR: 1 years: +0 %: 15 mins: Winter	0.12	8.3	3.860

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
CA 1	FSR: 30 years: +0 %: 15 mins: Winter	0.10	16.9	7.808
CA 2	FSR: 30 years: +0 %: 15 mins: Winter	0.17	29.3	13.548
CA 3	FSR: 30 years: +0 %: 15 mins: Winter	0.12	20.3	9.398
CA 4	FSR: 30 years: +0 %: 15 mins: Winter	0.16	27.4	12.684
CA 5	FSR: 30 years: +0 %: 15 mins: Winter	0.39	66.8	30.951
CA 6	FSR: 30 years: +0 %: 15 mins: Winter	0.27	46.7	21.640
CA 7	FSR: 30 years: +0 %: 15 mins: Winter	0.20	33.8	15.654
CA 8	FSR: 30 years: +0 %: 15 mins: Winter	0.33	56.9	26.348
CA 9	FSR: 30 years: +0 %: 15 mins: Winter	0.19	32.7	15.159
CA 10	FSR: 30 years: +0 %: 15 mins: Winter	0.20	35.2	16.296
CA 11	FSR: 30 years: +0 %: 15 mins: Winter	0.04	6.0	2.791
CA 12	FSR: 30 years: +0 %: 15 mins: Winter	0.21	36.7	16.980
CA 13	FSR: 30 years: +0 %: 15 mins: Winter	0.14	23.4	10.853
CA 14	FSR: 30 years: +0 %: 15 mins: Winter	0.13	22.3	10.352
CA 15	FSR: 30 years: +0 %: 15 mins: Winter	0.13	23.1	10.712
CA 16	FSR: 30 years: +0 %: 15 mins: Winter	0.15	26.4	12.206
CA 17	FSR: 30 years: +0 %: 15 mins: Winter	0.12	20.7	9.599
CA 18	FSR: 30 years: +0 %: 15 mins: Winter	0.25	43.1	19.963
CA 19	FSR: 30 years: +0 %: 15 mins: Winter	0.11	19.3	8.921
CA 20	FSR: 30 years: +0 %: 15 mins: Winter	0.10	16.5	7.661
CA 21	FSR: 30 years: +0 %: 15 mins: Winter	0.15	25.3	11.726

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



CA 22	FSR: 30 years: +0 %: 15 mins: Winter	0.24	40.8	18.895
CA 23	FSR: 30 years: +0 %: 15 mins: Winter	0.02	4.2	1.953
CA 24	FSR: 30 years: +0 %: 15 mins: Winter	0.12	20.4	9.464

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
CA 1	FSR: 100 years: +40 %: 15 mins: Winter	0.10	30.5	14.137
CA 2	FSR: 100 years: +40 %: 15 mins: Winter	0.17	53.0	24.525
CA 3	FSR: 100 years: +40 %: 15 mins: Winter	0.12	36.8	17.017
CA 4	FSR: 100 years: +40 %: 15 mins: Winter	0.16	49.6	22.953
CA 5	FSR: 100 years: +40 %: 15 mins: Winter	0.39	121.1	56.031
CA 6	FSR: 100 years: +40 %: 15 mins: Winter	0.27	84.6	39.170
CA 7	FSR: 100 years: +40 %: 15 mins: Winter	0.20	61.2	28.338
CA 8	FSR: 100 years: +40 %: 15 mins: Winter	0.33	103.0	47.689
CA 9	FSR: 100 years: +40 %: 15 mins: Winter	0.19	59.3	27.444
CA 10	FSR: 100 years: +40 %: 15 mins: Winter	0.20	63.7	29.502
CA 11	FSR: 100 years: +40 %: 15 mins: Winter	0.04	10.9	5.045
CA 12	FSR: 100 years: +40 %: 15 mins: Winter	0.21	66.4	30.738
CA 13	FSR: 100 years: +40 %: 15 mins: Winter	0.14	42.4	19.645
CA 14	FSR: 100 years: +40 %: 15 mins: Winter	0.13	40.5	18.733
CA 15	FSR: 100 years: +40 %: 15 mins: Winter	0.13	41.9	19.384
CA 16	FSR: 100 years: +40 %: 15 mins: Winter	0.15	47.7	22.096
CA 17	FSR: 100 years: +40 %: 15 mins: Winter	0.12	37.5	17.368
CA 18	FSR: 100 years: +40 %: 15 mins: Winter	0.25	78.1	36.137
CA 19	FSR: 100 years: +40 %: 15 mins: Winter	0.11	34.9	16.147
CA 20	FSR: 100 years: +40 %: 15 mins: Winter	0.10	30.0	13.864
CA 21	FSR: 100 years: +40 %: 15 mins: Winter	0.15	45.9	21.223

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



CA 22	FSR: 100 years: +40 %: 15 mins: Winter	0.24	73.9	34.199
CA 23	FSR: 100 years: +40 %: 15 mins: Winter	0.02	7.6	3.534
CA 24	FSR: 100 years: +40 %: 15 mins: Winter	0.12	37.0	17.125

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S20	FSR: 1 years: +0 %: 15 mins: Winter	79.700	78.200	78.341	0.141	109.3	0.248	0.000	106.8	56.501	OK
S22	FSR: 1 years: +0 %: 15 mins: Winter	83.750	81.038	81.091	0.053	13.4	0.060	0.000	12.4	6.180	OK
S16	FSR: 1 years: +0 %: 15 mins: Winter	83.910	81.295	81.429	0.134	58.2	0.237	0.000	55.5	27.810	OK
S2	FSR: 1 years: +0 %: 15 mins: Winter	85.640	84.000	84.074	0.074	19.0	0.131	0.000	17.7	8.996	OK
S23	FSR: 1 years: +0 %: 15 mins: Winter	81.250	79.700	79.771	0.071	28.6	0.126	0.000	27.7	13.946	OK
S8	FSR: 1 years: +0 %: 15 mins: Winter	81.850	80.000	80.119	0.119	78.8	0.304	0.000	76.4	40.483	OK
S17	FSR: 1 years: +0 %: 15 mins: Winter	82.700	80.913	81.044	0.131	65.1	0.231	0.000	63.3	32.212	OK
S18	FSR: 1 years: +0 %: 15 mins: Winter	82.000	80.450	80.569	0.119	94.7	0.134	0.000	91.6	47.146	OK
S19	FSR: 1 years: +0 %: 15 mins: Winter	80.860	79.310	79.441	0.131	101.1	0.148	0.000	98.6	51.488	OK
S9	FSR: 1 years: +0 %: 15 mins: Winter	80.200	78.600	78.743	0.143	93.0	0.162	0.000	89.4	48.151	OK
S10	FSR: 1 years: +0 %: 15 mins: Winter	79.750	78.250	78.351	0.101	98.9	0.179	0.000	97.7	52.797	OK
S15	FSR: 1 years: +0 %: 15 mins: Winter	85.800	83.236	83.321	0.085	31.9	0.096	0.000	31.0	15.206	OK
S4	FSR: 1 years: +0 %: 15 mins: Winter	84.250	82.200	82.332	0.132	35.7	0.233	0.000	33.1	17.669	OK
S3	FSR: 1 years: +0 %: 15 mins: Winter	85.300	83.300	83.380	0.080	29.6	0.141	0.000	28.8	14.523	OK
S24	FSR: 1 years: +0 %: 15 mins: Winter	80.050	78.000	78.106	0.106	42.7	0.187	0.000	41.0	20.874	OK
S1	FSR: 1 years: +0 %: 15 mins: Winter	87.150	85.500	85.549	0.049	11.2	0.056	0.000	10.7	5.173	OK
S7	FSR: 1 years: +0 %: 15 mins: Winter	82.610	81.100	81.238	0.138	45.7	0.156	0.000	44.0	23.719	OK
S14	FSR: 1 years: +0 %: 15 mins: Winter	85.050	83.700	83.773	0.073	13.8	0.083	0.000	12.9	6.383	OK
S25	FSR: 1 years: +0 %: 15 mins: Winter	82.450	81.000	81.056	0.056	14.4	0.063	0.000	13.7	6.648	OK
S11	FSR: 1 years: +0 %: 15 mins: Winter	82.800	81.450	81.509	0.059	8.5	0.066	0.000	7.6	3.910	OK
S12	FSR: 1 years: +0 %: 15 mins: Winter	82.500	81.000	81.067	0.067	25.2	0.119	0.000	24.5	12.047	OK
S6	FSR: 1 years: +0 %: 15 mins: Winter	83.200	81.700	81.936	0.236	39.9	0.417	0.000	39.0	20.776	OK
S21	FSR: 1 years: +0 %: 15 mins: Winter	82.850	81.400	81.479	0.079	23.2	0.090	0.000	22.3	10.764	OK
S13	FSR: 1 years: +0 %: 15 mins: Winter	80.050	78.700	78.758	0.058	8.3	0.066	0.000	7.7	3.853	OK
FC	FSR: 1 years: +0 %: 360 mins: Winter	79.300	77.100	77.413	0.313	14.9	0.553	0.000	14.8	340.684	Surcharged
Existing SW4	FSR: 1 years: +0 %: 720 mins: Summer	79.300	76.351	76.432	0.081	14.9	0.000	0.000	14.9	410.210	OK
S5	FSR: 1 years: +0 %: 15 mins: Winter	83.600	82.000	82.085	0.085	33.1	0.150	0.000	32.1	17.642	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

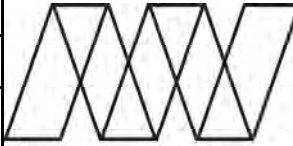
Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S20	FSR: 30 years: +0 %: 15 mins: Winter	79.700	78.200	78.448	0.248	272.7	0.439	0.000	267.2	138.529	OK
S22	FSR: 30 years: +0 %: 15 mins: Winter	83.750	81.038	81.123	0.085	32.7	0.096	0.000	30.8	15.145	OK
S16	FSR: 30 years: +0 %: 15 mins: Winter	83.910	81.295	81.560	0.265	143.7	0.468	0.000	137.9	68.170	OK
S2	FSR: 30 years: +0 %: 15 mins: Winter	85.640	84.000	84.122	0.122	46.7	0.216	0.000	44.1	22.050	OK
S23	FSR: 30 years: +0 %: 15 mins: Winter	81.250	79.700	79.814	0.114	70.9	0.202	0.000	69.3	34.192	OK
S8	FSR: 30 years: +0 %: 15 mins: Winter	81.850	80.000	80.205	0.205	197.5	0.523	0.000	191.5	100.311	OK
S17	FSR: 30 years: +0 %: 15 mins: Winter	82.700	80.913	81.162	0.249	161.3	0.440	0.000	157.0	78.990	OK
S18	FSR: 30 years: +0 %: 15 mins: Winter	82.000	80.450	80.656	0.206	234.5	0.233	0.000	228.6	115.619	OK
S19	FSR: 30 years: +0 %: 15 mins: Winter	80.860	79.310	79.542	0.232	251.7	0.262	0.000	246.4	126.286	OK
S9	FSR: 30 years: +0 %: 15 mins: Winter	80.200	78.600	78.846	0.246	232.2	0.278	0.000	225.3	119.150	OK
S10	FSR: 30 years: +0 %: 15 mins: Winter	79.750	78.250	78.423	0.173	248.8	0.306	0.000	246.3	130.552	OK
S15	FSR: 30 years: +0 %: 15 mins: Winter	85.800	83.236	83.382	0.146	78.6	0.165	0.000	76.9	37.264	OK
S4	FSR: 30 years: +0 %: 15 mins: Winter	84.250	82.200	82.436	0.236	88.7	0.417	0.000	83.0	43.342	OK
S3	FSR: 30 years: +0 %: 15 mins: Winter	85.300	83.300	83.431	0.131	73.4	0.231	0.000	71.9	35.589	OK
S24	FSR: 30 years: +0 %: 15 mins: Winter	80.050	78.000	78.180	0.180	106.0	0.319	0.000	102.5	51.178	OK
S1	FSR: 30 years: +0 %: 15 mins: Winter	87.150	85.500	85.580	0.080	27.4	0.090	0.000	26.4	12.676	OK
S7	FSR: 30 years: +0 %: 15 mins: Winter	82.610	81.100	81.300	0.200	113.9	0.226	0.000	110.6	59.182	OK
S14	FSR: 30 years: +0 %: 15 mins: Winter	85.050	83.700	83.824	0.124	33.8	0.140	0.000	31.9	15.640	OK
S25	FSR: 30 years: +0 %: 15 mins: Winter	82.450	81.000	81.091	0.091	35.2	0.103	0.000	34.0	16.287	OK
S11	FSR: 30 years: +0 %: 15 mins: Winter	82.800	81.450	81.547	0.097	20.7	0.109	0.000	19.1	9.585	OK
S12	FSR: 30 years: +0 %: 15 mins: Winter	82.500	81.000	81.107	0.107	62.2	0.190	0.000	61.5	29.464	OK
S6	FSR: 30 years: +0 %: 15 mins: Winter	83.200	81.700	82.000	0.300	99.3	0.531	0.000	97.4	51.705	OK
S21	FSR: 30 years: +0 %: 15 mins: Winter	82.850	81.400	81.528	0.128	56.9	0.145	0.000	55.2	26.360	OK
S13	FSR: 30 years: +0 %: 15 mins: Winter	80.050	78.700	78.795	0.095	20.4	0.108	0.000	19.3	9.454	OK
FC	FSR: 30 years: +0 %: 360 mins: Winter	79.300	77.100	77.839	0.739	16.9	1.305	0.000	16.6	594.813	Surcharged
Existing SW4	FSR: 30 years: +0 %: 15 mins: Winter	79.300	76.351	76.451	0.100	15.3	0.000	0.000	15.3	17.497	OK
S5	FSR: 30 years: +0 %: 15 mins: Winter	83.600	82.000	82.168	0.168	83.0	0.297	0.000	80.0	43.301	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S20	FSR: 100 years: +40 %: 15 mins: Winter	79.700	78.200	78.852	0.652	437.1	1.152	0.000	388.2	250.483	Surcharged
S22	FSR: 100 years: +40 %: 15 mins: Winter	83.750	81.038	81.155	0.117	59.3	0.133	0.000	56.3	27.430	OK
S16	FSR: 100 years: +40 %: 15 mins: Winter	83.910	81.295	82.709	1.414	227.6	2.498	0.000	211.5	123.445	Surcharged
S2	FSR: 100 years: +40 %: 15 mins: Winter	85.640	84.000	84.177	0.177	84.8	0.312	0.000	80.5	39.751	OK
S23	FSR: 100 years: +40 %: 15 mins: Winter	81.250	79.700	79.861	0.161	129.0	0.285	0.000	126.7	61.931	OK
S8	FSR: 100 years: +40 %: 15 mins: Winter	81.850	80.000	80.346	0.346	360.1	0.880	0.000	340.1	182.439	OK
S17	FSR: 100 years: +40 %: 15 mins: Winter	82.700	80.913	81.830	0.917	253.9	1.621	0.000	246.0	143.134	Surcharged
S18	FSR: 100 years: +40 %: 15 mins: Winter	82.000	80.450	80.761	0.311	386.7	0.352	0.000	347.3	209.367	OK
S19	FSR: 100 years: +40 %: 15 mins: Winter	80.860	79.310	80.045	0.735	389.1	0.831	0.000	389.3	228.744	Surcharged
S9	FSR: 100 years: +40 %: 15 mins: Winter	80.200	78.600	78.978	0.378	413.9	0.428	0.000	408.7	216.543	OK
S10	FSR: 100 years: +40 %: 15 mins: Winter	79.750	78.250	78.508	0.258	451.3	0.455	0.000	447.8	237.160	OK
S15	FSR: 100 years: +40 %: 15 mins: Winter	85.800	83.236	84.758	1.522	126.2	1.722	0.000	106.6	67.441	Surcharged
S4	FSR: 100 years: +40 %: 15 mins: Winter	84.250	82.200	83.014	0.814	154.0	1.437	0.000	149.4	78.454	Surcharged
S3	FSR: 100 years: +40 %: 15 mins: Winter	85.300	83.300	83.503	0.203	133.5	0.358	0.000	123.5	64.330	OK
S24	FSR: 100 years: +40 %: 60 mins: Winter	80.050	78.000	78.345	0.345	20.8	0.609	0.000	20.8	297.235	Surcharged
S1	FSR: 100 years: +40 %: 15 mins: Winter	87.150	85.500	85.613	0.113	49.6	0.127	0.000	48.0	22.946	OK
S7	FSR: 100 years: +40 %: 15 mins: Winter	82.610	81.100	81.378	0.278	207.1	0.314	0.000	202.5	107.858	OK
S14	FSR: 100 years: +40 %: 15 mins: Winter	85.050	83.700	84.961	1.261	61.2	1.426	0.000	41.6	28.160	Flood Risk
S25	FSR: 100 years: +40 %: 15 mins: Winter	82.450	81.000	81.131	0.131	63.7	0.148	0.000	61.7	29.493	OK
S11	FSR: 100 years: +40 %: 15 mins: Winter	82.800	81.450	81.590	0.140	37.5	0.158	0.000	34.9	17.354	OK
S12	FSR: 100 years: +40 %: 15 mins: Winter	82.500	81.000	81.150	0.150	112.9	0.265	0.000	111.7	53.364	OK
S6	FSR: 100 years: +40 %: 15 mins: Winter	83.200	81.700	82.091	0.391	179.9	0.692	0.000	177.1	94.080	OK
S21	FSR: 100 years: +40 %: 15 mins: Winter	82.850	81.400	81.587	0.187	103.0	0.211	0.000	100.2	47.543	OK
S13	FSR: 100 years: +40 %: 15 mins: Winter	80.050	78.700	78.838	0.138	37.0	0.156	0.000	35.0	17.115	OK
FC	FSR: 100 years: +40 %: 60 mins: Winter	79.300	77.100	78.342	1.242	16.8	2.194	0.000	16.6	963.982	Surcharged
Existing SW4	FSR: 100 years: +40 %: 15 mins: Summer	79.300	76.351	76.451	0.100	16.2	0.000	0.000	16.2	19.634	OK
S5	FSR: 100 years: +40 %: 15 mins: Winter	83.600	82.000	82.392	0.392	149.4	0.692	0.000	145.0	78.450	Surcharged

Project: Residential Development Barugh Green, Barnsley		Date: 19/08/2025		 Alan Wood & Partners
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: HD	Checked by: SC	
		Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. US Depth

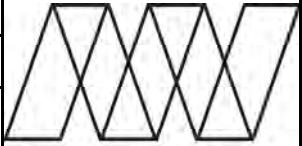
Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Basin 01	FSR: 1 years: +0 %: 360 mins: Winter	77.415	77.415	0.265	0.265	40.4	209.425	0.000	0.000	14.9	340.910	86.466	OK
Basin 02	FSR: 1 years: +0 %: 480 mins: Winter	77.781	77.781	0.131	0.131	6.3	47.733	0.000	0.000	3.7	34.532	90.220	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. US Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Basin 01	FSR: 30 years: +0 %: 360 mins: Winter	77.841	77.841	0.691	0.691	102.4	591.186	0.000	0.000	16.9	596.834	61.796	OK
Basin 02	FSR: 30 years: +0 %: 360 mins: Winter	77.842	77.842	0.192	0.192	16.9	70.822	0.000	0.000	15.1	107.502	85.490	OK

Project: Residential Development Barugh Green, Barnsley		Date: 19/08/2025		 Alan Wood & Partners
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: HD	Checked by: SC	
		Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. US Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Basin 01	FSR: 100 years: +40 %: 600 mins: Winter	78.344	78.344	1.194	1.194	120.2	1118.963	0.000	0.000	16.8	1043.812	27.690	OK
Basin 02	FSR: 100 years: +40 %: 600 mins: Winter	78.344	78.344	0.694	0.694	33.2	294.088	0.000	0.000	17.7	235.895	39.747	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.006	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S6	S7	83.200	81.936	0.112	20.776	1.6	0.18	39.0	OK
2.002	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S16	S17	83.910	81.429	0.133	27.810	1.8	0.35	55.5	OK
2.003	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S17	S18	82.700	81.044	0.125	32.212	2.3	0.33	63.3	OK
2.004	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S18	S19	82.000	80.569	0.125	47.146	2.8	0.2	91.6	OK
2.005	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S19	S20	80.860	79.441	0.136	51.488	2.7	0.24	98.6	OK
1.007	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S7	S8	82.610	81.238	0.085	23.719	2.7	0.17	44.0	OK
1.008	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S8	S9	81.850	80.119	0.131	40.483	2.2	0.21	76.4	OK
1.009	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S9	S10	80.200	78.743	0.122	48.151	2.6	0.17	89.4	OK
2.001	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S15	S16	85.800	83.321	0.110	15.206	1.6	0.3	31.0	OK
2.000	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S14	S15	85.050	83.773	0.072	6.383	1.2	0.21	12.9	OK
3.001	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S22	S23	83.750	81.091	0.053	6.180	1.5	0.07	12.4	OK
3.002	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S23	S24	81.250	79.771	0.089	13.946	1.6	0.12	27.7	OK
3.100	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S25	S23	82.450	81.056	0.055	6.648	1.8	0.13	13.7	OK
1.100	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S11	S12	82.800	81.509	0.058	3.910	0.9	0.14	7.6	OK
1.101	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S12	S8	82.500	81.067	0.066	12.047	2.1	0.1	24.5	OK
1.200	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S13	S10	80.050	78.758	0.057	3.853	1.0	0.14	7.7	OK
1.011	FSR: 1 years: +0 %: 180 mins: Winter	Pipe	Basin 01	FC	79.000	77.400	0.274	207.852	0.3	0.16	15.0	OK
1.012	FSR: 1 years: +0 %: 720 mins: Summer	Pipe	FC	Existing SW4	79.300	77.380	0.088	410.210	2.1	0.99	14.9	Surcharged
1.004	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S4	S5	84.250	82.332	0.109	17.669	1.4	0.36	33.1	OK
1.000	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S1	S2	87.150	85.549	0.049	5.173	1.7	0.1	10.7	OK
1.001	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S2	S3	85.640	84.074	0.073	8.996	1.3	0.13	17.7	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



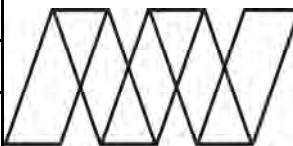
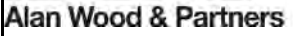
1.003	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S3	S4	85.300	83.380	0.106	14.523	1.3	0.16	28.8	OK
3.004	FSR: 1 years: +0 %: 480 mins: Winter	Pipe	Basin 02	Basin 01	79.000	77.781	0.146	34.532	0.1	0.03	3.7	OK
1.010	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S10	Basin 01	79.750	78.351	0.099	52.797	3.8	0.09	97.7	OK
2.006	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S20	Basin 01	79.700	78.341	0.118	56.501	3.6	0.24	106.8	OK
3.003	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S24	Basin 02	80.050	78.106	0.078	20.874	2.8	0.21	41.0	OK
1.005	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S5	S6	83.600	82.085	0.160	17.642	0.8	0.18	32.1	OK
Pipe	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S21	S18	82.850	81.479	0.099	10.764	1.1	0.15	22.3	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.006	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S6	S7	83.200	82.000	0.175	51.705	2.3	0.45	97.4	OK
2.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S16	S17	83.910	81.560	0.257	68.170	2.1	0.88	137.9	OK
2.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S17	S18	82.700	81.162	0.228	78.990	2.7	0.82	157.0	OK
2.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S18	S19	82.000	80.656	0.219	115.619	3.4	0.49	228.6	OK
2.005	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S19	S20	80.860	79.542	0.240	126.286	3.3	0.59	246.4	OK
1.007	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S7	S8	82.610	81.300	0.143	59.182	3.3	0.42	110.6	OK
1.008	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S8	S9	81.850	80.205	0.225	100.311	2.8	0.54	191.5	OK
1.009	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S9	S10	80.200	78.846	0.209	119.150	3.1	0.44	225.3	OK
2.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S15	S16	85.800	83.382	0.205	37.264	2.0	0.75	76.9	OK
2.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S14	S15	85.050	83.824	0.120	15.640	1.5	0.53	31.9	OK
3.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S22	S23	83.750	81.123	0.083	15.145	1.9	0.16	30.8	OK
3.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S23	S24	81.250	79.814	0.147	34.192	2.0	0.31	69.3	OK
3.100	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S25	S23	82.450	81.091	0.089	16.287	2.3	0.32	34.0	OK
1.100	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S11	S12	82.800	81.547	0.095	9.585	1.2	0.35	19.1	OK
1.101	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S12	S8	82.500	81.107	0.119	29.464	2.4	0.26	61.5	OK
1.200	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S13	S10	80.050	78.795	0.093	9.454	1.2	0.34	19.3	OK
1.011	FSR: 30 years: +0 %: 120 mins: Winter	Pipe	Basin 01	FC	79.000	77.787	0.300	194.993	0.3	0.18	17.0	Surcharged
1.012	FSR: 30 years: +0 %: 180 mins: Winter	Pipe	FC	Existing SW4	79.300	77.817	0.100	295.049	2.1	1.1	16.6	Surcharged
1.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S4	S5	84.250	82.436	0.202	43.342	1.6	0.89	83.0	OK
1.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S1	S2	87.150	85.580	0.078	12.676	2.1	0.25	26.4	OK
1.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S2	S3	85.640	84.122	0.119	22.050	1.7	0.32	44.1	OK

Project: Residential Development Barugh Green, Barnsley		Date: 19/08/2025			
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: HD	Checked by: SC		
		Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ			

1.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S3	S4	85.300	83.431	0.183	35.589	1.6	0.39	71.9	OK
3.004	FSR: 30 years: +0 %: 120 mins: Winter	Pipe	Basin 02	Basin 01	79.000	77.828	0.300	67.356	0.3	0.16	22.3	OK
1.010	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S10	Basin 01	79.750	78.423	0.192	130.552	4.5	0.23	246.3	OK
2.006	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S20	Basin 01	79.700	78.448	0.208	138.529	4.3	0.61	267.2	OK
3.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S24	Basin 02	80.050	78.180	0.134	51.178	3.3	0.52	102.5	OK
1.005	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S5	S6	83.600	82.168	0.234	43.301	1.3	0.45	80.0	OK
Pipe	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S21	S18	82.850	81.528	0.167	26.360	1.4	0.38	55.2	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.006	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S6	S7	83.200	82.091	0.260	94.080	2.7	0.81	177.1	OK
2.002	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S16	S17	83.910	82.709	0.300	123.445	3.0	1.35	211.5	Surcharged
2.003	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S17	S18	82.700	81.830	0.300	143.134	3.5	1.29	246.0	Surcharged
2.004	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S18	S19	82.000	80.745	0.369	186.922	3.4	0.77	360.6	OK
2.005	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S19	S20	80.860	80.045	0.375	228.744	3.5	0.94	389.3	Surcharged
1.007	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S7	S8	82.610	81.378	0.249	107.858	3.4	0.77	202.5	OK
1.008	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S8	S9	81.850	80.346	0.362	182.439	3.1	0.95	340.1	OK
1.009	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S9	S10	80.200	78.978	0.318	216.543	3.4	0.79	408.7	OK
2.001	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S15	S16	85.800	84.758	0.225	67.441	2.7	1.05	106.6	Surcharged
2.000	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S14	S15	85.050	84.961	0.225	28.160	1.3	0.69	41.6	Flood Risk
3.001	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S22	S23	83.750	81.155	0.115	27.430	2.3	0.3	56.3	OK
3.002	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S23	S24	81.250	79.861	0.230	61.931	2.2	0.56	126.7	OK
3.100	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S25	S23	82.450	81.131	0.127	29.493	2.7	0.58	61.7	OK
1.100	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S11	S12	82.800	81.590	0.136	17.354	1.4	0.65	34.9	OK
1.101	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S12	S8	82.500	81.150	0.210	53.364	2.2	0.46	111.7	OK
1.200	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S13	S10	80.050	78.838	0.133	17.115	1.4	0.62	35.0	OK
1.011	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	Basin 01	FC	79.000	77.679	0.300	21.358	0.3	0.2	19.1	Surcharged
1.012	FSR: 100 years: +40 %: 720 mins: Summer	Pipe	FC	Existing SW4	79.300	78.221	0.100	1155.041	2.1	1.1	16.6	Surcharged
1.004	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S4	S5	84.250	83.014	0.300	78.454	2.1	1.61	149.4	Surcharged
1.000	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S1	S2	87.150	85.613	0.110	22.946	2.5	0.46	48.0	OK
1.001	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S2	S3	85.640	84.177	0.170	39.751	1.9	0.58	80.5	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



1.003	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S3	S4	85.300	83.484	0.300	57.499	1.8	0.68	124.9	OK
3.004	FSR: 100 years: +40 %: 30 mins: Winter	Pipe	Basin 02	Basin 01	79.000	77.909	0.300	33.278	0.7	0.37	52.9	OK
1.010	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S10	Basin 01	79.750	78.508	0.328	237.160	4.9	0.42	447.8	OK
2.006	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S20	Basin 01	79.700	78.644	0.336	223.760	3.9	0.93	406.7	Surchar ged
3.003	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S24	Basin 02	80.050	78.300	0.212	92.682	3.4	0.9	179.4	OK
1.005	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S5	S6	83.600	82.392	0.300	78.450	2.1	0.82	145.0	Surchar ged
Pipe	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S21	S18	82.850	81.587	0.249	47.543	1.6	0.69	100.2	OK

Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

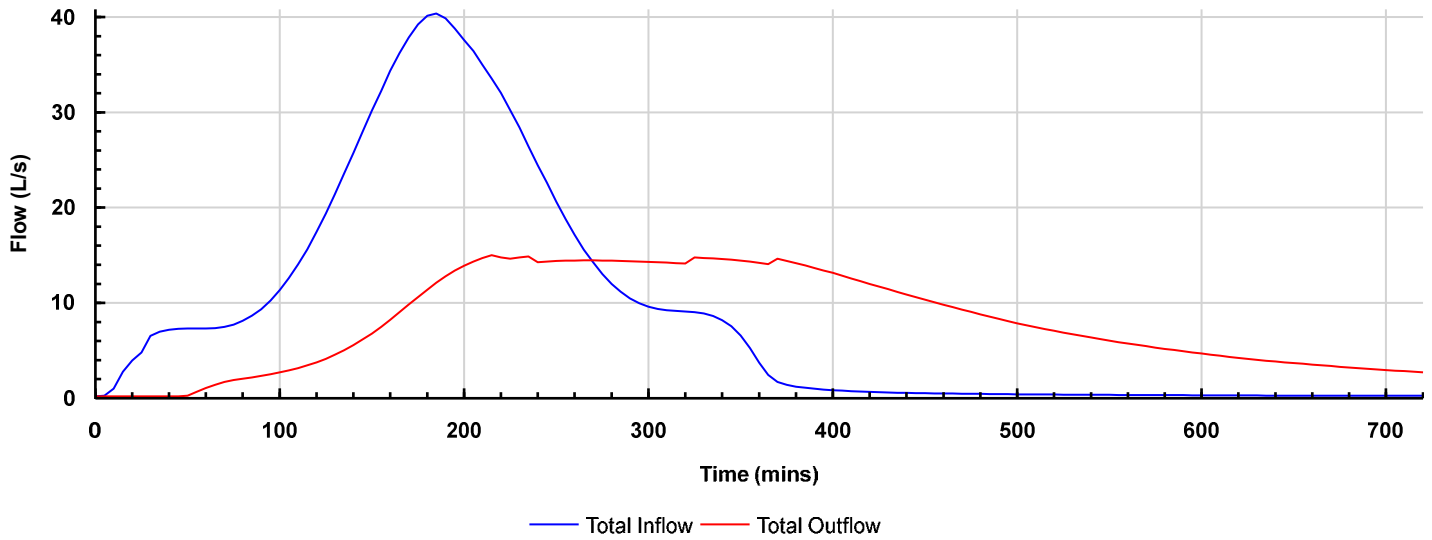


Basin 01
Critical by Return Period: FSR: 1 years: Increase Rainfall (%): +0: 360 mins: Winter

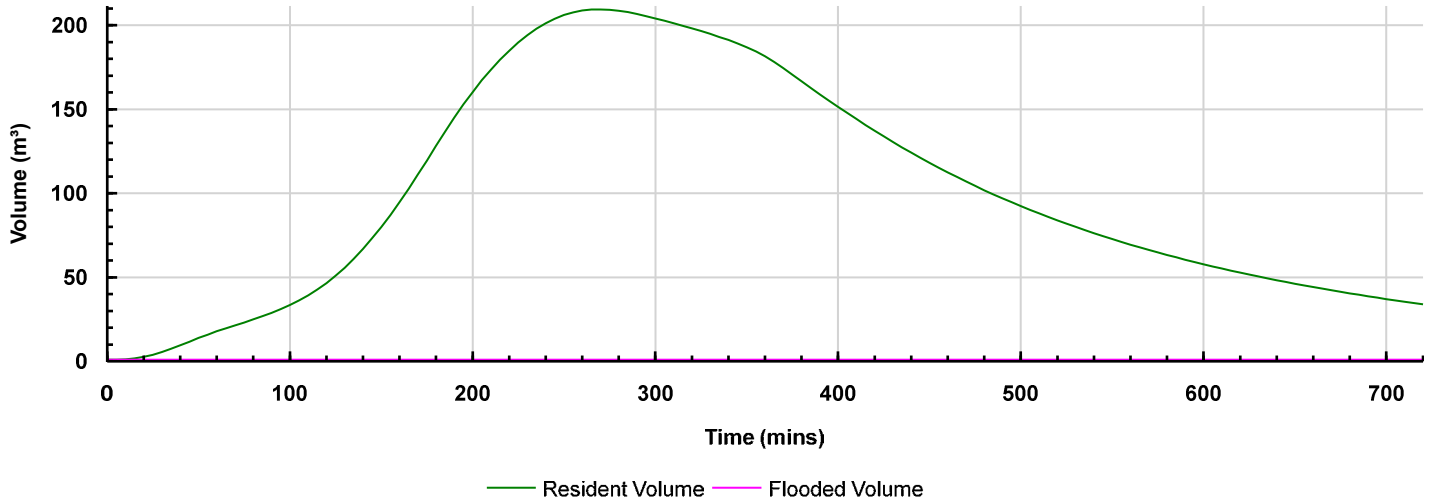
Type : Pond

Graphs

Flow Graph



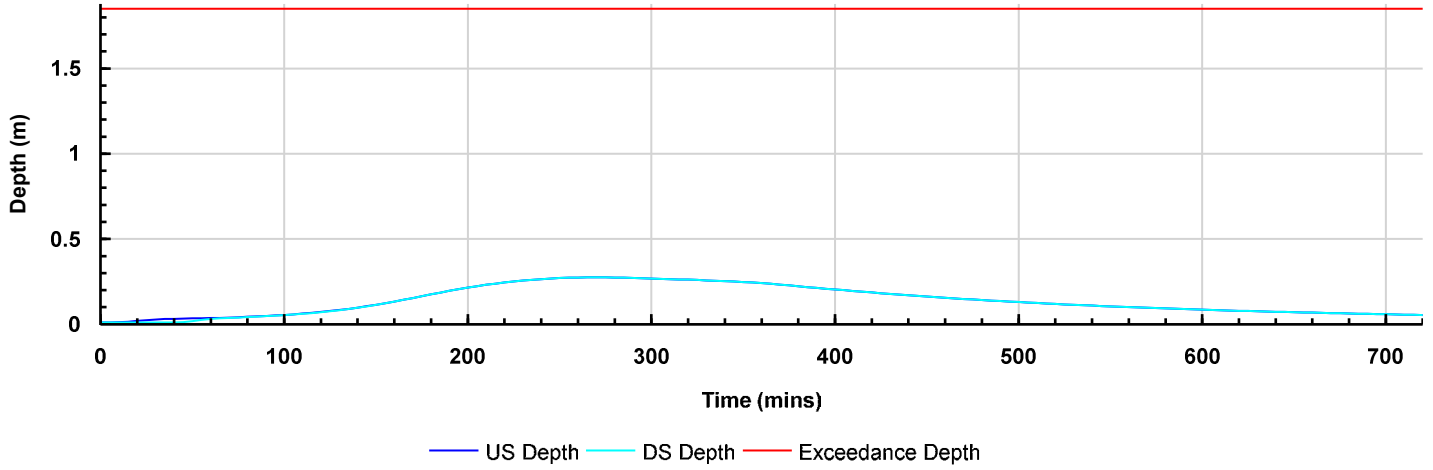
Volume Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

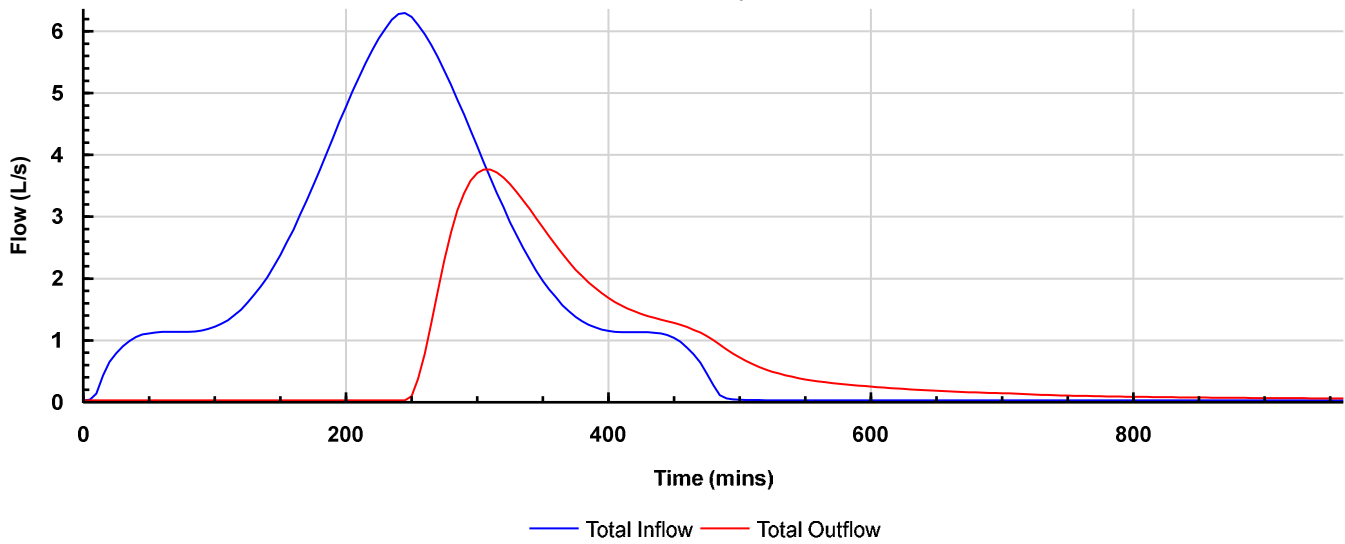


Basin 02
Critical by Return Period: FSR: 1 years: Increase Rainfall (%): +0: 480 mins: Winter

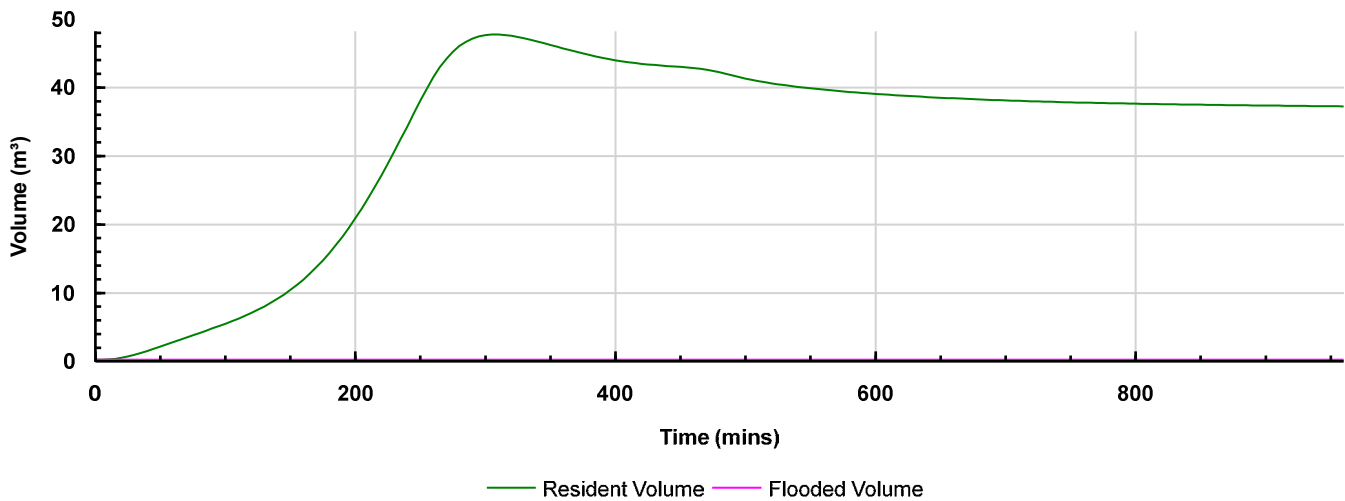
Type : Pond

Graphs

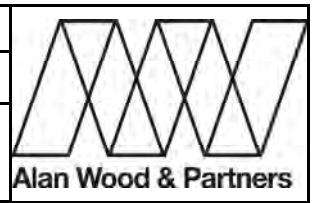
Flow Graph



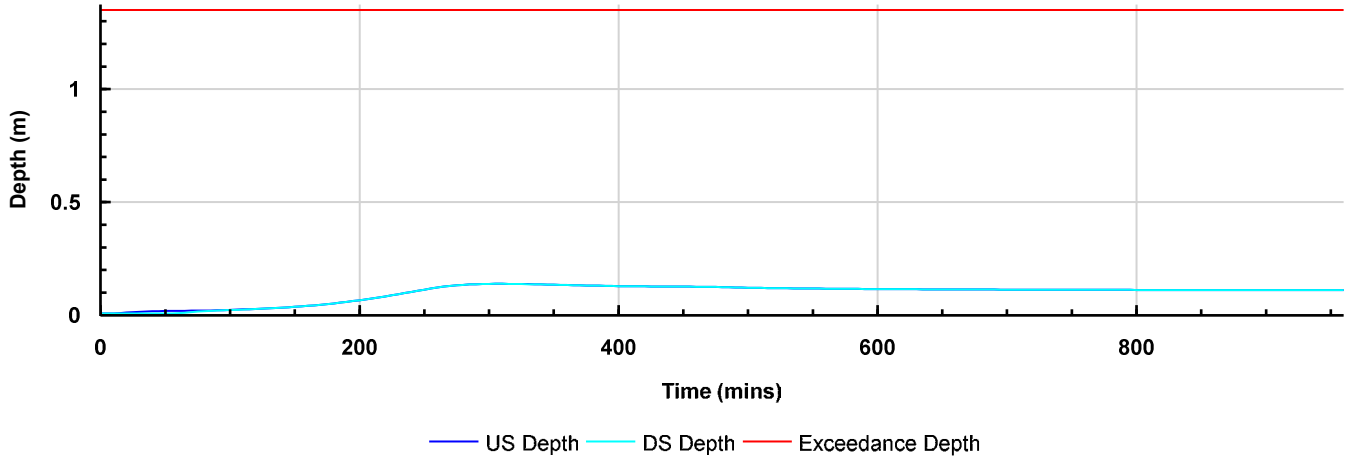
Volume Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

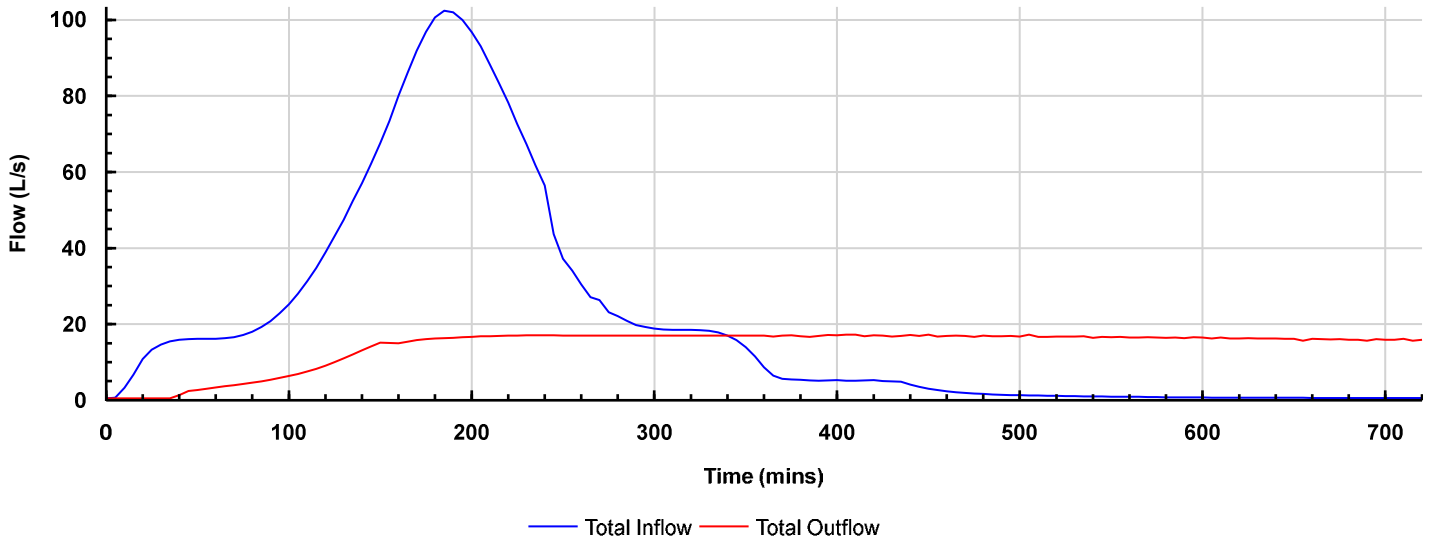


Basin 01
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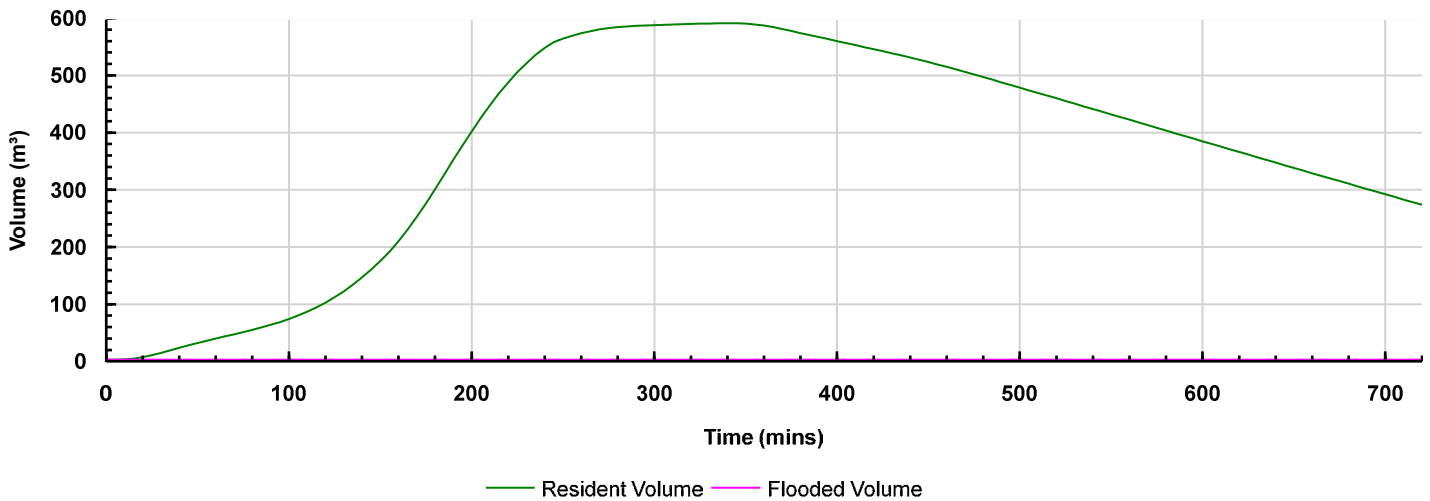
Type : Pond

Graphs

Flow Graph



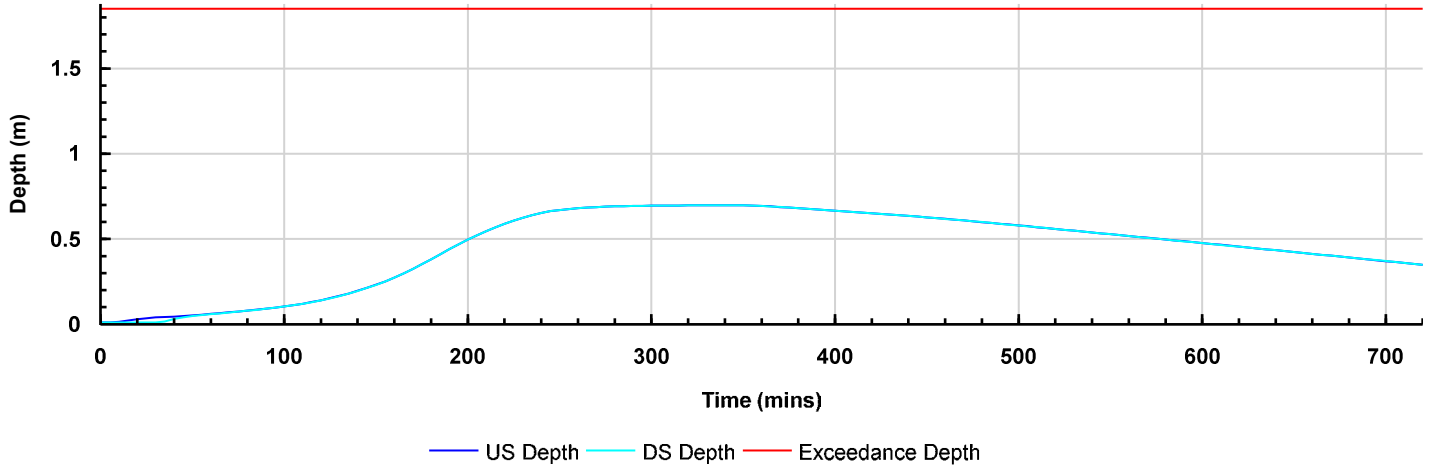
Volume Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

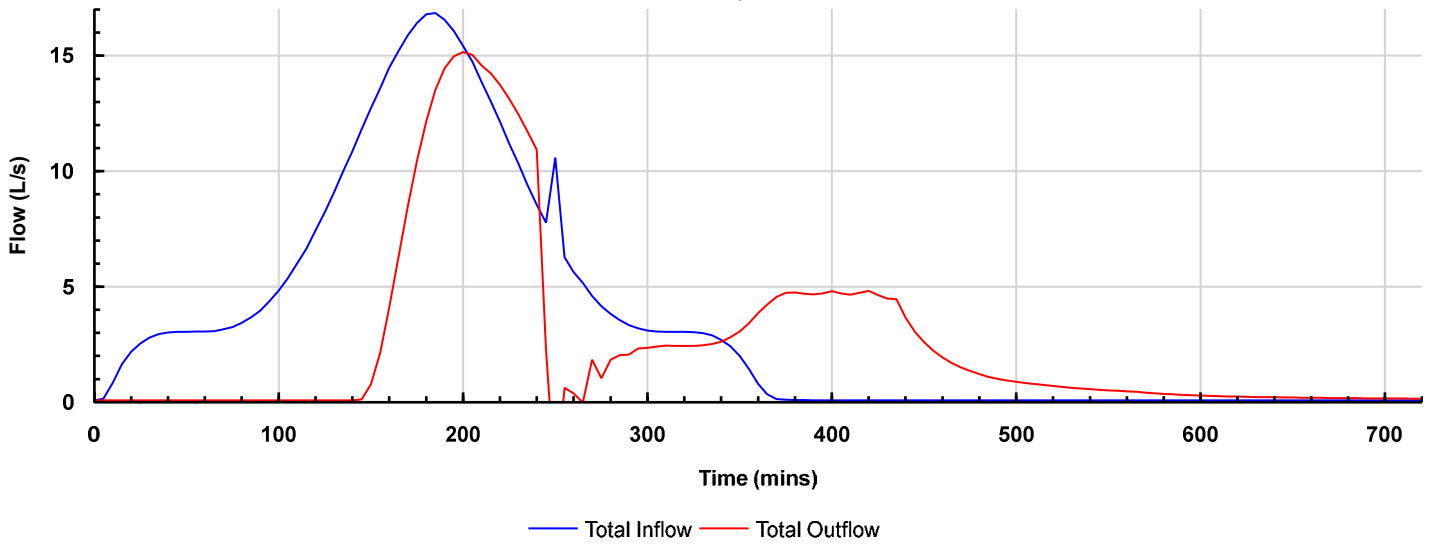


Basin 02
Critical by Return Period: FSR: 30 years: Increase Rainfall (%): +0: 360 mins: Winter

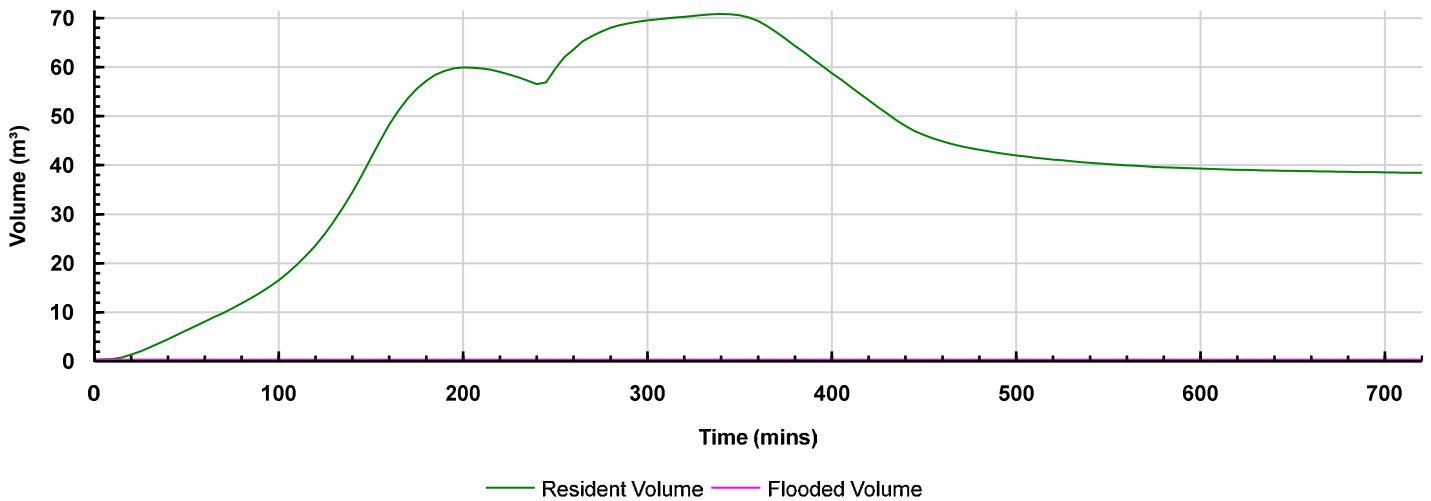
Type : Pond

Graphs

Flow Graph



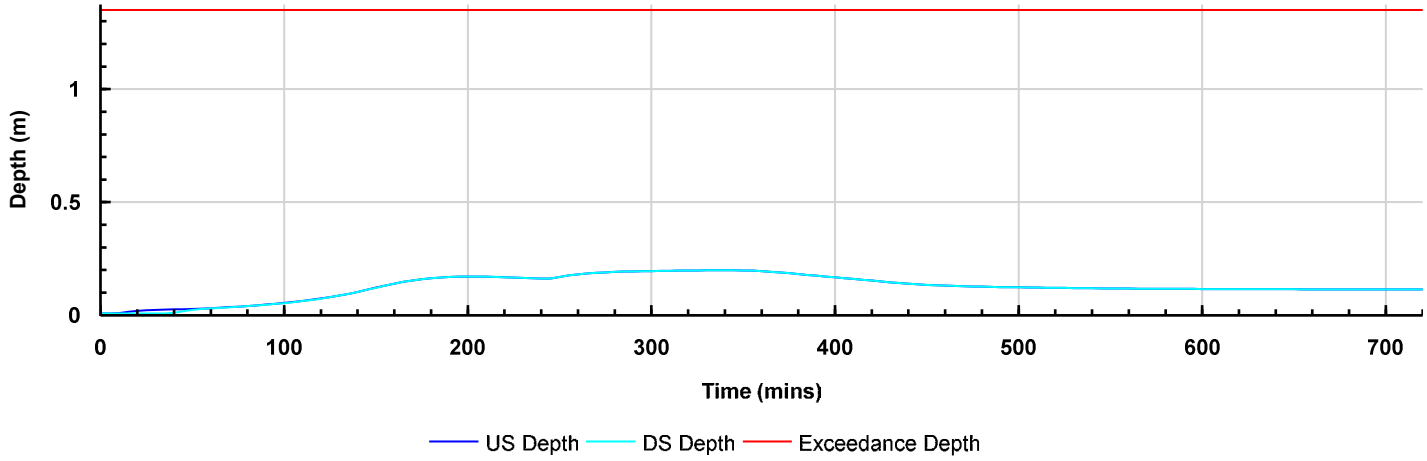
Volume Graph



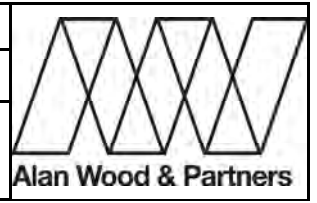
Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

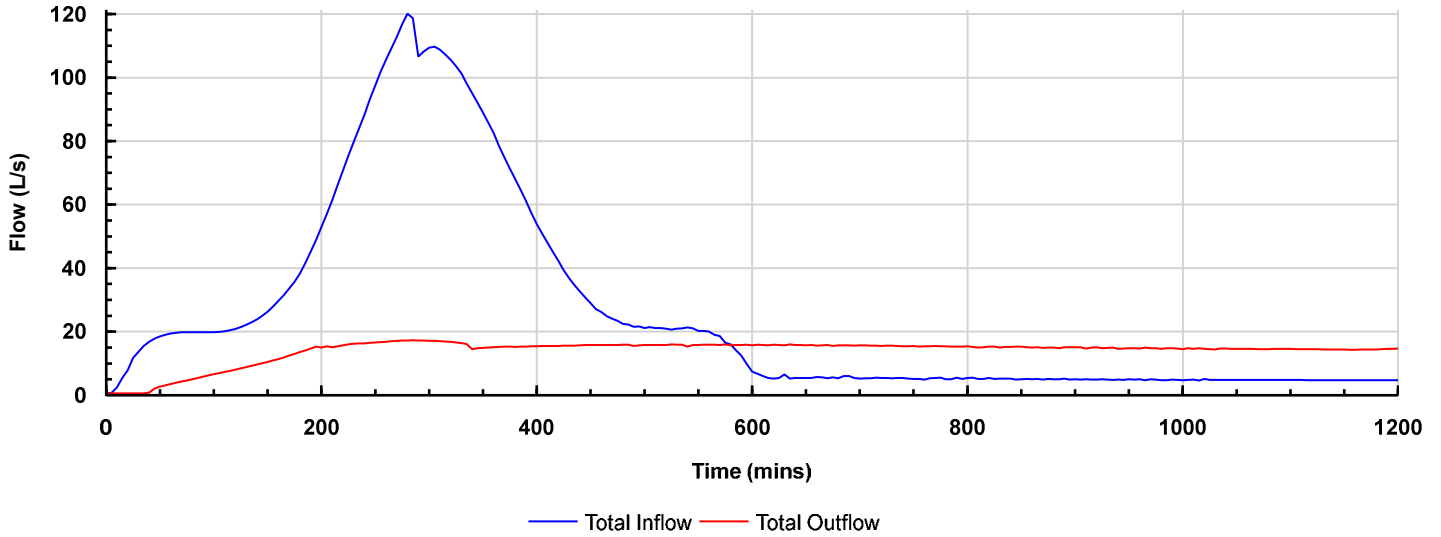


Basin 01
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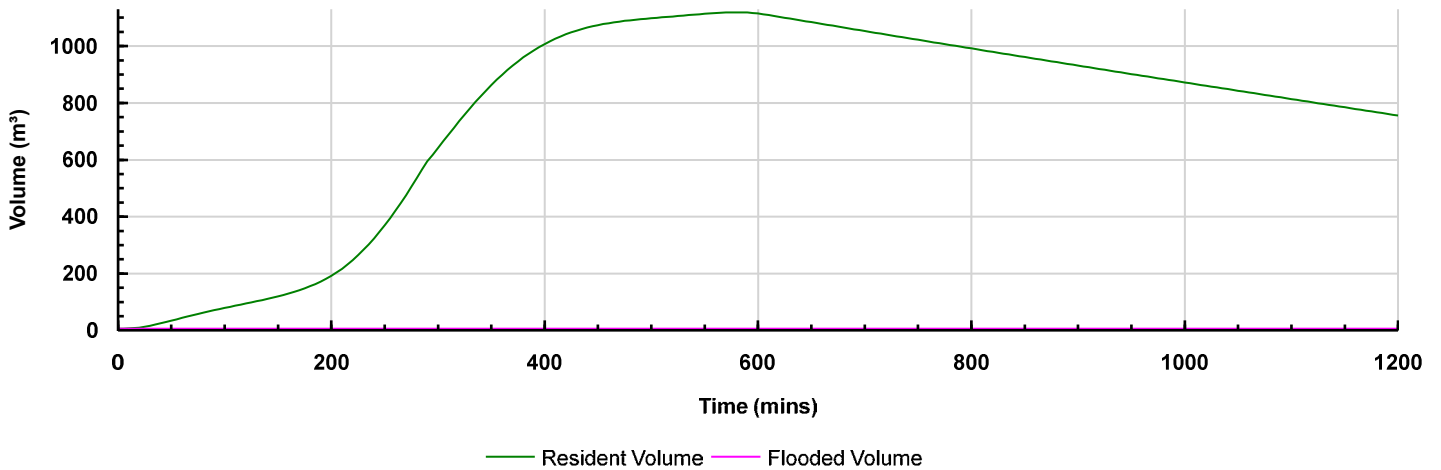
Type : Pond

Graphs

Flow Graph



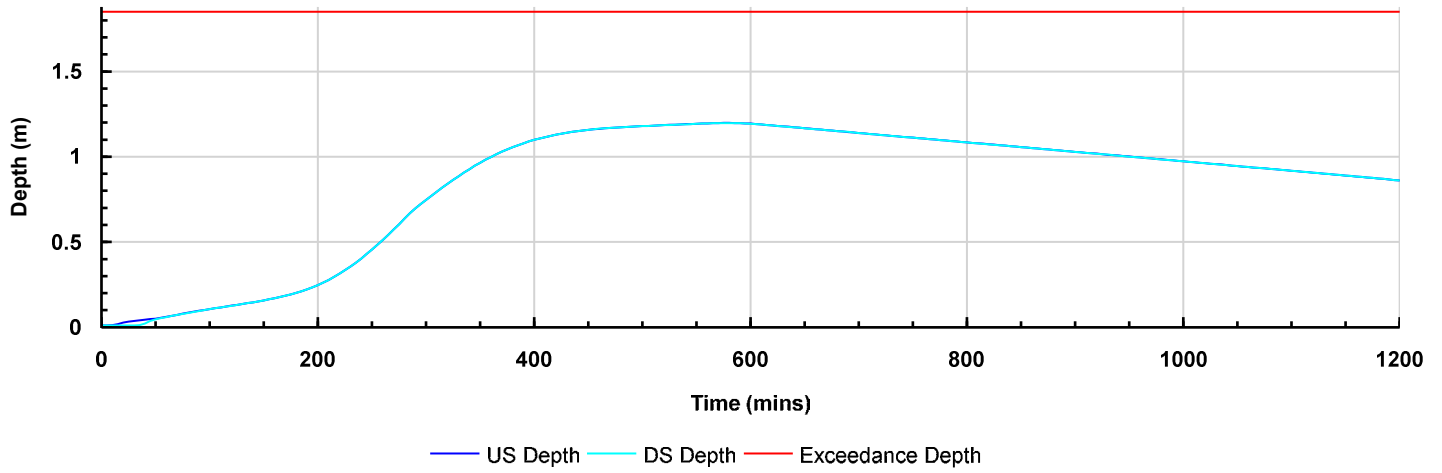
Volume Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		

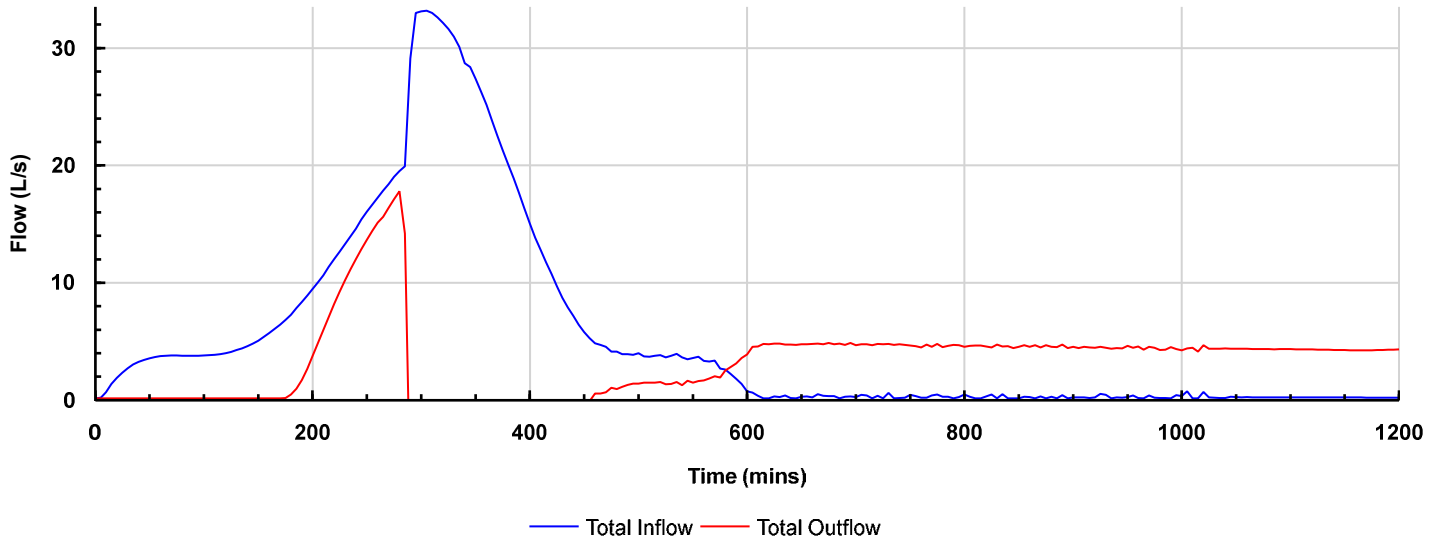


Basin 02
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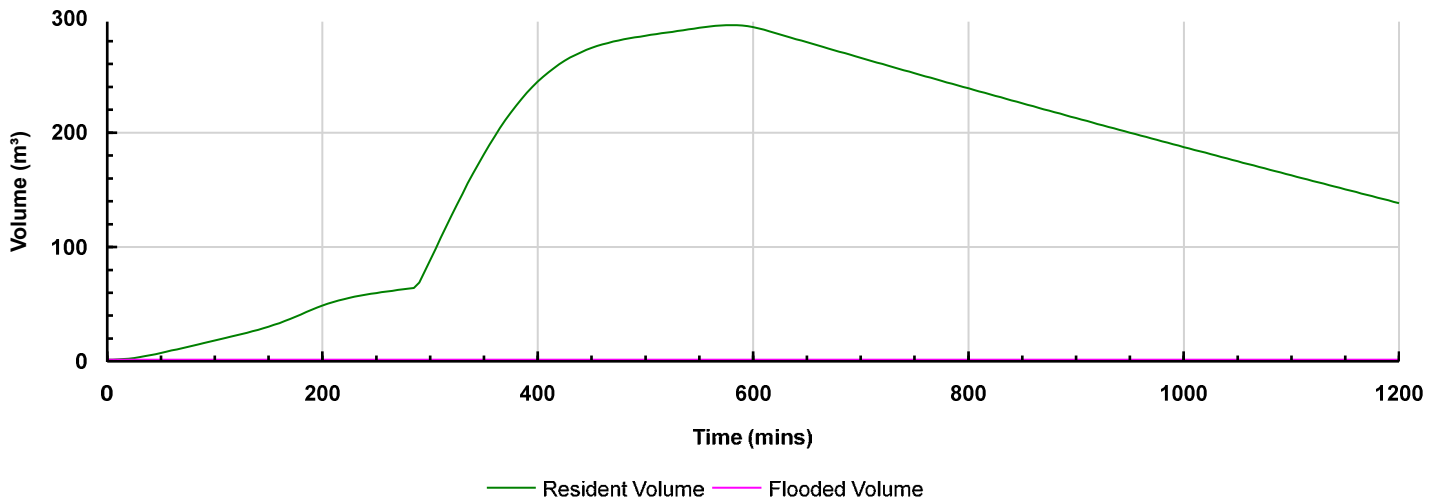
Type : Pond

Graphs

Flow Graph



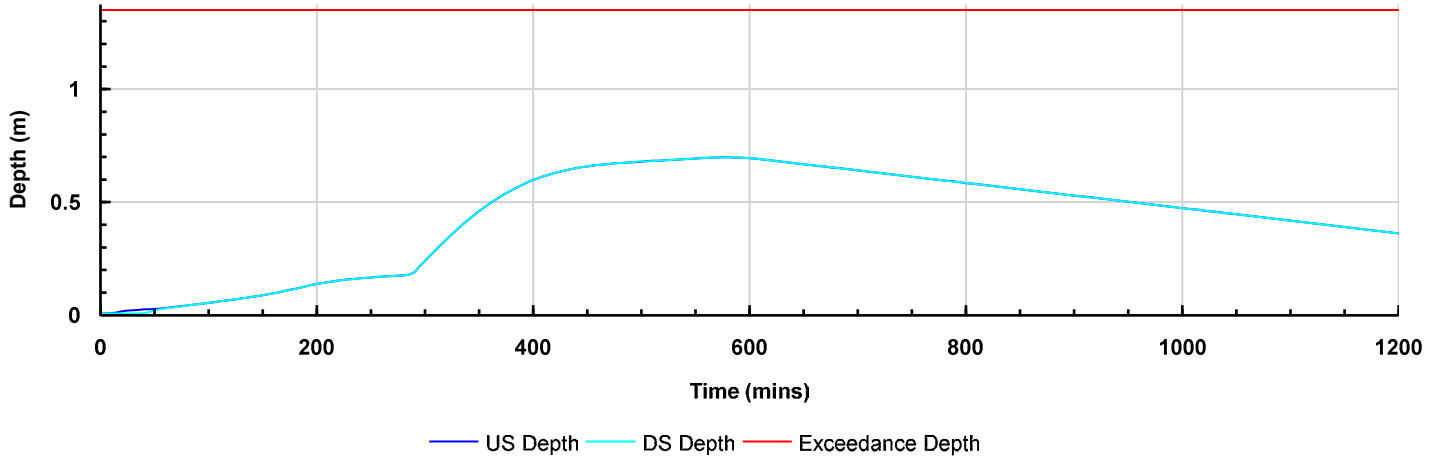
Volume Graph



Project: Residential Development Barugh Green, Barnsley	Date: 19/08/2025		
	Designed by: HD	Checked by: SC	Approved By: SC
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Alan Wood & Partners 18 Howley Park Business Village, Pullan Way, Morley, Leeds, LS27 0BZ		



Depth Graph



APPENDIX G

CIRIA SuDS Manual Water Quality Matrices

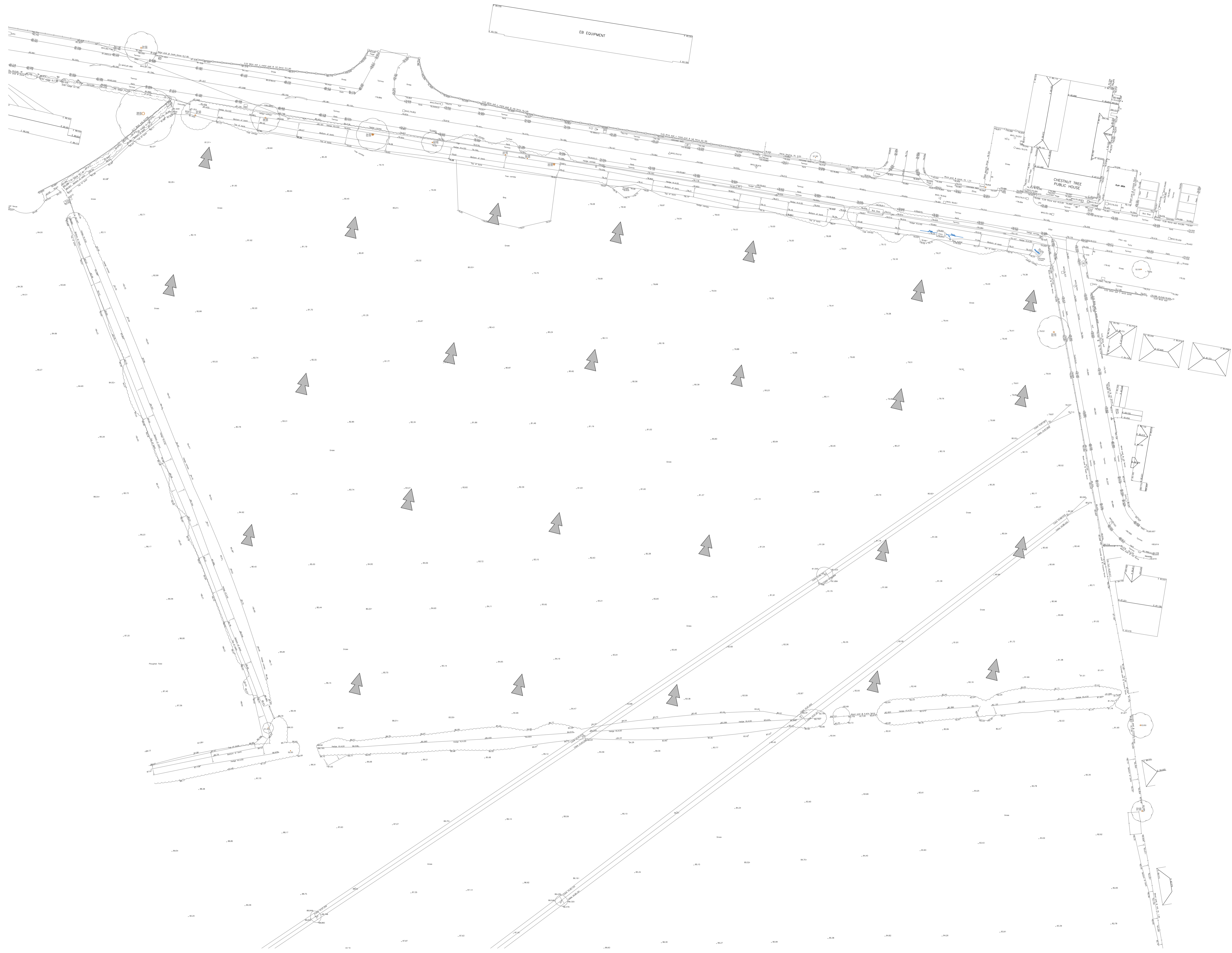
SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Residential roofing				
Pollution Hazard Level	Very low				
Pollution Hazard Indices					
TSS	0.2				
Metals	0.2				
Hydrocarbons	0.05				
SuDS components proposed					
Component 1	Filter drain (where the trench is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events		
Component 2	None				
Component 3	None				
SuDS Pollution Mitigation Indices					
TSS		0.4			
Metals		0.4			
Hydrocarbons		0.4			
Groundwater protection type	None				
Groundwater protection					
Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices		<p>Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but interception requires separate evaluation.</p>	Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England		
TSS	0.4				
Metals	0.4				
Hydrocarbons	0.4				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Low traffic roads (e.g. residential roads and general access roads, < 300 traffic movements/day) Low 0.5 0.4 0.4				
SuDS components proposed Component 1 Attenuation Lagoon		Detailed assessment of performance of designed component in reducing inflow concentrations of each pollutant type required as evidence of adopted indices. Enter indices approved by the environmental regulator in appropriate 'User Defined Indices' row below			
Component 2 None					
Component 3 None					
SuDS Pollution Mitigation Indices TSS Metals Hydrocarbons	0.6 0.5 0.6				
Groundwater protection type Groundwater protection Pollution Mitigation Indices TSS Metals Hydrocarbons	None 0 0 0				
Combined Pollution Mitigation Indices TSS Metals Hydrocarbons Acceptability of Pollution Mitigation TSS Metals Hydrocarbons	0.6 0.5 0.6 Sufficient Sufficient Sufficient	Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but interception requires separate evaluation.	Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England		

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Residential parking Low 0.5 0.4 0.4				
SuDS components proposed					
Component 1	Attenuation Lagoon	Detailed assessment of performance of designed component in reducing inflow concentrations of each pollutant type required as evidence of adopted indices. Enter indices approved by the environmental regulator in appropriate 'User Defined Indices' row below SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events		
Component 2	Filter drain (where the trench is not designed as an infiltration component)				
Component 3	None				
SuDS Pollution Mitigation Indices					
		0.8			
		0.7			
		0.8			
Groundwater protection type	None				
Groundwater protection Pollution Mitigation Indices					
	TSS	0			
	Metals	0			
	Hydrocarbons	0			
Combined Pollution Mitigation Indices		0.8	Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England		
	TSS	0.8			
	Metals	0.7			
	Hydrocarbons	0.8			
Acceptability of Pollution Mitigation		Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but interception requires separate evaluation.			
	TSS	Sufficient			
	Metals	Sufficient			
	Hydrocarbons	Sufficient			

APPENDIX H

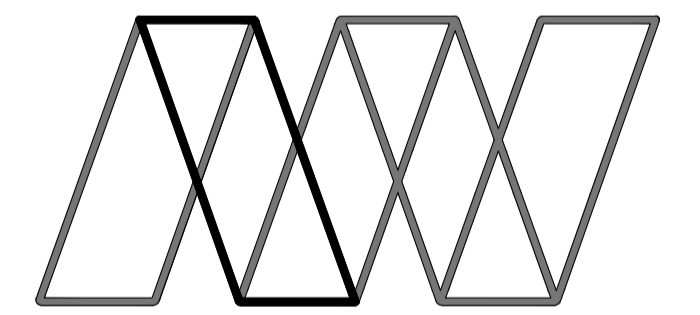
Surface Water Exceedance Flood Routing Drawing



- NOTES:**
1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
 3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
 4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY DEPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS WHICH MAY BE NECESSARY. SUCH MATERIAL REMAINING THE PROPERTY OF THE CONTRACTOR ON COMPLETION AND FOR ENSURING THAT THE WORKS AND ANY ADJACENT PROPERTIES ARE SAFE IN THE TEMPORARY CONDITION.

KEY
 = EXISTING SURFACE WATER
 = EXCEEDANCE FLOW PATH ROUTE

P1	FIRST ISSUE	04.12.24	HD	SC	--
Rev	Description	Date	By	Chk	App



Alan Wood & Partners

Hull Office 341 Beverley Road Hull HU5 1LD T. 01482 442138 www.alanwood.co.uk	Consulting Civil & Structural Engineers Project Managers Building Surveyors Leeds T. 01135 311098 Lincoln T. 01522 300210 Scarborough T. 01723 865484 Sheffield T. 01142 440077 York T. 01904 611594
---	--

Project:	Proposed Scheme at Barugh Green, Barnsley, South Yorkshire		
Client:	Avant Homes		
Drawing:	Existing Surface Water Exceedance		
Role:	Civil Engineer		
Drawing Status:	FOR APPROVAL	Suitability Code:	-
Job. no.	51335	Scale@ A1:	1:500
Project	Originator	Volume	Level
BGB - AWP - ZZ - XX - DR - C - 3401			
Rev.	P1		Number

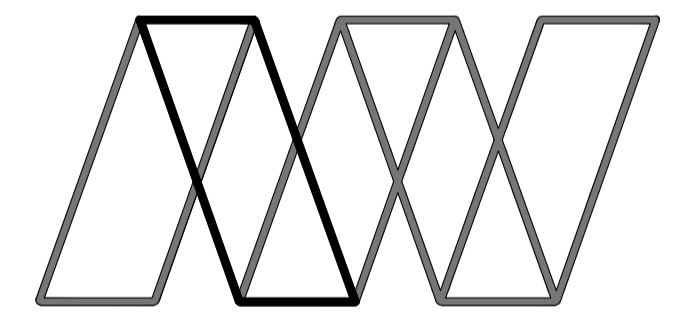
100mm at A1



- NOTES:**
1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION, OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
 3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
 4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS WHICH MAY BE NECESSARY. SUCH MATERIAL REMAINING THE PROPERTY OF THE CONTRACTOR ON COMPLETION, AND FOR ENSURING THAT THE WORKS AND ANY ADJACENT PROPERTIES ARE SAFE IN THE TEMPORARY CONDITION.

KEY
 = PROPOSED SURFACE WATER EXCEEDANCE FLOW PATH ROUTE

P3	UPDATED SITE PLAN	18.08.25	HD	SC	--
P2	PROPOSED AMENDMENTS	23.12.24	GJ	CM	KH
P1	FIRST ISSUE	04.12.24	HD	SC	--
Rev	Description	Date	By	Chk	App



Alan Wood & Partners

Hull Office
 341 Beverley Road
 Hull
 HU5 1LD

Consulting Civil & Structural Engineers
Project Managers
Building Surveyors

Leeds T. 01135 311098
 Lincoln T. 01522 300210
 Scarborough T. 01723 865484
 Sheffield T. 01142 440077
 York T. 01904 611594

T. 01482 442138
 www.alanwood.co.uk

Project:	Proposed Scheme at Barugh Green, Barnsley, South Yorkshire		
Client:	Avant Homes		
Drawing:	Proposed Surface Water Exceedance		
Role:	Civil Engineer		
Drawing Status:	FOR APPROVAL	Suitability Code:	-
Job. no.	51335	Scale@ A1:	1:500
Rev.	P3	Project	BGB - AWP - ZZ - XX - DR - C - 3400
	Originator	Volume	Level
	Type	Role	Number

APPENDIX I

Existing Drainage CCTV Survey



Project

Project Name: 10192590 - Barugh Green Road

Project Date: 07/04/2020

Inspection Standard: MSCC4 Sewers & Drainage GB (SRM4 Scoring)

CCTV Survey Report

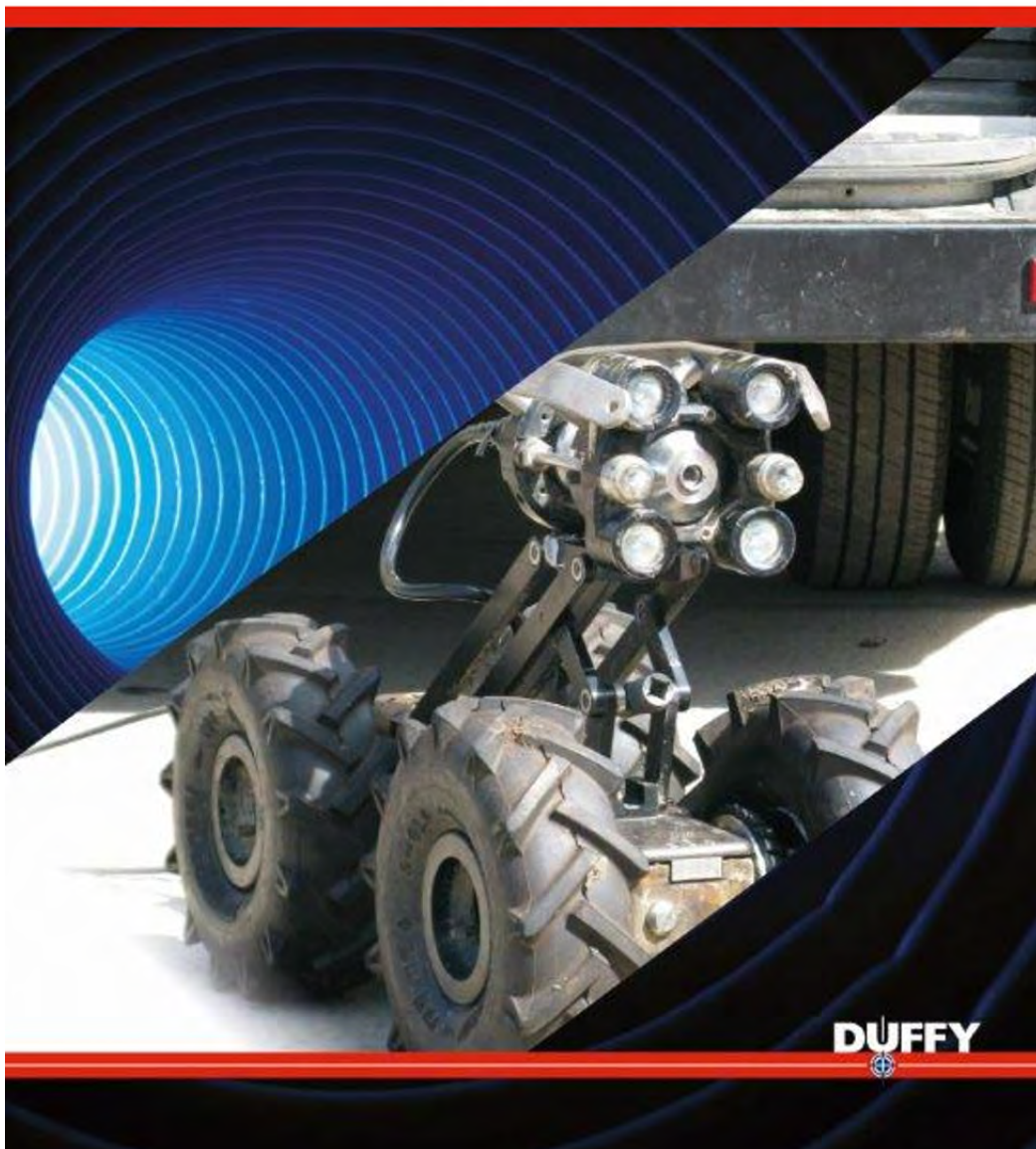




Table of Contents

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020

Project Information	P-1
Scoring Summary	P-2
Project Pictures	P-3
Defect Grade Description (Section)	P-8
Project Summary	P-9
Section: 1; CW1 > CW2 (CW1X)	1
Section: 2; CW2 > CW3 (CW2X)	2
Section: 3; CW3 > CW4 (CW3X)	4
Section: 4; CW4 > CW5 (CW4X)	5
Section: 5; CW5 > CW6 (CW5X)	6
Section: 6; SW1 > Outlet (SW1X)	7
Section: 7; Inlet > SW1 (InletX)	9
Section: 8; SW2 > SW1 (SW2X)	10
Section: 9; SW3 > SW1 (SW3X)	12
Section: 10; Inlet1 > SW4 (Inlet1X)	14
Section: 11; SW5 > SW6 (SW5X)	16
Section: 12; SW4 > SW5 (SW4X)	17
Section: 13; SW6 > SW7 (SW6X)	19
Section: 14; SW7 > Outlet (SW7X)	20



Project Information

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020

Client

Company: Countryside Properties (uk) Ltd
Contact: Mr Adam Clarke
Street: 3200 Century Way, Thorpe Park
Town or City: Leeds
County: West Yorkshire
Post Code: LS15 8ZB
Phone: 0113 5324484
Mobile: 07468 702603

Site

Company: Countryside Properties (UK) Ltd
Contact: Mr Adam Clarke
Street: Barugh Green Road
Town or City: Barugh Green, Barnsley
County: South Yorkshire
Post Code: S75 1HH
Mobile: 07468 702603

Contractor

Company: DrainsAid
Contact: Mike Booth
Department: CCTV & Desilt supervisor
Street: Connaught House, Park View, Lofthouse Gate
Town or City: Wakefield, WF3 3HA
County: West Yorkshire
Post Code: WF3 3HA
Phone: 0800 0180123
Fax: 01132 365488
Mobile: 07507 816063
Email: m.booth@peterduffyLtd.com

Scoring Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
---	-----------------------	-----------------------------------

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
12	SW4X	4	Hole in drain or sewer from 11 o'clock to 1 o'clock

Service / Operational Condition

- Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.
- Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.
- Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
2	CW2X	3	Multiple defects
6	SW1X	4	Settled deposits, other, 30% cross-sectional area loss
9	SW3X	4	Settled deposits, other, 25% cross-sectional area loss
10	Inlet1X	5	Other obstacles from 11 o'clock to 1 o'clock, 5% cross-sectional area loss
13	SW6X	3	Connection defective, connecting pipe is intruding at 10 o'clock, diameter: 225mm, intrusion: 10%

Abandoned Surveys

Section	PLR	Description
6	SW1X	Survey abandoned
7	InletX	Survey abandoned
8	SW2X	Survey abandoned
9	SW3X	Survey abandoned

Information

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

Project Pictures

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020



CW1 UTR Cover Stuck



SW2 UTR Bolted Cover Seized

Project Pictures

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020



CW4 UTR Cover Stuck



SW8 Water Level 100% UTS

Project Pictures

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020



SW8 Location



Mh1 UTS DES 40%

Project Pictures

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020



Mh1 UTS DES 40%_1



Mh2 UTS DES 45%

Project Pictures

Project Name	Project Number	Project Date
10192590 - Barugh Green Road		07/04/2020



Mh2 Location



Mh3 UTR Cover Broken

Defect Grade Description (Section)

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
---	-----------------------	-----------------------------------

1:	<p>Brick: No structural defects.</p> <p>Pipe: No structural defects.</p> <p>Acceptable structural condition.</p>
2:	<p>Brick: Circumferential cracking; single longitudinal crack; surface mortar loss (depth missing < 15mm); surface damage - slight spalling (breaking away of small fragments from the surface); surface damage - slight wear (increased roughness).</p> <p>Pipe: Circumferential crack; moderate joint defects (i.e. medium open joint or medium displaced joint); surface damage - slight spalling (breaking away of small fragments from the surface) or slight wear (increased roughness).</p> <p>Minimal collapse likelihood in the short term but potential for further deterioration.</p>
3:	<p>Brick: Medium mortar loss (depth missing 15-50mm) without other defects; more than one longitudinal crack (at a single location); multiple cracking; single bricks displaced; deformation < 5%; no fracture and only moderate mortar loss; surface damage - medium spalling (large areas of chipped brick); surface damage - medium wear (large area of brick surface is missing).</p> <p>Pipe: Fracture with no deformation or deformation < 5%; longitudinal cracking or multiple cracking; minor loss of level; severe joint defects (i.e. large open joint or large displaced joint); surface damage - partial area of pipe surface is missing or worn.</p> <p>! Collapse unlikely in the near future but further deterioration likely !</p>
4:	<p>Brick: Total mortar loss (depth missing > 50mm) with deformation > 10%; deformation up to 10% and fractured; displaced or hanging brickwork; small number of missing bricks; dropped invert (drop > 20mm); moderate loss of level; surface damage - large spalling (entire surface of brick is missing); surface damage - large wear (entire surface of brick is missing).</p> <p>Pipe: Broken; deformation up to 10% and broken; fracture with deformation 5-10%; multiple fractures; serious loss of level; serious joint defects with voids or soil visible (open joint with > 50mm soil or void visible or joint displacement > 25% of diameter); surface damage - entire area of pipe surface is missing or severely worn.</p> <p>!! Collapse likely in the foreseeable future !!</p>
5:	<p>Brick: Already collapsed; missing Invert; deformation > 10% and fractured; displaced or hanging brickwork and deformation < 10%; extensive areas of missing brickwork.</p> <p>Pipe: Already collapsed; deformation > 10% and broken; extensive areas of pipe fabric missing; fractures with deformation > 10%</p> <p>!!! Collapsed or collapse imminent !!!</p>

Project Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
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Pipe Summary

No.	Type	PLR	Upstream Node	Downstream Node	Road	Town	Use	Mat.	Profile	Length
1	SEC	CW1X	CW1	CW2	Barugh Green Road	Barugh Green	C	CO	Circular 600mm	77.90 m
2	SEC	CW2X	CW2	CW3	Barugh Green Road	Barugh Green	C	CO	Circular 600mm	72.60 m
3	SEC	CW3X	CW3	CW4	Barugh Green Road	Barugh Green	C	CO	Circular 600mm	73.10 m
4	SEC	CW4X	CW4	CW5	Barugh Green Road	Barugh Green	C	CO	Circular 600mm	62.50 m
5	SEC	CW5X	CW5	CW6	Barugh Green Road	Barugh Green	C	CO	Circular 600mm	61.50 m
6	SEC	SW1X	SW1	OUTLET	Barugh Green Road	Barugh Green	W	CO	Circular 525mm	3.00 m
7	SEC	InletX	INLET	SW1	Barugh Green Road	Barugh Green	W	MAR	Rectangular 450/300mm	13.00 m
8	SEC	SW2X	SW2	SW1	Barugh Green Road	Barugh Green	S	VC	Circular 225mm	0.90 m
9	SEC	SW3X	SW3	SW1	Barugh Green Road	Barugh Green	S	VC	Circular 225mm	40.70 m
10	SEC	Inlet1X	INLET1	SW4	Barugh Green Road	Barugh Green	W	CO	Circular 600mm	7.40 m
11	SEC	SW5X	SW5	SW6	Barugh Green Road	Barugh Green	W	CO	Circular 600mm	19.30 m
12	SEC	SW4X	SW4	SW5	Barugh Green Road	Barugh Green	W	CO	Circular 600mm	4.90 m
13	SEC	SW6X	SW6	SW7	Barugh Green Road	Barugh Green	W	CO	Circular 600mm	36.00 m
14	SEC	SW7X	SW7	OUTLET	Barugh Green Road	Barugh Green	W	CO	Circular 600mm	5.10 m
Total:										477.90 m

Project Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
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Pipe Levels

No.	PLR	Upstream Node	Upstream C.L.	Upstream I.L.	Upstream I.D.	Downstream Node	Downstream C.L.	Downstream I.L.	Downstream I.D.
1	CW1X	CW1			0.000 m	CW2			1.850 m
2	CW2X	CW2			1.850 m	CW3			1.700 m
3	CW3X	CW3			1.700 m	CW4			0.000 m
4	CW4X	CW4			0.000 m	CW5			2.450 m
5	CW5X	CW5			2.450 m	CW6			3.700 m
6	SW1X	SW1			2.100 m	OUTLET			0.000 m
7	InletX	INLET			0.000 m	SW1			2.100 m
8	SW2X	SW2			0.000 m	SW1			2.100 m
9	SW3X	SW3			0.000 m	SW1			2.100 m
10	Inlet1X	INLET1			0.000 m	SW4			2.600 m
11	SW5X	SW5			0.000 m	SW6			2.340 m
12	SW4X	SW4			2.600 m	SW5			0.000 m
13	SW6X	SW6			2.340 m	SW7			0.000 m
14	SW7X	SW7			0.000 m	OUTLET			0.000 m

Pipe Summary by Profile

Profile	Total Length	No. Pipes
Circular 225mm	0.90 m	
Circular 225mm	40.70 m	
Circular 225mm	= 41.60 m	2
Circular 525mm	3.00 m	
Circular 525mm	= 3.00 m	1
Circular 600mm	77.90 m	
Circular 600mm	72.60 m	
Circular 600mm	73.10 m	
Circular 600mm	62.50 m	
Circular 600mm	61.50 m	
Circular 600mm	7.40 m	
Circular 600mm	19.30 m	
Circular 600mm	4.90 m	
Circular 600mm	36.00 m	
Circular 600mm	5.10 m	

Project Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
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Profile		Total Length	No. Pipes
Circular 600mm	=	420.30 m	10
Rectangular 450/300mm		13.00 m	
Rectangular 450/300mm	=	13.00 m	1
Total	=	477.90 m	14

Inspection Summary

Pipe No.	Insp. No.	Upstream Node	Downstream Node	Dir.	Operator	Insp. Date	Insp. Time	Str	Ser	Final Observation	Length
1	1	CW1	CW2	US	C.Chilton	07/04/2020	20:40	1	1	MHF	77.90 m
2	1	CW2	CW3	DS	C.Chilton	07/04/2020	21:01	3	1	MHF	72.60 m
3	1	CW3	CW4	DS	C.Chilton	07/04/2020	21:16	1	1	MHF	73.10 m
4	1	CW4	CW5	DS	C.Chilton	07/04/2020	22:59	1	1	MHF	62.50 m
5	1	CW5	CW6	DS	C.Chilton	07/04/2020	23:05	1	1	MHF	61.50 m
6	1	SW1	OUTLET	DS	C.Chilton	07/04/2020	23:43	4	1	SA, DEX 30%	3.00 m
7	1	INLET	SW1	US	C.Chilton	08/04/2020	0:30	1	1	SA, SCR	0.40 m
8	1	SW2	SW1	US	C.Chilton	08/04/2020	0:36	5	1	SA, RTJ	0.90 m
9	1	SW3	SW1	US	C.Chilton	08/04/2020	0:43	4	1	SA, DEX 20% Mud	40.70 m
10	1	INLET1	SW4	US	C.Chilton	08/04/2020	20:28	5	1	OFF	7.40 m
11	1	SW5	SW6	US	C.Chilton	08/04/2020	20:52	1	1	MHF, Buried Possible Blind Chamber	19.30 m
12	1	SW4	SW5	US	C.Chilton	08/04/2020	21:00	1	4	CPF	4.90 m
13	1	SW6	SW7	DS	C.Chilton	08/04/2020	22:15	3	1	MHF, Buried Possible Blind Chamber	36.00 m
14	1	SW7	OUTLET	DS	C.Chilton	08/04/2020	22:24	1	1	OFF	5.10 m
Total:											465.30 m

Inspection Summary by Profile

Profile		Total Length	No. Inspections
Circular 225mm		0.90 m	
Circular 225mm		40.70 m	
Circular 225mm	=	41.60 m	2
Circular 525mm		3.00 m	

Project Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
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Profile		Total Length	No. Inspections
Circular 525mm	=	3.00 m	1
Circular 600mm		77.90 m	
Circular 600mm		72.60 m	
Circular 600mm		73.10 m	
Circular 600mm		62.50 m	
Circular 600mm		61.50 m	
Circular 600mm		7.40 m	
Circular 600mm		19.30 m	
Circular 600mm		4.90 m	
Circular 600mm		36.00 m	
Circular 600mm		5.10 m	
Circular 600mm	=	420.30 m	10
Rectangular 450/300mm		0.40 m	
Rectangular 450/300mm	=	0.40 m	1
Total	=	465.30 m	14

Defect Summary				CCTV Drainage Survey Observation Count																				
				General				Structural Condition								Service Condition								
Sect. No.	Insp. No.	Upstream Node	Downstream Node	Insp. Length (m)	No. Grade 4/5 Obs.	Survey Abandoned	Camera Under Water	Cracks	Fractures	Broken	Deformed	Collapsed	Holes	Surface Damage	Displaced Joints	Open Joints	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Level	Line Deviates
1	1	CW1	CW2	77.9																			1	
2	1	CW2	CW3	72.6																			1	
3	1	CW3	CW4	73.1																			1	
4	1	CW4	CW5	62.5																			1	
5	1	CW5	CW6	61.5																			2	
6	1	SW1	OUTLET	3.0		1																	1	
7	1	INLET	SW1	0.4		1																	1	
8	1	SW2	SW1	0.9	1	1											1						1	
9	1	SW3	SW1	40.7		1																	1	
10	1	INLET1	SW4	7.4	1													1				1	1	



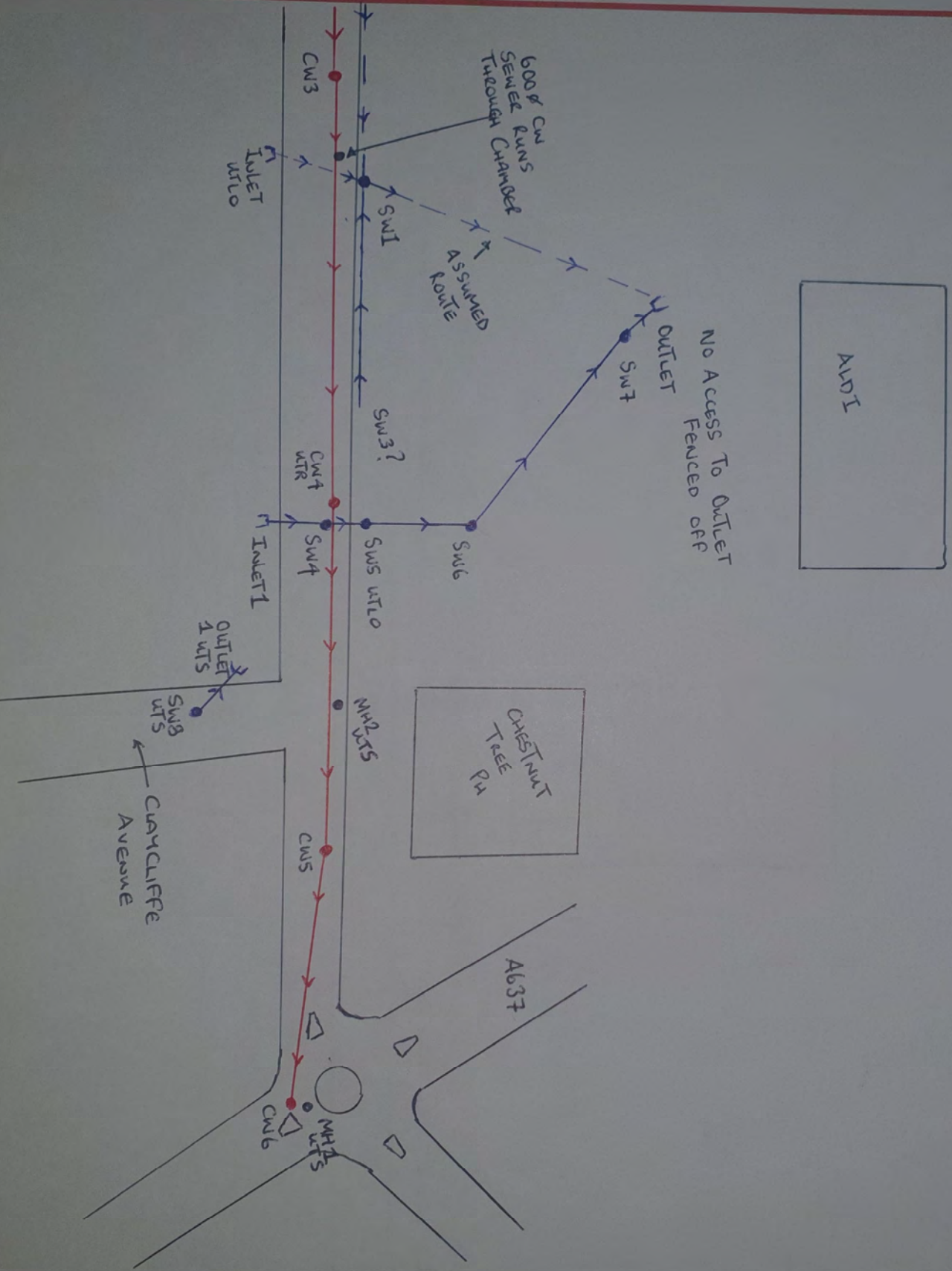
Project Summary

Project Name 10192590 - Barugh Green Road	Project Number	Project Date 07/04/2020
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Sect. No.	Insp. No.	Upstream Node	Downstream Node	Insp. Length (m)	No. Grade 4/5 Obs.	Survey Abandoned	Camera Under Water	Cracks	Fractures	Broken	Deformed	Collapsed	Holes	Surface Damage	Displaced Joints	Open Joints	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Level	Line Deviates
11	1	SW5	SW6	19.3																			1	
12	1	SW4	SW5	4.9	1								1										1	
13	1	SW6	SW7	36.0																			1	1
14	1	SW7	OUTLET	5.1																			1	
Total:				465.3	3	4											1	1				1	15	1

DrainsAid

First Aid For All Your Drains

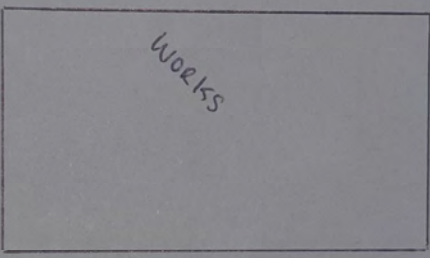
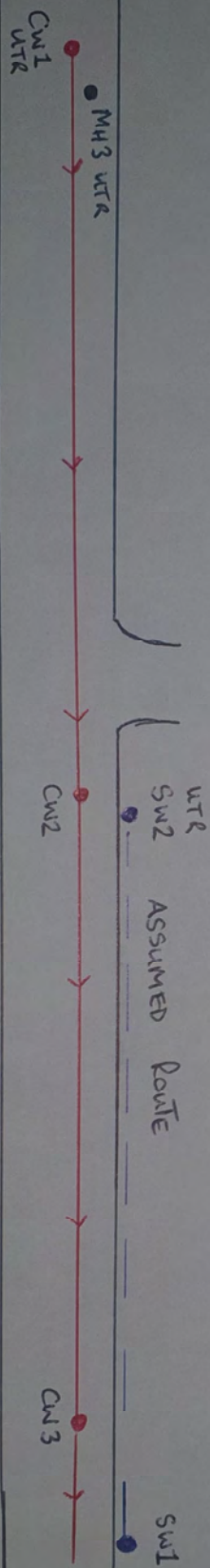


DrainsAid

Connaught House
Park View
Lofthouse Gate
Wakefield WF3 3HA

Telephone: 01132 365380
Facsimile: 01132 365488
Internet: www.drains-aid.com
E-mail: info@drains-aid.com

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Section Inspection - 07/04/2020 - CW1X

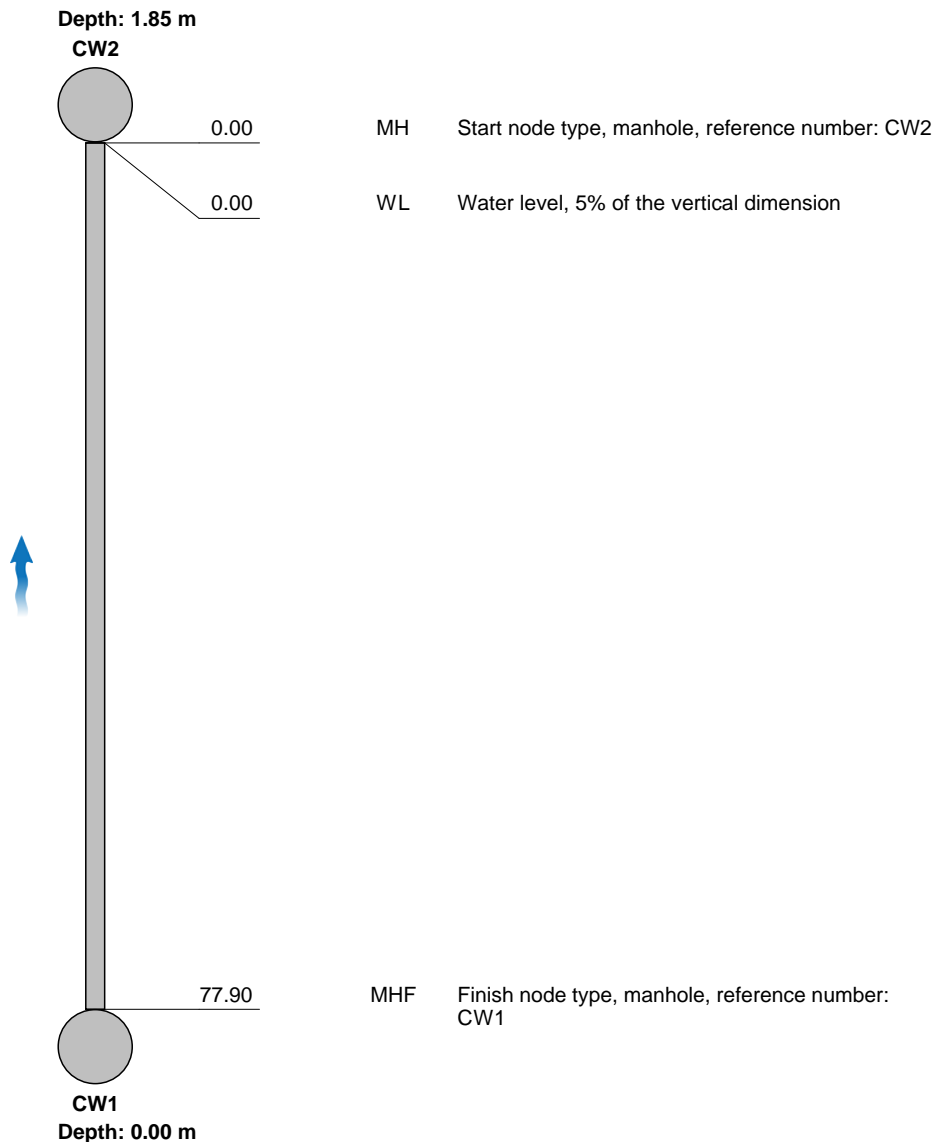
Section 1	Inspection 1	Date 07/04/20	Time 20:40	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR CW1X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	CW1
Road:	Barugh Green Road	Inspected Length:	77.90 m	Upstream Pipe Depth:	0.000 m
Location:	Road	Total Length:	77.90 m	Downstream Node:	CW2
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	1.850 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:678 Position [m] Code Observation Grade



STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
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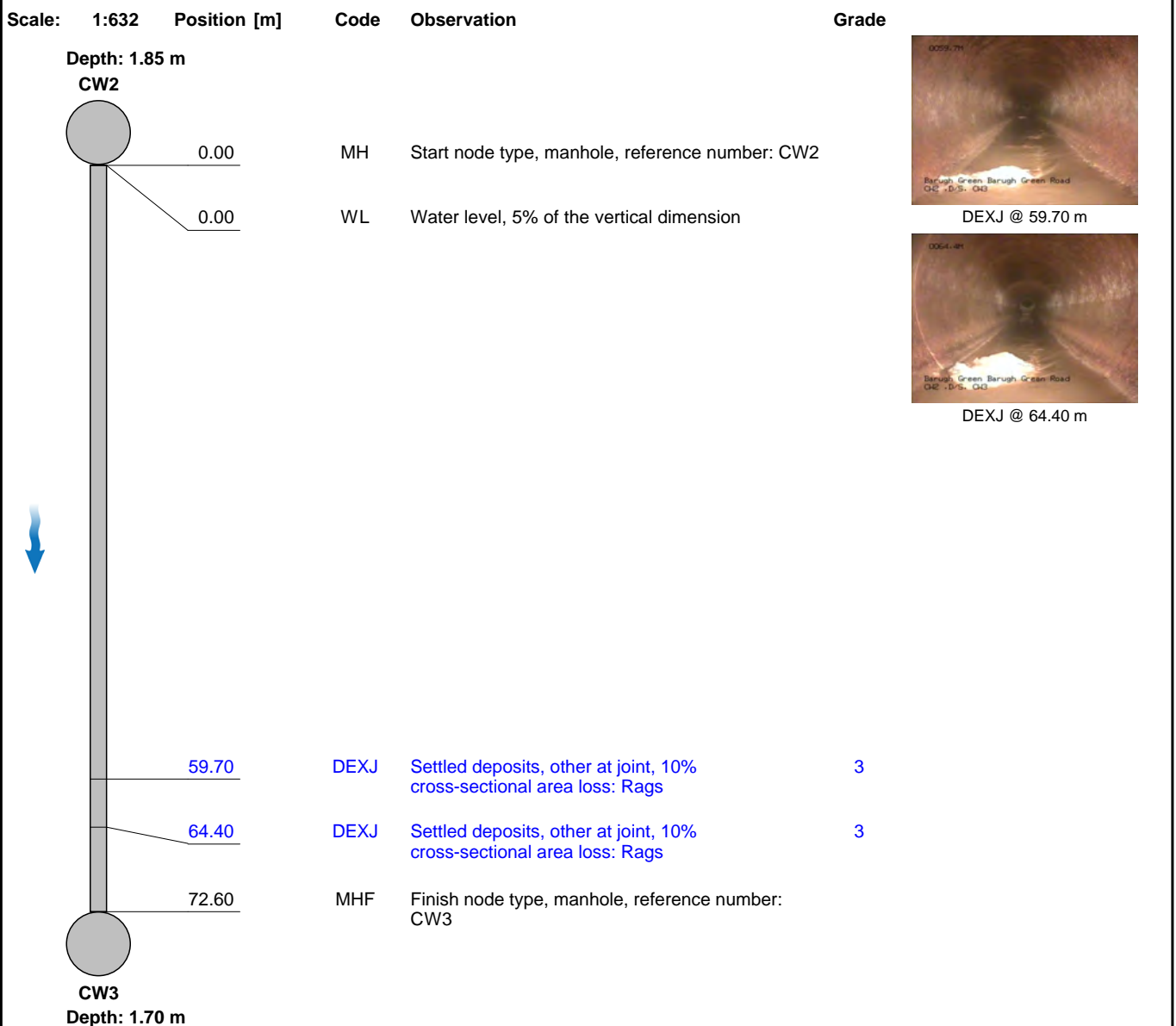
Section Inspection - 07/04/2020 - CW2X

Section 2	Inspection 2	Date 07/04/20	Time 21:01	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR CW2X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	CW2
Road:	Barugh Green Road	Inspected Length:	72.60 m	Upstream Pipe Depth:	1.850 m
Location:	Road	Total Length:	72.60 m	Downstream Node:	CW3
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	1.700 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

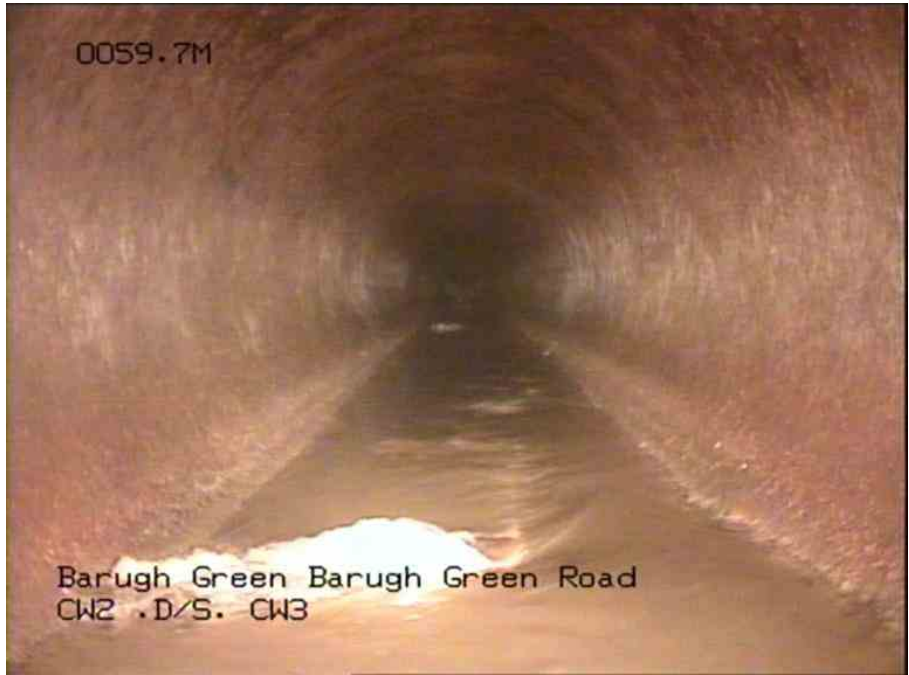
Recommendations:



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	2	2.0	0.1	4.0	3.0

Section Pictures - 07/04/2020 - CW2X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	CW2X		10192590



1, 00:03:22, 59.70 m
Settled deposits, other at joint, 10% cross-sectional area loss, Rags

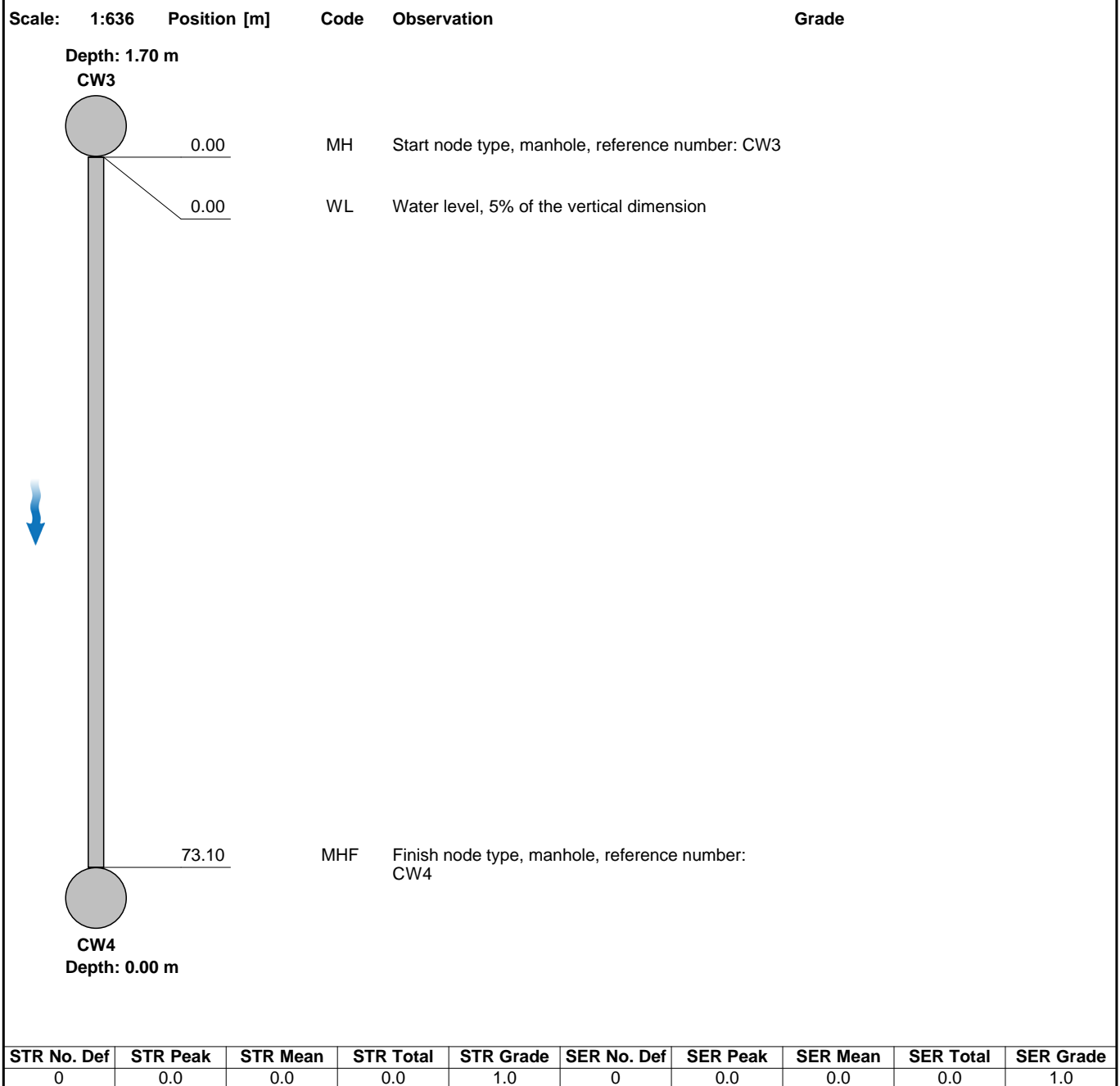


2, 00:03:42, 64.40 m
Settled deposits, other at joint, 10% cross-sectional area loss, Rags

Section Inspection - 07/04/2020 - CW3X

Section 3	Inspection 3	Date 07/04/20	Time 21:16	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR CW3X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 0.00 m	Legal Status Public Sewer	Alternative ID Not Specified

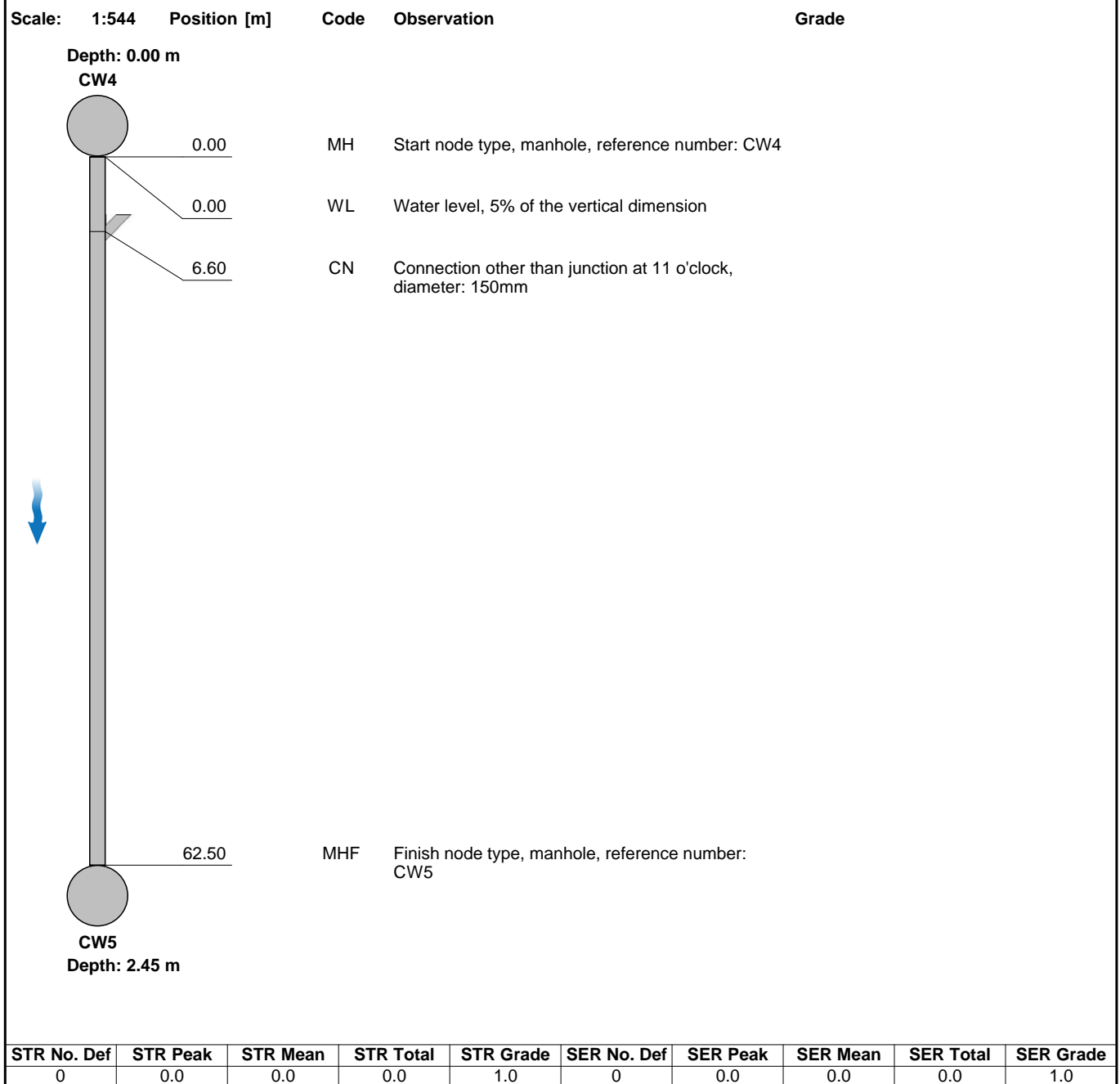
Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	CW3
Road:	Barugh Green Road	Inspected Length:	73.10 m	Upstream Pipe Depth:	1.700 m
Location:	Road	Total Length:	73.10 m	Downstream Node:	CW4
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	0.000 m
Use:	Combined	Pipe Shape:	Circular	Year Constructed:	
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm	Flow Control:	No flow control
Inspection Purpose:	Sample survey to determine asset condition	Lining Type:	No Lining	Inspection Purpose:	Sample survey to determine asset condition
Comments:	UTR CW4 Cover Stuck				
Recommendations:					



Section Inspection - 07/04/2020 - CW4X

Section 4	Inspection 4	Date 07/04/20	Time 22:59	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR CW4X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 0.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	CW4
Road:	Barugh Green Road	Inspected Length:	62.50 m	Upstream Pipe Depth:	0.000 m
Location:	Road	Total Length:	62.50 m	Downstream Node:	CW5
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	2.450 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		
Comments:	UTR CW4 Cover Stuck				
Recommendations:					



Section Inspection - 07/04/2020 - CW5X

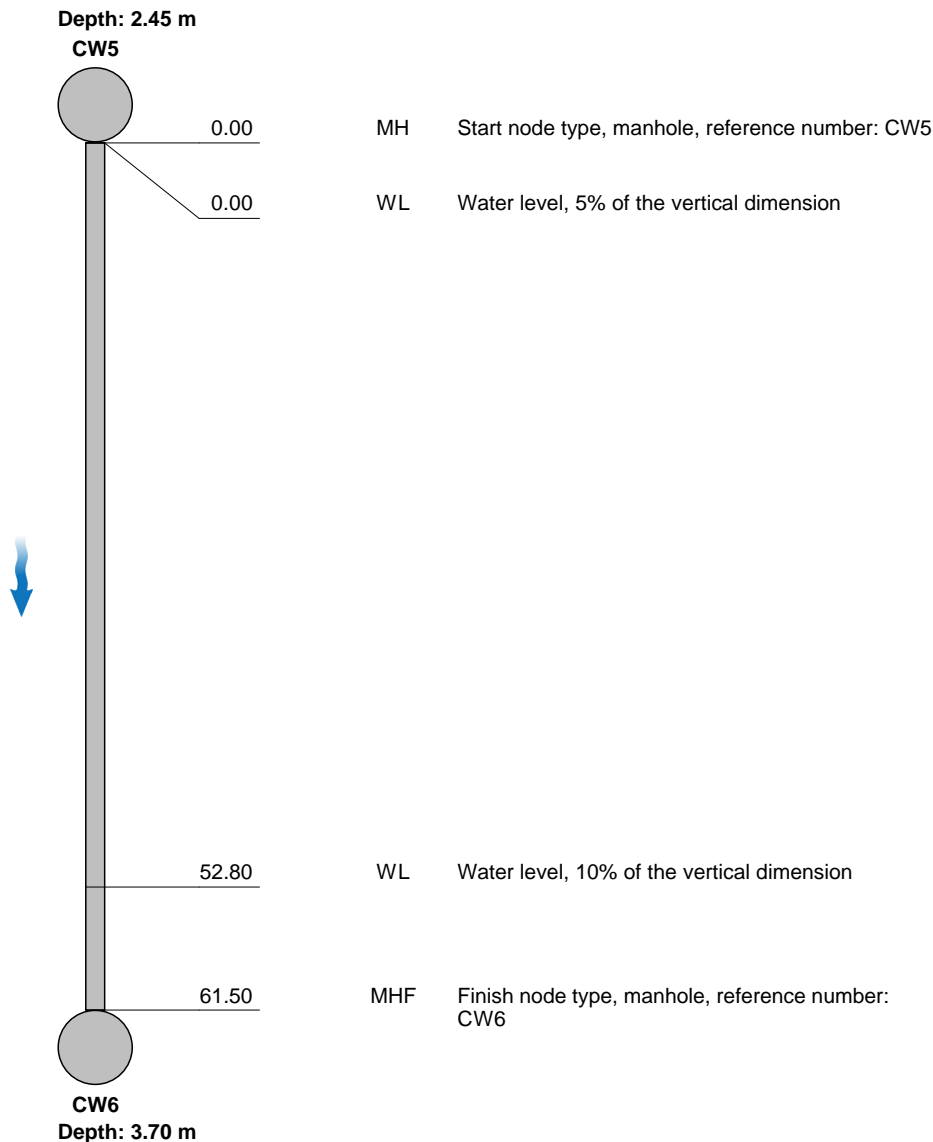
Section 5	Inspection 5	Date 07/04/20	Time 23:05	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR CW5X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 0.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	CW5
Road:	Barugh Green Road	Inspected Length:	61.50 m	Upstream Pipe Depth:	2.450 m
Location:	Road	Total Length:	61.50 m	Downstream Node:	CW6
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	3.700 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:535 Position [m] Code Observation Grade



STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
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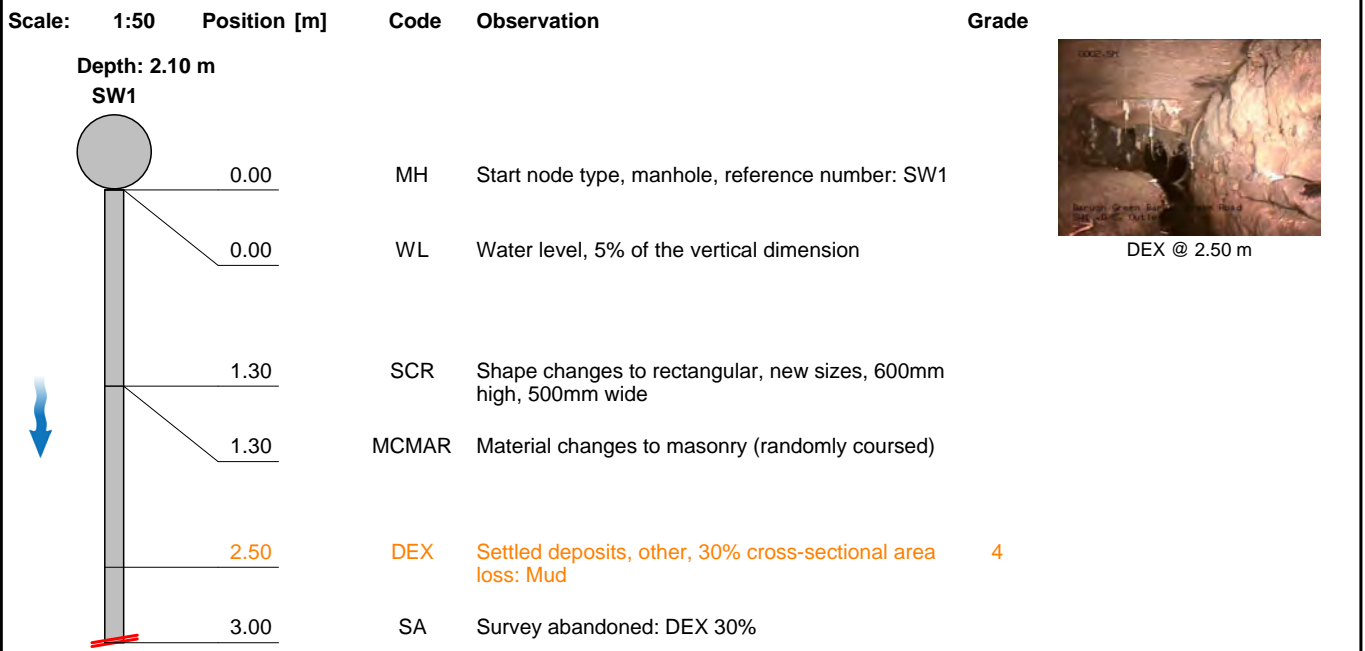
Section Inspection - 07/04/2020 - SW1X

Section 6	Inspection 6	Date 07/04/20	Time 23:43	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW1X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	SW1
Road:	Barugh Green Road	Inspected Length:	3.00 m	Upstream Pipe Depth:	2.100 m
Location:	A footway beside a road	Total Length:	3.00 m	Downstream Node:	OUTLET
Surface Type:	Asphalt Footway	Joint Length:	2.50 m	Downstream Pipe Depth:	0.000 m
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	525 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:



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	1	5.0	2.0	5.0	4.0

Section Pictures - 07/04/2020 - SW1X

Section 6	Inspection Direction Downstream	PLR SW1X	Client's Job Ref	Contractor's Job Ref 10192590
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1, 00:00:54, 2.50 m
Settled deposits, other, 30% cross-sectional area loss, Mud

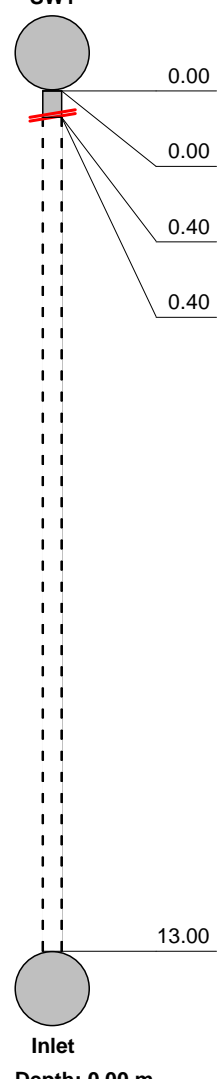
Section Inspection - 08/04/2020 - InletX

Section 7	Inspection 7	Date 08/04/20	Time 0:30	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR INLETX
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	INLET
Road:	Barugh Green Road	Inspected Length:	0.40 m	Upstream Pipe Depth:	0.000 m
Location:	A footway beside a road	Total Length:	13.00 m	Downstream Node:	SW1
Surface Type:	Asphalt Footway	Joint Length:	0.00 m	Downstream Pipe Depth:	2.100 m
Use:	Culverted watercourse	Pipe Shape:	Rectangular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	450 mm	Width:	300 mm
Year Constructed:		Pipe Material:	Masonry (randomly coursed)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale:	1:114	Position [m]	Code	Observation	Grade																				
<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>Depth: 2.10 m</p> <p>SW1</p>  </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">0.00</td> <td style="width: 10%;">MH</td> <td style="width: 45%;">Start node type, manhole, reference number: SW1</td> <td style="width: 10%;"></td> </tr> <tr> <td>0.00</td> <td>WL</td> <td>Water level, 5% of the vertical dimension</td> <td></td> </tr> <tr> <td>0.40</td> <td>SCR</td> <td>Shape changes to rectangular, new sizes, 150mm high, 300mm wide</td> <td></td> </tr> <tr> <td>0.40</td> <td>SA</td> <td>Survey abandoned: SCR</td> <td></td> </tr> <tr> <td>13.00</td> <td></td> <td>End of pipe</td> <td></td> </tr> </table> </div>						0.00	MH	Start node type, manhole, reference number: SW1		0.00	WL	Water level, 5% of the vertical dimension		0.40	SCR	Shape changes to rectangular, new sizes, 150mm high, 300mm wide		0.40	SA	Survey abandoned: SCR		13.00		End of pipe	
0.00	MH	Start node type, manhole, reference number: SW1																							
0.00	WL	Water level, 5% of the vertical dimension																							
0.40	SCR	Shape changes to rectangular, new sizes, 150mm high, 300mm wide																							
0.40	SA	Survey abandoned: SCR																							
13.00		End of pipe																							
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 Inspection - 08/04/2020 - SW2X

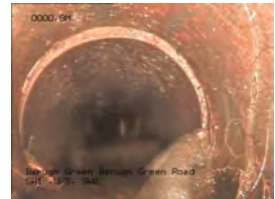
Section 8	Inspection 8	Date 08/04/20	Time 0:36	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW2X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	SW2
Road:	Barugh Green Road	Inspected Length:	0.90 m	Upstream Pipe Depth:	0.000 m
Location:	A footway beside a road	Total Length:	0.90 m	Downstream Node:	SW1
Surface Type:	Asphalt Footway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.100 m
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	225 mm		
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale:	1:50	Position [m]	Code	Observation	Grade
		Depth: 2.10 m SW1			
		0.00	MH	Start node type, manhole, reference number: SW1	
		0.00	WL	Water level, 5% of the vertical dimension	
		0.00	DEX	Settled deposits, other, 20% cross-sectional area loss: Mud	3
		0.60	JN	Junction at 10 o'clock, diameter: 150mm	
		0.80	RTJ	Roots, tap at joint	4
		0.90	SA	Survey abandoned: RTJ	

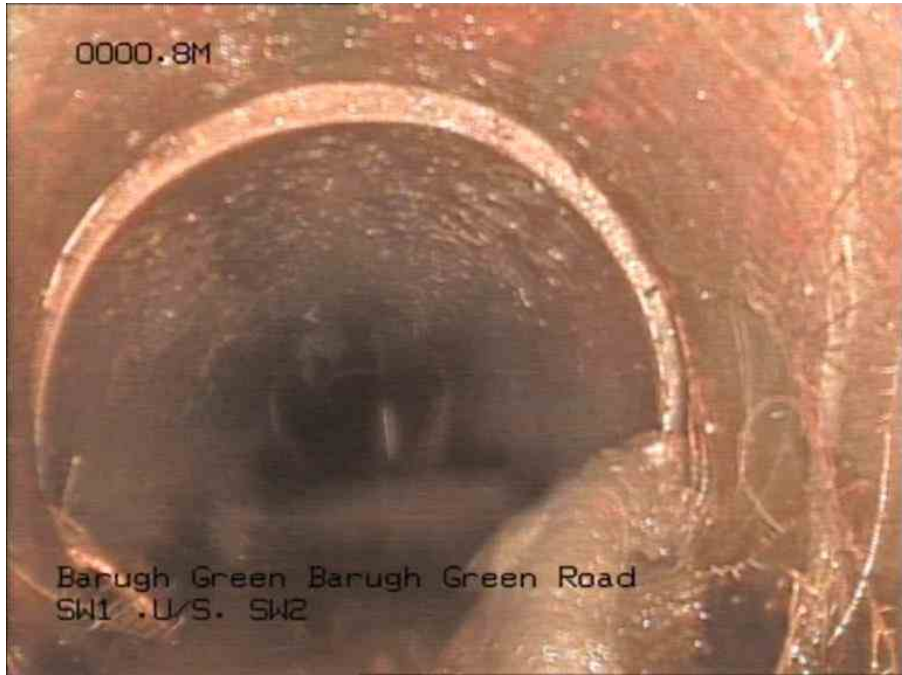


RTJ @ 0.80 m

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	2	5.0	8.8	7.0	5.0

Section Pictures - 08/04/2020 - SW2X

Section 8	Inspection Direction Upstream	PLR SW2X	Client's Job Ref	Contractor's Job Ref 10192590
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1, 00:01:10, 0.80 m
Roots, tap at joint

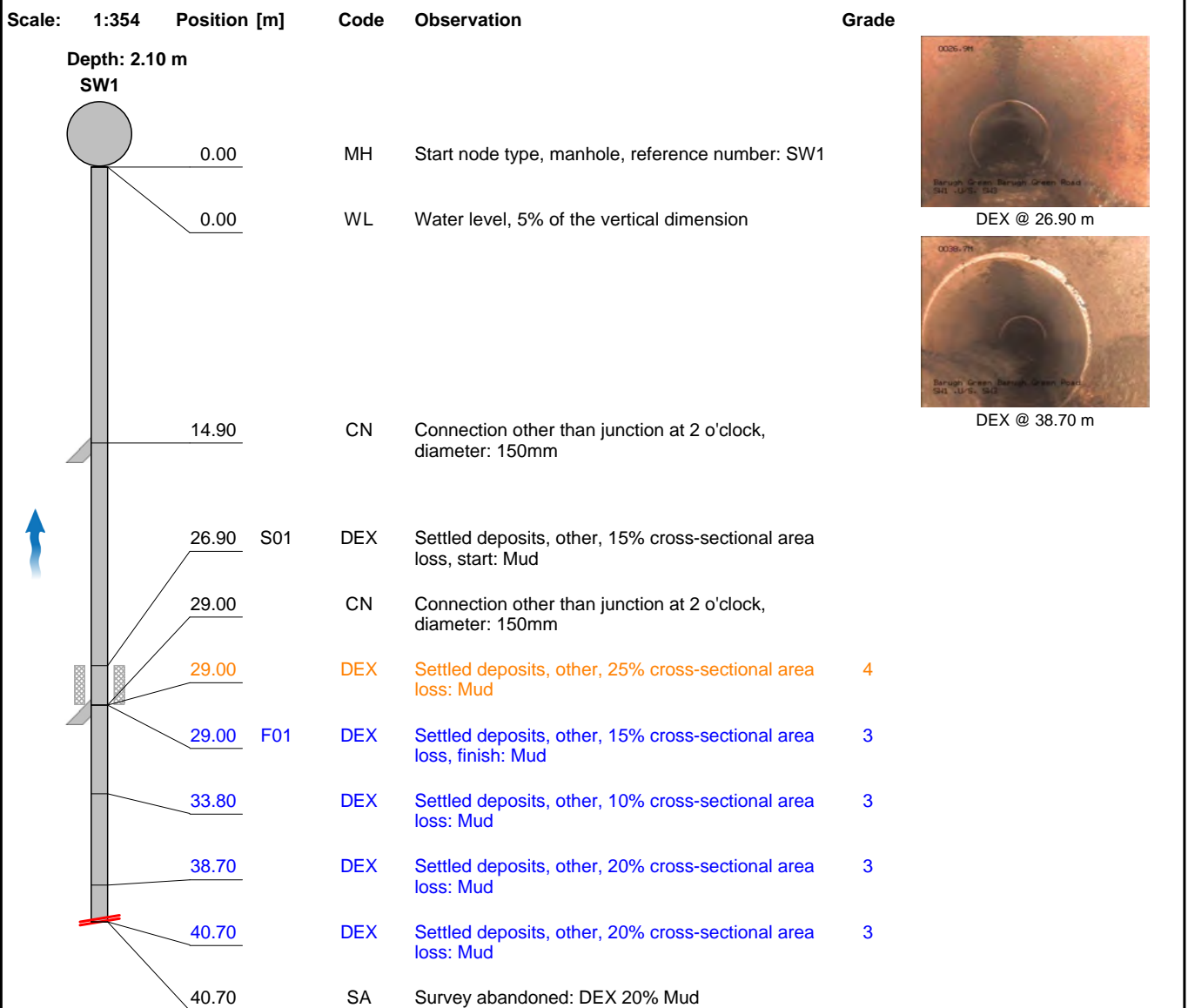
Section Inspection - 08/04/2020 - SW3X

Section 9	Inspection 9	Date 08/04/20	Time 0:43	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW3X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	SW3
Road:	Barugh Green Road	Inspected Length:	40.70 m	Upstream Pipe Depth:	
Location:	A footway beside a road	Total Length:	40.70 m	Downstream Node:	SW1
Surface Type:	Asphalt Footway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.100 m
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	225 mm		
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:



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	5	7.0	0.4	17.0	4.0

Section Pictures - 08/04/2020 - SW3X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
9	Upstream	SW3X		10192590



1, 00:03:00, 26.90 m
 Settled deposits, other, 15% cross-sectional area loss, start, Mud



2, 00:05:35, 38.70 m
 Settled deposits, other, 20% cross-sectional area loss, Mud

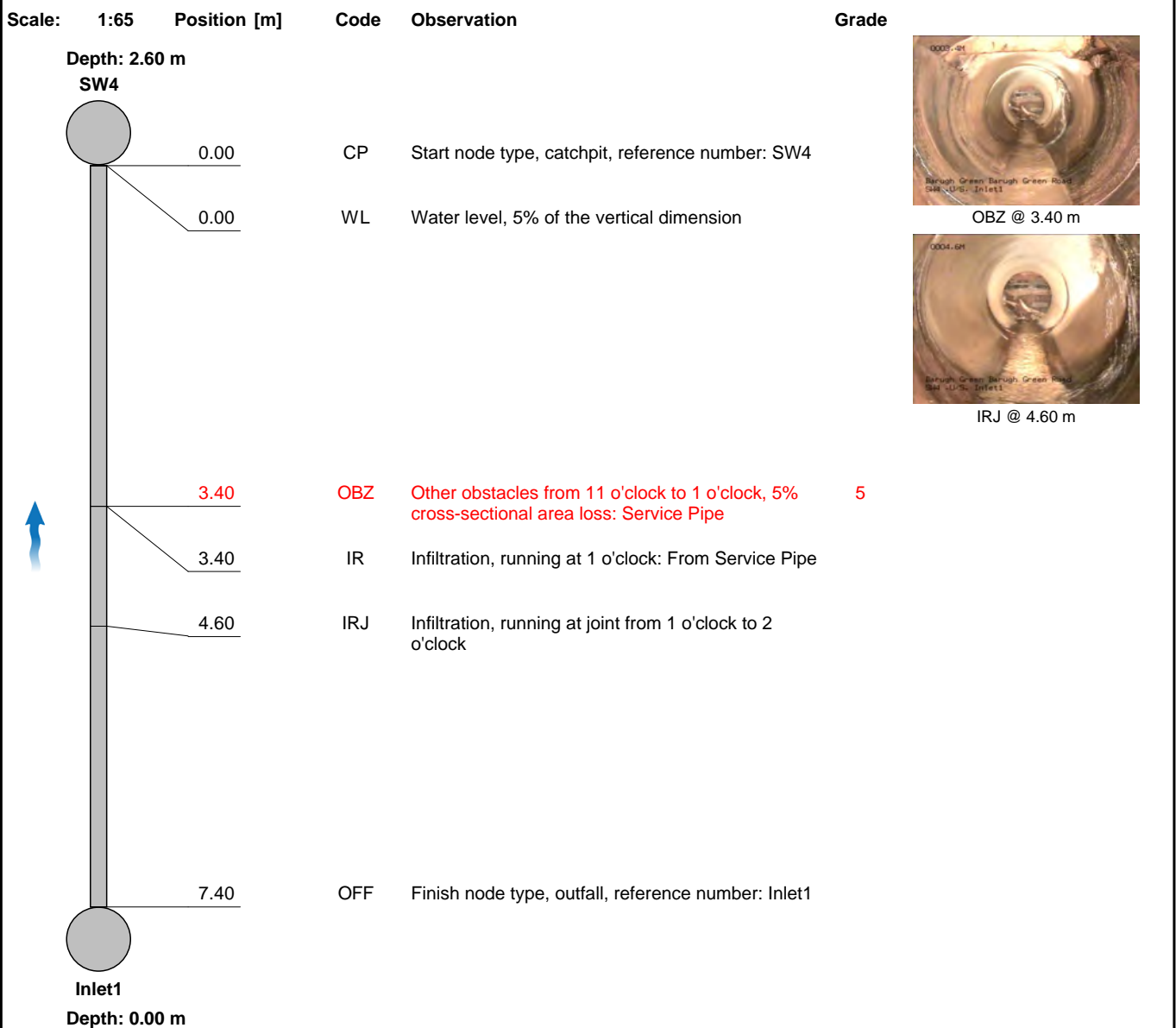
Section Inspection - 08/04/2020 - Inlet1X

Section 10	Inspection 10	Date 08/04/20	Time 20:28	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR INLET1X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	INLET1
Road:	Barugh Green Road	Inspected Length:	7.40 m	Upstream Pipe Depth:	0.000 m
Location:	Road	Total Length:	7.40 m	Downstream Node:	SW4
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	2.600 m
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:



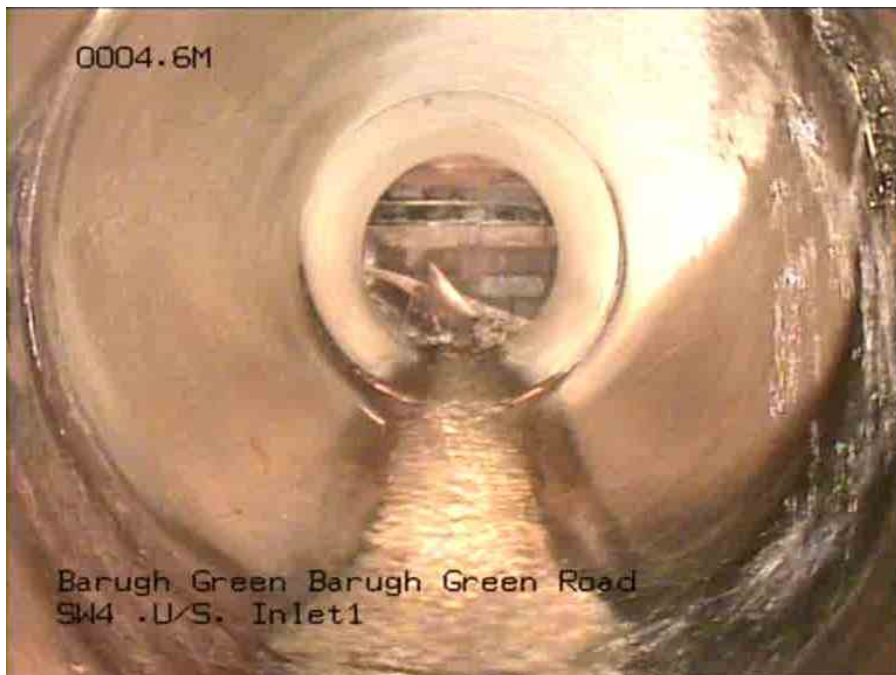
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	10.0	2.2	10.0	5.0

Section Pictures - 08/04/2020 - Inlet1X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
10	Upstream	INLET1X		10192590



1, 00:00:47, 3.40 m
 Other obstacles from 11 o'clock to 1 o'clock, 5% cross-sectional area loss, Service Pipe



2, 00:01:03, 4.60 m
 Infiltration, running at joint from 1 o'clock to 2 o'clock

Section Inspection - 08/04/2020 - SW5X

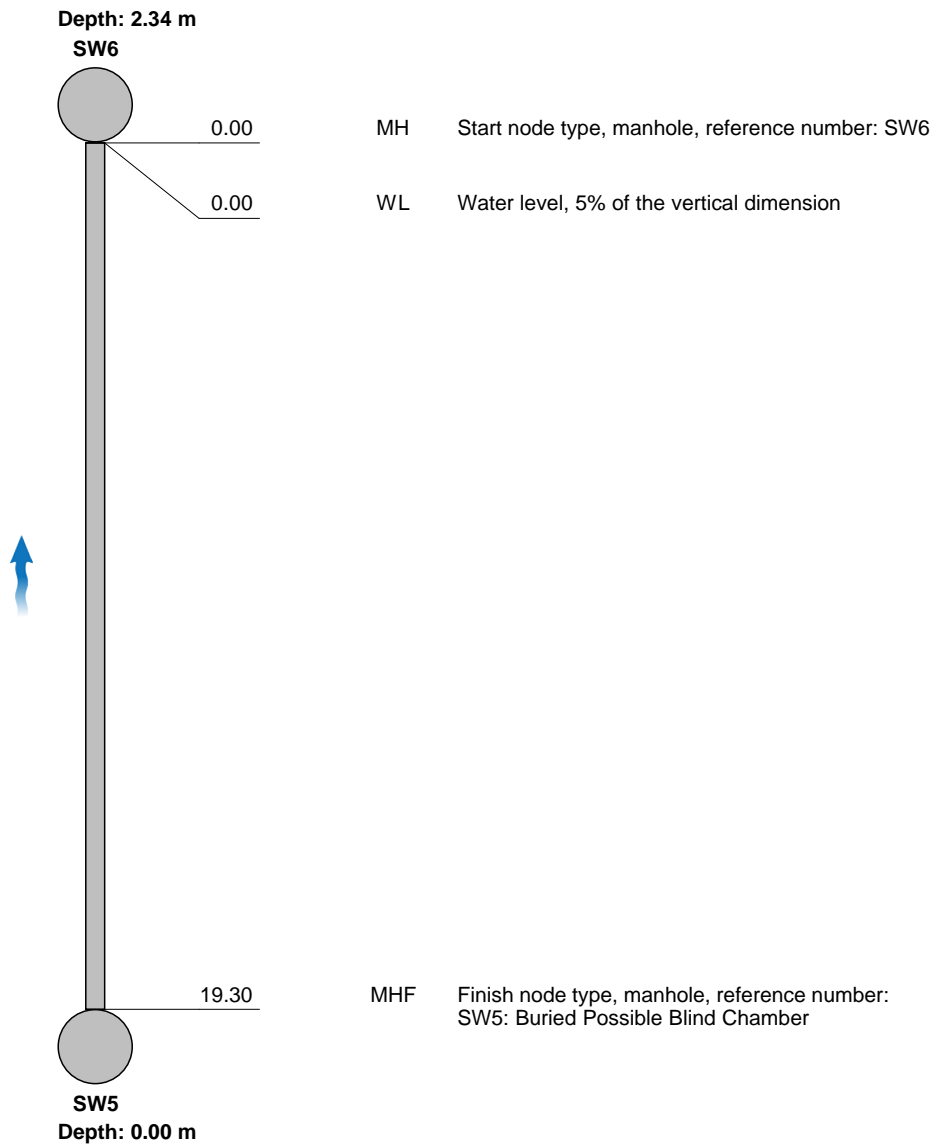
Section 11	Inspection 11	Date 08/04/20	Time 20:52	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW5X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	SW5
Road:	Barugh Green Road	Inspected Length:	19.30 m	Upstream Pipe Depth:	0.000 m
Location:	Road	Total Length:	19.30 m	Downstream Node:	SW6
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	2.340 m
Use:	Culverted watercourse	Pipe Shape:	Circular	Dia/Height:	600 mm
Type of Pipe:	Gravity drain/sewer	Pipe Material:	Concrete	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	No flow control				
Inspection Purpose:	Sample survey to determine asset condition				

Comments:

Recommendations:

Scale: 1:168 Position [m] Code Observation Grade



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

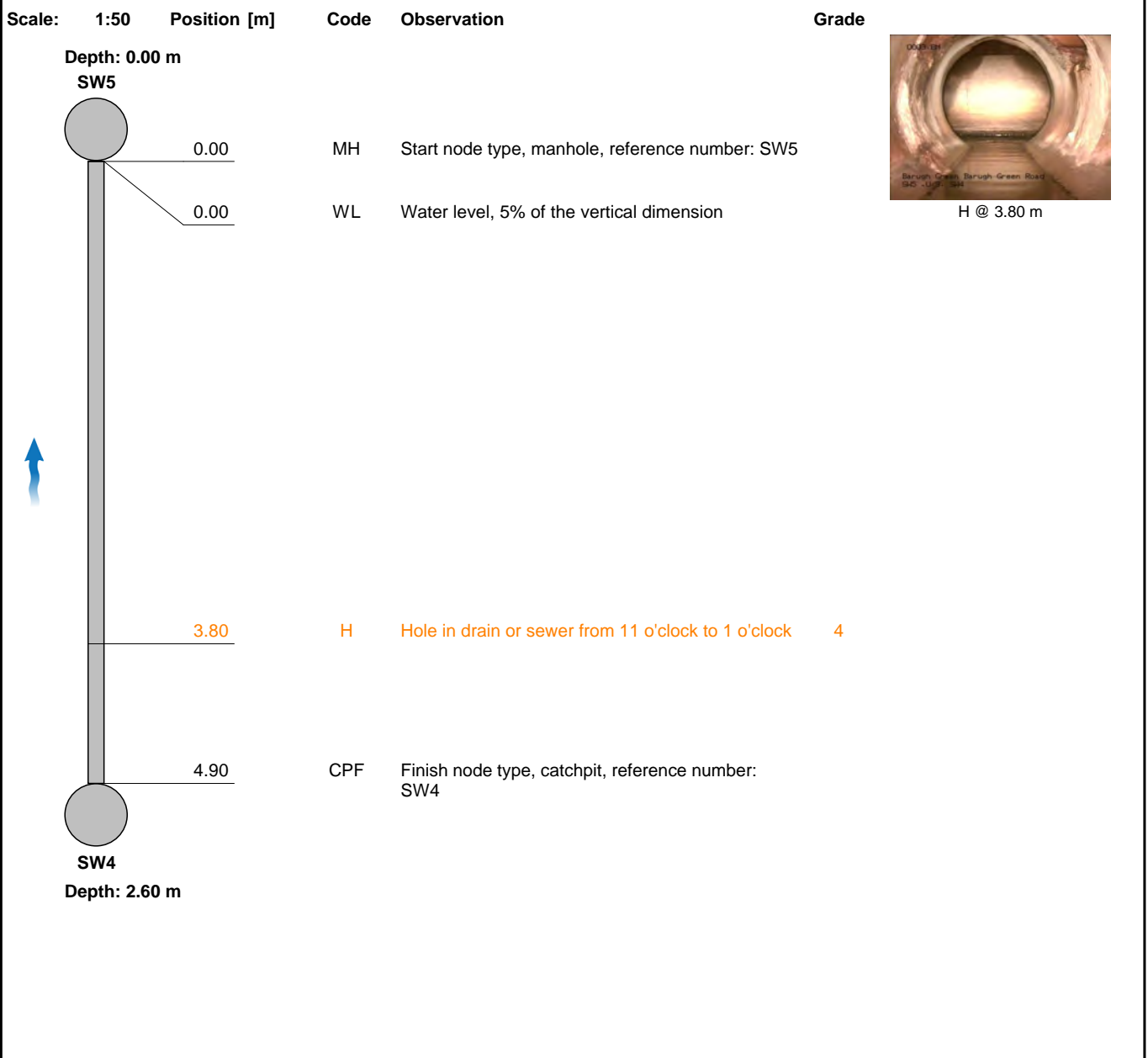
Section Inspection - 08/04/2020 - SW4X

Section 12	Inspection 12	Date 08/04/20	Time 21:00	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW4X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 0.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Upstream	Upstream Node:	SW4
Road:	Barugh Green Road	Inspected Length:	4.90 m	Upstream Pipe Depth:	2.600 m
Location:	Road	Total Length:	4.90 m	Downstream Node:	SW5
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	0.000 m
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:



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	21.1	80.0	4.0	0	0.0	0.0	0.0	1.0

Section Pictures - 08/04/2020 - SW4X

Section 12	Inspection Direction Upstream	PLR SW4X	Client's Job Ref	Contractor's Job Ref 10192590
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1, 00:00:31, 3.80 m
Hole in drain or sewer from 11 o'clock to 1 o'clock

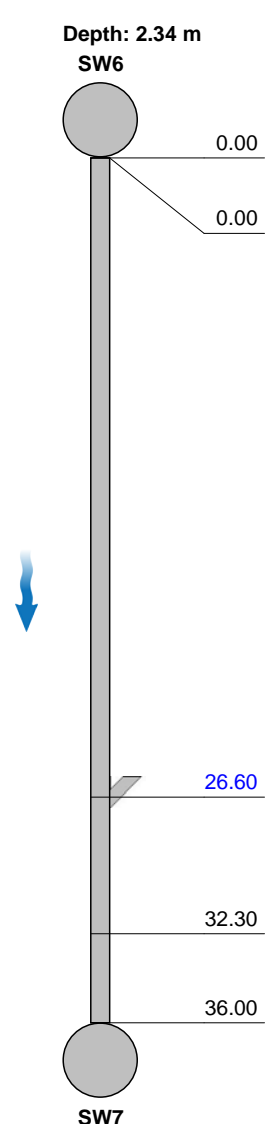
Section Inspection - 08/04/2020 - SW6X

Section 13	Inspection 13	Date 08/04/20	Time 22:15	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW6X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 1.30 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	SW6
Road:	Barugh Green Road	Inspected Length:	36.00 m	Upstream Pipe Depth:	2.340 m
Location:	Road	Total Length:	36.00 m	Downstream Node:	SW7
Surface Type:	Asphalt Highway	Joint Length:	2.50 m	Downstream Pipe Depth:	0.000 m
Use:	Culverted watercourse	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale:	1:314	Position [m]	Code	Observation	Grade																				
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Depth: 2.34 m SW6</p>  </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">0.00</td> <td style="width: 10%;">MH</td> <td style="width: 50%;">Start node type, manhole, reference number: SW6</td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;">0.00</td> <td>WL</td> <td>Water level, 5% of the vertical dimension</td> <td></td> </tr> <tr> <td style="text-align: center;">26.60</td> <td>CXI</td> <td>Connection defective, connecting pipe is intruding at 10 o'clock, diameter: 225mm, intrusion: 10%</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">32.30</td> <td>LR</td> <td>Line deviates right: Slight</td> <td></td> </tr> <tr> <td style="text-align: center;">36.00</td> <td>MHF</td> <td>Finish node type, manhole, reference number: SW7: Buried Possible Blind Chamber</td> <td></td> </tr> </table> </div>						0.00	MH	Start node type, manhole, reference number: SW6		0.00	WL	Water level, 5% of the vertical dimension		26.60	CXI	Connection defective, connecting pipe is intruding at 10 o'clock, diameter: 225mm, intrusion: 10%	3	32.30	LR	Line deviates right: Slight		36.00	MHF	Finish node type, manhole, reference number: SW7: Buried Possible Blind Chamber	
0.00	MH	Start node type, manhole, reference number: SW6																							
0.00	WL	Water level, 5% of the vertical dimension																							
26.60	CXI	Connection defective, connecting pipe is intruding at 10 o'clock, diameter: 225mm, intrusion: 10%	3																						
32.30	LR	Line deviates right: Slight																							
36.00	MHF	Finish node type, manhole, reference number: SW7: Buried Possible Blind Chamber																							
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	1	2.0	0.1	2.0	3.0																

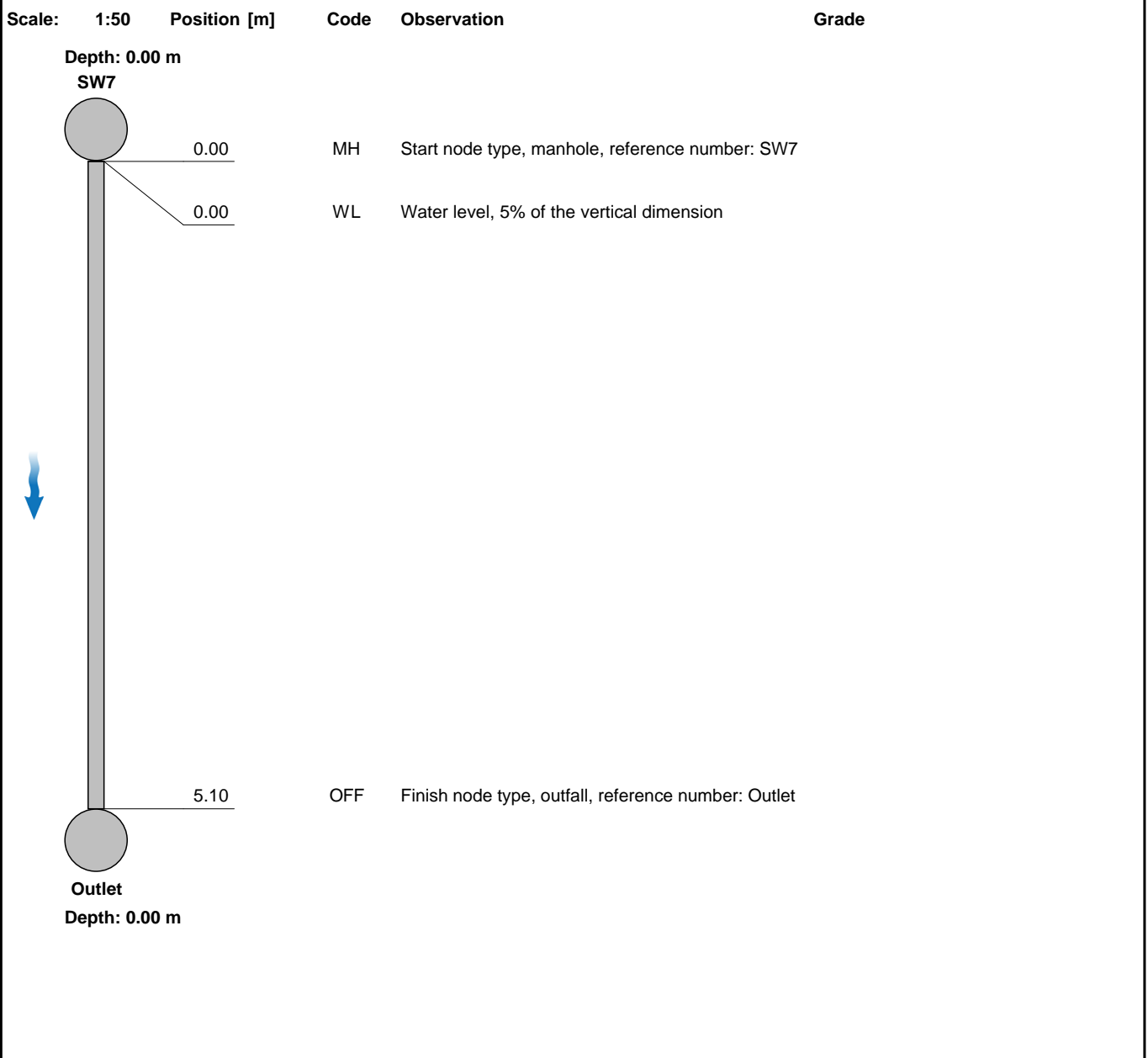
Section Inspection - 08/04/2020 - SW7X

Section 14	Inspection 14	Date 08/04/20	Time 22:24	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR SW7X
Operator C.Chilton		Vehicle YD13 JZC		Camera Forward Facing	Preset Length 0.00 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Barugh Green	Inspection Direction:	Downstream	Upstream Node:	SW7
Road:	Barugh Green Road	Inspected Length:	5.10 m	Upstream Pipe Depth:	0.000 m
Location:	Verge	Total Length:	5.10 m	Downstream Node:	OUTLET
Surface Type:	Grass	Joint Length:	2.50 m	Downstream Pipe Depth:	0.000 m
Use:	Culverted watercourse			Pipe Shape:	Circular
Type of Pipe:	Gravity drain/sewer			Dia/Height:	600 mm
Year Constructed:				Pipe Material:	Concrete
Flow Control:	No flow control			Lining Type:	No Lining
Inspection Purpose:	Sample survey to determine asset condition			Lining Material:	No Lining

Comments:

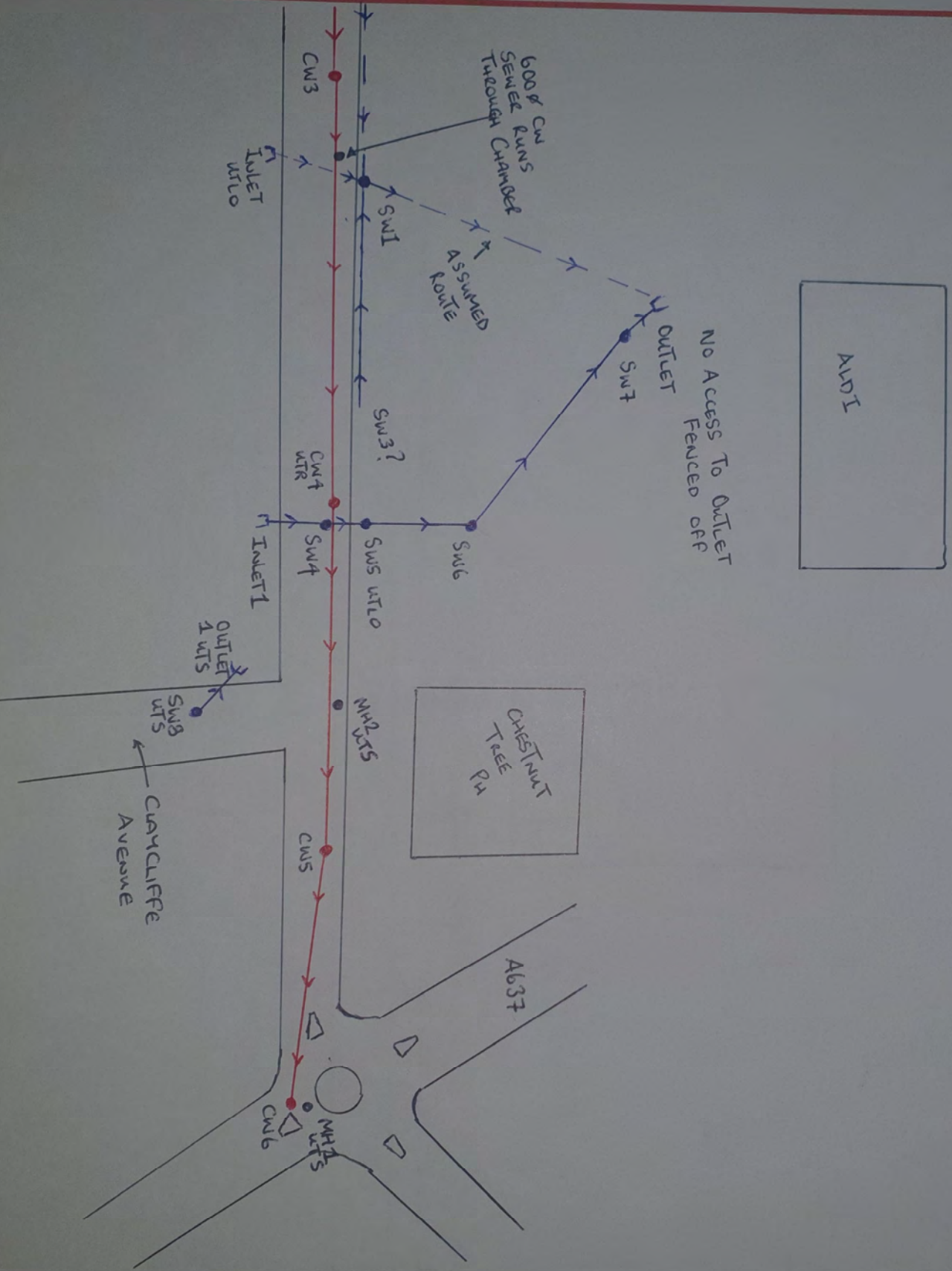
Recommendations:



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

DrainsAid

First Aid For All Your Drains

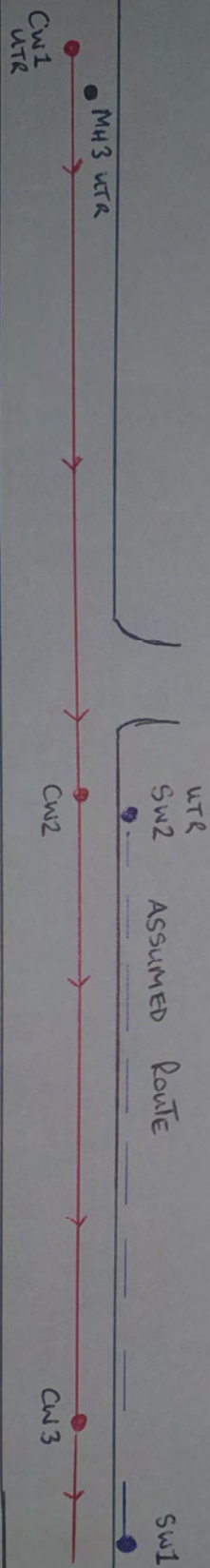


DrainsAid

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E-mail: info@drains-aid.com

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