



RIDGE

DEVELOPMENT AT BIRCH
BUSINESS PARK
FLOOD RISK ASSESSMENT &
DRAINAGE STRATEGY
REPORT

August 2025

BIRCH BUSINESS PARK FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY REPORT

Prepared for

Yeagate Ltd

Birch Business Park,
The Gatehouse,
Whittle Lane,
Heywood,
OL10 2SX

Prepared by

Ridge and Partners LLP
2nd Floor,
100 Embankment,
Cathedral approach,
Manchester
M3 7FB

Tel: 0161 833 9579

Contact

Eleanor Dale-Maude
Associate Partner
edale-maude@ridge.co.uk

VERSION CONTROL

[illegible]

CONTENTS

1.	EXECUTIVE SUMMARY	1
2.	INTRODUCTION	3
3.	PLANNING POLICY AND CONSULTATION	4
3.1.	Planning Policy Framework	4
3.2.	Rochdale Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA)	4
4.	THE SITE	6
4.1.	Site Details	6
4.2.	Site Description	6
4.3.	Proposed Development	7
5.	DEFINITION OF FLOOD HAZARD	8
4.4.	Sources of information	8
4.5.	Flooding from Rivers (Fluvial)	8
4.6.	Flooding From Land (Overland Flow)	10
4.7.	Flooding from Sewers	11
4.8.	Flooding from Groundwater	11
4.9.	Flooding from Artificial Sources	12
4.10.	Summary	12
5.	OUTLINE DRAINAGE STRATEGY	13
5.1.	Existing Surface Water Runoff	13
5.2.	Geology	13
5.3.	Hydrology	13
5.4.	Existing Drainage	13
5.5.	Sustainable Drainage Systems	14
5.6.	Surface Water Drainage Strategy	17
5.7.	Pollution Control	18
5.8.	Foul Water Strategy	19
6.	MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK	20
6.1.	Flood Risk Management Measures	20
6.2.	Off Site Impacts	20
6.3.	Residual Risk	20
7.	APPENDICES	22
•	Appendix A – Architectural Site Layout	
•	Appendix B – Site Information	
•	Appendix C – Ridge Design Drawings	
•	Appendix D – Outline Surface Water Attenuation Calculations	
•	Appendix E – Outline Drainage Strategy Hydraulic Simulation Outputs	

1. EXECUTIVE SUMMARY

This report details the Flood Risk and Drainage Strategy for the new development. The proposals are for the Construction of 2no. new industrial units for B2/B8 use. **Table 1** below provides a summary of the Flood Risk and Drainage / SuDS Strategy for the scheme.

Table 1 – Drainage / SuDS Summary

Item	Brief Description
Flood Zone	The development lies within Flood zone 1 (Low Probability) – land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%). See Figure 2 .
Flood Risk Assessment	The site is at low risk of flooding from all other sources.
Geology	British Geological Survey information confirmed that the site is underlain by solid mudstone/siltstone.
Infiltration Rate	Cohesive nature of the underlying geology means infiltration is not deemed suitable.
Nearest Watercourses	There is an unnamed tributary of Brightley Brook designated as Main River to the north of the site. Its outfall to Brightley Brook is approximately 1km to the northwest of the site. The current private drainage for the Business Park discharges into the Ordinary Watercourse that forms the head of the tributary.
Nearest Adopted Sewers	No existing adopted sewers near the site.
Surface Water Outfall and SuDS Hierarchal Approach	Rainwater recycling – due to the large roof areas and likely few toilets proposed given the industrial nature of the development, rainwater recycling opportunity will be limited. To be determined in detailed design potentially feasible Infiltration – discounted based on the cohesive nature of the underlying geology and evidence of marshy ground to the east Watercourse – The proximity of the existing Ordinary Watercourse and the existing surface water outfall from the Business Park means this option is considered feasible. Surface Water Sewer – There are no public surface water sewers in close proximity. As such this is option is discounted. Combined Water Sewer – discounted as a method higher up in the SuDS hierarchy is feasible.
Existing SW Discharge Rate	The Existing Greenfield rates are from Infodrainage and its runoff rate calculation tool. Calculations can be found in Appendix D. QBAR Rural: 30.3 l/s Q 1(years): 26.4 l/s Q 30(years): 51.4 l/s Q 100(years): 63.1 l/s

Item	Brief Description
Proposed SW Discharge Rate	The proposed maximum runoff rate for the development is limited to 26.4 l/s.
Allowance for Climate Change	Irwell Management Catchment, Upper End Allowance, 2070's: 3.3% AEP – 40% 1% AEP % - 45% The climate change allowances highlighted above have been applied to the modelled drainage calculations.
Proposed Attenuation Method and Volume	Geocellular Storage Tank and oversized pipes. Proposed development 1,517m³– 2,312m³ to contain the 100 year +45% event.
SuDS features	Water Quantity – Permeable paving attenuating sub-base, Geocellular Storage Tanks and oversized pipes. Water Quality – Permeable paving, Gullies, catchpit manholes, silt traps and polishing swale.
Maintenance Responsibility	Business Parks existing Management Company – Yeagate Ltd
Foul Drainage Outfall	Due to proposed levels and avoiding foul water pumping, propose foul water to be treated through package treatment works and treated discharge to the Ordinary Watercourse to the east.

There is a reduction in surface water flood risk from the development site to the surrounding district due to the reduction of existing storm water flow rates. Therefore, the development does not increase the risk of flooding to the other adjacent properties and roads. Out of chamber or gully flooding for events exceeding the 100-year plus 45% climate change critical event may occur within the development site and are classed as exceedance flows. Flood water from this scenario will be contained within the development site and directed away from the buildings to external hard and soft landscaped areas.

2. INTRODUCTION

- 2.1 Ridge & Partners LLP have been appointed by Yeargate Ltd to prepare this Flood Risk Assessment (FRA) and Drainage Strategy Report to support the construction of 2no. new industrial units for B2/B8 use. The assessment has been undertaken in line with the new 'National Planning Policy Framework' (NPPF), plus the accompanying 'Flood Risk and Coastal Change' chapter of the National Planning Practice Guidance (NPPG).
- 2.2 This report has been commissioned by Yeargate Ltd and is specific to their interests in the development proposals as described by the Architectural masterplan in **Appendix A**.
- 2.3 The report has been commissioned to identify any drainage-related issues associated with the proposed development and which are subsequently addressed within this report.
- Identify available data relating to flood risk at the site.
 - Determine whether the site is at risk from flooding from all sources, including from breach or overtopping of any existing flood defences, surface water flooding and/or groundwater flooding.
 - Consider the flood risk from all other sources.
 - Determine the current surface water drainage regime and assess any potential increase in surface water runoff because of the proposed development.
 - Discuss Sustainable Drainage Systems (SuDS) as an option for reducing surface water flood risk.
 - Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any potential increase in surface water runoff and include for climate change.
 - Devise an appropriate outline foul water drainage strategy.
 - Consider the recommendations of Rochdale Borough Council Strategic Flood Risk Assessment (SFRA)
 - Assess mitigation measures & off-site impacts and define any residual risks.

3. PLANNING POLICY AND CONSULTATION

3.1. Planning Policy Framework

3.1.1. The flood maps provided by the Environment Agency (EA) indicates that the site is within Flood Zone 1, land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%). As a requirement of the NPPF and accompanying NPPG, the proposed development must satisfy the requirements of the Sequential Test and where applicable the Exception Test.

3.1.2. Sequential Test:

Under the NPPF, Zone 1 is defined as low probability flood risk. The proposal is for a new commercial development, which in line with Table 2 is classified as 'Less Vulnerable'.

3.1.3. Placing both these criteria into Table 3 (Flood Risk Vulnerability and Flood Zone 'Compatibility'), Less Vulnerable development in Flood Zone 1 determines that 'Development is Appropriate'.

3.1.4. Exception Test:

As the Sequential Test is passed, the Exception Test is not required.

3.2. Rochdale Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA)

3.2.1. An SFRA assesses the risk associated with all types of flooding and provide the information required to identify the amount of development permitted in an area; how drainage systems in the area should function and how risks in vulnerable areas can be reduced and/or mitigated. The NPPF states that Regional Planning Bodies (RPB's) or Local Planning Authorities (LPA's) should prepare SFRA's in consultation with the EA

3.2.2. In August 2017, JBA Consulting was commissioned by Greater Manchester Combined Authority (GMCA) to update the Level 1 Strategic Flood Risk Assessment (SFRA) and Strategic Flood Risk Management Framework (SFRMF) to cover the ten Greater Manchester (GM) councils that make up GMCA, of which Rochdale Metropolitan Borough Council is one. The purpose of the SFRA is to assess and map all known sources of flood risk including fluvial, surface water, sewer, groundwater and all impounded water bodies, considering future climate change predictions.

3.2.3. A summary of the main elements from the SFRA associated with the development site is detailed below. The full report can be found on the GMCA Website.

- SFRA provides a detailed understanding of flood risks across the borough from all sources.
- The main source of flood risk in Rochdale is from the River Roch.
- Most flood defences along the River Roch are in good condition, providing a 1 in 100-year Standard of Protection to adjacent areas. During detailed modelling which included improved hydrological estimation, it was found that these defences also managed the 1 in 100-year plus climate change event, albeit with a reduced freeboard or factor of safety.
- There are several locations along Buckley Brook in Rochdale where defences are at a lower standard and are at risk of overtopping in the 1 in 100-year event. The immediate hazard is

relatively small, however during larger events, flood flow paths form placing several key residential and proposed development sites at greater risk.

- Flood risk management strategies have been discussed in Rochdale, identifying the need to improve the quality of defences along Buckley Brook to reduce the impact of defences overtopping and the possibility of leaving proposed development sites upstream of central Rochdale open for flood storage.
- The River Roch catchment in Rochdale is relatively steep, which tends to promote surface water flooding. This is a particular problem in Littleborough and Heywood, both of which have been identified as Critical Drainage Areas.
- There are relatively few reported incidents of groundwater flooding in Bury, Rochdale and Oldham.
- Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event. Where possible SUDS should be implemented.

4. THE SITE

4.1. Site Details

4.1.1. The site details are summarised in Table 2 below:

Table 2: Site Referencing Information

Item	Brief Description
Site name	Birch Business Park
Site address and location	Birch Business Park, Whittle Lane, Heywood, OL10 2SX
Planning Authority	Rochdale Metropolitan Borough Council
Lead Local Flood Authority	Rochdale Metropolitan Borough Council
Drainage Statutory Undertaker	United Utilities
Site Area	4.106ha application area
Approximate Grid Reference	OS: 384270, 408683
General Locality	The site is approximately 2.3km to the southwest of Heywood Town Centre, situated to the northeast of the existing Birch Business Park.

4.2. Site Description

- 4.2.1. The existing site is greenfield, see **Figure 1**. The redline boundary denotes the detailed application boundary.
- 4.2.2. The existing commercial units associated with Birch Business Park border the site to the west and southwest. The eastern boundary of the site is bordered by an unnamed watercourse and agricultural land generally surrounds the site on all other sides.

Figure 1: Aerial Photograph of Existing Site (Google Maps, 2026)



4.3. Proposed Development

- 4.3.1. The proposals are for the construction of 2no. new industrial units for B2/B8 use.
- 4.3.2. The new development extends to approximately 4.106 Ha in area that includes the existing access road through the Business Park from Moss Hall Road. The net development area is 3.80 Ha.
- 4.3.3. The site is accessed from Moss Hall Road, which is located to the West of the site.
- 4.3.4. The current outline General Arrangement of the proposed development attached within **Appendix A** provides an indication of the proposals of the site.

5. DEFINITION OF FLOOD HAZARD

4.4. Sources of information

- 4.4.1. The NPPF requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the development footprint. Further, the report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk. Section 6 then discusses in further detail the probability of flooding and the likely impacts.

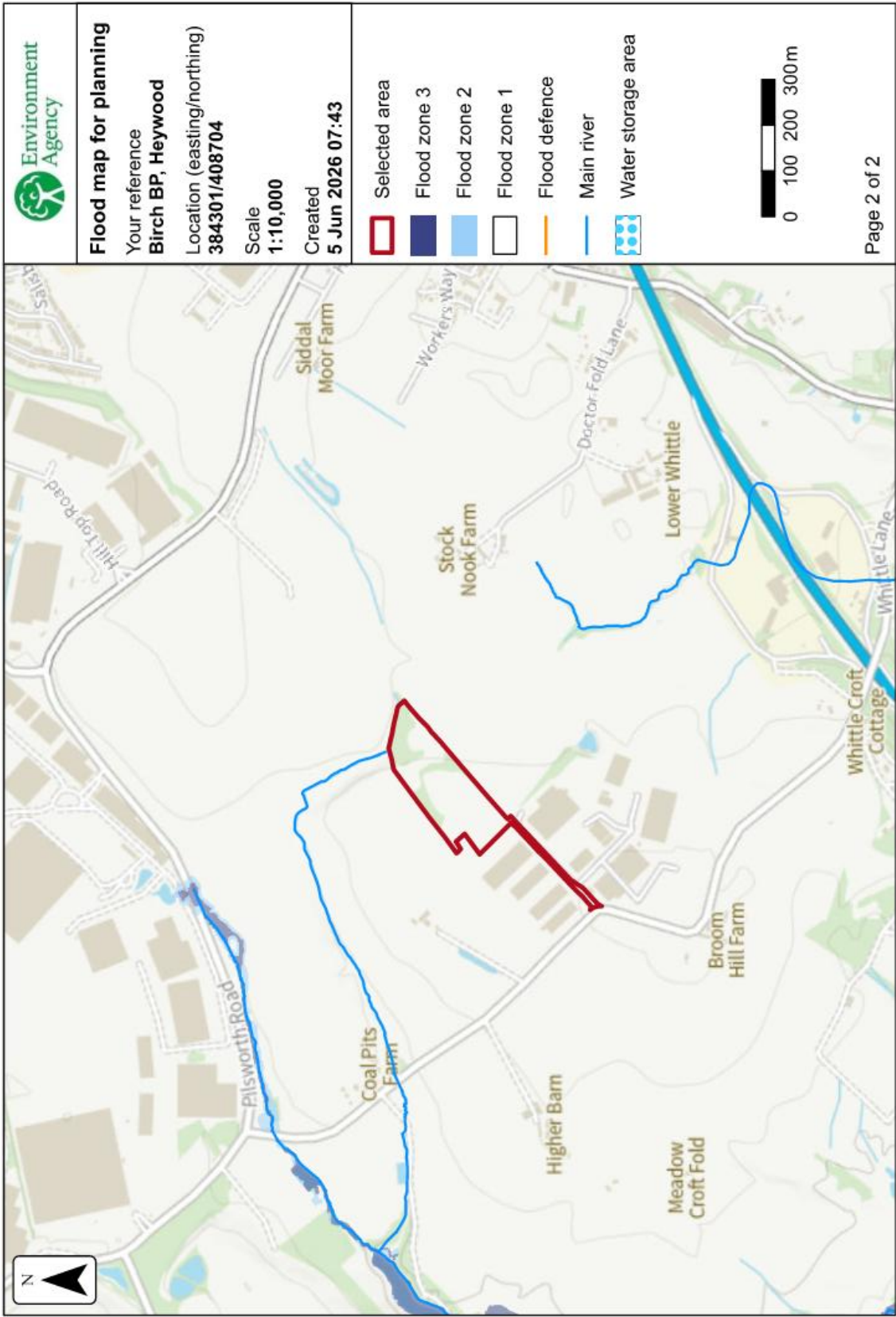
Table 2: Sources of information used in the identification of flood risk

Source of Information	Details
Environment Agency Flood Map	Indicative Flood Maps
United Utilities	Sewer Records
Historic Maps	From various websites
Rochdale Metropolitan Borough Council	Report & Various Maps from the SFRA

4.5. Flooding from Rivers (Fluvial)

- 4.5.1. There is an EA main river near the northeast corner of the site. See **Figure 2**. There is an existing Ordinary Watercourse within the site boundary to the east corner.
- 4.5.2. Flooding from watercourses can occur when flows exceed the capacity of the channel, or where a restrictive structure is encountered, leading to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.
- 4.5.3. **Figure 2** below places the site on the Environment Agency's indicative flood zone map. It is considered the site lays within a Flood Zone 1.
- 4.5.4. Therefore, the flood risk associated with this source is considered low.

Figure 2 – The EA’s Flood Zone Map

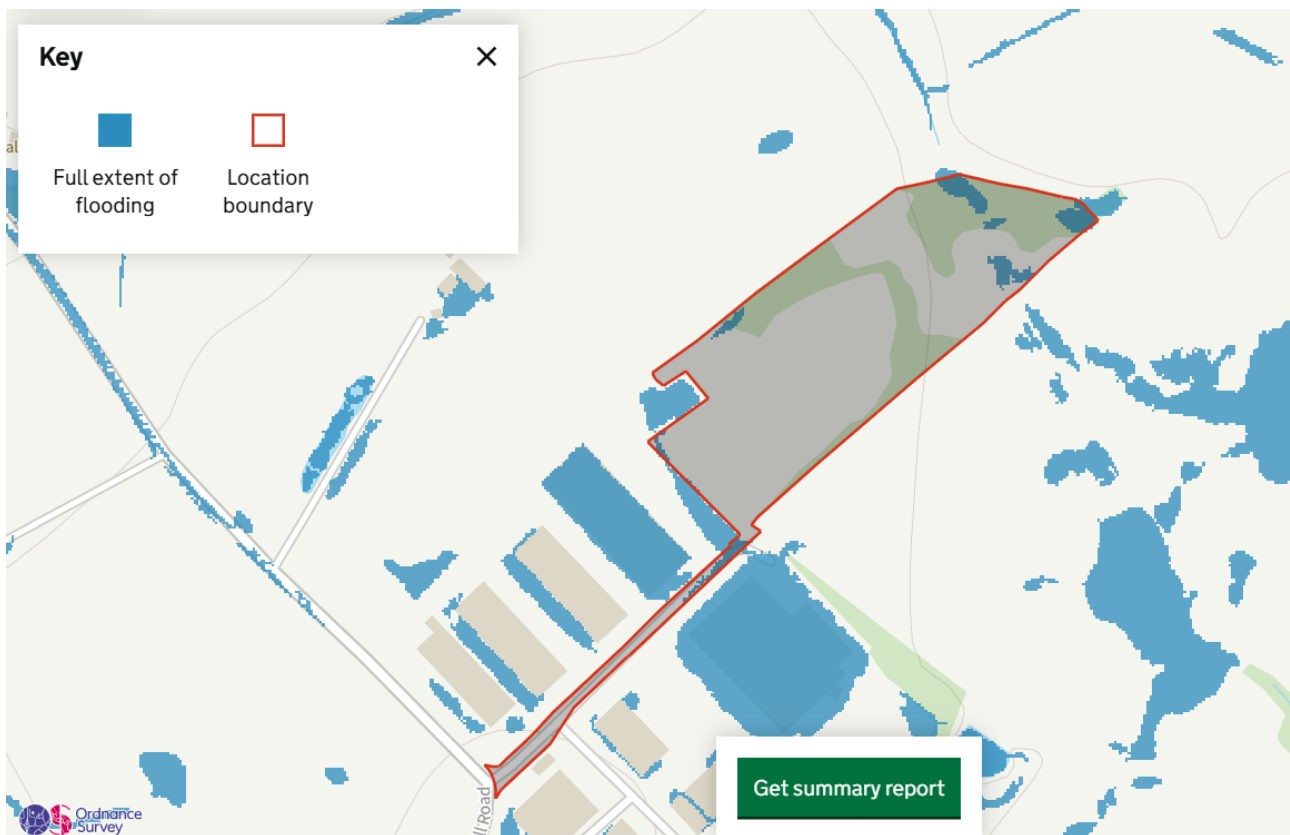


© Environment Agency copyright and/or database rights 2026. All rights reserved. © Crown copyright and database rights 2026 Ordnance Survey licence number AC0000807064.

4.6. Flooding From Land (Overland Flow)

- 4.6.1. Any surface water runoff from the surrounding area is captured by the existing drainage infrastructure and conveyed away from the site.
- 4.6.2. The indicative risk of surface water flooding map, illustrated in **Figure 3**, shows the worst-case scenario of the 1 in 1000 annual likelihood of flooding for the site including climate change (2061 to 2125). It indicates small areas of potential ponding that all coincide with existing low points in topography. Refer to **Appendix B** for the Topographic Survey.
- 4.6.3. The new proposed units sit entirely within an area of very low risk of surface water flooding on the site. There are no existing surface water flow routes through the site that need to be maintained and no surface water flooding showing that would potentially impact access/egress at the site.
- 4.6.4. The proposed Surface Water Drainage Strategy is to be designed so that no surface water flooding / overland flow occurs up to the 1:30 year event. Exceedance flows beyond the 1:30 year up to the 1:100 year + climate change events are permitted to flood the surrounding hardstanding areas. However, these flows shall be kept away from the buildings and surrounding areas. As such, by incorporating appropriate mitigation measures and designing the drainage strategy to current best practice guidance to ensure that any surface water flooding is controlled, the risk of flooding from overland flow is considered to be low.

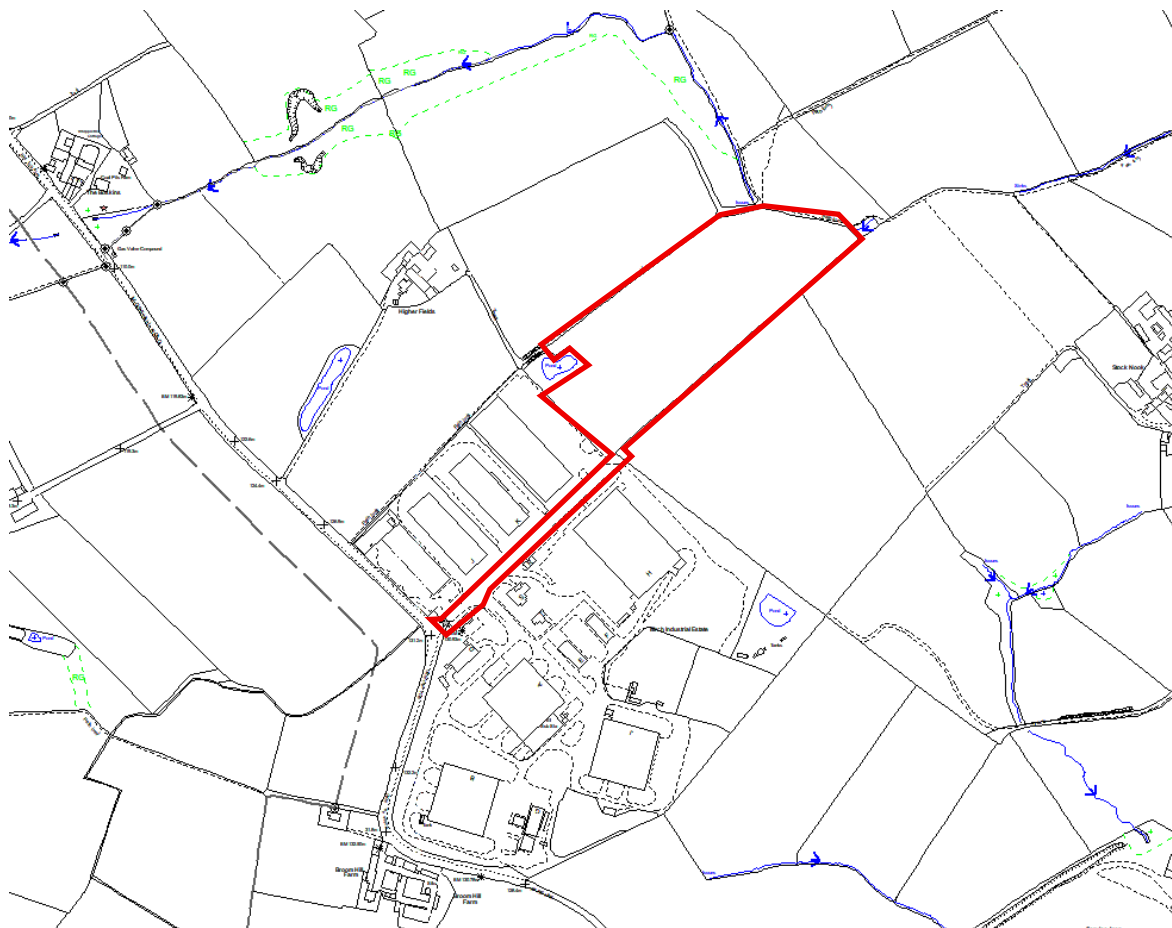
Figure 3 – The EA's Indicative Surface Water Flood map



4.7. Flooding from Sewers

- 4.7.1. The existing business park has a network of private drainage that is managed and maintained by the existing management company. Significant re-development has been occurring at the Business Park in recent years which has ensured all private drainage is designed and installed to current standards.
- 4.7.2. United Utilities (UU) sewer records have been reviewed and confirms there are no public sewers crossing the development site. An extract of the UU sewer records is shown in **Figure 4**.
- 4.7.3. The SFRA does not highlight problems of sewer flooding at the site or nearby.
- 4.7.4. As such the risk of flooding at the site is regarded as low.

Figure 4 – Extract of United Utilities Sewer Records from 2006



4.8. Flooding from Groundwater

- 4.8.1. The development site is underlain by a variable thickness of Made/Worked Ground. The main body of the site is shown to have superficial deposits of glacial Till with a portion of the eastern extent shown to be Lacustrine deposits (sand and gravel). Pennine Lower Coal Measures Formation (Mudstone, siltstone and sandstone) is shown to form the bedrock geology of the whole site. These are both Secondary A Aquifers which are classified as permeable layers capable of supporting

water supplies at a local scale, and in some cases forming an important source of base flow to rivers.

4.8.2. According to the SFRA information there are relatively few reported incidents of groundwater flooding in the area.

4.8.3. The proposals for the site do not include any basement or underground structures that would be susceptible to groundwater, therefore flood risk from groundwater is considered low.

4.9. Flooding from Artificial Sources

4.9.1. There are no ponds, reservoirs or canals near the site. Therefore, flood risk from artificial sources is considered low.

4.9.2. Assessment of Flood Risk on Development Site (Probability)

4.10. Summary

4.10.1. **Section 5** has defined the anticipated flood risks from all sources. **Table 3** below considers each of the sources and defines in tabular format the Probability of Flood Risk associated for each and the likely impact to the proposed development site.

Table 3 – Flood Risk Summary

Source	Flood Risk	Likely Impacts	Remarks
Tidal	Low	Low	Site not tidally influenced.
Fluvial (Watercourse)	Low	Low	Site is located in Flood Zone 1.
Overland Flow	Low	Low	Indicative EA mapping shows site is at low risk with small areas of potential ponding at low points of the site. The detailed levels undertaken at detailed design will mitigate existing runoff ponding to ensure this does not occur post-development.
Sewers	Low	Low	There are no UU sewers passing through the site.
Groundwater	low	Low	No indication through SFRA or local borehole records that site is at risk from groundwater flooding.
Artificial Sources	Low	Low	No ponds, canals or reservoirs are in close proximity to the site.

5. OUTLINE DRAINAGE STRATEGY

5.1. Existing Surface Water Runoff

- 5.1.1. The development area for calculation is approximately 3.8ha and is classified as greenfield.
- 5.1.2. To calculate the Greenfield runoff rates, the Infodrainage software Rural Runoff tool has been used. The Greenfield runoff rates for the red edge boundary are tabulated below in **Table 4**. A copy of the greenfield runoff calculation is included in **Appendix D**.

Table 4: Greenfield Runoff Rates

Area (m ²)	Greenfield Runoff Rate (l/s)			
3,800	1 in 1 Year	Qbar	1 in 30 Year	1 in 100 Year
	26.4	30.3	51.4	63.1

5.2. Geology

- 5.2.1. According to British Geological Survey data, any Made Ground is expected to be underlain by Superficial strata comprising Glacial Till (comprised of sandy, silty boulder clay). These are then underlain by the Pennine Lower Coal Measures Formation comprised of mudstone, siltstone and sandstone.
- 5.2.2. Based on the presence of cohesive boulder clay, infiltration is not a viable option.

5.3. Hydrology

- 5.3.1. There is an existing Ordinary Watercourse to the east of the site, surveyed within the blue edged land. Recent site work has exposed a brick sided, flag-stone topped culvert within the red edged land. The exact location is to be surveyed and considered further in detailed design stage.
- 5.3.2. It is understood that the current private drainage system for the Business Park discharges into the Ordinary Watercourse upstream.
- 5.3.3. The nearest Main River, a tributary of Brightley Brook, is situated approximately 35m to the north of the development boundary in adjacent land.
- 5.3.4. The culverted watercourse in the development and free-flowing water upstream and downstream of it, suggests below ground connectivity between Ordinary Watercourse and Main River.

5.4. Existing Drainage

- 5.4.1. There are no existing public surface water and foul water sewers located in proximity to the site. There is private surface water and foul water drainage within the surrounding roads of the Business Park.

5.5. Sustainable Drainage Systems

5.5.1. SuDS Objectives

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

5.5.2. SuDS's Design Themes

A strong design theme is essential if the maximum aesthetic benefits are to be gained from the SuDS approach. At a more local scale the SuDS should link with the individuals plot structure, planting, public open space requirements and amenity areas, gaining multiple benefits from a limited area of land.

5.5.3. The SuDS Management Train

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

1. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.
2. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
3. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.
4. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

5.5.4. SuDS Site Constraints

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

- **Land Use Characteristics:** The size and type of the development plot allows a range of source control and site control SuDS devices to be considered are to be below and above ground.
- **Site Characteristics:** Cohesive underlying clays mean infiltration is not a viable SuDS technique.
- **Catchment Characteristics:** The site is currently classed as Greenfield.
- **Environmental and Amenity Performance:** The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. Safety to all future occupiers is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

5.5.5. SuDS Methods

Tables 5 and 6, below, provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the development.

Table 5: Surface SuDS Methods

Method	Comment	Suitability for Development
Green Roofs	- Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater - Promotes evaporation and local biodiversity.	<u>Not Suitable</u> Architectural proposals for the development and maintenance issues deem this unsuitable.
Water Butts	Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	<u>Not Suitable</u> Cannot be used with siphonic drainage.
Rainwater Harvesting	Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	<u>Potentially:</u> Limited opportunity for water re-use given the proposed industrial use and runoff contributing area vs likely number of proposed toilets. To be determined in detailed design
Infiltration Options	Reduces total run off volume from the development.	<u>Not Suitable:</u> Cohesive underlying clays means infiltration is not a viable SuDS technique.
Permeable Surfacing (Infiltration)	- Reduces total run off volume from the development. - Can be used to enhance water quality.	<u>Not Suitable:</u> Cohesive underlying clays means infiltration is not a viable SuDS technique.
Permeable Surfacing (Standard)	- Can be used to enhance quality of runoff water. - Sub-base provides 'source' storage and reduces the volume of storage downstream. - The storage can be created with selection of the stone fill or use of plastic box stems. - Impermeable membrane at base of construction to prevent impact on pavement stability.	<u>Suitable:</u> Private parking bays have the potential to attenuate and filter surface water flows through the use of permeable surfacing (subject to confirmation from architect on surface finishes).

Swales, basins and ponds	• Provide areas for above ground surface runoff storage. • Swales also improve water quality through filtration.	<u>Suitable:</u> • A length of polishing swale to further improve runoff water quality is viable prior to final outfall to the Ordinary Watercourse. • Due to the size of parking, service yards and roofs it means the incorporation of basins or ponds will impact viability of development.
--------------------------	---	--

Table 6: Sub-Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	• Suitable for sites with insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc. • Can be very effective infiltration devices subject to ground conditions.	<u>Suitable:</u> • The use of geocellular attenuation may be possible to retain excess storm water.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally suitable for adoption by the statutory water company.	<u>Suitable:</u> • The use of oversized pipes may be possible to retain excess storm water.

5.5.6. SuDS Hierarchal Approach

Based on the SuDS assessment in **Tables 5 and 6**, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Table 7: SuDS Hierarchal Approach

Method	Suitability	Suitability for Development
Collected for non-potable use	Limited	Given the industrial nature of the development vs limited provision of non-potable facilities compared to runoff contributing area, the opportunity for non-potable use is very limited. Feasibility to be confirmed in detailed design stage and RM application
Infiltration to Ground	No	Underlying ground conditions deem this approach unsuitable. See section 6.2.
Connection to Watercourse	Yes	There is an unnamed Ordinary Watercourse at the eastern side of the site, the existing Birch Business Park development discharges into this and the existing surface water runoff from the proposed development site currently contributes toward this. Therefore, this approach is considered feasible .
Connection to Surface Water Sewer	No	There are no public surface water sewers within proximity.
Connection to Combined Sewer	No	Discounted due to presence of the adjacent watercourse.

5.5.7. SuDS Design Philosophy

The SuDS assessment and hierarchal approach discussed in **Tables 5, 6 and 7** above has defined the overall SuDS strategy. Thus, the SuDS philosophy for the development site is the promotion of Prevention, Source Control and Site Control techniques with discharge rates to be restricted to greenfield runoff rate (QBAR), to reduce the risk of both site and downstream flooding.

The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the ground.
- Site control in the form of geocellular storage and oversized pipes.
- Aim to limit where possible the impermeable fraction of development.

5.6. Surface Water Drainage Strategy

- 5.6.1. This section should be read in conjunction with the 'Proposed Drainage Strategy' drawing, outline calculations and hydraulic simulation outputs provided in **Appendix C, D and E**.
- 5.6.2. A drainage strategy has been undertaken for the site to demonstrate that surface water runoff can be effectively managed within the site, without increasing the risk of flooding to the site or elsewhere.
- 5.6.3. As outlined above in **Table 7**, surface water runoff for the proposed development is feasible to be discharged into the Ordinary Watercourse. The post development runoff rate is shown in **Table 8**.

Table 8: Post-Development Runoff Rates

	1 Year (l/s)	30 Year (l/s)	100 year + 45% CC (l/s)
Proposed Development	26.4		

- 5.6.4. An infrastructure-based SW Drainage Strategy is considered feasible for the development, with run off from the hardstanding areas (car parks, service yards, roofs and access road) directed to the new below ground infrastructure. To achieve the post-development runoff rate in **Table 8**, a flow control device is to be situated at the downstream end of the surface water network.
- 5.6.5. The flows from the proposed development are to be collected via a series of channel drains and gullies before being stored in oversized pipes or a geo-cellular tank on each unit's development parcel. Thereafter, the surface water will collate in the access road spine drainage to be directed and discharged into the unnamed watercourse to the east at the maximum allowable rate.
- 5.6.6. The proposed drainage layout for the new development will be designed in accordance with Design & Construction Guidance (DCG), BS EN 752: 2008 and Building Regulations Part H guidance, i.e. up to the 30-year storm return period criterion (including the 40% increase to account for climate change) and tested for the 1 in 100 year return period including a 45% increase to account for climate change to confirm that there is no flood risk to the buildings.
- 5.6.7. Flooding can occur on a local scale beyond the 30-year criterion due to runoff exceeding the capacity of the minor system during extreme events and it can only be addressed on a site-specific basis. Design & Construction Guidance states that developments should be protected against flooding from extreme events (1 in 30 year) and that flood pathways are identified when the drainage system is exceeded.
- 5.6.8. In the case of this development, exceedance flows will be all those over and above the 30-year design criterion set by Design & Construction Guidance. Using storage within the external areas would be achievable and would direct flood water away from the proposed buildings, with flows directed back into the surface water drainage network as water levels in the drainage network recede. The exceedance flows and volumes can be calculated for the new development drainage layout. In the case of this development and due to the fall across the site, consideration will be given to make sure all water is controlled so that it does not impact on any adjoining properties.
- 5.6.9. Any future drainage calculations carried out as part of a site-wide drainage strategy or for the development layouts themselves must include the appropriate increase in rainfall to satisfy the future Climate Change allowances.

5.7. Pollution Control

- 5.7.1. There are to be multiple levels of treatment incorporated into the development, trapped gullies, silt traps, catchpit manholes and polishing swale. These provide filtration at various points in the system to improve water quality.
- 5.7.2. To improve the water quality from the proposed development the proposed drainage strategy has incorporated SuDS features that are line with the Simplified Index Approach (Ciria 753). The pollution hazard for the proposed scheme is very low, see the extract below from CIRIA 753 SuDS Manual.

TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05

- 5.7.3. To mitigate the Total Suspended Solids (TSS) from site, the drainage strategy incorporates series of catchpit manholes, trapped gullies and channel drains and a final length of polishing swale. These measures collect the sediment and debris that gets carried along the SW system and reduces the possibility of blockages occurring.

5.8. Foul Water Strategy

- 5.8.1. Due to existing topography and proposed unit finished floor levels, the proposed development sits up to 6m lower than the existing Business Park. Given the general fall of levels to the east, the presence of an Ordinary Watercourse and proposed foul water flows considered to be low, it is envisaged the most efficient foul water solution is for a package treatment works with discharge to the Ordinary Watercourse ditch. This strategy will be subject to Environment Agency approval through the consent process.

6. MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK

6.1. Flood Risk Management Measures

- 6.1.1. The report has found the site to be at low risk of flooding from various sources.
- 6.1.2. The surface water drainage strategy will restrict runoff from the Proposed development to greenfield runoff rate for 1in1 year. Attenuation has been proposed in the form of below ground geocellular storage tank and oversized pipe. The new surface water networks will be designed in line with current British Standard and Design & Construction Guidance up to the 100-year storm return period including an allowance for climate change.
- 6.1.3. The use of SuDS in the form of Source Control and Site Control measures, with controlled (restricted) outflow, will help to minimise the flood risk impact to the surrounding sewer network.
- 6.1.4. There will be a site management health and safety document prepared in respect of the final development. This will include the required maintenance regime for the on-site drains and drainage features such as the channels, gullies, pipes, manholes and all SuDS features.
- 6.1.5. The Management Company, Yeagate Limited, and site occupiers will be responsible for site cleanliness, gully emptying and drain cleansing to ensure that the surface water drainage system will always operate at its maximum efficiency.
- 6.1.6. Should any flooding occur from the new sewers and drains it will be directed away from the buildings to the external areas.

6.2. Off Site Impacts

- 6.2.1. Up to and including the 100-year plus increase in rainfall allowance due to climate change (CC) event, the report has justified that there is no risk of flooding.
- 6.2.2. Surface water runoff does not increase from the pre-development regime and utilises SuDS solutions to satisfy the site constraints, the proposed development will therefore not increase flood risk onto its locality.

6.3. Residual Risk

- 6.3.1. With careful design of the drainage elements as described above, residual risks post-completion can be managed with proper planning through site design and operation. Residual risks associated with flooding are summarised below:
 - **Exceedance of design events:** flooding may occur during rainfall events that exceed the design standard, resulting in temporary surface water ponding or flow across the site.
 - **Blockage or failure of drainage infrastructure:** drainage systems; pipes, inlets, and attenuation features, may become blocked or fail due to inadequate maintenance, debris, or unforeseen circumstances.
 - **Overland flow routing:** In exceedance conditions, runoff may flow along preferential pathways. The site will be designed to direct overland exceedance flows away from buildings and towards safe discharge locations.

- **Off-site flood risk influences:** External sources of flooding, including surface water runoff from surrounding land or surcharging of the wider drainage network, may affect the site in extreme conditions.
- **Climate change uncertainty into the future:** an allowance for climate change has been applied in accordance with current guidance but there remains uncertainty regarding the magnitude and frequency of future rainfall events.

7. APPENDICES

- Appendix A – Architectural Site Layout
- Appendix B – Existing Site Information
- Appendix C – Drainage Strategy Drawing
- Appendix D – Outline Surface Water Attenuation Calculations
- Appendix E – Outline Drainage Strategy Hydraulic Simulation Outputs

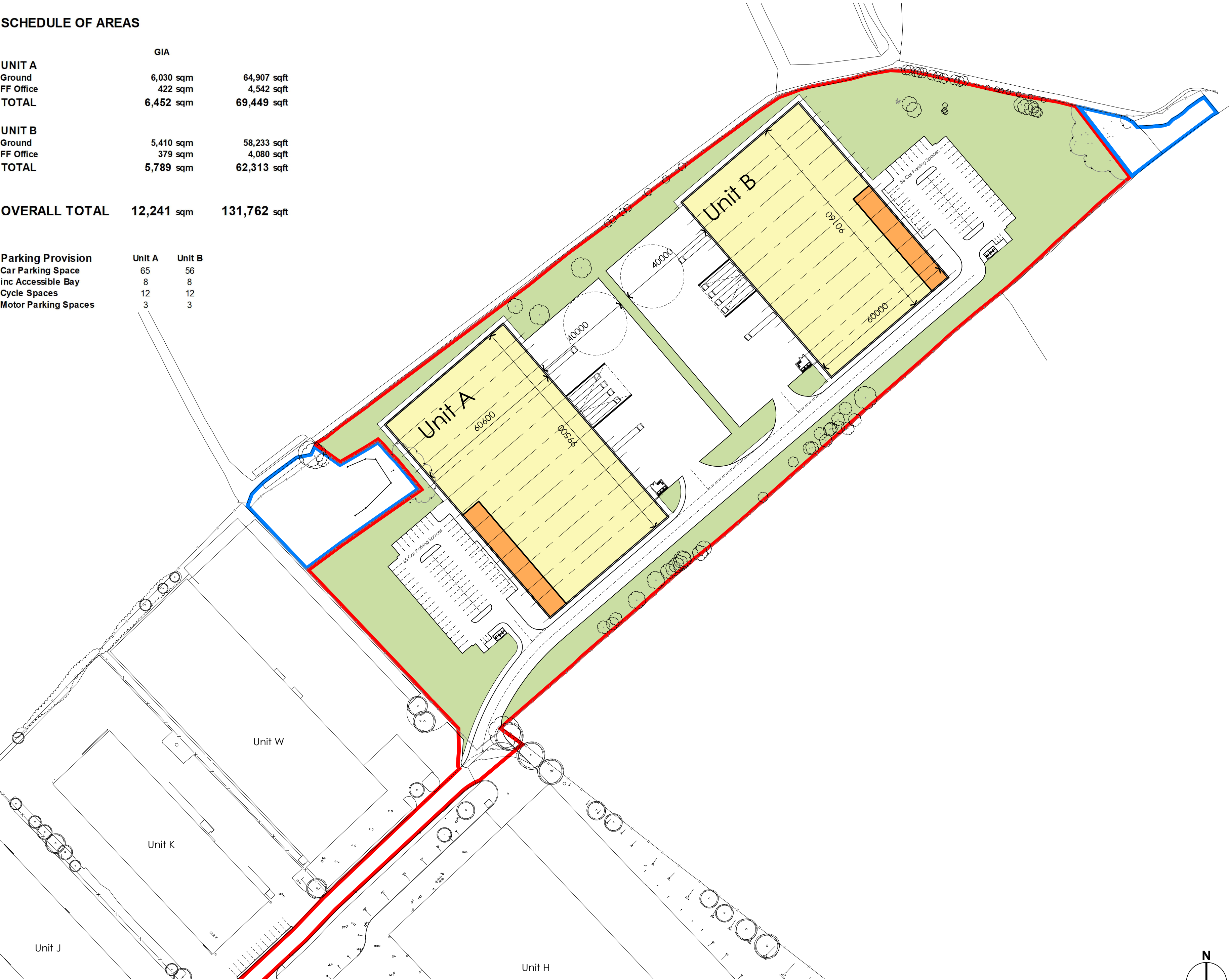
APPENDIX A – ARCHITECTURAL SITE LAYOUT

SCHEDULE OF AREAS

UNIT A		
GIA		
Ground	6,030 sqm	64,907 sqft
FF Office	422 sqm	4,542 sqft
TOTAL	6,452 sqm	69,449 sqft
UNIT B		
Ground	5,410 sqm	58,233 sqft
FF Office	379 sqm	4,080 sqft
TOTAL	5,789 sqm	62,313 sqft

OVERALL TOTAL 12,241 sqm 131,762 sqft

Parking Provision	Unit A	Unit B
Car Parking Space	65	56
inc Accessible Bay	8	8
Cycle Spaces	12	12
Motor Parking Spaces	3	3



General Notes:

This drawing is the property of Fletcher-Rae (UK) Limited and copyright is reserved by them. The drawing is not to be copied, reproduced or re-distributed either in whole or in part without the prior written consent of Fletcher-Rae (UK) Limited.

The originator shall have no responsibility for any liability, loss, cost, damage or expense arising from or relating to any use of this document other than for its intended purpose on this project.

This drawing shall be read in conjunction with all other relevant drawings, specifications and associated documentation. Any discrepancies, errors or omissions are to be reported to the originator before proceeding with work.

All dimensions are to be checked on site by the contractor prior to proceeding with any work. This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.

DISCLAIMER
When this drawing is issued in CAD, it is an uncontrolled version issued for information only, to enable the recipient to prepare their own documents/ drawings for which they are solely responsible.

SOFTWARE INTEROPERABILITY
Fletcher-Rae (UK) Limited prepared this drawing using Autodesk Autocad.

Fletcher-Rae (UK) Limited does not accept liability for any loss or degradation of any information held in the drawing resulting from the translation from the original file format to any other file format or from the recipients reading of it in any other programme.

Hazard Identification		
Ref	Hazard	Date

- Planning Boundary
Area: 41,061sqm (10.15Acres)
- Ownership Boundary

WORK IN
PROGRESS

P3 Planning boundary amended to reflect planning consultant's comments	AL	04.08.25	BB
P2 Planning boundary updated, Road alignment amended to reflect highway specialist comments.	AL	25.07.25	BB
P1 First Issue	AL	11.07.25	BB
Rev Revision Details	Drawn	Date	Chck'd

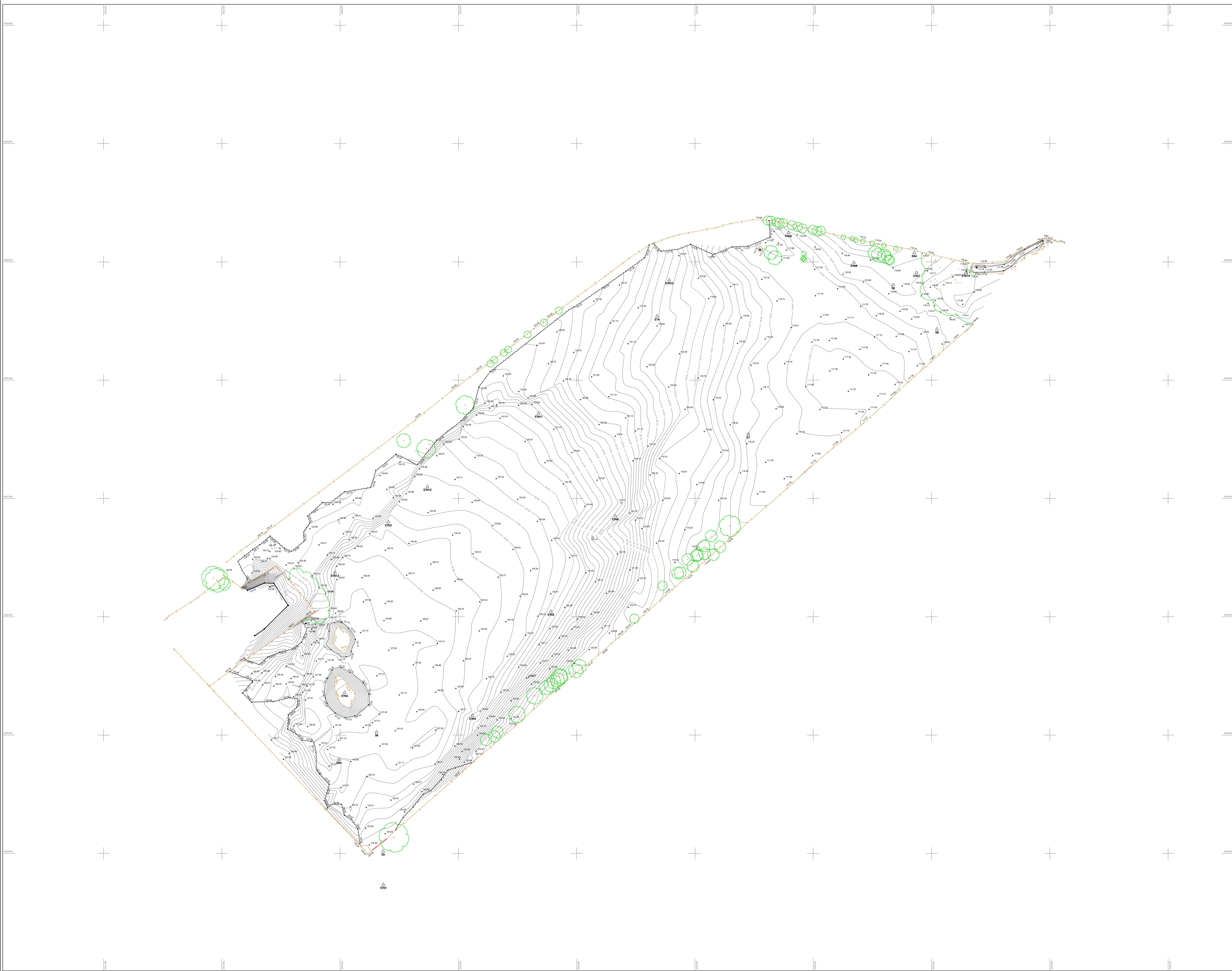
Project No. 25017
Suitability S0 Work in Progress
Status S

Client:
Yeagate

Project:
The Field, Birch Business Park

Sheet Name: Illustrative Masterplan	
Drawing No. 25017-HFR- AV-XX-DR-A-9120	Rev. P3
Drawn By AL	Scale 1:1000@A2
Created 11.07.25	

APPENDIX B – EXISTING SITE INFORMATION



Survey Grid and Datum

The derived coordinate system used for this survey is related to Ordnance Survey national grid using Smartnet RTK (OSTN15 Transformation), orientated to north with a scale factor of 1.000.

The derived level datum used for this survey is related to Ordnance Survey (OSGM15 Geoid Model) using Smartnet RTK.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

- Legend
- Top/Bottom of bank
 - Building
 - Channel
 - Overhead fence
 - Concrete slab
 - Concrete post & panel fence
 - Chain link fence
 - Post & rail fence
 - Post and wire fence
 - Bridge
 - Level 1
 - Level 2 (bottom)
 - Level 3 (top)
 - Overhead Power lines
 - Subsoil
 - Soil
 - Verge
 - Wall
 - Bank
 - CATV
 - Electric cover
 - Electric pole
 - Earth cut
 - Fire hydrant
 - Gully
 - Gas cover
 - Inspection cover
 - Lamp post
 - Manhole
 - Marker post
 - Obelisk
 - Riding eye
 - Road sign
 - Rip post
 - Stump
 - Stake Valve
 - Telegate Pole
 - Tree
 - Traffic lights
 - Tree pit
 - Tree Tuck
 - Water cover
 - Bus stop
 - BT roadside 3 pin

Notes

The contractor must ensure that adequate checks on building dimensions, levels, features are completed prior to commencing any construction works.

Any errors or discrepancies must be notified to Powers UK Ltd immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

Topographical Surveys

Any surveyed boundary features may not be representative of the legal boundary of the site.

All reasonable effort has been made to survey features and detail that are unobstructed/visible during at the time of survey.

Grouped trees have been shown as a tree spread. Individual trees are drawn to scale showing a bole diameter taken at approximately 1.5m above GL and an average spread.

Measured Building Surveys

All measurements to internal wall are taken at approximately 1.5m above floor level and assumed to be vertical.

© Powers UK Ltd holds the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

Do not scale from this drawing.

SURVEY STATIONS			
Name	Eastings	Northings	Height
ST1	384172.888686562	7271	126.302
ST2	384140.28868777	718	126.504
ST3	384132.288686561	718.000	126.500
ST4	384132.888686568	725.537	126.537
ST5	384132.888686568	725.537	126.537
ST6	384132.888686568	725.537	126.537
ST7	384132.888686568	725.537	126.537
ST8	384132.888686568	725.537	126.537
ST9	384132.888686568	725.537	126.537
ST10	384132.888686568	725.537	126.537
ST11	384132.888686568	725.537	126.537
ST12	384132.888686568	725.537	126.537
ST13	384132.888686568	725.537	126.537
ST14	384132.888686568	725.537	126.537
ST15	384132.888686568	725.537	126.537
ST16	384132.888686568	725.537	126.537
ST17	384132.888686568	725.537	126.537
ST18	384132.888686568	725.537	126.537
ST19	384132.888686568	725.537	126.537
ST20	384132.888686568	725.537	126.537
ST21	384132.888686568	725.537	126.537
ST22	384132.888686568	725.537	126.537
ST23	384132.888686568	725.537	126.537
ST24	384132.888686568	725.537	126.537
ST25	384132.888686568	725.537	126.537
ST26	384132.888686568	725.537	126.537
ST27	384132.888686568	725.537	126.537
ST28	384132.888686568	725.537	126.537
ST29	384132.888686568	725.537	126.537
ST30	384132.888686568	725.537	126.537
ST31	384132.888686568	725.537	126.537
ST32	384132.888686568	725.537	126.537
ST33	384132.888686568	725.537	126.537
ST34	384132.888686568	725.537	126.537
ST35	384132.888686568	725.537	126.537
ST36	384132.888686568	725.537	126.537
ST37	384132.888686568	725.537	126.537
ST38	384132.888686568	725.537	126.537
ST39	384132.888686568	725.537	126.537
ST40	384132.888686568	725.537	126.537
ST41	384132.888686568	725.537	126.537
ST42	384132.888686568	725.537	126.537
ST43	384132.888686568	725.537	126.537
ST44	384132.888686568	725.537	126.537
ST45	384132.888686568	725.537	126.537
ST46	384132.888686568	725.537	126.537
ST47	384132.888686568	725.537	126.537
ST48	384132.888686568	725.537	126.537
ST49	384132.888686568	725.537	126.537
ST50	384132.888686568	725.537	126.537
ST51	384132.888686568	725.537	126.537
ST52	384132.888686568	725.537	126.537
ST53	384132.888686568	725.537	126.537
ST54	384132.888686568	725.537	126.537
ST55	384132.888686568	725.537	126.537
ST56	384132.888686568	725.537	126.537
ST57	384132.888686568	725.537	126.537
ST58	384132.888686568	725.537	126.537
ST59	384132.888686568	725.537	126.537
ST60	384132.888686568	725.537	126.537
ST61	384132.888686568	725.537	126.537
ST62	384132.888686568	725.537	126.537
ST63	384132.888686568	725.537	126.537
ST64	384132.888686568	725.537	126.537
ST65	384132.888686568	725.537	126.537
ST66	384132.888686568	725.537	126.537
ST67	384132.888686568	725.537	126.537
ST68	384132.888686568	725.537	126.537
ST69	384132.888686568	725.537	126.537
ST70	384132.888686568	725.537	126.537
ST71	384132.888686568	725.537	126.537
ST72	384132.888686568	725.537	126.537
ST73	384132.888686568	725.537	126.537
ST74	384132.888686568	725.537	126.537
ST75	384132.888686568	725.537	126.537
ST76	384132.888686568	725.537	126.537
ST77	384132.888686568	725.537	126.537
ST78	384132.888686568	725.537	126.537
ST79	384132.888686568	725.537	126.537
ST80	384132.888686568	725.537	126.537
ST81	384132.888686568	725.537	126.537
ST82	384132.888686568	725.537	126.537
ST83	384132.888686568	725.537	126.537
ST84	384132.888686568	725.537	126.537
ST85	384132.888686568	725.537	126.537
ST86	384132.888686568	725.537	126.537
ST87	384132.888686568	725.537	126.537
ST88	384132.888686568	725.537	126.537
ST89	384132.888686568	725.537	126.537
ST90	384132.888686568	725.537	126.537
ST91	384132.888686568	725.537	126.537
ST92	384132.888686568	725.537	126.537
ST93	384132.888686568	725.537	126.537
ST94	384132.888686568	725.537	126.537
ST95	384132.888686568	725.537	126.537
ST96	384132.888686568	725.537	126.537
ST97	384132.888686568	725.537	126.537
ST98	384132.888686568	725.537	126.537
ST99	384132.888686568	725.537	126.537
ST100	384132.888686568	725.537	126.537

Layout Key

(1)

Rev	Date	Description	Check
-----	------	-------------	-------

Meridian House, 58-60 Hildale Road, Frodsham, Cheshire WAG 6AG
Tel: 01528 734473
Email: surveyors@powersuk.com
www.powersuk.com

Client
Yeagate Ltd

Site
Birch Industrial Estate
Whittle Lane
Heywood
OL10 2SX

Title
Topographical Survey

Survey by	LA	Drawn by	RC
Check by	PB	Date	10/05/24
Scale	A0 Sheet	Project No.	Status
1:500	6779		FINAL
Drawing No.	FP6779	Revision	*

APPENDIX C – DRAINAGE STRATEGY DRAWING



DISCLAIMER NOTES:

- THIS DOCUMENT IS COPYRIGHT OF THE ORIGINATOR AND MUST BE TREATED AS CONFIDENTIAL.
- THIS DOCUMENT MUST NOT BE ALTERED, REPRODUCED OR DISTRIBUTED WITHOUT PRIOR WRITTEN CONSENT OF THE ORIGINATOR.
- THIS DOCUMENT MUST NOT BE ALTERED - THE ORIGINATOR ACCEPTS NO RESPONSIBILITY FOR ANY DISCREPANCIES ARISING AS A RESULT OF THE ORIGINATOR'S INFORMATION BEING ALTERED BY OTHERS.
- ANY DISCREPANCY MUST BE REPORTED TO THE ORIGINATOR.
- DO NOT SCALE THIS DOCUMENT - USE FIGURED DIMENSIONS ONLY.
- ALL DIMENSIONS MUST BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF ANY RELATED WORKS.
- THIS DOCUMENT MUST BE READ IN CONJUNCTION WITH ALL SUPPORTING DOCUMENTS PRODUCED BY THE ORIGINATOR AND OTHER PROJECT DISCIPLINES.
- THE ORIGINATOR ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF BACKGROUND INFORMATION PRODUCED BY THIRD PARTIES - THIS MUST BE TREATED AS INDICATIVE ONLY.
- USERS OF THIS DOCUMENT ARE RESPONSIBLE FOR CHECKING WHICH REVISION IS CURRENT.
- THE DOCUMENT STATUS "INFORMATION" OR "PRELIMINARY", INDICATES THAT THIS DRAWING IS FOR REFERENCE PURPOSES ONLY - THE ORIGINATOR WILL ACCEPT NO RESPONSIBILITY FOR THE COMPLETENESS OF INFORMATION UNDER THIS STATUS.
- THE DOCUMENT STATUS "RECORD" OR "AS BUILT" HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ORIGINATOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS "RECORD" OR "AS BUILT" DOCUMENT OR FOR ANY ERRORS OR OMISSIONS THAT MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT OF INCORRECT INFORMATION PROVIDED TO THE ORIGINATOR. THOSE RELYING ON THE "RECORD" OR "AS BUILT" DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY.

DRAWING NOTES:

CDM REGULATIONS 2015

SIGNIFICANT OR NON-OBSVIOUS RISKS AND RISKS WHICH ARE DIFFICULT TO MANAGE ARE IDENTIFIED ON THIS DRAWING USING THE FOLLOWING SYMBOL, IDENTIFIED TO THE RIGHT WITH BRIEF ACCOMPANYING TEXT. FOR FURTHER DETAILS OF THE RISKS IDENTIFIED BY DESIGNERS, REFERENCE SHOULD BE MADE TO CDM HAZARD REGISTER.

- LEGEND
- PROPOSED SURFACE WATER DRAIN AND ACCESS POINT
 - PROPOSED CHANNEL DRAIN
 - PROPOSED FOUL WATER DRAIN AND ACCESS POINT
 - PROPOSED POROUS SURFACE
 - ATTENUATING SUB-BASE
 - BELOW-GROUND GEOCELLULAR ATTENUATION TANK
 - PROPOSED SWALE
 - PROPOSED FOUL WATER TREATMENT PLANT
 - PROPOSED PETROL / OIL INTERCEPTOR
 - ASSUMED LINE OF EXISTING CULVERT
 - EXISTING ORDINARY WATERCOURSE DITCH

P01	INCLUSION IN FRA REV 2.0	07.07.2026	SD	AM
REV	DESCRIPTION	DATE	BY	CHKD
ORIGINATOR:	www.ridge.co.uk			



PROJECT NUMBER: 5029705

CLIENT: YEARGATE LTD

IN ASSOCIATION WITH:

PROJECT: BIRCH BUSINESS PARK HEYWOOD

TITLE: OUTLINE DRAINAGE STRATEGY GENERAL ARRANGEMENT

DRAWN BY:	SD	CHECKED BY:	AM	APPROVED BY:	SD
SCALE:	1:500	@ A1	DATE:	10/05/2026	
STATUS:	DESCRIPTION:				
S2 FOR INFORMATION					
DRAWING No: 5029705-RDG-XX-00-D-C-000501					
PROJECT:	ORG:	FUNCTION:	SPATIAL:	FORM:	DISCIPLINE:
RDG	XX	00	D	C	000501
					P01

APPENDIX D – OUTLINE SURFACE WATER ATTENUATION CALCULATIONS

Project: Birch Business Park Heywood, Rochdale	Date: 20/04/2026			
	Designed by: SDowning	Checked by: AMatadar	Approved By: SDowning	
Report Title: UK and Ireland Rural Runoff Calculator	Company Name: Ridge and Partners LLP, 2nd Floor 100 Embankment, Cathedral Approach Manchester. M3 7FB			

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	3.80
SAAR (mm)	1076.0
Soil	0.47
Region	Region 10
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 10	30.3	30.3	26.4	51.4	63.1

QUICK STORAGE ESTIMATE INPUT & RESULTS

Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

2.538

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

26.4

Infiltration Rate (m/hr)

0.0

Safety Factor

2.0

Full (inc. graphs)

Calculate

Create New

From Library

All

FSR

Method

FSR

Number of Storms

36

Max. Run Time (mins)

5760

Input

Results

2D Graph

OK

Cancel

Create New

Help

Quick Storage Estimate

Results

Quick Storage Estimate variables require approximate storage of between 244m³ - 462m³.

These values are estimates only and should not be used for final design purposes.

Input

Results

2D Graph

OK

Cancel

Create New

Help

Quick Storage Estimate

2D Graph

Design

Overview

Volume (m³)

600

500

400

300

200

100

0

15

20

25

30

35

40

45

50

Discharge Rate (L/s)

Design Curve

Discharge Rate (L/s)

Input

Results

2D Graph

OK

Cancel

...

APPENDIX E – OUTLINE DRAINAGE STRATEGY HYDRAULIC SIMULATION OUTPUTS

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Junctions Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S1	Manhole	384229.435	408578.371	125.600	1.450	124.150	Circular	1.200
S2	Manhole	384238.151	408596.597	124.400	2.200	122.200	Circular	1.200
S3	Manhole	384245.281	408616.225	123.350	1.590	121.760	Circular	1.200
S4	Manhole	384251.360	408611.883	123.200	1.575	121.625	Circular	1.500
S5	Manhole	384286.774	408733.443	123.000	1.450	121.550	Circular	1.500
S10	Manhole	384321.013	408692.921	123.000	2.270	120.730	Circular	2.400
S11	Manhole	384332.306	408681.498	122.215	1.650	120.565	Circular	1.800
S12	Manhole	384308.374	408752.272	121.600	1.665	119.935	Circular	1.500
S17	Manhole	384342.682	408713.094	121.600	2.105	119.495	Circular	2.400
S18	Manhole	384356.537	408701.625	121.500	2.424	119.076	Circular	2.400
S19	Manhole	384421.754	408757.462	121.235	2.520	118.715	Circular	2.400
S20	Manhole	384423.010	408767.077	121.235	2.695	118.540	Circular	2.700
S21	Manhole	384439.556	408780.709	121.000	2.514	118.486	Circular	2.700
S22	Manhole	384462.466	408813.597	118.800	0.823	117.977	Circular	1.200
OF1	Manhole	384460.143	408819.202	119.000	1.200	117.800	Circular	1.200
S8	Manhole	384276.473	408695.710	123.200	1.650	121.550	Circular	2.100
S9	Manhole	384291.516	408677.744	123.200	1.767	121.433	Circular	2.100
S15	Manhole	384336.866	408745.973	121.235	1.416	119.819	Circular	2.100
S16	Manhole	384353.026	408727.204	121.235	1.540	119.695	Circular	2.100
S13	Manhole	384323.422	408734.617	121.600	1.742	119.858	Circular	1.500
S14	Manhole	384326.638	408730.919	121.600	1.763	119.837	Circular	1.500
S6	Manhole	384297.892	408720.492	123.000	1.650	121.350	Circular	1.500
S7	Manhole	384300.757	408717.075	123.000	1.669	121.331	Circular	1.500

Name	Lock	Access Required	Intersection Easting (m)	Intersection Northing (m)
S1	None	☒	384229.435	408578.371
S2	None	☐		
S3	None	☐		
S4	None	☐		
S5	None	☐		
S10	None	☐		
S11	None	☐		
S12	None	☐		
S17	None	☐		
S18	None	☐		
S19	None	☐		
S20	None	☐		
S21	None	☐		
S22	None	☐		
OF1	Levels	☐		
S8	None	☐		
S9	None	☐		
S15	None	☐		
S16	None	☐		
S13	None	☐		
S14	None	☐		
S6	None	☐		
S7	None	☐		

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
Report Details: Type: Junctions Storm Phase: Phase (1)		Designed by: SD	Checked by: AM		Approved By: SD
		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

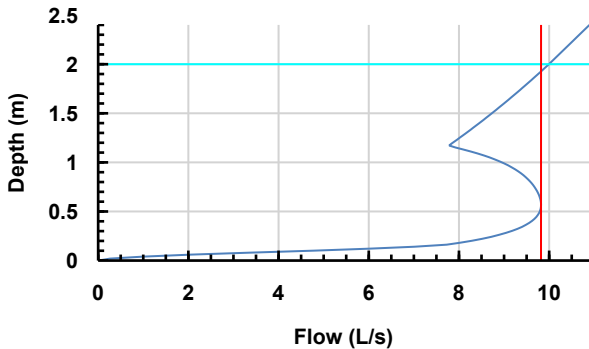
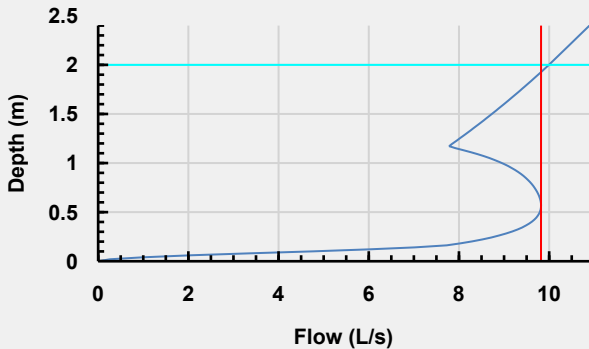
Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet	Catchment Area (4)	(None)	No Restriction
S2	Inlet	1.000	(None)	No Restriction
S3	Inlet (3)	2.000	(None)	No Restriction
S4	Inlet	1.001	(None)	No Restriction
	Inlet (1)	2.001	(None)	No Restriction
	Inlet (2)	Catchment Area (6)	(None)	No Restriction
S5	Inlet	Catchment Area (1)	(None)	No Restriction
S10	Inlet (3)	3.003	(None)	No Restriction
S11	Inlet	1.002	(None)	No Restriction
	Inlet (1)	3.004	(None)	No Restriction
S12	Inlet	Catchment Area (2)	(None)	No Restriction
S17	Inlet	5.003	(None)	No Restriction
S18	Inlet	1.003 Catchment Area (8)	(None)	No Restriction
	Inlet (1)	5.004	(None)	No Restriction
S19	Inlet	1.004	(None)	No Restriction
S20	Inlet	1.005	(None)	No Restriction
	Inlet (3)	7.000	(None)	No Restriction
S21	Inlet	1.006	(None)	No Restriction
S22	Inlet	1.008	(None)	No Restriction
OF1	Inlet	1.009	(None)	No Restriction
S8	Inlet	Catchment Area (5)	(None)	No Restriction
S9	Inlet	4.000	(None)	No Restriction
S15	Inlet (1)	Catchment Area (7)	(None)	No Restriction
S16	Inlet	6.000	(None)	No Restriction
S13	Inlet	5.000	(None)	No Restriction
S14	Inlet	5.001	(None)	No Restriction
S6	Inlet	3.000	(None)	No Restriction
S7	Inlet	3.001	(None)	No Restriction

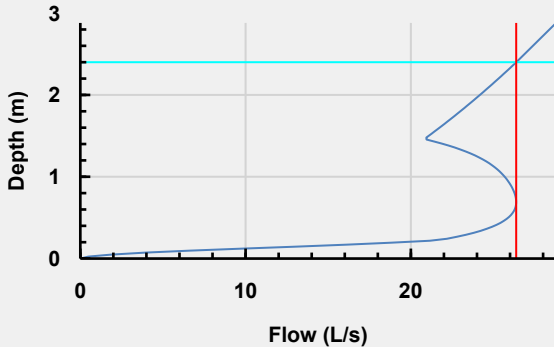
Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S1	Outlet	1.000	Free Discharge
S2	Outlet	1.001	Free Discharge
S3	Outlet	2.001	Free Discharge
S4	Outlet	1.002	Free Discharge
S5	Outlet	3.000	Free Discharge
	Outlet	3.004	Hydro-Brake®

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
Report Details: Type: Junctions Storm Phase: Phase (1)		Designed by: SD	Checked by: AM		Approved By: SD
		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

Junction	Outlet Name	Outgoing Connection	Outlet Type
S10	Invert Level (m)	120.730	
	Design Depth (m)	2.000	
	Design Flow (L/s)	10.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☒	
	Unit Reference	SHE-0131-1000-2000-1000	
			
S11	Outlet	1.003	Free Discharge
S12	Outlet	5.000	Free Discharge
S17	Outlet	5.004	Hydro-Brake®
	Invert Level (m)	119.495	
	Design Depth (m)	2.000	
	Design Flow (L/s)	10.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☒	
	Unit Reference	SHE-0131-1000-2000-1000	
			
S18	Outlet	1.004	Free Discharge
S19	Outlet	1.005	Free Discharge
S20	Outlet	1.006	Free Discharge
	Outlet	1.007	Hvdro-Brake®

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Junctions Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

S21	Junction	Outlet Name	Outgoing Connection	Outlet Type
	Invert Level (m)		118.486	
	Design Depth (m)		2.400	
	Design Flow (L/s)		26.4	
	Objective	Minimise Upstream Storage Requirements		
	Application	Surface Water Only		
	Sump Available	☒		
	Unit Reference	SHE-0204-2640-2400-2640		
				

S22	Outlet	1.009	Free Discharge
S8	Outlet	4.000	Free Discharge
S9	Outlet	4.001	Free Discharge
S15	Outlet	6.000	Free Discharge
S16	Outlet	6.001	Free Discharge
S13	Outlet	5.001	Free Discharge
S14	Outlet	5.002	Free Discharge
S6	Outlet	3.001	Free Discharge
S7	Outlet	3.002	Free Discharge

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		





Porous Paving

Type : Porous Paving

Dimensions

Exceedance Level (m)	123.200
Depth (m)	0.490
Base Level (m)	122.710
Paving Layer Depth (mm)	90
Membrane Percolation (m/hr)	300.0
Porosity (%)	30
Length (m)	59.466
Long. Slope (1:X)	1000.00
Width (m)	26.769
Total Volume (m³)	191.021

Inlets

Inlet

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

Outlets

Outlet

Outgoing Connection	2.000
Outlet Type	Orifice
Diameter (m)	0.033
Coefficient of Discharge	0.600
Invert Level (m)	122.710

Advanced

Conductivity (m/hr)	0.001
---------------------	-------

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		





Porous Paving (1)

Type : Porous Paving

Dimensions

Exceedance Level (m)	121.235
Depth (m)	0.490
Base Level (m)	120.745
Paving Layer Depth (mm)	90
Membrane Percolation (m/hr)	300.0
Porosity (%)	30
Length (m)	50.208
Long. Slope (1:X)	1000.00
Width (m)	25.225
Total Volume (m³)	151.977

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (3)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	7.000
Outlet Type	Orifice
Diameter (m)	0.033
Coefficient of Discharge	0.600
Invert Level (m)	120.745

Advanced

Conductivity (m/hr)	0.001
---------------------	-------

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		

**RIDGE**
Built Environment Consultancy



Swale

Type : Swale

Swale

Exceedance Level (m)	119.250
Depth (m)	1.250
Base Level (m)	118.000
Top Width (m)	8.000
Side Slope (1:X)	3.00
Base Width (m)	0.500
Freeboard (mm)	0
Length (m)	15.000
Long. Slope (1:X)	39.164
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.032
Total Volume (m³)	79.652

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.007
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.008
Outlet Type	Free Discharge

Advanced

Swale

Porosity (%)	100
--------------	-----

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	121.600
Depth (m)	1.200
Base Level (m)	119.500
Number of Crates Long	20
Number of Crates Wide	56
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	639.300

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	6.001
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	5.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	5.003
Outlet Type	Free Discharge

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		





Cellular Storage (1)

Type : Cellular Storage

Dimensions

Exceedance Level (m)	123.000
Depth (m)	1.200
Base Level (m)	120.900
Number of Crates Long	25
Number of Crates Wide	48
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	684.900

Inlets

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	4.001
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	3.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	3.003
Outlet Type	Free Discharge

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Connections Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Height (mm)	Upstream Cover Level (m)
1.000	20.204	Pipe	10.361		0.6	225		125.600
1.001	20.202	Pipe	40.404		0.6	225		124.400
2.000	7.955	Pipe	8.372		0.6	100		123.259
2.001	7.471	Pipe	55.442		0.6	150		123.350
1.002	106.764	Pipe	99.131		0.6	300		123.200
3.000	17.068	Pipe	85.342		0.6	300		123.000
3.004	16.064	Pipe	150.000		0.6	225		123.000
1.003	31.499	Pipe	44.055		0.6	375		122.215
5.002	2.232	Pipe	59.909		0.6	300		121.600
5.004	17.986	Pipe	149.882		0.6	225		121.600
1.004	85.855	Pipe	237.826		0.6	600		121.500
1.005	9.696	Pipe	387.855		0.6	600		121.235
1.006	21.439	Pipe	397.011		0.6	750		121.235
1.008	4.695	Pipe	200.000		0.6	300		119.633
1.009	6.067	Pipe	34.277		0.6	300		118.800
7.000	3.827	Pipe	2.457		0.6	100		121.285
6.000	24.768	Pipe	200.000		0.6	450		121.235
5.003	1.772	Pipe	354.428		0.6	450		121.600
4.000	23.432	Pipe	200.000		0.6	450		123.200
4.001	8.682	Pipe	75.617		0.6	450		123.200
1.007	20.654	Pipe	200.522		0.6	300		121.000
5.000	23.198	Pipe	300.000		0.6	300		121.600
5.001	4.900	Pipe	240.000		0.6	300		121.600
6.001	8.060	Pipe	177.827		0.6	450		121.235
3.001	4.459	Pipe	240.000		0.6	300		123.000
3.002	2.538	Pipe	19.372		0.6	300		123.000
3.003	4.028	Pipe	23.721		0.6	450		123.000

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Connections Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

Name	Upstream Invert Level (m)	Downstrea m Cover Level (m)	Downstrea m Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Velocity (m/s)	Culvert Type
1.000	124.150	124.400	122.200		All			(None)
1.001	122.200	123.200	121.700		All			(None)
2.000	122.710	123.350	121.760		All	1.4		(None)
2.001	121.760	123.200	121.625		All			(None)
1.002	121.700	122.215	120.623		All			(None)
3.000	121.550	123.000	121.350		None			(None)
3.004	120.730	122.215	120.623		All	10.6		(None)
1.003	120.565	121.500	119.850		Levels			(None)
5.002	119.837	121.600	119.800		All			(None)
5.004	119.495	121.500	119.375		All	10.2		(None)
1.004	119.076	121.235	118.715		All			(None)
1.005	118.715	121.235	118.690		All			(None)
1.006	118.540	121.000	118.486		All	26.4		(None)
1.008	118.000	118.800	117.977		All			(None)
1.009	117.977	119.000	117.800		All			(None)
7.000	120.745	121.235	119.187		All	1.4		(None)
6.000	119.819	121.235	119.695		All			(None)
5.003	119.500	121.600	119.495		All			(None)
4.000	121.550	123.200	121.433		All			(None)
4.001	121.433	123.000	121.318		All			(None)
1.007	118.486	119.633	118.383		All	27.0		(None)
5.000	119.935	121.600	119.858		All			(None)
5.001	119.858	121.600	119.837		None			(None)
6.001	119.695	121.600	119.650		All			(None)
3.001	121.350	123.000	121.331		None			(None)
3.002	121.331	123.000	121.200		Levels			(None)
3.003	120.900	123.000	120.730		Levels			(None)

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Connections Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			

Name	Culvert Entrance	Wall Thickness (mm)	Material	Trench Width (mm)	Bedding Material	Surrounding Material
1.000	(None)	0		0		
1.001	(None)	0		0		
2.000	(None)	0		0		
2.001	(None)	0		0		
1.002	(None)	0		0		
3.000	(None)	0		0		
3.004	(None)	0		0		
1.003	(None)	0		0		
5.002	(None)	0		0		
5.004	(None)	0		0		
1.004	(None)	0		0		
1.005	(None)	0		0		
1.006	(None)	0		0		
1.008	(None)	0		0		
1.009	(None)	0		0		
7.000	(None)	0		0		
6.000	(None)	0		0		
5.003	(None)	0		0		
4.000	(None)	0		0		
4.001	(None)	0		0		
1.007	(None)	0		0		
5.000	(None)	0		0		
5.001	(None)	0		0		
6.001	(None)	0		0		
3.001	(None)	0		0		
3.002	(None)	0		0		
3.003	(None)	0		0		

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Junctions Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

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
S1	FSR: 2 years: +0 %: 15 mins: Winter	125.6 00	124.1 50	124.19 2	0.042	12.8	0.048	0.000	12.6	5.902	OK
S2	FSR: 2 years: +0 %: 15 mins: Winter	124.4 00	122.2 00	122.25 9	0.059	12.6	0.066	0.000	12.2	5.874	OK
S3	FSR: 2 years: +0 %: 15 mins: Winter	123.3 50	121.7 60	121.79 4	0.034	0.3	0.039	0.000	0.3	0.070	OK
S4	FSR: 2 years: +0 %: 15 mins: Winter	123.2 00	121.6 25	121.79 4	0.169	28.9	0.299	0.000	23.0	13.470	OK
S5	FSR: 2 years: +0 %: 15 mins: Winter	123.0 00	121.5 50	121.70 1	0.151	50.7	0.267	0.000	49.6	23.400	OK
S10	FSR: 2 years: +0 %: 240 mins: Winter	123.0 00	120.7 30	121.09 7	0.367	9.1	1.660	0.000	9.1	190.509	Surcharged
S11	FSR: 2 years: +0 %: 30 mins: Winter	122.2 15	120.5 65	120.64 4	0.079	28.0	0.200	0.000	27.9	41.367	OK
S12	FSR: 2 years: +0 %: 15 mins: Winter	121.6 00	119.9 35	120.14 6	0.211	50.9	0.373	0.000	49.0	23.486	OK
S17	FSR: 2 years: +0 %: 480 mins: Winter	121.6 00	119.4 95	119.75 6	0.261	8.2	1.179	0.000	8.2	206.206	Surcharged
S18	FSR: 2 years: +0 %: 30 mins: Winter	121.5 00	119.0 76	119.20 1	0.125	43.3	0.564	0.000	43.0	63.788	OK
S19	FSR: 2 years: +0 %: 30 mins: Summer	121.2 35	118.7 15	118.91 7	0.202	40.9	0.912	0.000	36.4	56.278	OK
S20	FSR: 2 years: +0 %: 30 mins: Winter	121.2 35	118.5 40	118.95 0	0.410	35.8	2.347	0.000	29.0	60.034	OK
S21	FSR: 2 years: +0 %: 60 mins: Winter	121.0 00	118.4 86	118.97 2	0.486	26.4	2.783	0.000	24.6	113.872	Surcharged
S22	FSR: 2 years: +0 %: 60 mins: Winter	118.8 00	117.9 77	118.05 8	0.081	24.7	0.092	0.000	24.7	112.995	OK
OF1	FSR: 2 years: +0 %: 60 mins: Winter	119.0 00	117.8 00	117.87 3	0.073	24.7	0.000	0.000	24.7	112.995	OK
S8	FSR: 2 years: +0 %: 15 mins: Winter	123.2 00	121.5 50	121.76 3	0.213	96.0	0.738	0.000	93.3	44.339	OK
S9	FSR: 2 years: +0 %: 15 mins: Winter	123.2 00	121.4 33	121.60 8	0.175	93.3	0.605	0.000	90.0	44.273	OK
S15	FSR: 2 years: +0 %: 15 mins: Winter	121.2 35	119.8 19	120.02 9	0.210	87.3	0.726	0.000	84.5	40.341	OK
S16	FSR: 2 years: +0 %: 15 mins: Winter	121.2 35	119.6 95	119.89 7	0.202	84.5	0.700	0.000	80.6	40.258	OK
S13	FSR: 2 years: +0 %: 15 mins: Winter	121.6 00	119.8 58	120.03 7	0.179	49.0	0.317	0.000	47.3	23.449	OK
S14	FSR: 2 years: +0 %: 15 mins: Winter	121.6 00	119.8 37	119.98 4	0.147	47.3	0.260	0.000	46.6	23.435	OK
S6	FSR: 2 years: +0 %: 15 mins: Winter	123.0 00	121.3 50	121.52 5	0.175	49.6	0.308	0.000	47.4	23.367	OK
S7	FSR: 2 years: +0 %: 15 mins: Winter	123.0 00	121.3 31	121.44 5	0.114	47.4	0.201	0.000	47.8	23.361	OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Junctions Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Outflow

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
S1	FSR: 30 years: +40 %: 15 mins: Winter	125.600	124.150	124.219	0.069	33.8	0.078	0.000	33.5	15.619	OK
S2	FSR: 30 years: +40 %: 15 mins: Winter	124.400	122.200	122.300	0.100	33.5	0.113	0.000	32.6	15.574	OK
S3	FSR: 30 years: +40 %: 15 mins: Summer	123.350	121.760	121.864	0.104	0.5	0.117	0.000	0.7	0.205	OK
S4	FSR: 30 years: +40 %: 15 mins: Winter	123.200	121.625	121.871	0.246	76.7	0.435	0.000	64.4	36.016	OK
S5	FSR: 30 years: +40 %: 15 mins: Winter	123.000	121.550	121.993	0.443	134.1	0.783	0.000	128.9	61.916	Surcharged
S10	FSR: 30 years: +40 %: 60 mins: Winter	123.000	120.730	121.405	0.675	11.3	3.054	0.000	9.8	61.114	Surcharged
S11	FSR: 30 years: +40 %: 15 mins: Winter	122.215	120.565	120.695	0.130	73.0	0.330	0.000	69.9	48.222	OK
S12	FSR: 30 years: +40 %: 15 mins: Winter	121.600	119.935	120.682	0.747	134.6	1.319	0.000	129.5	62.138	Surcharged
S17	FSR: 30 years: +40 %: 120 mins: Winter	121.600	119.495	120.178	0.683	10.2	3.089	0.000	9.8	91.572	Surcharged
S18	FSR: 30 years: +40 %: 15 mins: Winter	121.500	119.076	119.473	0.397	124.9	1.797	0.000	114.7	74.169	OK
S19	FSR: 30 years: +40 %: 15 mins: Winter	121.235	118.715	119.471	0.756	114.7	3.419	0.000	87.4	55.119	Surcharged
S20	FSR: 30 years: +40 %: 15 mins: Summer	121.235	118.540	119.362	0.822	87.3	4.706	0.000	56.7	42.952	Surcharged
S21	FSR: 30 years: +40 %: 15 mins: Summer	121.000	118.486	119.362	0.876	56.7	5.017	0.000	26.4	33.437	Surcharged
S22	FSR: 30 years: +40 %: 15 mins: Summer	118.800	117.977	118.061	0.085	26.4	0.096	0.000	26.4	32.057	OK
OF1	FSR: 30 years: +40 %: 15 mins: Summer	119.000	117.800	117.875	0.075	26.4	0.000	0.000	26.4	32.057	OK
S8	FSR: 30 years: +40 %: 15 mins: Winter	123.200	121.550	121.975	0.425	254.1	1.474	0.000	245.0	117.337	OK
S9	FSR: 30 years: +40 %: 15 mins: Winter	123.200	121.433	121.754	0.321	245.0	1.113	0.000	238.7	117.251	OK
S15	FSR: 30 years: +40 %: 15 mins: Winter	121.235	119.819	120.255	0.436	231.2	1.512	0.000	222.6	106.773	OK
S16	FSR: 30 years: +40 %: 15 mins: Winter	121.235	119.695	120.085	0.390	222.6	1.352	0.000	213.9	105.860	OK
S13	FSR: 30 years: +40 %: 15 mins: Winter	121.600	119.858	120.280	0.422	129.5	0.746	0.000	127.4	62.106	Surcharged
S14	FSR: 30 years: +40 %: 15 mins: Winter	121.600	119.837	120.128	0.290	127.4	0.513	0.000	125.6	62.091	OK
S6	FSR: 30 years: +40 %: 15 mins: Winter	123.000	121.350	121.692	0.342	128.9	0.605	0.000	124.5	61.876	Surcharged
S7	FSR: 30 years: +40 %: 15 mins: Winter	123.000	121.331	121.542	0.211	124.5	0.373	0.000	124.2	61.872	OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Junctions Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

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
S1	FSR: 100 years: +45 %: 15 mins: Winter	125.600	124.150	124.231	0.081	45.2	0.091	0.000	44.9	20.886	OK
S2	FSR: 100 years: +45 %: 15 mins: Winter	124.400	122.200	122.322	0.122	44.9	0.139	0.000	43.6	20.831	OK
S3	FSR: 100 years: +45 %: 1440 mins: Winter	123.350	121.760	121.783	0.023	1.3	0.026	0.000	1.3	74.504	OK
S4	FSR: 100 years: +45 %: 15 mins: Winter	123.200	121.625	121.910	0.285	102.5	0.504	0.000	86.6	48.198	OK
S5	FSR: 100 years: +45 %: 15 mins: Winter	123.000	121.550	122.433	0.883	179.3	1.560	0.000	172.8	82.780	Surcharged
S10	FSR: 100 years: +45 %: 30 mins: Summer	123.000	120.730	121.385	0.655	12.4	2.963	0.000	9.8	29.378	Surcharged
S11	FSR: 100 years: +45 %: 15 mins: Winter	122.215	120.565	120.716	0.151	95.6	0.385	0.000	91.7	60.765	OK
S12	FSR: 100 years: +45 %: 15 mins: Winter	121.600	119.935	121.195	1.260	180.0	2.227	0.000	170.0	83.083	Surcharged
S17	FSR: 100 years: +45 %: 60 mins: Summer	121.600	119.495	120.184	0.689	10.3	3.119	0.000	9.8	45.910	Surcharged
S18	FSR: 100 years: +45 %: 15 mins: Winter	121.500	119.076	120.042	0.966	166.1	4.372	0.000	160.6	82.310	Surcharged
S19	FSR: 100 years: +45 %: 15 mins: Winter	121.235	118.715	120.045	1.330	160.6	6.019	0.000	82.9	57.724	Surcharged
S20	FSR: 100 years: +45 %: 15 mins: Summer	121.235	118.540	119.801	1.261	82.2	7.219	0.000	53.2	45.112	Surcharged
S21	FSR: 100 years: +45 %: 60 mins: Winter	121.000	118.486	120.943	2.457	40.7	14.068	0.000	26.4	149.508	Flood Risk
S22	FSR: 100 years: +45 %: 120 mins: Summer	118.800	117.977	118.061	0.085	26.4	0.096	0.000	26.4	308.409	OK
OF1	FSR: 100 years: +45 %: 120 mins: Summer	119.000	117.800	117.875	0.075	26.4	0.000	0.000	26.4	308.409	OK
S8	FSR: 100 years: +45 %: 15 mins: Winter	123.200	121.550	122.221	0.671	339.8	2.326	0.000	332.0	156.870	Surcharged
S9	FSR: 100 years: +45 %: 15 mins: Winter	123.200	121.433	121.845	0.412	332.0	1.428	0.000	324.1	156.787	OK
S15	FSR: 100 years: +45 %: 15 mins: Winter	121.235	119.819	120.510	0.691	309.1	2.392	0.000	297.2	142.966	Surcharged
S16	FSR: 100 years: +45 %: 15 mins: Winter	121.235	119.695	120.218	0.523	297.2	1.812	0.000	288.4	141.593	Surcharged

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026					
		Designed by: SD	Checked by: AM	Approved By: SD			
Report Details: Type: Junctions Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester					

S13	FSR: 100 years: +45 %: 15 mins: Winter	121.6 00	119.8 58	120.53 0	0.672	170.0	1.188	0.000	165.8	82.932	Surcharged
S14	FSR: 100 years: +45 %: 15 mins: Winter	121.6 00	119.8 37	120.28 4	0.447	165.8	0.790	0.000	163.9	82.766	Surcharged
S6	FSR: 100 years: +45 %: 15 mins: Winter	123.0 00	121.3 50	121.87 9	0.529	172.8	0.934	0.000	170.8	82.737	Surcharged
S7	FSR: 100 years: +45 %: 15 mins: Winter	123.0 00	121.3 31	121.60 3	0.272	170.8	0.480	0.000	169.1	82.710	OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

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. Velocity (m/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)
Cellular Storage	FSR: 2 years: +0 %: 480 mins: Winter	119.756	119.756	0.256	0.256	20.7	136.105	0.000	0.000		8.2	206.483	78.710
Porous Paving	FSR: 2 years: +0 %: 1440 mins: Winter	123.271	122.710	0.501	0.000	2.2	75.214	3.572	0.000		0.0	0.000	60.625
Cellular Storage (1)	FSR: 2 years: +0 %: 240 mins: Winter	121.097	121.097	0.197	0.197	34.5	112.496	0.000	0.000		9.1	190.846	83.575
Porous Paving (1)	FSR: 2 years: +0 %: 1440 mins: Winter	121.296	120.745	0.501	0.000	1.9	65.255	2.746	0.000		0.0	0.000	57.063
Swale	FSR: 2 years: +0 %: 60 mins: Winter	118.441	118.116	0.058	0.116	24.6	0.882	0.000	0.000	0.6	24.7	113.116	98.893

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		



Status
OK
Flood
OK
Flood
OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Resident Volume

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. Velocity (m/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)
Cellular Storage	FSR: 30 years: +40 %: 360 mins: Winter	120.299	120.299	0.799	0.799	61.2	424.863	0.000	0.000		10.0	308.259	33.542
Porous Paving	FSR: 30 years: +40 %: 1440 mins: Winter	123.278	122.808	0.508	0.098	5.2	167.597	11.472	0.000		0.6	22.621	12.262
Cellular Storage (1)	FSR: 30 years: +40 %: 360 mins: Winter	121.586	121.586	0.686	0.686	66.4	391.149	0.000	0.000		10.2	387.133	42.890
Porous Paving (1)	FSR: 30 years: +40 %: 1440 mins: Winter	121.302	120.877	0.507	0.132	4.5	136.359	9.243	0.000		0.8	30.738	10.277
Swale	FSR: 30 years: +40 %: 15 mins: Summer	118.443	118.120	0.060	0.120	26.4	0.927	0.000	0.000	0.6	26.4	32.243	98.836

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		



Status
OK
Flood
OK
Flood
OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

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. Velocity (m/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)
Cellular Storage	FSR: 100 years: +45 %: 480 mins: Winter	120.680	120.680	1.180	1.180	68.1	627.810	0.000	0.000		10.1	421.098	1.797
Porous Paving	FSR: 100 years: +45 %: 1440 mins: Winter	123.279	123.058	0.510	0.348	6.7	193.969	16.352	0.000		1.3	74.511	-1.543
Cellular Storage (1)	FSR: 100 years: +45 %: 480 mins: Winter	121.919	121.919	1.019	1.019	71.4	581.082	0.000	0.000		10.3	496.965	15.158
Porous Paving (1)	FSR: 100 years: +45 %: 1440 mins: Winter	121.303	121.248	0.508	0.503	5.8	160.963	13.393	0.000		1.4	75.836	-5.913
Swale	FSR: 100 years: +45 %: 120 mins: Summer	118.443	118.120	0.060	0.120	26.4	0.927	0.000	0.000	0.6	26.4	308.596	98.836

Project: 5029705 Birch Business Park Heywood	Date: 07/07/2026		
	Designed by: SD	Checked by: AM	Approved By: SD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester		



Status
OK
Flood
OK
Flood
OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Connections Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 2 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
1.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S1	S2	125.600	124.192	0.050	5.902	1.9	0.08	12.6	OK
1.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S2	S4	124.400	122.259	0.077	5.874	1.0	0.15	12.2	OK
2.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Porous Paving	S3	123.259	122.736	0.016	0.000	0.0	0	0.0	OK
2.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S3	S4	123.350	121.794	0.102	0.000	0.0	0.01	0.3	OK
1.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S4	S11	123.200	121.794	0.093	13.397	1.2	0.21	23.0	OK
3.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S5	S6	123.000	121.701	0.163	23.400	1.3	0.41	49.6	OK
3.004	FSR: 2 years: +0 %: 240 mins: Winter	Pipe	S10	S11	123.000	121.097	0.072	190.468	0.8	0.22	9.1	Surcharged
1.003	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	S11	S18	122.215	120.644	0.078	41.367	1.7	0.09	27.9	OK
5.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S14	Cellular Storage	121.600	119.984	0.132	23.435	1.6	0.32	46.6	OK
5.004	FSR: 2 years: +0 %: 480 mins: Winter	Pipe	S17	S18	121.600	119.756	0.068	206.167	0.8	0.19	8.2	Surcharged
1.004	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	S18	S19	121.500	119.201	0.167	63.788	0.9	0.1	43.0	OK
1.005	FSR: 2 years: +0 %: 30 mins: Summer	Pipe	S19	S20	121.235	118.917	0.212	56.278	0.7	0.1	36.4	OK
1.006	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	S20	S21	121.235	118.950	0.437	60.034	0.5	0.05	29.0	OK
1.008	FSR: 2 years: +0 %: 60 mins: Winter	Pipe	Swale	S22	119.633	118.077	0.099	113.116	1.2	0.31	24.7	OK
1.009	FSR: 2 years: +0 %: 60 mins: Winter	Pipe	S22	OF1	118.800	118.058	0.077	112.995	1.7	0.13	24.7	OK
7.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Porous Paving (1)	S20	121.285	120.774	0.000	0.000	0.0	0	0.0	OK
6.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S15	S16	121.235	120.029	0.206	40.341	1.2	0.37	84.5	OK
5.003	FSR: 2 years: +0 %: 480 mins: Winter	Pipe	Cellular Storage	S17	121.600	119.756	0.258	206.483	0.2	0.05	8.2	OK
4.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S8	S9	123.200	121.763	0.194	44.339	1.4	0.41	93.3	OK

Project: 5029705 Birch Business Park Heywood				Date: 07/07/2026									
				Designed by: SD		Checked by: AM						Approved By: SD	
Report Details: Type: Connections Summary Storm Phase: Phase (1)				Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester									

4.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S9	Cellular Storage (1)	123.200	121.608	0.162	44.273	1.7	0.24	90.0	OK
1.007	FSR: 2 years: +0 %: 60 mins: Winter	Pipe	S21	Swale	121.000	118.972	0.088	113.699	1.4	0.32	24.6	Surcharged
5.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S12	S13	121.600	120.146	0.195	23.486	1.0	0.77	49.0	OK
5.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S13	S14	121.600	120.037	0.163	23.449	1.2	0.66	47.3	OK
6.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S16	Cellular Storage	121.235	119.897	0.190	40.258	1.3	0.33	80.6	OK
3.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S6	S7	123.000	121.525	0.144	23.367	1.4	0.66	47.4	OK
3.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S7	Cellular Storage (1)	123.000	121.445	0.101	23.361	2.3	0.19	47.8	OK
3.003	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage (1)	S10	123.000	121.006	0.190	11.622	0.7	0.03	17.9	OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
		Designed by: SD	Checked by: AM		Approved By: SD
Report Details: Type: Connections Summary Storm Phase: Phase (1)		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 30 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
1.000	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S1	S2	125.600	124.219	0.085	15.619	2.5	0.21	33.5	OK
1.001	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S2	S4	124.400	122.300	0.136	15.574	1.3	0.4	32.6	OK
2.000	FSR: 30 years: +40 %: 1440 mins: Winter	Pipe	Porous Paving	S3	123.259	123.207	0.014	22.619	1.0	0.03	0.6	Flood
2.001	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	S3	S4	123.350	121.864	0.150	0.000	0.0	0.03	0.7	OK
1.002	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S4	S11	123.200	121.871	0.167	35.797	1.6	0.58	64.4	OK
3.000	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S5	S6	123.000	121.993	0.300	61.916	1.8	1.07	128.9	Surcharged
3.004	FSR: 30 years: +40 %: 120 mins: Winter	Pipe	S10	S11	123.000	121.506	0.075	125.697	0.8	0.23	9.8	Surcharged
1.003	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S11	S18	122.215	120.695	0.126	48.222	2.1	0.23	69.9	OK
5.002	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S14	Cellular Storage	121.600	120.128	0.254	62.091	2.0	0.87	125.6	OK
5.004	FSR: 30 years: +40 %: 240 mins: Summer	Pipe	S17	S18	121.600	120.165	0.225	194.431	0.8	0.24	10.2	Surcharged
1.004	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S18	S19	121.500	119.473	0.576	74.169	1.2	0.26	114.7	OK
1.005	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S19	S20	121.235	119.471	0.600	55.119	0.9	0.25	87.4	Surcharged
1.006	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	S20	S21	121.235	119.362	0.750	42.952	0.4	0.09	56.7	Surcharged
1.008	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	Swale	S22	119.633	118.080	0.102	32.243	1.2	0.34	26.4	OK

Project: 5029705 Birch Business Park Heywood				Date: 07/07/2026									
				Designed by: SD		Checked by: AM						Approved By: SD	
Report Details: Type: Connections Summary Storm Phase: Phase (1)				Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester									

1.009	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	S22	OF1	118.800	118.061	0.080	32.057	1.7	0.14	26.4	OK
7.000	FSR: 30 years: +40 %: 1440 mins: Winter	Pipe	Porous Paving (1)	S20	121.285	121.242	0.010	30.737	2.0	0.02	0.8	Flood
6.000	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S15	S16	121.235	120.255	0.413	106.773	1.5	0.98	222.6	OK
5.003	FSR: 30 years: +40 %: 30 mins: Winter	Pipe	Cellular Storage	S17	121.600	119.913	0.416	18.809	0.3	0.06	10.4	OK
4.000	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S8	S9	123.200	121.975	0.373	117.337	1.7	1.07	245.0	OK
4.001	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S9	Cellular Storage (1)	123.200	121.754	0.291	117.251	2.2	0.64	238.7	OK
1.007	FSR: 30 years: +40 %: 30 mins: Winter	Pipe	S21	Swale	121.000	119.913	0.091	72.444	1.4	0.34	26.4	Surch arged
5.000	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S12	S13	121.600	120.682	0.300	62.138	1.8	2.03	129.5	Surch arged
5.001	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S13	S14	121.600	120.280	0.300	62.106	1.8	1.78	127.4	Surch arged
6.001	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S16	Cellular Storage	121.235	120.085	0.358	105.766	1.6	0.88	213.9	OK
3.001	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S6	S7	123.000	121.692	0.277	61.876	1.8	1.74	124.5	Surch arged
3.002	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S7	Cellular Storage (1)	123.000	121.542	0.179	61.872	2.8	0.49	124.2	OK
3.003	FSR: 30 years: +40 %: 30 mins: Winter	Pipe	Cellular Storage (1)	S10	123.000	121.298	0.450	31.683	0.8	0.02	13.3	OK

Project: 5029705 Birch Business Park Heywood		Date: 07/07/2026			
Report Details: Type: Connections Summary Storm Phase: Phase (1)		Designed by: SD	Checked by: AM		Approved By: SD
		Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester			



FSR: 100 years: Increase Rainfall (%): +45: 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
1.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S1	S2	125.600	124.231	0.102	20.886	2.6	0.28	44.9	OK
1.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S2	S4	124.400	122.322	0.166	20.831	1.4	0.53	43.6	OK
2.000	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	Porous Paving	S3	123.259	123.210	0.020	74.509	1.2	0.06	1.3	Flood
2.001	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	S3	S4	123.350	121.783	0.067	74.504	0.2	0.05	1.3	OK
1.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S4	S11	123.200	121.910	0.204	47.917	1.7	0.78	86.6	OK
3.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S5	S6	123.000	122.433	0.300	82.780	2.4	1.44	172.8	Surcharged
3.004	FSR: 100 years: +45 %: 60 mins: Winter	Pipe	S10	S11	123.000	121.600	0.225	61.502	0.8	0.24	10.1	Surcharged
1.003	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S11	S18	122.215	120.716	0.146	60.765	2.3	0.3	91.7	OK
5.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S14	Cellular Storage	121.600	120.284	0.300	82.766	2.3	1.14	163.9	Surcharged
5.004	FSR: 100 years: +45 %: 60 mins: Summer	Pipe	S17	S18	121.600	120.184	0.225	13.578	0.8	0.24	10.2	Surcharged
1.004	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S18	S19	121.500	120.042	0.600	79.856	1.2	0.36	160.6	Surcharged
1.005	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S19	S20	121.235	120.045	0.600	57.724	0.6	0.24	82.9	Surcharged
1.006	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	S20	S21	121.235	119.801	0.750	45.112	0.6	0.09	53.2	Surcharged
1.008	FSR: 100 years: +45 %: 120 mins: Summer	Pipe	Swale	S22	119.633	118.080	0.102	308.596	1.2	0.34	26.4	OK

Project: 5029705 Birch Business Park Heywood				Date: 07/07/2026									
				Designed by: SD		Checked by: AM						Approved By: SD	
Report Details: Type: Connections Summary Storm Phase: Phase (1)				Company Address: 2nd Floor, 100 Embankment Cathedral Approach Manchester									

1.009	FSR: 100 years: +45 %: 120 mins: Summer	Pipe	S22	OF1	118.800	118.061	0.080	308.409	1.7	0.14	26.4	OK
7.000	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	Porous Paving (1)	S20	121.285	121.246	0.100	75.835	2.0	0.04	1.4	Flood
6.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S15	S16	121.235	120.510	0.450	142.288	1.9	1.3	297.2	Surch arged
5.003	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	Cellular Storage	S17	121.600	120.016	0.450	4.623	0.4	0.07	11.7	Surch arged
4.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S8	S9	123.200	122.221	0.450	156.870	2.1	1.46	332.0	Surch arged
4.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S9	Cellular Storage (1)	123.200	121.845	0.368	156.787	2.3	0.87	324.1	OK
1.007	FSR: 100 years: +45 %: 60 mins: Winter	Pipe	S21	Swale	121.000	120.943	0.091	149.251	1.4	0.34	26.4	Flood Risk
5.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S12	S13	121.600	121.195	0.300	83.083	2.4	2.67	170.0	Surch arged
5.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S13	S14	121.600	120.530	0.300	82.932	2.3	2.32	165.8	Surch arged
6.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S16	Cellular Storage	121.235	120.218	0.449	139.950	1.8	1.19	288.4	Surch arged
3.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S6	S7	123.000	121.879	0.300	82.737	2.4	2.39	170.8	Surch arged
3.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	S7	Cellular Storage (1)	123.000	121.603	0.225	82.710	3.0	0.67	169.1	OK
3.003	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	Cellular Storage (1)	S10	123.000	121.300	0.450	16.544	0.9	0.06	43.3	OK



RIDGE



www.ridge.co.uk