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DRAINAGE STATEMENT

STAIRFOOT GLASSWORKS, WOMBWELL LANE, BARNSELEY

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1. INTRODUCTION

Ramboll UK (Ramboll) has been appointed to undertake a Drainage Strategy to support the planning application for the development of the former Stairfoot Brickworks site into a proposed waste glass recycling and repurposing facility and associated works.

The development, hereafter known as "Stairfoot Glassworks", is located on an existing brownfield site adjacent to Wombwell Lane and centred at the approximate National Grid reference SE3790404978

1.1 Scope and Objectives

This Drainage Statement report should be read in conjunction with all other planning documents.

The specific objectives of this assessment are to establish the following:

- Existing drainage systems on the Application Site;
- Proposals for collection and discharge of surface water from the Application Site;
- Proposals for collection and discharge of foul water from the Application Site; and
- The methods of pollution prevention on the Application site.

This strategy will also demonstrate how Sustainable Urban Drainage Systems (SuDS) have been considered, and where suitable, will be incorporated into the development. Pollution risks and prevention and operation and maintenance will also be assessed and incorporated into the strategy.

1.2 General Limitations

This report has been prepared in support of a Planning Application for this development and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

The findings and opinions in the report are based upon information derived from a variety of information sources. Ramboll believes these information sources to be reliable and where possible, has tried to verify the information.

This report has been prepared based on the proposed end use defined by the Client at the time of writing. If this proposed end use or duration is altered, then it will be necessary to review the findings of this report.

It should be noted that some of the aspects considered in this study are subject to change with time. Therefore, if the development is delayed or postponed for a significant period then it should be reviewed to confirm that no changes have taken place, either at the Application Site or within relevant legislation.

1.3 Records Review

The key reports, documents and surveys made available to Ramboll by the client and subsequently reviewed as part of this study are listed below.

Table 1 – Documents referenced in this report

Author	Title	Reference	Date
Ashton Bennett	Phase II Site Investigation	PB 3465	October 2021
Phoenix Adam Consultants	Flood Risk Assessment	1392-02	3 RD March 2022
Linear Survey	Topographical Survey	PBL/SFB/SEPT22-01_02	September 2022
Potters Ballotini	Historical Drainage Layout	FSBW/DSO/1121-01	November 2021
Ramboll	Flood Risk Assessment	14620015371-001 Potters Stairfoot FRA	March 2024
Ramboll	Generic Quantitative Risk Assessment	R1620015371-0002 Potters Stairfoot GQRA	March 2024

2. LEGISLATION, DESIGN GUIDANCE & CONSULTATIONS

This drainage statement sets out the principles for the proposed drainage strategy and provides outline proposals for the development, including demonstrating how SuDS techniques are proposed to be used on site. The design of the drainage within the development will be in accordance with the current revisions of the relevant British Standards, Codes of Practice and Building Regulations. These include, but are not limited to the following:

- National Planning Policy Framework (NPPF) 2021
- BS EN 752 - Drain and sewer systems outside buildings.
- BS EN 12056 - Drain and sewer systems inside buildings.
- Building Regulations – Part H: Drainage and waste disposal.
- UKWIR Ltd - Civil engineering specification for the water industry.
- CIRIA C753 - The SUDS Manual.
- WRC – Sewer Sector Design Guidance (SSG) – Appendix C.
- Pollution Prevention Guidelines (PPG 3) – For information only
- Barnsley Strategic Flood Risk Assessment (2010)
- Barnsley Local Flood Risk Management Strategy
- Yorkshire Water – Strategic Environmental Assessment

2.1 National Planning Policy Framework & Planning Practice Guidance

Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications and this is covered in Section 14 of National Planning Policy Framework July (NPPF) 2023. As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015 and the NPPF 2021, must consider sustainable drainage systems.

Assessment of the suitability of sustainable drainage systems must be undertaken in accordance with Section 14 'Meeting the challenge of climate change, flooding and coastal change'. The Department for Environment, Food and Rural Affairs (DEFRA) has produced a non-statutory technical standard for sustainable drainage systems which states that:

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

2.2 DEFRA National Standards for Sustainable Drainage Systems

As stated in section B7 of the Defra National Standard for Sustainable Drainage Systems, the approach for sites on previously developed land is as follows:

"Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event."

The drainage systems must be designed so that, unless an area is designated for flood management in the Local Flood Risk Management Strategy, flooding from the drainage system does not occur:

- On any part of the site for a 1 in 30 year rainfall event; and

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- During a 1 in 100 year rainfall event in any part of: a building or utility plant susceptible to water (e.g. pumping station or electricity substation); or
- On neighbouring sites during a 1 in 100 year rainfall event

2.3 Barnsley Council Design Standards

The lead local flood authority (LLFA) for this scheme is Barnsley Metropolitan Borough Council. As part of their role as a LLFA, they have prepared a Strategic Flood Risk Assessment for the wider Barnsley area. In accordance with section 3.5.2. of the SFRA, which references the Barnsley Local Development Framework, the extent and impact of flooding will be reduced by implementing the following:

- Requiring site-specific Flood Risk Assessments (FRAs) for development proposals over 1 hectare in Flood Zone 1 and all development proposals in Flood Zones 2 and 3
- Requiring all development proposals on Brownfield sites to reduce surface water run-off by at least 30% and development on Greenfield sites to maintain existing run-off rates.

Therefore, to comply with the requirement as set out in the SFRA, a Flood Risk Assessment will be undertaken for the development and storm water discharge rates will not exceed 70% of the existing 1 in 1 year storm water runoff event.

2.4 Climate Change

In accordance with the criteria set out by the Environment Agency, indicated below, a Climate Change Allowance (CCA) will be utilised in the design when considering the effects on rainfall intensity.

Figure 1: EA Climate Change Allowance – Rainfall Intensities¹¹

¹¹ Flood risk assessments: Climate change allowances (no date) GOV.UK. Available at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> (Accessed: 27 March 2024).

Don and Rother Management Catchment peak rainfall allowances



3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	35%
2070s	25%	35%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	40%
2070s	25%	40%

*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

To ensure that the development will be resilient to future increases in rainfall intensity (see figure 1) a climate change factor of 25% will be applied to all calculations and models to ensure the proposed drainage strategy minimises the risk of flooding.

Sensitivity testing for a 40% increase in rainfall intensities will be applied to the surface water network. This will determine the effects of the upper end of predicted increase in rainfall intensities over the design life of the development.

2.5 Pre-Development Enquiry

As part of the preliminary design, a pre-development enquiry was submitted to the sewerage undertaker, in the case Yorkshire Water, to determine the proximity of public sewers to the development and if there is sufficient capacity within these sewers to accept flows from the proposed development.

A response from Yorkshire(appendix 4) confirms that there are public sewers in close proximity to the site and that there is sufficient capacity within the network to accept the proposed discharges from the development.²

2.6 MicroDrainage Modelling

In accordance with best practice, the surface water drainage has been designed and modelled using Windes MicroDrainage software. This will ensure the network is designed to accommodate flows from a range of storm events. FSR rainfall data will be used for short term rainfall events (15-, 30- & 60-minute storm events) and FEH2013 will be used for long term rainfall events (120min+). MicroDrainage modelling will not be used on the foul water networks.

3. EXISTING SITE DESCRIPTION

3.1 General Existing and Proposed Description

The existing area within the application site boundary is classed as brownfield with previous use as a brickworks site. The application site area is North of Wombwell Lane, located at postcode S70 3NS.

The proposed planning boundary is approximately **6.39 Ha** in area. The proposed works include the construction of a clad building for internal processing works, construction of a workshop and admin office, construction of; a gatehouse, external cullet bays, external processing area, lorry park, storage areas, car park and access. The works also include associated external hard and soft landscaping.

Details of the proposed development can be found in the appendix 5.

3.1.1 Site Topography

A review of the topographical survey indicates that site slopes in a southerly direction with levels varying from 53.97m on the northern extremity to 47.07m at the south entrance to Wombwell lane.

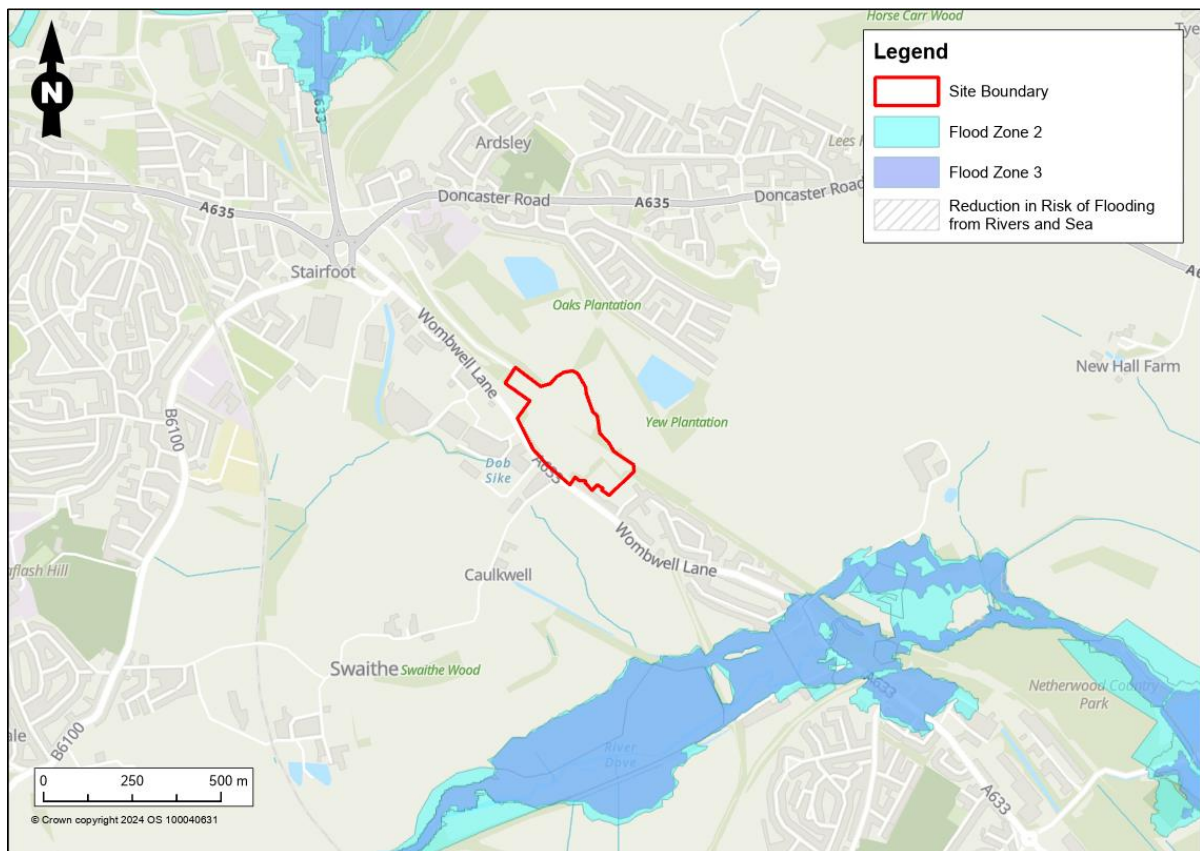
3.2 Flood Risk

The proposed development is located roughly 3.4km south-east of Barnsley Town centre. The closest water course is Dob Sike stream, which is located adjacent to the retail park, 120m south of the existing site.

3.2.1 Fluvial and Sea Risk

The proposed development is, according to Environment Agency Flood Maps, located within a Flood Zone 1 (see Fig. 2). This means that the site is at very low risk (less than a 1 in 1000 year or 0.1% annual exceedance probability) of flooding from fluvial or sea sources.

Figure 2: Flood Map for Planning³

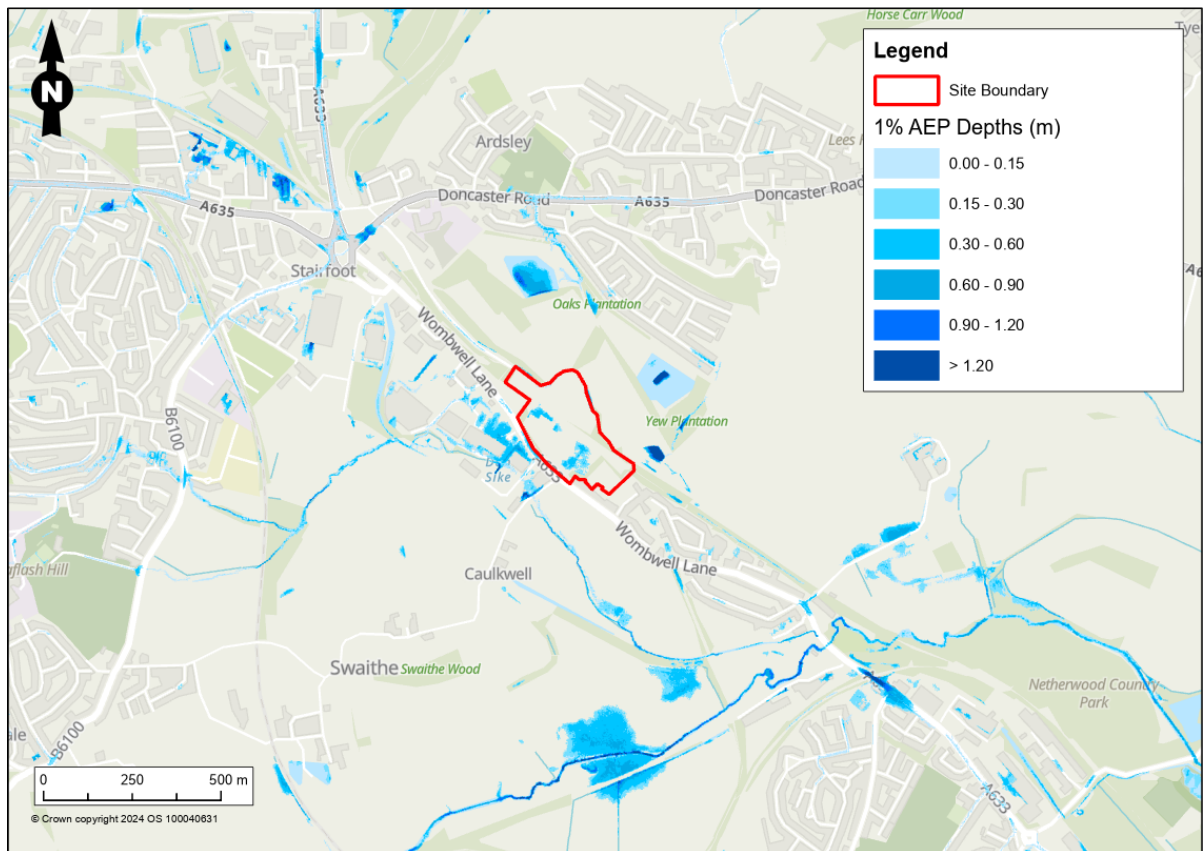


3.2.2 Pluvial Risk

Environment agency surface water flood mapping indicates that there some areas of the site which are at medium and high risk (between 1.0 and 3.0% annual probability or between 30 and 100 year) of surface water flooding up to a depth of 300mm.

³ Ramboll (2024) 14620015471-001 Stairfoot Glassworks FRA

Figure 3: Risk of Surface Water Flooding³

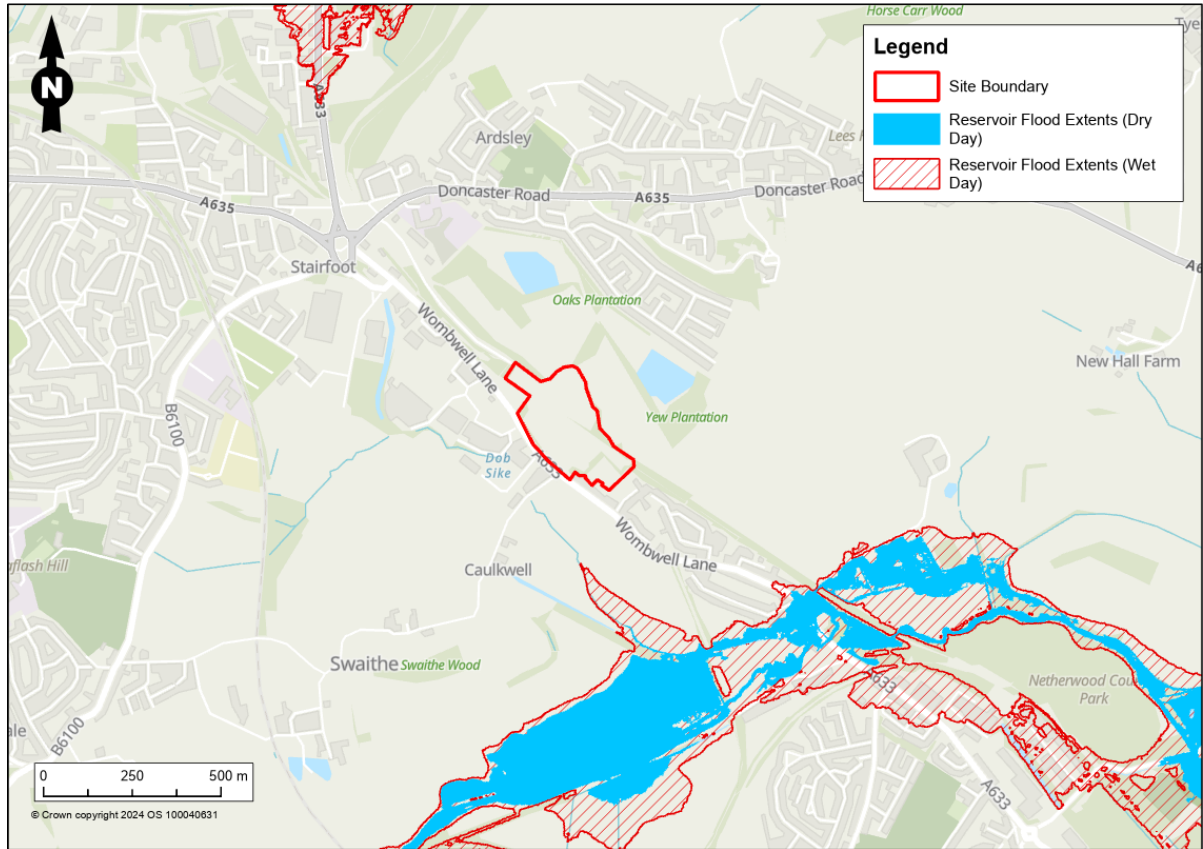


This has been addressed in the Flood Risk Assessment undertaken by Ramboll² [4].

3.2.3 Reservoir Risk

Agency flood mapping indicates that the site is at very low risk of reservoir flooding.

Figure 4: Risk of Reservoir Flooding³



4. PRE-DEVELOPMENT DRAINAGE

4.1 Existing Public Drainage

An Asset Location Search provided by Yorkshire Water [Ref:C12C4 Date:14th December 2023] indicates the presence of a combined sewer that drains water from the south side of the site largely to a pumping station south of the proposed development, cutting through Wombwell Lane. This 150mm vitrified clay sewer flows from southeast to northwest with a connection at roughly the south entrance. Additionally, north of the site, there is a large 300mm vitrified clay surface water pipe. It can be assumed that this bisects the site before eventually discharging water into the Dob Sike stream on the south side of Wombwell Lane. However, it is recommended that this is confirmed with future drainage surveys.

We also understand from discussions with the client that there is an existing storm water drain which runs south beneath the Transpennine Way. It is understood that this surface water drain collects land drainage from the landfill to the north-east of the site and discharges flows to the Dob Sike further downstream. This sewer is not shown on public water records and therefore is assumed to be private.

4.2 Private Existing Drainage

A drainage survey provided by Linear Surveys with information from the client presents the existing assumed private drainage on site. There are surface water pipes throughout the site, and some foul water pipes located at the southern extent, adjacent to Wombwell Lane. For further information, see Appendix 4.

4.3 Existing Runoff Rates

The existing site is approximately 6.39Ha (63,900m²) and is a mix of concrete hardstanding, unmade ground, and soft landscaping. Although the site is unoccupied, it is considered brownfield due to the extents of hardstanding areas. It is assumed that at present all storm water falling on the site discharges unrestricted to the public sewers through a series of below ground drains, land drainage and overland flows. The brownfield runoff rate for the total site has been calculated by applying a coefficient of runoff (Cr) to determine the effective contributing area, for each section of the site. This effective contributing hardstanding area will then be used in the Modified Rational Method to determine the overall brownfield runoff. The effective contributing areas are as follows:

Table 2: Effective contributing area calculations

Area / Type	Contributing Area (Ha)	Coefficient of Volumetric Runoff (Cr)	Effective Contributing Area (Ha)
Concrete Hardstanding	2.58	0.95 (95%)	2.45
Undeveloped soft landscaping	1.58	0.3 (30%)	0.47
Unmade ground	2.2	0.50 (50%)	1.1
Total			4.02 Ha

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The existing runoff rates for the positively drained areas have been calculated using the modified rational method, FSR rainfall data (extracted from MicroDrainage software) and effective hardstanding areas and has been calculated as such;

$$Q = 2.78 C_v.i.A$$

Where:

- C_v = Volumetric Run-off co-efficient, assumed as 1.0;
- i = Average Rainfall intensity (taken from MicroDrainage Rainfall Generator using FSR data);
- A = Contributing Area, 0.98 Ha.

The combined existing runoff rates at each of the three discharge points has been calculated as follows;

Table 3: Combined existing runoff rate calculations

Event	Rainfall Intensity (mm/hr)	Runoff Rate (l/s)
1 in 1 year	28.40	317.4
1 in 30 year	69.56	777.4
1 in 100 year	89.993	1005.7

4.4 Greenfield Runoff Rate

For completeness, the greenfield runoff rates have been calculated using the ICP SUDS method. This is a more accurate method of calculation for sites less than 50Ha in area. The table below shows the Greenfield Runoff rates for the whole site.

Table 4 – Greenfield Runoff Estimations⁵

Event	Greenfield Runoff Rate (l/s)
QBar	10.53 l/s
1 in 1 year	9.06 l/s
1 in 30 year	18.43 l/s
1 in 100 year	21.90 l/s

⁵ Woods Ballard B et al.(2015) The SuDS Manual (C753F). CIRIA, London

5. FOUL PROPOSED DRAINAGE

The foul water flows have been calculated in accordance with the method as set out in *Sewer Sector Guidance Appendix C*. This method is recommended in the absence of individual discharge units (DUs) being known and assumes a trade effluent flow of 1.0 l/s/ha for wet industry.

Therefore, the average flow from the process building only can be calculated as follows;

$$\begin{aligned}Q(\text{foul}) &= 1.0 \times A(\text{ha}) \\Q &= 1.0 \times 0.4\text{Ha} \\Q &= 0.4 \text{ l/s}\end{aligned}$$

It is estimated therefore that the average foul flow (DWF) from the new development is 0.4 l/s and the estimated peak foul flow (6DWF) is 2.4 l/s. It is proposed that foul flows generated by the proposed buildings will be collected by a series of minimum 100mm diameter pipes which will be laid to fall at a gradient to ensure a self-cleansing velocity of 0.7 m/s or at an absolute minimum gradient of 1:DN, where DN is the pipe diameter, to comply with Building Regulations Part H guidance. The foul water will then connect to a series of 150mm diameter drains where it will connect to the existing foul water drainage connections located onsite. The foul water will in turn discharge to the existing combined water sewer located beneath Wombwell Lane. It is proposed that foul water will discharge under gravity, however, if pumping is required 24-hour emergency storage will be provided.

Discharge to the combined water network is subject to all necessary connectivity and condition surveys and an S106 Agreement with Yorkshire Water. A trade effluent agreement will also be required. Yorkshire Water have confirmed (Email Ref: V336721, Date: 14 December 2023) that there is sufficient capacity within their foul water network to accept flows from this development. Please reference Appendix 4 for this correspondence.

6. STORM WATER DRAINAGE

The proposed development shall adopt where possible the principles embodied in Sustainable Urban Drainage Systems (SuDS) and follow the drainage hierarchy and principles as set out in the Building Regulations and CIRIA C753: "The SuDS Manual". Appropriate SuDS systems can;

- Reduce the impact of a new development on the surrounding infrastructure;
- Reduce and remove pollutants from urban run-off at source and improve water quality; and
- Promote green spaces and provide amenity benefits within the development

6.1 Drainage Hierarchy

The design will incorporate SuDS measures in accordance with the Environment Agency guidance and prevailing site conditions. The design shall conform to the drainage hierarchy as set out in Building Regulations Part H.

6.1.1 Rainwater as a Resource

Given the nature of the proposed development and the processes used, the implementation of large-scale rainwater harvesting systems is suitable for this site. It is proposed that storm water collected on the roof of the processing building will discharge to a rainwater harvesting tank. It is intended that this water will be re-used as part of the recycling processes undertaken at the facility. At this stage of design, the size and location of the rainwater harvesting tank has not been developed. This rainwater harvesting tank will be fitted with an overflow discharge which will connect to the below ground network. For hydraulic design purposes, this tank volume will not be considered as part of the attenuation requirements for the site as the rainwater harvesting system is always considered full.

6.1.2 Rainwater Conveyance

As rainwater harvesting is proposed, the use of roof level conveyance features is not considered suitable for this development.

A small sedum roof is proposed on the administration building adjacent to the car park. This sedum roof will provide increased conveyance times but any storm water attenuation within the layer will not be considered as part of the hydraulic design.

6.1.3 Discharge by Infiltration

A review of the intrusive site investigation indicates that the site is underlain by a layer of clay which has low infiltration potential. The site investigation (Ramboll Ref: R1620015371-0002 Potters Stairfoot GQRA, Date: March 2024) also indicates the presence of high and perched ground water. Further to this, the north and west of the site are known capped landfills, and the areas along the northern boundary are also known landfills. Infiltration in or near these areas presents a high risk of migration of leachate and contaminants. Therefore, discharge by infiltration is not considered viable for the site and has been discounted.

Further attenuation storage and water treatment will be provided using permeable surfacing on site. Due to the poor ground conditions, a Type-C (full attenuation as per BS7522-13) systems will be utilised on site.

6.1.4 Discharge to Watercourse

There are no open watercourses in the immediate vicinity of the proposed development. The closest watercourse is the Dob Sike stream which is located 120m from the development (See Sect. 3.3). Therefore, discharge to a watercourse has been discounted.

6.1.5 Discharge to Sewer

The Yorkshire Water asset record plans indicate that the site is served by a combined water sewerage network beneath Wombwell Lane and that there are no storm water sewers in the general area. Additional survey information indicates the presence of a storm water sewer to the south-east of the site beneath the TransPennine public footway. As discharge by infiltration or to a watercourse are not possible, it is proposed that storm water will discharge under restriction to the combined water sewer and private sewers.

6.2 Proposed Drainage Infrastructure

The storm water network will be designed under full pipe conditions to accommodate the 1 in 2-year storm event. The network will be designed to ensure that no surcharging occurs in the 1 in 5-year event and that no flooding occurs in the 1 in 30 year event. We have allowed for minimal flooding for the 1 in 100-year event in accordance with regulations. A climate change factor of 20% will be included in each scenario. Sensitivity testing will also be carried out for a climate change allowance for 40% to determine the effects of the upper end of rainfall changes due to climate change, in accordance with updated Environment Agency guidance. Due to the nature of the development and the location of existing sewers and connections, it is proposed that storm water will discharge to the public sewers at three locations on site.

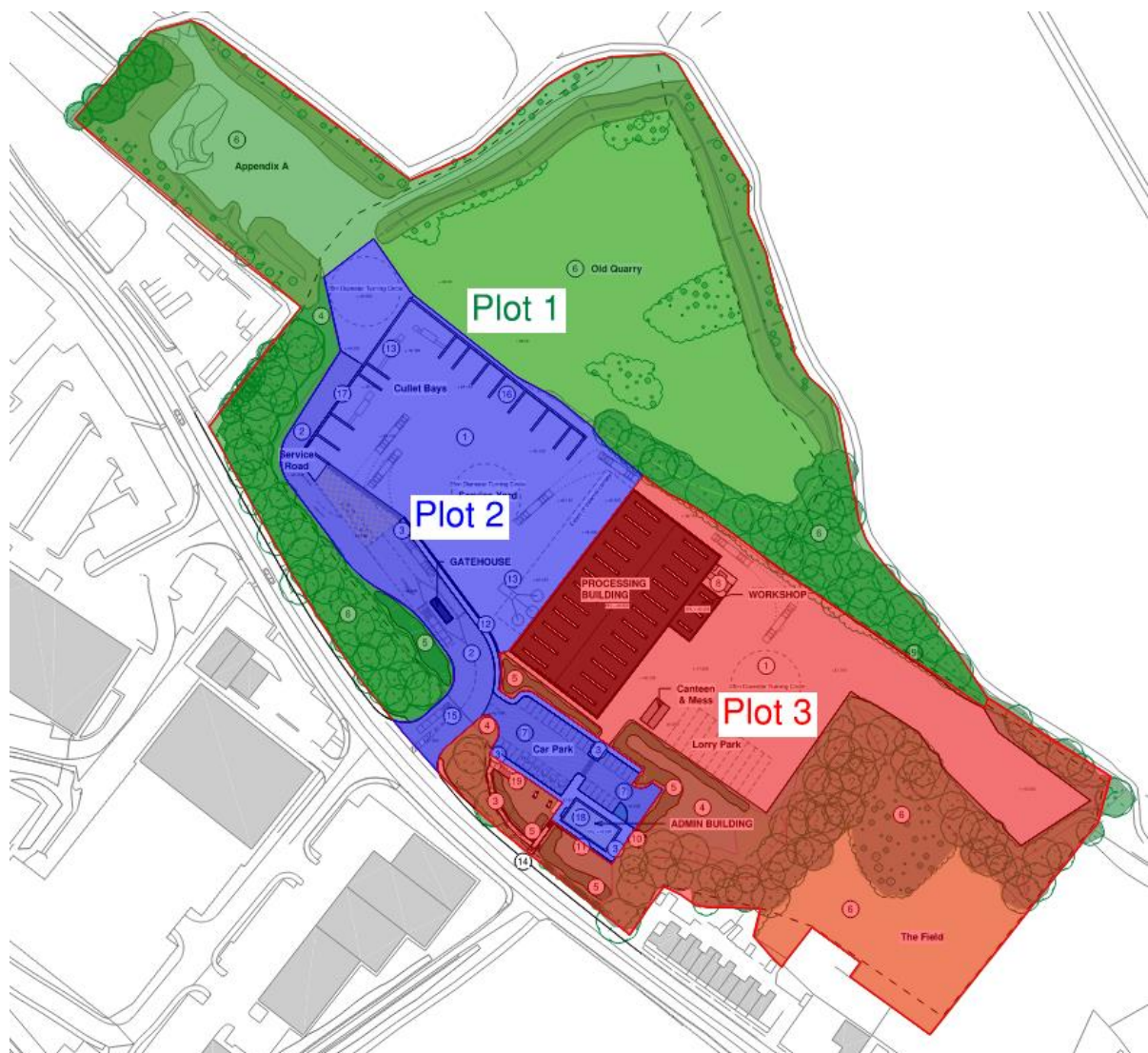
The existing brownfield runoff rate for the 1 in 1-year storm event is 317.4 l/s. It is proposed that storm water discharge rates will be restricted to and not exceed 222 l/s for all storm water events up to and including the 1 in 100 year event (+25% climate change) in the post-development scenario, combined across all three outfall points. This rate has been chosen as it represents a 30% reduction in existing brownfield runoff rates which complies with the guidance as set out in Section 3.5.2 of the Barnsley Strategic Flood Risk Assessment report which states that "*... all development proposals on Brownfield sites to reduce surface water run-off by at least 30% and development on Greenfield sites to maintain existing run-off rates.*". Reducing to greenfield rates was discounted as it would have led to prohibitively large attenuation volumes, increased land take up and would require a pumped discharge, which was assessed as being unsustainable over the lifetime of the project due to running and maintenance costs. Furthermore, this would have required costly excavations and removal of existing hardstanding which is to be reused as part of the proposed development.

Analysis of the network will be undertaken for the 1 in 100-year (+40% C.C.) to understand the upper end effects of climate change as per the EA guidance.

Due to the nature of the development and the location of existing sewers and connections, it is proposed that storm water will discharge to the public sewers at three locations on site. The site

will be split into three separate areas which are outlined on Figure 5. The following sections will provide a summary of the proposed drainage for each phase.

Figure 5: Site plan to demonstrate respective plot areas (adapted from D5 Architects LLP drawing)



6.2.1 Plot 1 - Landscaped Area Drainage

This plot features the areas to be left undeveloped. Overland flows from the north are to be intercepted by a series of 4no. conveyance swales of varying lengths and will convey storm water flows to the existing below ground drainage network on site which in turn discharges to the existing combined water sewer at a restricted runoff rate. These swales will have a maximum water depth of 600mm and a side-slope of 1:3 which allows for ease of maintenance. The swales will act in sequence and will convey storm flows gradually downstream. In long term rainfall events, storm water can be stored in these swales for gradual release. This plot also retains several trees, with provide benefits to surface water management by providing transpiration, interception, phytoremediation, and an increased infiltration.

Storm water from Plot 1 will be restricted to 50 l/s for all storm water events up to and including the 1 in 100 year (+25% Climate Change) event. Flow restrictions will be achieved through the use

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of the vortex flow control. This arrangement ensures that additional above ground SuDS features can be incorporated into the site wide design and prevents overland flows from inundating the main sitewide drainage. The swales are subject to full design and modelling at the next stage of design.

6.2.2 Plot 2 – Service Yard & Site Access Drainage

This plot contains the service yard and access road to the site to the west of the proposed building and the admin building and car park to the south of the proposed building. At present, it is predominantly concrete hardstanding.

Storms generated by the existing concrete service yard will be laid to fall towards at high capacity channel drain (e.g. ACO QMax Range) along the perimeter of the service yard. The service yard levels are to be laid to fall toward this channel drain. This channel drain will then discharge via a Full Retention Interceptor to the below ground storm water network beneath the site access road. This will ensure that storm water flows will receive a level of treatment in accordance with C753 prior to discharge.

Storm water flows generated by the site access road will be laid to fall to a 500mm x 900mm (dp) gravel filter trench located along the perimeter of the road. This filter trench will be lined with an impermeable geomembrane and backfilled with clean coarse graded aggregated. A 100mm perforated drain will be installed in this filter trench which will convey storm water flows to a small swale located immediately adjacent to the access road which will in turn convey water the below ground network.

The proposed admin building is sited adjacent to the car park. It is proposed that this building is installed with a sedum roof. This will provide biodiversity benefits and increase conveyance times of storm water discharging to the below ground network. However, for the purposes of hydraulic design this system is considered saturated and any attenuation benefits are not included in hydraulic modelling.

Permeable paving is proposed for the main site car park. This will be a lined Type C “full attenuation system” with a minimum depth of 450mm clean coarse graded aggregate providing c.162m³ attenuation storage. It is proposed that rainwater downpipes from the admin building sedum roof will discharge directly to this sub-base. A perforated sub-base drain will convey storm water to the below ground network beneath the site access.

Storm water from Plot 2 will be restricted to 50 l/s for all storm water events up to and including the 1 in 100 year (+25% Climate Change) event. Flow restrictions will be achieved through the use of the vortex flow control. This arrangement ensures that SuDS can be incorporated where possible, flows are restricted from pre-development rates and water undergoes sufficient treatment prior to discharge.

6.2.3 Plot 3 - Proposed Building and Lorry Park

This section of the site contains the processing yard and the main building. It is proposed that storm water generated by the proposed building will be collected by a series of drains and gullies and discharge directly to a rainwater harvesting tank located adjacent to the building. This tank will collect water that can be reused as part of the processes within the building. This tank will be fitted with an overflow connection that will discharge excessive flows to the below ground network. As this is a rainwater harvesting tank, it is assumed to be full at all times therefore this volume (TBC

at design stage) will not be considered as part of the total attenuation for the site. Excess flows will then be conveyed to the below ground network.

Storms generated by the existing concrete processing yard will be laid to fall to a 500mm x 900mm (dp) gravel filter trench located along the perimeter of the service yard. This filter trench will be lined with an impermeable geomembrane and backfilled with clean coarse graded aggregated. A 100mm perforated drain will be installed in this filter trench which will convey storm water flows to the below ground network.

It is then proposed that storm water flows from the processing yard and works building discharge via a class one full retention separator to a 980m³ drainage basin located to the east of the site. This basin will have a base width of 650m² and a side slope of 1:3 for ease of maintenance with a maximum water depth of 1.2m. Storm water will then discharge to the existing storm water network beneath the TransPennine footway at a restricted rate of 120 l/s for all storm water events up to and including the 1 in 100yr (+25% C.C.). Refer to Appendix 6 for our drainage layout.

6.3 Statutory Approvals

A pre-development enquiry was submitted to Yorkshire Water. They have confirmed that there is sufficient capacity in their sewer to accept the discharge rates proposed for the development (see appendix 5).

The proposed strategy is subject to approval by the Lead Local Flood Authority (Barnsley Metropolitan Borough) and Yorkshire Water. An S106 agreement will be required to discharge directly to the existing public sewer.

6.4 Summary of SuDS Features

All proposed drainage schemes are required to implement Sustainable Urban Drainage (SuDS) systems in order to reduce the impact of a development on downstream sewer or water course flows. Sustainable drainage systems are an effective method of managing increased risk of surface water flooding from a new development by reducing runoff rates and volumes through combined use of infiltration, attenuation or slowing conveyance times. They also offer improvements in water quality through removal of silt and pollutants, can reduce potable water demands, improve amenity and biodiversity and allow faster recharge of groundwater. Each new development should aim to achieve greenfield runoff rates and ensure that surface water runoff is managed as close to its source as possible. The table below outlines the drainage and SuDS hierarchy and how each method is being incorporated in this project.

Table 5 – Evaluation of SuDS features and drainage hierarchy

Drainage Hierarchy Method	Notes	Implemented
Store rainwater for later use	It is proposed that a rainwater harvesting tank will capture storm water from the main process building, for re-use. Large-scale infiltration is not suitable due to ground conditions.	Y
Infiltration	Natural infiltration of storm water in vegetated areas is expected however overland flows from these areas has been included in below ground drainage design.	N
Green Roofs and Blue Roofs	Small green/sedum roof above the admin building	Y
Attenuate Rainwater in ponds or open water features for gradual release	A lined pond/basin is proposed at the eastern extent of the proposed development. A series of swales are proposed on site to capture and convey water to the below ground network. A series of conveyance swales will be installed across site to convey overland flows at various locations throughout the site	Y
Attenuate rainwater by storing in tanks or sealed water features for gradual release:	Filter trenches will capture and convey storm water from the access road to the below ground network. Storm water attenuation will be provided in a series of large open basins adjacent to the car park. Type-C permeable pavements will also be utilised in the site car-park to provide additional storage volumes.	Y
Discharge rainwater direct to a watercourse	The nearest watercourse (Dob Sike stream) is not available for direct discharge as it is on the other side of Wombwell lane and there are too many obstacles to guarantee access	N
Discharge rainwater direct to a surface water sewer/drain	N/A There are no public surface water sewers in close proximity to the site.	N
Discharge rainwater to a combined sewer	It is proposed that surface water flows discharge under striction to the combined water sewer beneath Wombwell Lane.	N

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6.5 Storm Water Betterment

The maximum discharge for the post-development scenario will be limited to 220 l/s for all storm water events up to and including the 1 in 100 year (+25% C.C.) event. This represents a 30% reduction of the 1 in 1-year pre-development runoff rate and complies with the local design requirements. This approach results in betterments exceeding 30% in events greater than the 1 in 1 year storm event, as outlined below.

Table 6: Storm Water Betterment Values

	1 in 1 Year	1 in 30 year	1 in 100 year
Pre-development runoff rate (l/s)	317.4	777.4	1005.7
Post-development runoff rate (l/s)	220	220	220
% Betterment	30.6%	71.7%	78.1%

7. POLLUTION PREVENTION

A well designed and implemented drainage strategy should not only reduce runoff rates but it can improve surface water quality. There are a range of methods for managing surface water pollution risks. Table 26.13 of C753: The SuDS Manual outlines how surface water pollution can be managed at source by a range of soft and hard SuDS components. This pollution index table has been used to assess the methods of pollution where possible for the site.

According to the Table 26.2 of the SuDS Manual (Table 7 below) this site will be classed as having a medium risk of hydrocarbon pollution, as this site consists predominantly of roof areas and vehicular use external hardstanding areas. The primary risk of pollution will be from vehicles using the site as part of processing undertaken on site.

Table 7 – Pollution Hazard Indices for different land use classifications

Land use	Pollution Hazard Level	Pollution Hazard Index		
		Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other roofs (i.e. commercial /industrial)	Low	0.3	0.2 (up to 0.8)	0.05
Individual driveways, low-traffic roads and non-residential car parks.	Low	0.5	0.4	0.4
Commercial yards & delivery areas	Medium	0.7	0.6	0.7
Lorry parks & industrial approaches ¹	High	0.8	0.8	0.9
Sites where fuels are delivered ²	High	0.8	0.8	0.9
¹ Access Roads to be designed to suit local highways authority requirements – not included in this assessment ² Whilst the site will receive deliveries of fuels, these shall be limited to localised areas that are suitably intercepted/bunded. These areas will be designed to contain the associated stored/delivered volumes. Isolation valves shall also be provided on the drainage systems as a final control. As such, the risk of spillage of large volumes is reduced and limited to small areas and therefore at this stage, the pollution hazard level is deemed to be Medium rather than high. <u><i>This will be reviewed and confirmed at the next stage.</i></u>				

PPG3 and the SuDS Manual states that treatment of pollution should be provided at source through the use of SuDS, and this principle is being implemented on this development.

To ensure that there is adequate treatment of water prior to discharge, the SuDS components should have a pollution mitigation index that equals or exceeds the pollution hazard index. The

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pollution mitigation indices in Table 26.3 of the SuDS Manual (figure 7 below) outlines the mitigation index for a range of SuDS components.

Table 8 – SuDS Mitigation indices

Type of SuDS component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter Drain	0.4	0.4	0.4
Filter Strip	0.4	0.4	0.5
Swale	0.5	0.6	0.6
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin ¹	0.5	0.5	0.6
Pond ¹	0.7	0.7	0.5
Wetland ¹	0.8	0.8	0.8
Proprietary treatment System	TBC at detailed design – may require additional SuDS components or increase in size of proprietary treatment unit		

¹ Type of basin/attenuation system to be defined at the next stage in line with landscaping, levels, ground investigation, ground water and infiltration test results

7.1 Low Pollution Risk – Roof Area

Downpipes from the processing building will be collected by a series of below ground drains and will discharge to a series dry swales located immediately adjacent to the building. The pollution mitigation index for swales exceeds the pollution hazard index for industrial roofs. Therefore, this element of the surface water receives sufficient treatment prior to discharge.

7.2 Low Pollution – Site Car Park

Permeable paving systems are proposed for the site car park. It is intended that the workshop roof will discharge directly to this permeable pavement. The pollution mitigation index for permeable pavements exceeds the pollution hazard index for non-residential car parks (Low Risk). Therefore, this element of the surface water receives sufficient treatment prior to discharge. Furthermore, the combination of permeable surfacing and catchpit manholes will provide the necessary filtration of hydrocarbons and air-borne pollutants. This will mitigate against any such pollution before it reaches the below ground storm water network.

7.3 Low-Medium Pollution – Site Access & External Areas

There is a medium risk of hydrocarbon pollution from the site access road. The risk arises from leaks or spills arising from vehicles accessing the site. There is also a low-risk of pollution from the roof areas draining into the same network. It is proposed that surface water from the access road will drain towards a filter trench which will provide the first level of water treatment. The water is then conveyed to a small detention basin which will provide the second level of treatment. Storm water collected from the roof areas will discharge to the below ground network via a dry swale. As three trains of treatment are being used, the factor of 0.5 is applied to the second and subsequent

trains of treatment to account for reduced performance of secondary or tertiary components. The mitigation index for the treatment of the site access road is as follows:

$$\begin{aligned}\text{Total SuDS mitigation index} &= \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2) \\ &= \text{Filter Trench} + 0.5 \times (\text{Detention Basin}) \\ &= 0.4 + (0.5 \times 0.6) \\ &= 0.7\end{aligned}$$

Therefore, the total SuDS mitigation index equals the pollution risk index for the access road. This is acceptable and will ensure sufficient mitigation of pollution before it reaches the below ground network.

7.4 Mitigation Pollution – External Service Yard and Lorry Park

There is a medium risk of hydrocarbon pollution from the external concrete yard. The risk arises from leaks or spills arising from vehicles accessing and setting down on site. Surface Water will be collected by a series of filter drains and channel drains and will be conveyed to a detention basin via a full retention separator. A full retention separator has been specified as an interceptor is required when the total hardstanding area is greater than 800m², if other SuDS features cannot be implemented.

As two trains of treatment are being used, the factor of 0.5 is applied to the second and subsequent trains of treatment to account for reduced performance of secondary or tertiary components. The mitigation index for the treatment of the site access road is as follows:

$$\begin{aligned}\text{Total SuDS mitigation index} &= \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2) \\ &= \text{Full Retention Separator} + 0.5 \times (\text{Detention Basin}) \\ &= 0.9 + (0.5 \times 0.6) \\ &= 1.2\end{aligned}$$

Therefore, the total SuDS mitigation index equals the pollution risk index for the access road. This is acceptable and will ensure sufficient mitigation of pollution before it reaches the below ground network.

As the combined pollution mitigation index of the components used exceeds the pollution hazard index for this site, the SuDS treatment is sufficient.

8. OPERATION AND MAINTENANCE

In order to ensure that the drainage networks continue to perform efficiently, and flow conditions are maintained, it is essential that the networks are appropriately maintained and inspected regularly. This also ensures that the systems comply with health and safety requirements and is economically efficient.

8.1 Maintenance Schedule

The operation and maintenance of the below ground drainage will be the responsibility of the building manager or a third party acting on their behalf. Any parties involved with the disposal of any waste materials from the underground drainage system should hold appropriate management licenses to undertake any such activities. Disposal of any site materials is required to be made in accordance with current legislation and guidance.

A strategy for the maintenance of the underground drainage elements will be developed incorporating normal regular maintenance requirements, any potential long-term maintenance work and any monitoring required.

This initial maintenance schedule will be prepared using guidance provided in '*CIRIA C625 – Model agreements for sustainable water management systems*', *CIRIA 626 – Rainwater and Greywater systems and manufacturers recommendation for specialist drainage elements*. The detailed designed drawings will incorporate the maintenance requirements for the project.

The following paragraphs provide guidance on the type of operational and maintenance requirements that may be appropriate for the drainage features proposed in this drainage strategy report. This will be further developed during the next stage of works and expanded upon in the sitewide operation & maintenance strategy.

8.2 Channel drains, Gullies and catchpit chambers

Channel drains and trapped gullies should be checked for silt build-up and cleared of any blockages, especially after heavy rainfall events. Gully and drain covers are to be firmly fixed to ensure no health and safety issues arise after maintenance.

Catchpit chambers should be vacuum cleared of silt on a regular basis and at least every six months.

8.3 Vortex Flow Controls

It is essential that the network and associated flow controls are appropriately maintained to ensure discharge is restricted to the approved rate and to prevent flooding onsite. Vortex flow controls or any other discharge restrictor should be checked regularly and after every major storm event to ensure that they are free from blockage.

8.4 Detention Basin / Pond

The detention basin is a fundamental element in the drainage network and its regular maintenance is very important to the functioning of the surface water network. The basin should be kept free from silt and debris and the vegetation should be maintained. In principle, the following should be undertaken:

Figure 6 – Operation and maintenance of ponds⁴⁶

Operation and maintenance requirements for ponds and wetlands		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

8.5 Permeable Pavements

The most common maintenance concern of permeable pavements is the potential clogging of pores. Over time detritus and silt can build up on the surface which cause it to underperform. Inspections should be carried out regularly to ensure that this buildup does not cause clogging. Non-aggressive brushing can be used to maintain the performance of the surface. In general, the following principles should be undertaken;

Figure 7 – Operation and maintenance of Permeable Paving⁴

Operation and maintenance requirements for pervious pavements		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

8.6 Swales

Swales will require regular maintenance to continue operating as intended. Swales should be kept free from silt and debris, and vegetation is to be maintained. In principle, the following should be undertaken:

Figure 8 – Operation and maintenance of Swales⁴

Operation and maintenance requirements for swales		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseed	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

8.7 Filter Trench

The filter trenches along the road should be kept free from blockages to ensure that water is captured and conveyed to the below ground network. In principle, the following should be undertaken:

Figure 9 – Operation and maintenance of Filter Drains⁴

Operation and maintenance requirements for filter drains		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

APPENDIX 1

GREENFIELD RUNOFF RATE AND QUICK STORAGE ESTIMATES

Calculated by:

Rudran Ratnanandan

Site name:

Barnsley Brickworks

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

53.54053° N

Longitude:

1.42956° W

Reference:

1042073287

Date:

Nov 20 2023 14:34

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

6.5

Methodology

Q_{BAR} estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	633	633
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 30 years:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	10.53	10.53
1 in 1 year (l/s):	9.06	9.06
1 in 30 years (l/s):	18.43	18.43
1 in 100 year (l/s):	21.9	21.9
1 in 200 years (l/s):	24.96	24.96

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Calculated by:	Rudran Ratnanandan
Site name:	Barnsley Brickworks
Site location:	

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.54015° N
Longitude:	1.43004° W

Reference:	1720413634
Date:	Nov 28 2023 14:10

Site characteristics

Total site area (ha):	3.76
Significant public open space (ha):	0
Area positively drained (ha):	3.76
Impermeable area (ha):	3.76
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	3.76
Net impermeable area for storage volume design (ha):	3.76
Pervious area contribution to runoff (%):	0

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	179

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	85.47
FEH / FSR conversion factor:	1.11	1.11
SAAR (mm):	638	638
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 10 year:	1.45	1.45
Growth curve factor 30 year:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	6.15	6.15
Q_{BAR} for net site area (l/s):	6.15	6.15

Site discharge rates

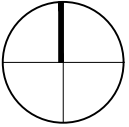
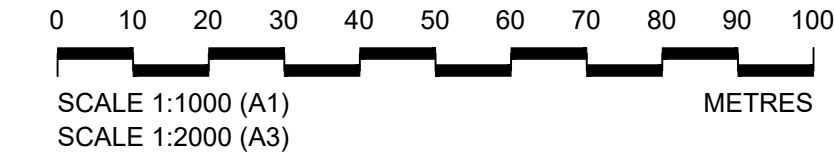
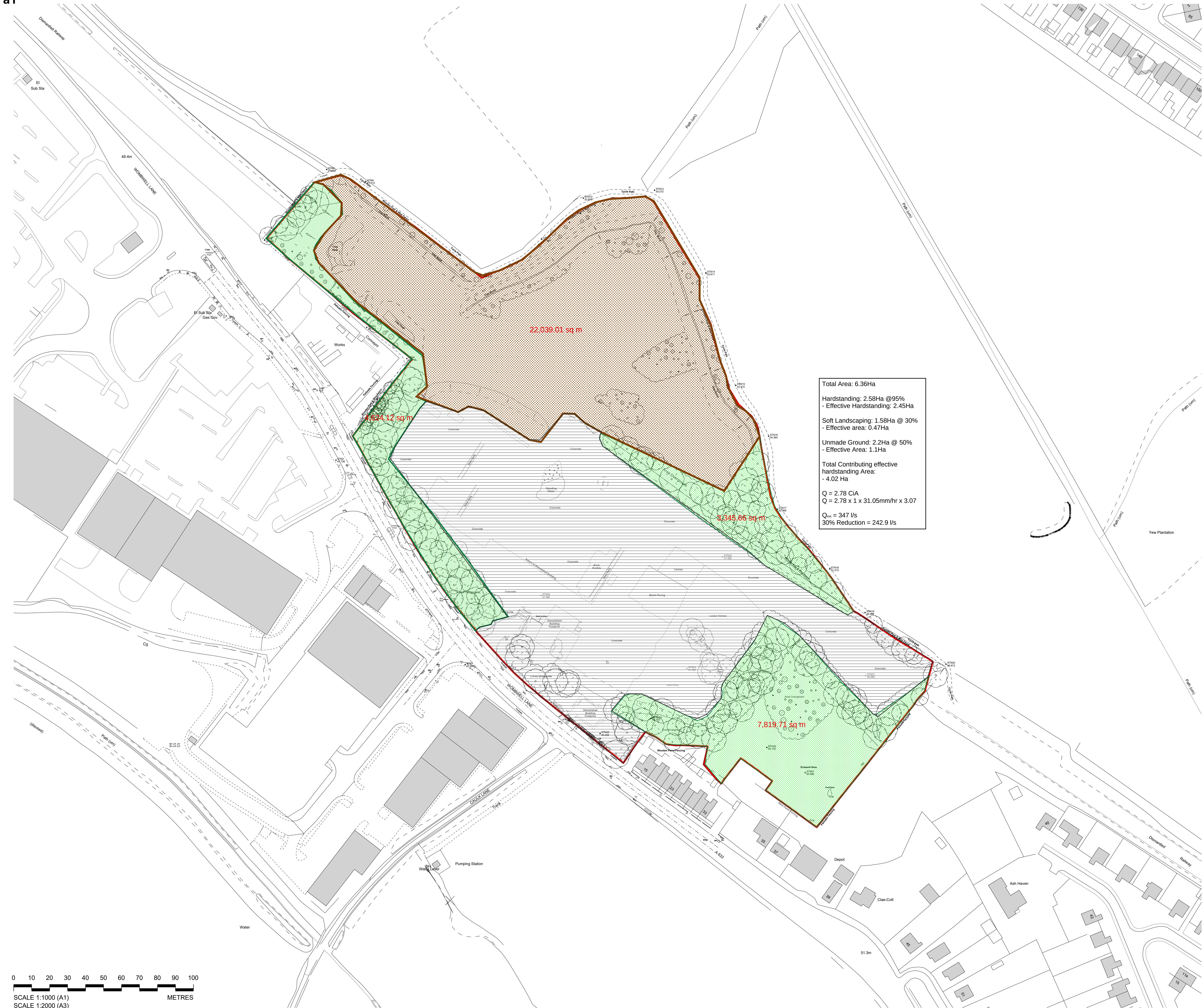
	Default	Edited
1 in 1 year (l/s):	179	179
1 in 30 years (l/s):	179	179
1 in 100 year (l/s):	179	179

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	1024	1024
Long term storage 1/100 years (m³):	0	0
Total storage 1/100 years (m³):	1024	1024

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to

estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following risks and information.

Risks listed here are not exhaustive. For residual architectural risks Refer to D5 H&S Risk Register ref: 965-D5A-XX-XX-HS-A-0001

- CONSTRUCTION:**
D5A-001 Risk of existing underground services
D5A-002 Risk of asbestos
D5A-003 Risk of contamination
D5A-004 Risk of unknown voids

For information relating to Use, Cleaning and Maintenance refer to the above H&S Risk Register.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement.

notes
Existing site plan created from Linear Surveys topographical survey ref. PBL/SFB/AUG21-01

revisions



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client
Potters Industries

project
**Stairfoot Processing Plant
Wombwell Lane, Barnsley**

drawing title
Existing Site Plan

1620015371-RAM-ZZ-XX-CA-CD-0001

EXISTING RUNOFF AREAS

BY: RR, CHECK: DOC
DATE: 23.11.2023

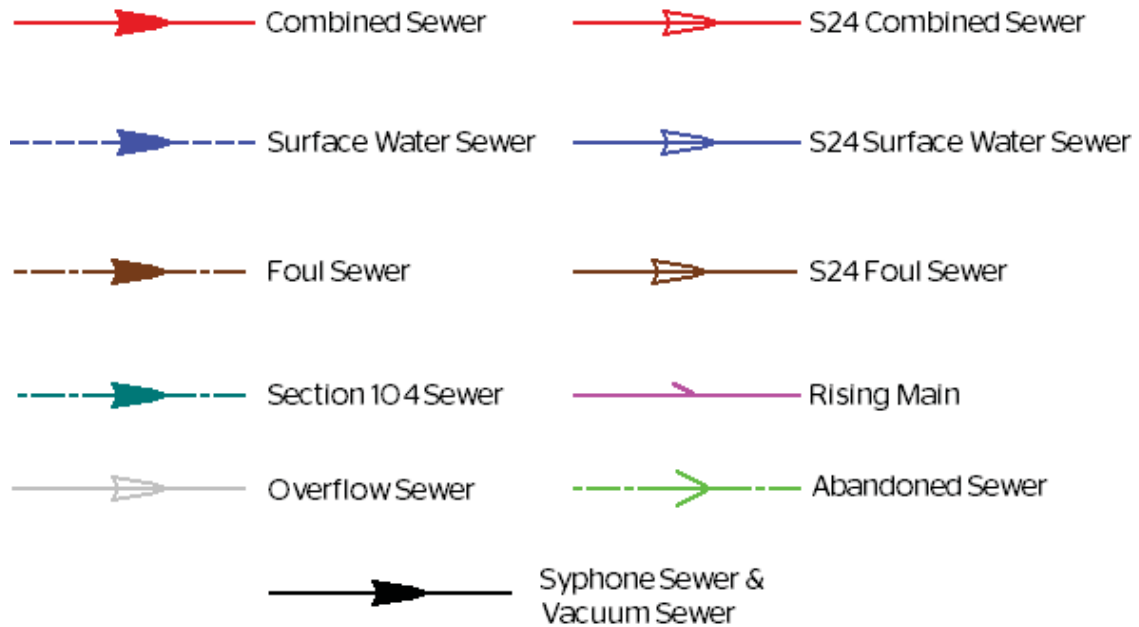
APPENDIX 2

EXISTING DRAINAGE RECORDS

Property Identifier



Sewer Legend

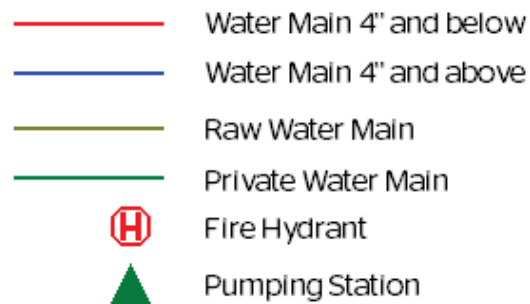


Pumping Station



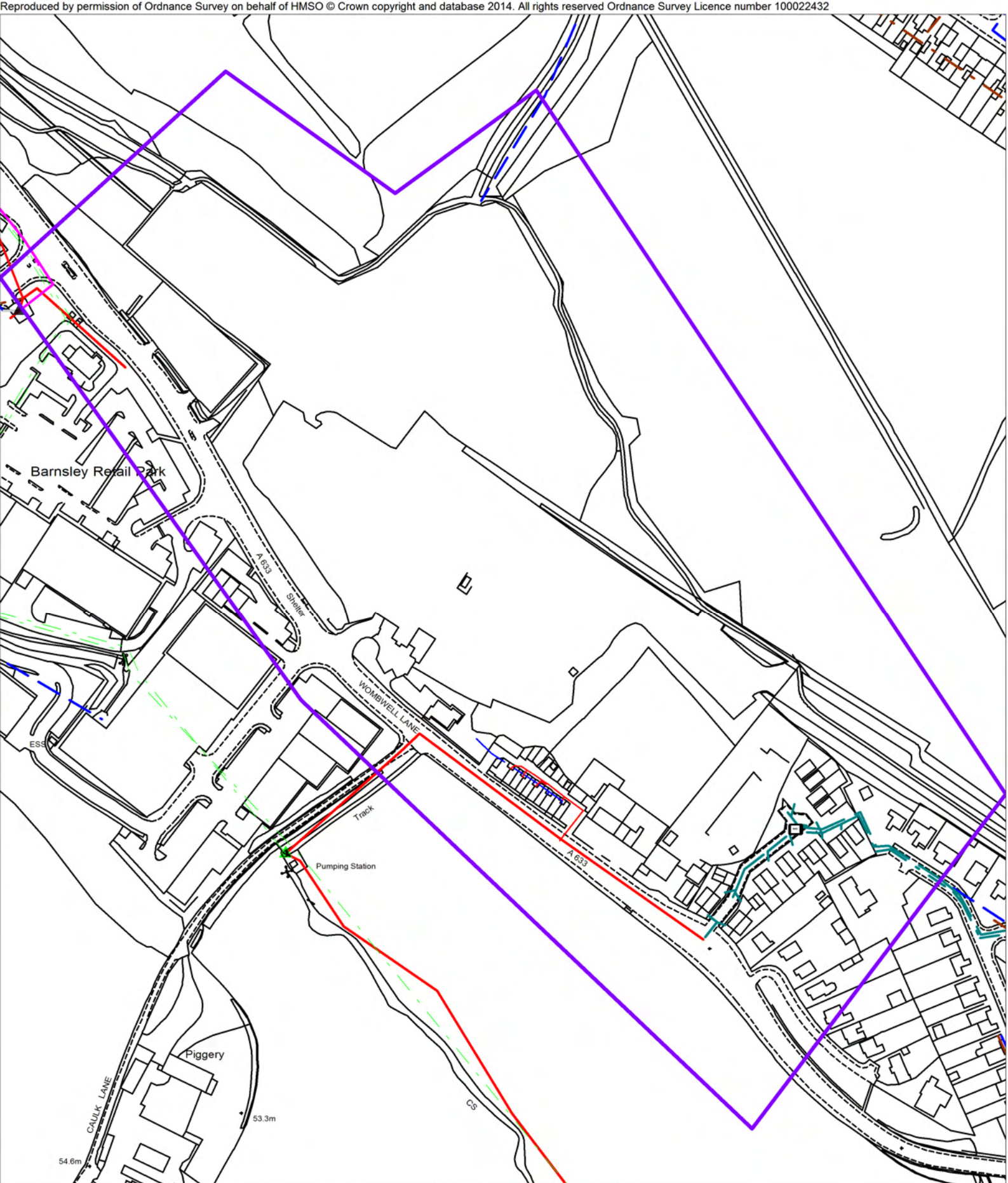
Public Sewer Treatment Works

Water Legend

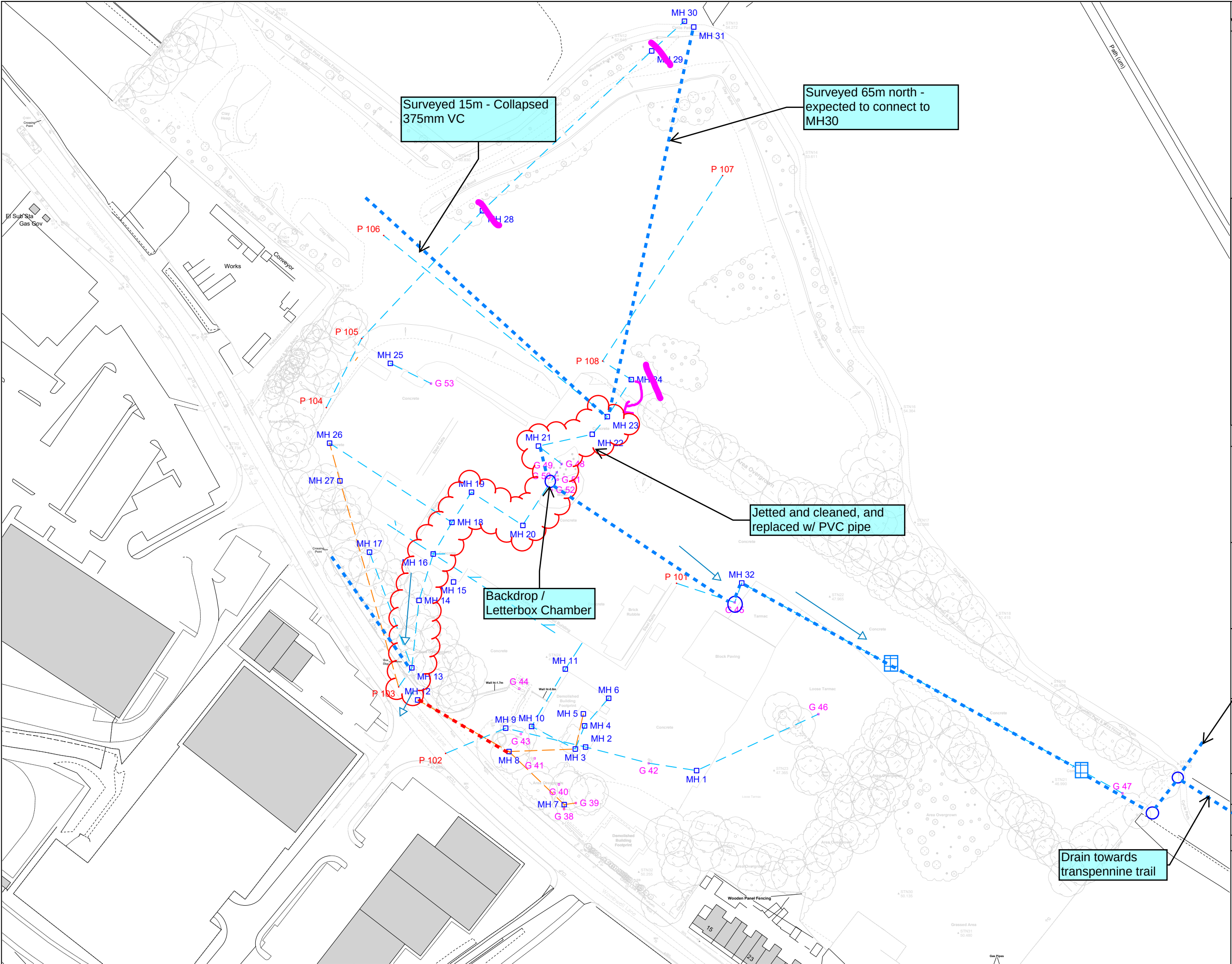




Public Clean Water Network 09/03/2021 09:13:40 OS Grid Coordinates: 437663 : 404613 Map Name : SE3704NE svcGISSafeMo



Public Waste Water Network 09/03/2021 09:13:45 OS Grid Coordinates: 437663 : 404613 Map Name : SE3704NE svcGISSafeMo



REVISIONS

Date	Description	By
//	//	//
//	//	//
//	//	//
//	//	//

Legend:

Station	Eastings	Northings	Level
345	437844.527	404905.548	47.676
STN1	437844.542	404905.518	47.683
STN2	437772.542	405015.300	47.736
STN3	437795.534	405053.150	48.283
STN4	437812.115	405075.769	49.215
STN5	437789.793	405093.104	49.540
STN6	437732.987	405141.772	50.486
STN7	437748.327	405161.112	50.043
STN8	437767.490	405180.944	51.548
STN9	437789.277	405174.225	51.712
STN10	437854.530	405122.242	50.830
STN11	437887.108	405142.200	51.505
STN12	437910.220	405165.039	52.645
STN13	437959.868	405169.462	54.272
STN14	437978.347	405123.385	53.611
STN15	437995.060	405060.902	52.472
STN16	438013.112	405052.664	54.368
STN17	438018.154	404992.023	52.066
STN18	438047.279	404958.894	51.415
STN19	438066.950	404934.518	49.995
STN20	438111.966	404905.849	48.673
STN21	438087.336	404895.446	46.990
STN22	437987.735	404965.520	47.965
STN23	437967.864	404903.460	47.365
STN24	437886.690	404943.972	47.986
STN30	438012.506	404859.598	50.135
STN31	438033.600	404845.465	50.480
STN32	437919.564	404867.261	50.425
STN23A	437947.937	404875.669	48.751

Datum:

Levels relative to Ordnance Survey by connection to OS Active Network by GPS

N

LINEAR surveys

LINEAR SURVEYS

23 Knowler Way,

Liversedge

West Yorkshire

WF15 6DG

Connection from pond

Tel: 01924 521862

Mobile: 07884434452

Email: linear-surveys@gmail.com

Client

Potters Ballotini

Job Title

FORMER STAIRFOOT BRICKWORKS

Project Title

HISTORICAL DRAINAGE LAYOUT

Scale

Date

Drawn by

Checked

1:1250@A3

NOV 2021

SW

Dwg. title

Drainage layout extracted from historical Fennell, Green & Bates IPPC Plan dated January 2004

DWG No.

FSBW/DSO/1121-01

PLOT SIZE: A3. PLOT SCALE: 1: TYPE SCALE HERE

APPENDIX 3

TOPOGRAPHICAL SURVEYS

APPENDIX 4

YORKSHIRE WATER CORRESPONDENCE



YorkshireWater

Ramboll UK
240 Blackfriars Road
London
SE1 8NW
darragh.oconnell@ramboll.co.uk

Your Ref:
Our Ref: Z006066

Yorkshire Water Services
Developer Services
Pre-Development Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482

Fax:

Email:
technical.sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
George Mullaney on 0345 120 8482

14th December 2023

Dear Mr O'Connell,

Land North of Wombwell Lane, Barnsley, S70 3NS – Pre-planning Enquiry V336721

Thank you for your recent enquiry and remittance. Our official VAT receipt has been sent to you under separate cover. Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records.

The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:

Foul Water

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

Foul water domestic waste can discharge to the 150 mm diameter public combined sewer recorded in Wombwell Lane, at a point to the south the site.

Yorkshire Water's Trade Effluent team must be consulted in respect of any proposed trade



effluent discharge to the public sewer. Please visit –
<https://www.yorkshirewater.com/business/trade-effluent/>

Surface Water

The developer's attention is drawn to Requirement H3 of the Building Regulations 2010. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

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

It is understood that a watercourse is located to the south of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable). Please note Yorkshire Water cannot provide plans of culverted watercourses or highway drains. To obtain plans please contact the Lead Local Flood Authority for more details.

If other methods of surface water disposal are not viable and subject to providing satisfactory evidence as to why they have been discounted, curtilage surface water discharges to the public sewer will be restricted to the level of run-off – i.e. same rate of discharge – to that from the existing use of the site less a 30% reduction in the existing discharge. Any discharge of surface water from the site should discharge to similar points of connection to that of the existing use of the site. You will need to demonstrate positive drainage, based on a 1 in 1 year storm, to the public sewer to Yorkshire Water by means of investigation and calculation carried out at your expense.

To do this, Yorkshire Water requires to see existing and proposed drainage layouts with pipe sizes, gradients, gullies, downpipes and connection points, measured impermeable areas of the present and proposed use of the site, along with the calculations that show the existing and proposed discharge rate from the site to the public sewer.

Surface water run-off from communal parking (greater than 800 sq metres or more than 50 car parking spaces) and hardstanding must pass through an oil, petrol and grit interceptor/separator of adequate design before any discharge to the public sewer network. Roof water should not pass through the traditional 'stage' or full retention type of interceptor/separator. It is good drainage practice for any interceptor/separator to be located upstream of any on-site balancing, storage or other means of flow attenuation that may be required.

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



YorkshireWater

Other Observations

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

Under the provisions of section 111 of the Water Industry Act 1991 it is unlawful to pass into any public sewer (or into any drain or private sewer communicating with the public sewer network) any items likely to cause damage to the public sewer network or interfere with the free flow of its contents or affect the treatment and disposal of its contents. Amongst other things this includes fat, oil, nappies, bandages, syringes, medicines, sanitary towels and incontinence pants. Contravention of the provisions of section 111 is a criminal offence.

An off-site foul and surface water sewer may be required which may be provided by the developer and considered for Code for Adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991 for which an application must be made in writing. For further information, please telephone 0345 120 84 82.

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

Yours sincerely

George Mullaney
Development Services Technician

APPENDIX 5

PROPOSED DRAINAGE LAYOUT

