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FLOOD RISK ASSESSMENT AND SURFACE WATER MANAGEMENT STRATEGY

FOR A PROPOSED DEVELOPMENT

AT

WOOLLEY COLLIERY, WOOLLEY COLLIERY ROAD, DARTON

Prepared for

ROUSE HOMES

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1 INTRODUCTION

1.1 iD Civils Design Ltd (iD), have been appointed by Rouse Homes (RH) to prepare a Flood Risk Assessment (FRA) and drainage strategy report for the proposed residential development on land to the west of Woolley Colliery Road, Darton.

1.2 The report will be undertaken in accordance with Environment Agency, Barnsley Metropolitan Borough Council (BC) and Yorkshire Water (YW) development control policies and will focus on:

Site Use and Current Drainage regime, Flooding History, Ground Conditions and use of SUDS, Impact of development and proposed drainage strategy, pluvial flooding routes and the overall impact of development on the site and surrounds.

1.3 The report is for the sole use of RH and presents comments and conclusions based on information available at the time of writing. iD Civils reserve the right to amend conclusions if further information is made available.

2 BACKGROUND

2.1 RH are seeking outline planning consent to develop two parcels of land to the west of Woolley Colliery Road, Darton, Barnsley. The parcels are located to the north and south of Woolley Colliery Miners Cricket Club. It is proposed that the site is developed to provide cc 115 new residential dwellings with associated open space, landscaping and new highway infrastructure. The parcels will be linked by an amenity area running to the west of the cricket club.

2.2 This Flood Risk Assessment has been undertaken with reference to the following reports and documents:

- Environment Agency Flood Zone Maps (EA website)
- Environment Agency Surface Water Flooding Maps (EA website)
- Environment Agency Flood Warning Plans (EA website)
- Barnsley MBC Preliminary Flood Risk Assessment
- Barnsley Strategic Flood Risk Assessment
- National Planning Policy Framework (NPPF)
- Technical Guidance to NPPF
- Codes for Adoption 2020
- Public Sewer Records (Yorkshire Water)
- Proposed Layout (Rouse Homes)
- SUDS Manual (Ciria C753)
- Site investigation (Sirius Consulting)
- EA Technical Guidance

2.3 In addition, iD Civils has reviewed commercially available information including aerial photographs and historic ordnance survey maps of the area during the preparation of the report.

2.4 **Site Walkover:** A site visit was undertaken in April 2022. During the site walkover overland flood routes onto and from the site were inspected in order to assess the risk of flooding from external sources. In addition, land to the west of the site to the railway line was inspected to try to determine the route of any offsite culverts from the northern watercourse.

2.5 **Regulator Liaison:** Liaison has taken place with Yorkshire Water and the Lead Local Flood Authority (BC) extracts from which are appended to this report.

3 REGULATORY GUIDANCE

3.1 National Planning Policy Framework (NPPF), along with the Technical Guidance to NPPF provides the regulatory framework and guidance for planning authorities in relation to Flood Issues for new developments. Any application submitted to a local planning authority will be considered in conjunction with this guidance and local development control policies, and dependant on the nature and location of the application, the planning authority may request a Flood Risk Assessment as part of the planning application submission.

3.2 The Environment Agency is a statutory consultee to the Planning Authority in relation to flood risk issues.

3.3 Barnsley Metropolitan Borough Council(BC) is the Lead Local Flood Authority (LLFA), and has their own internal Flood Management/Drainage Department which would advise on drainage issues and work with the EA on strategic issues within the area.

3.4 The Environment Agency has, in April 2015, provided guidance for local planning authorities regarding the relevant consultees to the planning process in terms of flood risk. In summary, this advises that the Lead Local Flood Authority should be consulted for major developments in all flood zones, with the Environment Agency also consulted if the development is within 20 metres of a main river. If the site is more distant to a main river then the Environment Agency should only be consulted for Flood Zone 2 and 3 developments, with the exception of water compatible developments in Flood Zone 2 where consultation is not needed.

3.5 The Environment Agency have undertaken a national study of flood risk across England and published flood maps covering the country. The maps can be viewed on the agency web site at **www.gov.uk/government/organisations/environment-agency**. Specific locations can be studied by searching either using postcode or address.

3.6 The EA flood maps identify 3 zones.

Flood Zone 1: This zone comprises land with a less than 1 in 1000 annual probability of river or sea flooding in any one year (<0.1%)

Flood Zone 2: This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%-0.1%) in any year. This flood zone is denoted by light blue shading on the EA flood zone maps.

Flood Zone 3: The zone comprises land assessed as having a 1 in 100 year or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. This flood zone is denoted by dark blue shading on the EA flood zone maps.

3.7 Flood risk should be assessed from the following sources;

- Tidal and river
- Surface water overland flow
- Groundwater
- Sewers (Pluvial Flooding)
- Artificial sources e.g. canals, reservoirs water mains.

3.8 Flood zone plans reflect the undefended flood scenario for a particular area. Many flood areas are defended with flood defences of varying types and design life. Areas benefiting from flood protection are shown hatched on the EA plans. The EA have also published additional flood risk mapping, the Risk of Flooding from Rivers and the Sea, which shows the defended scenario.

3.9 The EA has published a series of Surface Water Flood Maps which demonstrate overland flood routes on the basis of a 100-year storm event assuming that the natural drainage system is blocked or at capacity (pluvial flooding). Whilst this premise may have a low risk of occurrence, the plans assist designers in identifying areas at risk so that the necessary flood mitigation measures can be designed to produce a safe development.

3.10 The level of detail and complexity of a Flood Risk Assessment can vary considerably, dependant on the scale, nature and location of the planned development. EA guidance sets out the criteria for the level of information which should be included within the FRA.

3.11 The application sites are shown to lie within Flood Zone 1 on the Environment Agency's Flood Map for Planning and on the Risk of Flooding from Rivers and the Sea plan. A copy of this plan is included as drawing 5124-FRA02.

3.12 The Planning Practice Guidance to the NPPF refers to vulnerability classifications, which are based on the sensitivity of different forms of development. In accordance with the guidance (Table 2) the residential end use planned for this development is classed as *'More Vulnerable'*.

3.13 Table 3 in the NPPF technical guidance provides information in relation to the appropriate vulnerability classes within each of the flood risk zones. The table is presented below:

Table 5124.1 – Flood Risk Vulnerability and Flood Zone compatibility

Flood Risk Vulnerability Classification (Table 2 NPPF)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	√	√	√	√	√
Zone 2	√	√	Exception Test Required	√	√
Zone 3a	Exception Test Required	√	x	Exception Test Required	√
Zone 3b	Exception Test Required	√	x	x	x

3.14 Based on the above table it can be seen that the intended use of the development is consistent with NPPF guidance.

3.15 **The Sequential Test:** In accordance with NPPF, LPA's allocating land for development should apply the Sequential Test, to demonstrate that there are no available sites in the area with a lower risk of flooding. As the site is within Flood Zone 1 there is no land of a lesser flood risk in the area.

3.16 **The Exception Test:** The exception test is relevant if, following the application of the sequential test; it is not possible for the development to be allocated in zones of lower probability of flooding. The exception test is not required for this site.

3.17 **Development Drainage:** Yorkshire Water work within the framework of new 'Codes for Adoption', which sets the standard for adoptable surface water and foul water sewers. They also apply development control standards which are consistent with current best practice and Building Regulations. Codes for Adoption requires YW to adopt SUDS drainage features, however the design standards for these features have not yet been formally issued, and it is understood that in the interim design guidance from the Ciria 'SUDS Manual' will be adopted.

3.18 Developers are encouraged to make 'pre-development' enquiries to Yorkshire Water to ensure that there is sufficient time for the company to fully assess the capacity of their network and treatment works. This process also ensures that drainage strategies are acceptable in principle, prior to planning permission and helps avoid any objections from Yorkshire Water during the planning process. IDC issued a pre-development enquiry to YW. The response to the predevelopment enquiry is included in Appendix C and outlined in further detail in Section 10 below.

3.19 BC as Lead Local Flood Authority, is a statutory consultee to the Local Planning Authority regarding SUDS matters on major developments. At the present time there is no obligation for local authorities or LLFA's to adopt SUDS features. New 'Codes for Adoption' allows Yorkshire Water a mechanism for the adoption of SUDS drainage. The LLFA will however have an input in terms of the technical requirements and performance of the SUDS features to ensure compliance to their development control policies. It is understood that where the LLFA have local development control requirements, YW will flex their design standards to accommodate the local authority.

3.20 BC LLFA are part of the South Yorkshire Authorities group which includes Doncaster, Rotherham and Sheffield. The group has published SUDS guidance for the region which has been referred to in devising the strategy described in this report.

4 SITE DESCRIPTION AND HISTORY

4.1 A site location plan is included as Drawing No. 5124-FRA01. Site details are summarised in the Table below.

Table 5124.2 - Site Location Summary

Detail	Remarks
Location	West of Woolley Colliery Road, Darton, Barnsley. Postcode: S75 5RR
NGR	431189, 410810
Area	Development North – 2.95 Ha Development South – 1.27 Ha
Current Use	Brownfield – former colliery site which is currently scrub land with remnants of previous development.

4.2 **Topography:** A detailed topographical survey of the two development parcels has been undertaken. As reclaimed brownfield land both sites are covered in varying thicknesses of made ground and there are many stockpiles and man-made features across the surface relating to the reclamation.

Southern Parcel

The topographical survey shows gentle falls across the site from high point in the north east to low point in the south west. The highest point on the site is adjacent to Colliery Road at 80.80m AOD and the low point in the west of the site is cc 77.40m AOD. There are various bunds and manmade batter slopes and plateau's within the site.

The site is bounded by Woolley Colliery Road to the east, a railway line to the south/west and a football pitch to the north.

Northern Parcel

The topographical survey shows a number of manmade bunds and batter slopes within the site with land in the southern half of the site mounded cc 5m above the level of Colliery Road with a high point of cc 85m AOD. As you move north the site falls away from Colliery Road with a low point adjacent to the open watercourse in the north of cc 76.5m AOD.

The site is bounded by Woolley Colliery Road to the east, the cricket club to the south, scrub land to the east and existing residential development/scrub land to the north. Along the northern boundary is an open watercourse which is cc 30m in length prior to going into culvert adjacent to the existing pumping station. The culvert will drain to the west below the railway line and into the River Dearne.

4.3 **Existing Hardstanding:** There are hardstanding areas within both of the sites but these areas are poorly drained with little sign of any formal system. Runoff from these areas is not managed. There are tracks and footpaths within the sites formed from compaction of the made ground at surface as can be seen in the photographs in appendix F.

4.4 **Hydrology:** There is a watercourse flowing east to west along the northern edge of the northern development parcel. This watercourse goes to culvert before discharging to the River Dearne to the west. There are no other visible open watercourses within the site.

Liaison with the LLFA has revealed a culvert crossing the northern ,site from east to west. The culvert starts at the field edge east of Woolley Colliery Road and crosses the site to the woodland to the north west and down into the low-lying area joining the watercourse along the northern edge of the site and eventually discharging below the railway lines and into the River Dearne.

The precise alignment of the culvert is not known accurately, although the landowner has confirmed its existence. There is a reported collapse in the pipe approximately 30m into the site from Woolley Colliery Road.

4.5 The River Dearne runs approximately 120m west of the site, east of the railway line which marks the boundary of the southern parcel. The river and railway line are cc 10m lower than the site.

4.6 **Groundwater:** The site investigation undertaken by Sirius Consulting in 2019 did not encounter groundwater in any of the trial pits in the southern parcel. In the northern parcel groundwater was encountered in 6 of the sample locations at depths varying from 1.0m to 4.6m. The groundwater was perched within the made ground fill which accounts for its variable depth. It is expected that the groundwater will be at varying depths across the site dependant on the nature of fill material, its compaction and other factors.

4.7 The site will need to be regraded to provide a suitable development platform and as such will be subject to an earthworks phase prior to development commencing which may alter/disturb perched groundwater.

4.8 **Existing Drainage:** Yorkshire Water record plans show a number of public sewers within and adjacent to the site which are detailed in section 5 below.

4.9 **Ground Conditions:** The phase 2 site investigations, produced by Sirius Geoenvironmentlal note that the site was cleared in the 1990's and has been used for storage of colliery spoil since that date. The reports note that made ground is present across both parcels of varying depth (from 2.0m to 9.40m) and nature. The made ground is predominantly colliery spoil both cohesive and granular in nature but with coal washings and reworked natural material within the matrix. Below the made ground was a mix of soft/firm clays and sandstone bedrock with occasional mudstone and siltstone.

4.10 Environment Agency mapping shows that the site does not fall within a source protection zone.

5 EXISTING SITE DRAINAGE

5.1 iD has obtained a copy of Yorkshire Water's Sewerage Record plans for the area. A summary is presented below, and a copy of the sewer record is included within Appendix B:

Table 5124.3 – Existing Drainage Summary

Sewer Type	Comment
Surface Water	**North** Yorkshire Water's records show that there are no surface water sewers within the site. The nearest surface water sewer is approximately 80m north of the site in the existing development. **South** Yorkshire Water's records show that there are no surface water sewers within the site.
Combined Water	**North** The record plans show that there are no combined water sewers within or close to the site. **South** The record plans show that there are no combined sewers within the site. The nearest combined sewer is east of the site in Woolley Colliery Road. This system is 225mm diameter.
Foul Sewers	**North** Yorkshire Water plans show that there is a 150mm diameter foul sewer to the north of the site running parallel to the watercourse. This sewer discharges to a pumping station to the north west which pumps flows east along the watercourse turning south down Woolley Colliery Road and into the combined sewer which passes the southern site.

Sewer Type	Comment
	South Plans show that there are no foul sewers within or close to the site.
Highway Drainage	**North** There is a highway drain running in the verge adjacent to Woolley colliery Lane which flows north discharging into the watercourse. **South** ID Civils is not aware of any highway drainage within or close to the site. Highway runoff is assumed to drain to the combined sewer.
Private Drainage	There are no records of land drainage or other private drainage on the site. It is possible that drainage may have been installed on site and that it may be encountered during forthcoming site work. Given the derelict condition of the site any drainage system is likely to be in disrepair.

5.2 Although a historic brownfield site, due to its undrained nature the site is effectively greenfield in terms of its runoff characteristics. Liaison with the LLFA has established that the LLFA will accept a greenfield calculation based on IOH124 methodology.

5.3 Based on a development area of 50 Ha (as required by guidance), the greenfield rate of the site has been assessed as below;

Table 5104.4 – Greenfield Runoff Rates

Return Period (years)	Greenfield Runoff Rate based on 50 Ha (l/s)	Greenfield Runoff rate per Ha
Q_{bar}	233.74	4.67
Q30	409.05	8.18
Q100	486.19	9.72

6 PROPOSED DEVELOPMENT

6.1 It is proposed that the northern site is developed to provide 75 new dwellings with ancillary open space and landscape areas. The southern site is to be developed with 40 new dwellings.

6.2 The sites will be accessed from Woolley Colliery Road. The northern site already has an existing access formed but this will be relocated to improve visibility and also to facilitate the surface water overland flow path from the east. The southern site access will be retained in its current location.

6.3 The highways within site will be offered for adoption under a section 38 agreement with the highway authority, Barnsley Council.

6.4 Foul and surface water sewerage networks and storage will be adopted by Yorkshire Water via a section 104 agreement. The storage will be designed as a dry basin to Yorkshire Water adoption requirements subject to groundwater monitoring.

6.5 The precise size and detailed technical design of surface water attenuation will be determined through detailed design in response to discharge of conditions. A strategy plan has been drawn up to illustrate the location and approximate size of the SUDS attenuation required for each development site, as outlined in Section 10 below.

7 FLOOD HISTORY AND SITE VULNERABILITY

7.1 Flooding can occur from a variety of sources, including tidal, rivers, watercourses, overland run-off, sewers and culverts. NPPF and WC guidance requires flood risk from all sources to be evaluated and suitable mitigation provided where required.

7.2 Environment Agency mapping shows that the site is located within Flood Zone 1 and is at a low risk of flooding.

7.3 The LLFA has been consulted and they have confirmed that they have no historical record of the site being flooded.

7.4 **Climate Change:** NPPF provides guidance with respect to the implications of climate change and suggests appropriate additional allowances for climate change with respect to rainfall intensities as below;

Table 5104.5 – Peak Rainfall Allowances

Scenario	2010-2039	2040-2059	2060-2115
Upper End	+10%	+20%	+40%
Central	+5%	+10%	+20%

7.5 The technical guide to NPPF recommends that residential development should be regarded as having a design life of 100 years. Allowances of 20% and 40% should therefore be considered when assessing attenuation features on this development. Storage should be designed to accommodate a 20% allowance and the model should be tested for 40% in order to determine the additional volume of water and ensure that it can be accommodated on site in safe location.

7.6 The LLFA development control advice states that a climate change allowance of 30% should be used for new development.

7.7 **Urban Creep:** Discussion with the LLFA indicate that no urban creep allowance is required for this development.

8 FLOOD IMPACT AND MITIGATION MEASURES

8.1 NPPF guidance requires the risk from a range of potential sources to be evaluated. The range of flood sources identified in NPPF is reviewed below:

Southern Site

8.2 **Flood Risk from Rivers/Watercourses or the Sea – Fluvial Flooding:** Environment Agency mapping shows that the application site is located within Flood Zone 1. This flood zone is the lowest risk of 1 in 1000 year or 0.1% annual risk of flooding. The flood risk comes from Langthwaite Beck to the south of the site.

Mitigation: None required.

8.3 **Flooding from Overland Surface Water – Pluvial Flood Risk:** The Environment Agency's risk of flooding from surface water plans shows that there is a high-risk surface water flooding area in the western part of the site. Review of the topographical survey and based on the walkover observations, this represents a low spot in the site topography between embankments to the north and south. During a site visit in may 2022 this area was flooded (see pictures).

Mitigation: The surface water flood risk is modelled based on current topography and as this area is low comparted to its surroundings is liable to flood. This site will be regraded to provide a development platform and remove the embankments and low spots and provide a positive drainage system with attenuation. This flood risk area will be removed and the majority of the flooded volume will effectively be held in the new storage system. Land to the north west can be regraded to prevent flows towards the site as part of the open space treatment. As part of any regrading proposals, areas can be designed to hold water if required.

8.4 **Flooding from Sewers:** Yorkshire Water record plans show that there are no surface water sewers through the site therefore there is no risk from surface water sewer flooding. There is a small diameter combined sewer in Woolley colliery Road. Flooding from that sewer in a blockage scenario will remain in the highway and flow past the site.

Mitigation: None required.

8.5 **Flooding from Artificial or Other Sources:** Environment Agency mapping shows that the site is not at risk of reservoir flooding. There are no large water mains across the site which could pose a flood risk.

Mitigation: None required.

8.6 **Groundwater:** The groundwater level has not been located during the site investigation in any of the pits.

Mitigation: None required

Northern Site

8.7 **Flood risk from Rivers, Watercourses or the Sea – Fluvial Flooding:** The EA plans do not show any flood risk from the watercourse to the north of the site.

Mitigation: None required.

8.8 **Flood Risk from Overland Surface Water – Pluvial Flood Risk:** The EA plans show a medium to high risk of overland flooding from the east across Woolley Colliery Road and across the site to the low area in the north west. This flooding has been modelled assuming that the culvert system is blocked and based on LIDAR topographical levels. During the site visit it was observed that the inlet headwall to the culvert was partially submerged and that there is a low spot in the road which will direct water onto the site.

Mitigation: The access is to be relocated close to the area of the overland flood route to allow water to enter the site within the highway. The estate road highway and external spaces have been designed to allow a flow exceedance route to be designed to create an overland flood route. The culvert through site will be renewed on a new alignment replacing the blocked pipe that exists at present. The watercourse to the north will be cleared of silt which is partially restricting the outflow from the culvert crossing to the east and will also be regraded in part to remove the large existing step in bed levels caused by relict slabs from the colliery.

8.9 **Flood Risk from Sewers:** There are no sewers within the site that could cause a flood risk. Sewers to the north of the site are low compared to the site and flooding from this part of the network would be drained in the open section of watercourse.

Mitigation: None required.

8.10 **Flood Risk from Artificial Sources:** Review of the EA reservoir flood risk plans confirms that the site is not at risk from reservoir flooding. There are no large water mains within or close to the site.

Mitigation: None required.

8.11 **Flood Risk from Groundwater:** Trial pits in the south of the site located groundwater at a range of depths from 1.0m to 4.6m. Groundwater is perched across the site due to the variable nature of the made ground.

Mitigation: The site will be subject to a programme of remediation and the creation of a development platform which will regularise the groundwater depths. In addition, the installation of a drainage system across the site will manage the surface water falling on the site directing it to the storage facility. Land to the north of the site is substantially lower than the site (approx. 6m), therefore high groundwater is not expected.

9 SUDS

9.1 Building Regulations (Part H), the National Planning Policy Framework, Yorkshire Water and BC development control policies and Environment Agency advice notes, require the consideration of sustainable drainage techniques for new developments.

9.2 Surface Water drainage should be considered in accordance with a prescribed hierarchy aimed at minimising the impact of development. Surface Water flows should be designed to discharge to:

1. Infiltration based or sustainable drainage systems
2. Watercourses
3. Surface water Sewers
4. Combined water sewers

Guidance on SUDS techniques can be found in the SUDS Manual (Ciria 2015). There are various forms of technique available as summarised below:

Table 5104.6 – Forms of SUDS Drainage

Technique	Description
Trenches	Shallow excavations filled with rubble or stone that create temporary storage and either filter into the ground or convey water to an outlet. Known as 'French drains'
Swales	Shallow linear vegetated drain ditches which can either convey flows to an outlet or infiltrate via a granular sub base to the sub strata.
Pervious Pavements	Material which allows water to permeate into underlying sub strata – best utilised on flat sites with permeable sub strata. Permeable paving can be used on clay sub strata but will require a piped drainage outlet from the sub base to a positive system.
Geocellular Systems/Tank systems	Modular plastic geocellular systems which have a high void ratio and allow water to be storage below ground. Large diameter pipework or purpose designed tanks to allow below ground storage.
Infiltration Basins	Vegetated depressions which allow water storage and slow infiltration into the ground.
Detention Basins	Surface water storage basins which remain dry when not in use and allow flood water to collect and discharge to a design flow rate.

Technique	Description
Ponds	Ponds can provide both attenuation and treatment, together with landscape and ecology value. Run off through storms is attenuated in an upper level above ambient pond depth.

9.3 The use of SUDS techniques is designed to mitigate the impact of development on receiving watercourses or sewers by mimicking pre-development conditions as far as possible. New development should not worsen flooding downstream and should attempt to improve flooding wherever practical.

9.4 Sustainable Drainage can take many forms dependant on site use, ground conditions and topography. In terms of the hierarchy of sustainable options, infiltration-based systems should be considered in the first instance i.e. soakaways/infiltration swales/basins etc. The use of infiltration systems will be subject to the infiltration characteristics of the natural ground below the site and any environmental constraints which may apply i.e. sensitivity of the groundwater or risk of increasing water flow through the ground.

9.5 In areas with cohesive sub soils or made ground, such as this site, it is unlikely that sufficient percolation can be provided to allow the implementation of infiltration techniques. In addition, the level of groundwater below the site can affect the performance of infiltration drainage.

9.6 Sustainable Drainage in areas of cohesive sub soils can be provided by a range of flow attenuation devices to suit the proposed development, policies of adopting authorities and planning authority requirements. Attenuation ponds and swales can provide ecological benefits by the creation of wetland habitats and also improve the quality of water by adding a treatment element to the drainage process but not all sites are suitable for ponds or swales due to specific constraints or levels.

9.7 New Codes for Adoption require Yorkshire Water to adopt SUDS features as part of the public sewer system and therefore any SUDS on this site will be adopted by YW provided that it complies with their design requirements.

9.8 An assessment of the available SUDS source control, pre-treatment and SUDS components mentioned in the SUDS Manual has been completed and is summarised in the table below:

Table 5104.7 – Site Specific SUDS Consideration

Source Control Feature	Included Y/N	Comment
Green Roof	N	Not appropriate to the form of development which is traditional steep pitched roofs. Householders are not appropriate to maintain this specialist form of roof covering.
Soakaways	N	The ground conditions below this site will not support infiltration drainage due to the variable nature of the made ground.
Water Butts	Y	Can be included in the development as part of the builder's standard specification.
Rainwater Harvesting	N	High capital cost and high maintenance and running costs make this form of SUDS inappropriate for this development. The development can be served by new water mains so there is not restriction to supply in this area. Harvesting tanks need to be on an individual property basis therefore it is unlikely that householders will be sufficiently aware of their ongoing maintenance obligations and it is considered that in the long terms they will be less effective.
Pre-Treatment Feature		
Silt Traps/Sumps	Y	Plot drainage and driveway drainage will feature trapped gullies and sumps which will collect silts and sediments as a pre-treatment feature. Householders will need to maintain the system within their property curtilage.
Vortex Separator	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Separators would not be adopted by any of the regulators or water authority.
Filtration System	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Filtration systems would not be adopted by any of the regulators or water authority.
Oil Separators	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Separators would not be adopted by any of the regulators or water authority.
SUDS Component		

Filter Strips	Y/N	Not appropriate in general to the form of development and layout as these systems deal with sheet runoff and require large areas to accommodate. Mainly used for car parking and large hardstanding areas. There are limited areas of shared private drives that could be drained onto soft landscape areas by using filter strips and a perforated under drain.
Trenches	N	Not appropriate in a residential setting. Their use would be limited as runoff from driveways tends to be towards the footway or plot and gravel filled trenches could not be accommodated in these locations.
Swales	N	Not appropriate for the housing or roads within the development as swales take substantial area due to the batter slopes and the need to be reasonably deep to receive flows from any road gullies.
Bio retention	N	Unsuitable for this form of residential layout.
Permeable Paving	N	Predominantly used where soils can infiltrate to the groundwater. Infiltration systems are not appropriate for use on the site due to ground conditions. BC do not adopt permeable paved roads.
Geocellular Systems	Y/N	These types of systems are adoptable by the water authority so can be used. They are not however favoured due to the difficulty in maintaining them and removing silt. Often used as overflow from a main storage tank so that the cellular storage does not take the low flows which are heavily silted.
Infiltration Basin	N	Ground conditions are not suitable for the use of infiltration basins.
Detention Basin	Y	YW will adopt dry attenuation basins as a means of surface water storage however they require that groundwater is greater than 1m below the bottom of the basin. The precise level of groundwater will be determined through long term monitoring following remediation. An offline basin is proposed for the southern site at the western edge of the site adjacent to the open area. An online basin is proposed to the northern site.
Ponds	N	Given that YW prefer the use of a dry SUDS basin a pond has been discounted in the southern area. If overriding ecological issues are apparent during the planning process consideration can be given to a pond if agreed with YW.
Wetlands	N	Wetland areas could not be provided due to limited space within the site, topography and the volumes of storage required.
Tanks/Oversized Pipes	N	Can be adopted as part of the Yorkshire Water Section 104 network if required. At this stage it is proposed that both sites will feature storage basins subject to detailed design and ground conditions.

10 PROPOSED DRAINAGE STRATEGY

10.1 The development will require new drainage systems designed to suit the final layout, and in compliance with current Building Regulations and Sewers for Adoption. The pipe drainage network and SUDS storage will be adopted by Yorkshire Water under a section 104 agreement.

10.2 A predevelopment enquiry was submitted to Yorkshire Water to ascertain suitable points of discharge and rates for foul and surface water drainage. Their response, included in Appendix C, is summarised below;

'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

Northern Site

10.3 Yorkshire Water has confirmed that foul water flows from the development can be discharged to the 375mm diameter foul sewer recorded in the north of the site.

Comment: Due to there being no depths on the sewer records a survey will need to be undertaken to determine the precise location of the connection to the sewer. At this stage it is anticipated that a gravity connection can be made.

Southern Site

10.4 Yorkshire Water state that a connection can be made to the 225mm diameter combined sewer in Woolley Colliery Road.

SURFACE WATER

10.5 In accordance with the hierarchy contained within Part H of the building regulations, NPPF and the SuDS guidance, the surface water strategy should be considered in order of the sustainable hierarchy. The hierarchy and ability of the site to support the particular elements of the hierarchy are discussed below:

10.6 **Discharge to infiltration drainage/soakaway:** The ability of any development to discharge to infiltration drainage is wholly reliant on the ground conditions across the site. The site ground conditions across both sites comprise deep made ground colliery spoil and are not suitable for infiltration drainage, so this option has been discounted.

10.7 **Discharge to Watercourse:** The northern site has a watercourse running along its northern boundary which can be used to discharge surface water flows. There are no watercourses available to discharge flows from the southern site.

10.8 **Discharge to Sewer:** The northern site will discharge to watercourse.

Due to the absence of any watercourse to discharge the southern site to, a connection was requested from YW to connect to the combined sewer in Woolley Colliery Road. YW has given consent to connect to this sewer and state in their pre-development response;

'As soakaways will not be viable and the water course is higher than the site and pumping will not be agreed by the LLFA curtilage surface water may discharge to the 225 mm diameter public combined sewer recorded in Wooley Colliery Road, at a point to the east of the site. The surface water discharge from the site to be restricted to not greater than 3.5 (three point five) litres/second. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.'

SURFACE WATER STRATEGY OUTLINE

Northern Site

10.9 It is proposed that surface water flows are discharged to the unnamed watercourse to the north of the site at existing greenfield rate of 4.67 l/s/ha. The watercourse requires some remedial work in the form of silt removal and reprofiling as part of the site remediation. The scale of works is to be agreed with the LLFA upon detailed survey and design.

10.10 As flows will be restricted to the Qbar rate across all storm event up to the 100 year plus climate change event storage of surface water is required on site. The proposed network and storage can be seen on the Drainage Strategy Plan 5104-FRA06.

10.11 **Storage Required:** The site catchment area has been measured and is confirmed as 1.352 Ha. The net developed area of the site is 2.558ha so the discharge rate based on a greenfield rate of 4.67 l/s/ha is 11.94 l/s. A summary of the storage required for the site is set out below base on micro drainage source control quick storage tool;

Table 5104.8 – Storage summary- Northern site

Development Area (Ha)	Impermeable Area (Ha)	Discharge Rate (l/s)	Storage Q30 (m^3)	Storage Q100+30%cc (m^3)
2.558	1.352	11.94	418	823

10.12 **Design Requirements:** The surface water drainage system should be designed not to surcharge in a 2-year storm, not to flood in a 30-year storm and to safely accommodate surface water to the 100 year plus 30% climate change volume on site in a designated storage area.

10.13 **Form of Storage:** The surface water storage will be provided by a new 'online' storage basin set in an open space in the north of the site. The whole of the storage for the 100 year +30% climate change volume will be provided in the basin and the lower reaches of the network. The use of a basin is subject to groundwater monitoring proving that the groundwater level is 1m or greater below the bottom of the basin.

10.14 **Access to Storage/ Flow Controls and Watercourse:** Access will be required to inspect and maintain the flow control device and an access track has been shown on the strategy plan which would be used by YW.

10.15 **Diversion of Culverted Watercourse:** The existing culverted watercourse through the site is likely to be in very poor condition and has collapsed in part. The line and level of the culverted watercourse will not suit the new development and the existing pipe is likely to be affected by the site remediation and creation of new development platform levels. It is therefore proposed that a new 450mm diameter culvert will be laid through the site to pass water from the edge of Woolley Colliery Road to the edge of the existing woodland to the north east, at which point it will reconnect onto the existing culvert at the site boundary.

Southern Site

10.16 **Strategy Outline:** It is proposed that surface water will be discharged to the existing combined sewer in Woolley Colliery Road to the east of the site. The system is to be designed as a gravity system with oversized pipework through the site so that it can be laid as flat as possible. At the north west of the site there will be an overspill basin which will, together with the site network, store up to the 100 year plus 30% climate change event. The basin is intended to be offered for adoption.

Yorkshire Water have placed a restriction on the discharge rate to the combined sewer of 3.5 l/s which is lower than greenfield rate.

10.17 **Storage Required:** The site catchment has been measured based on the illustrative masterplan and the drained area is 0.614 Ha. Based on this drained area, a design storm of 100 year +30% and a discharge rate of 3.5 l/s the volume of storage has been calculated using micro drainage source control quick storage estimate tool;

Table 5104.9 – Storage summary- Southern site

Development Area (Ha)	Impermeable Area (Ha)	Discharge Rate (l/s)	Storage Q30 (m^3)	Storage Q100+30%cc(m^3)
1.181	0.614	3.5	223	431

10.18 **Design Requirements:** The surface water drainage system should be designed not to surcharge in a 2-year storm, not to flood in a 30-year storm and to safely accommodate surface water to the 100 year plus 30% climate change volume on site in a designated storage area.

10.19 **Form of Storage:** The surface water storage will be provided in a combination of oversized pipework below the roads and an overflow basin to the north west of the site at the edge of the open space. The strategy plan illustrates 79m^3 of storage in the network along with 406m^3 of storage in the basin at a maximum of 1m depth.

10.20 As the site falls slightly from Woolley Colliery Road to the west it is important that the surface water system is laid as flat as possible through the site from the head of the system in the west. By laying the system with a shallow gradient the depth of the sewer at the point it crosses into Woolley Colliery Road will be as shallow as possible. The new system will be deeper than the existing at the site entrance. The connection will need to be at a point along the road where the systems can be at a similar level.

10.21 **Access to Storage/Flow Controls for maintenance:** The flow control is required at the entrance of the site at the end of the oversized pipe system. This will be located in the access road just back from the junction.

Access in and around the basin can be provided from the end of the estate road and via a 3m wide access track as shown on the strategy plan.

10.22 **Long Term Maintenance:** As part of the adopted public sewer system, Yorkshire Water will be responsible for ongoing maintenance for the network, storage and pumping station and will specify the maintenance schedule in accordance with their terms of service.

10.23 The foul water pumping station will also be included as part of the adoption agreement and will become a public sewer on completion of the development and a maintenance period.

10.24 **Management of Runoff during Construction:** During the construction phase of the project the site remediation and construction contractor will need to manage surface water flows from the site in order to prevent surface water runoff contaminated with silts from washing down of the site in an uncontrolled manner. Measures to manage flow and water quality need to be put in place via an agreed Construction Phase Environment Management Plan (CEMP). This will be agreed with the LLFA/LPA as part of the planning condition discharge process.

10.25 **Exceedance Routes:** In the event of blockage, or a storm which exceeds the design storm surface water may emerge from the system and flow overland. Highway and external works levels need to be designed so that clear safe exceedance routes are provided through the site. Anticipated routes are shown on the strategy plan but this is subject to detailed design.

11 IMPACT OF DEVELOPMENT AND RESIDUAL RISK

11.1 A detailed Flood Risk Assessment and outline drainage strategy has been undertaken with respect to the planned development on land at Woolley Colliery Road, Darton.

11.2 The FRA has been undertaken in accordance with Environment Agency, Yorkshire Water and BC development control guidance, and considers the setting of the development and likely impact on surrounding areas. A surface water and foul water drainage strategy has been outlined in the report.

11.3 It has been established that the sites are located within fluvial Flood Zone 1 as defined in the EA flood maps, and there are medium/high risks from surface water flooding on both sites which require mitigation. Mitigation has been proposed in this report which will render the development safe in accordance with EA guidance and LLFA development control policy.

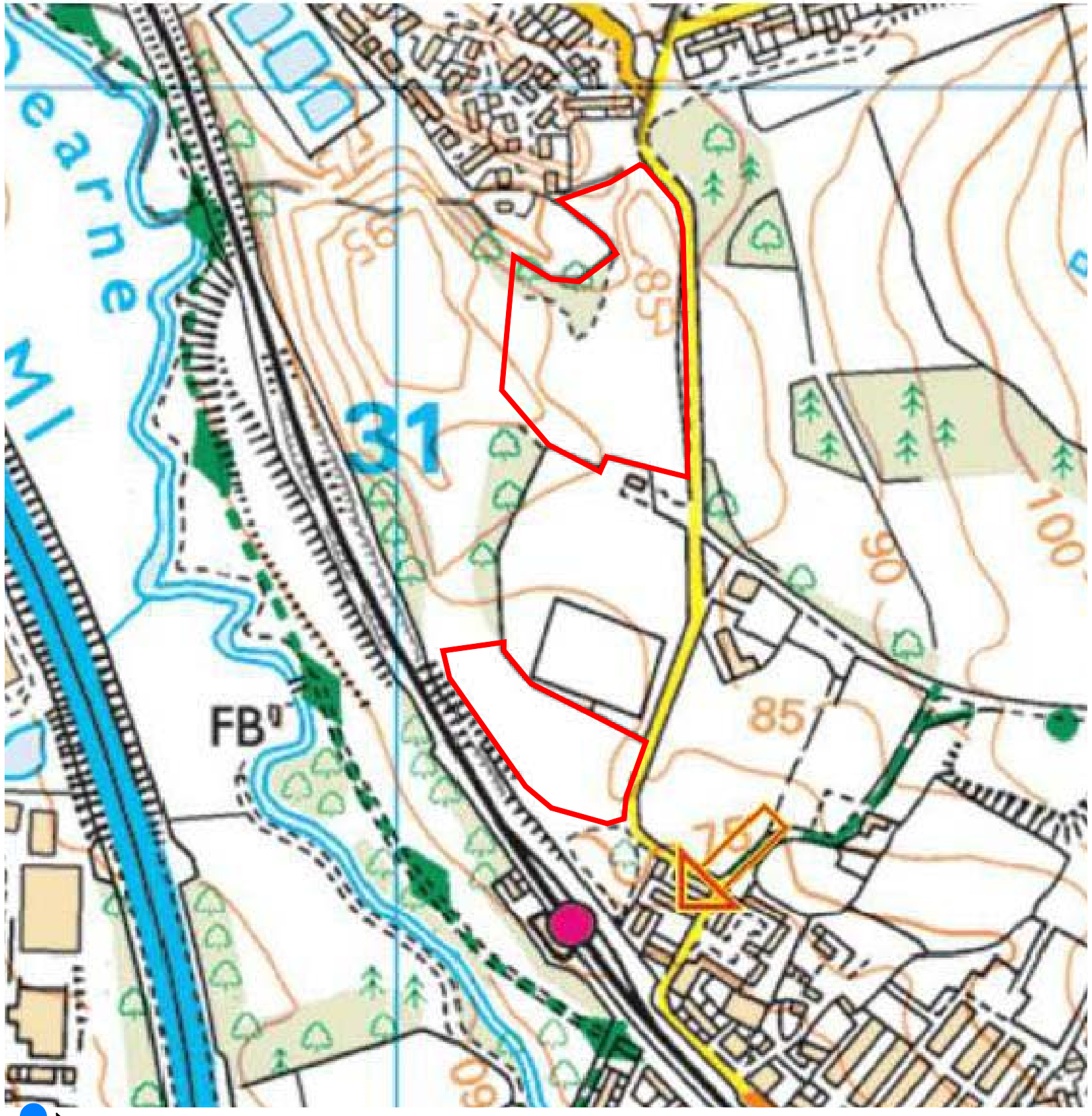
11.4 The SUDS hierarchy in NPPF and Building Regulations has been reviewed in terms of surface water disposal and recommendations in line with BC development control policy has been made which will ensure that the development is not at risk of flooding and that flood risk is not increased in the surrounding area.

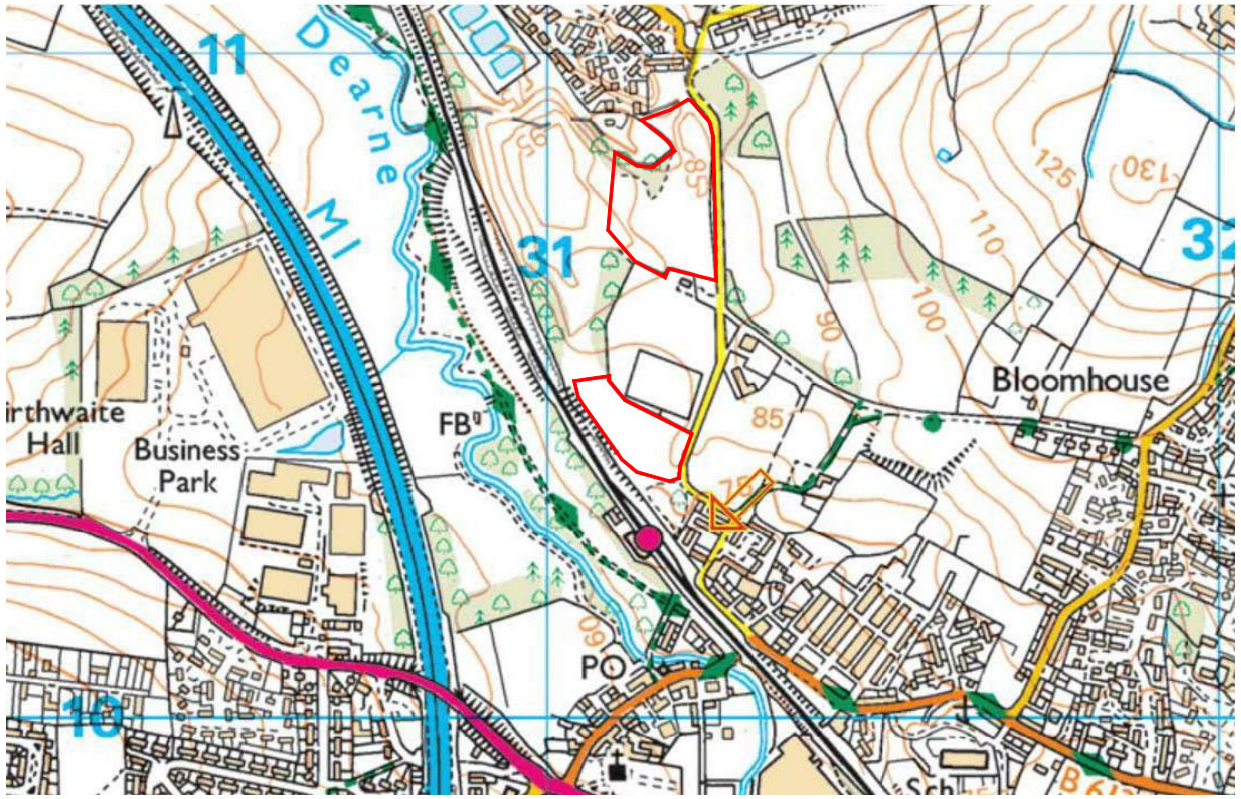
11.5 The assessment has identified the current site drainage characteristics and also established the current level of risk from flooding. A summary of the risks and mitigation identified is presented below:

Table 5104.10 - Summary of Main Issues

Issue	Summary	Residual Risk
Flood Zone	The sites are located within Flood Zone 1. The proposed development is compatible to the flood setting in accordance with NPPF.	**Low**
Fluvial Flooding	The development is within flood zone 1 and mapping shows that the site is not at risk from fluvial flooding from the watercourse.	**Low**
Pluvial Flooding	Environment Agency mapping shows medium/high risk surface water flooding on both sites. The norther site has a flood route through the site from west to north. The layout has been designed to accommodate this flood route safely. Overland flood routing is modelled assuming the drainage system is blocked or to capacity. There will be a new culvert through the site so the risk of the overland route being triggered is low. The southern area has a high risk in a localised area which is an existing low spot between landscape mounds. As part of the sites development these mounds will be removed and the site levels remodelled removing this low spot and the flood risk.	**Low**

Artificial Sources	The EA plan shows that the site is not subject to flood risk from reservoirs. There are no large water mains which could pose a risk to the site.	**Low**
Groundwater	The groundwater levels as identified in the site investigation to date confirm that the site will not be affected by high groundwater emergence.	**Low**
Surface Water Management	The rate of surface water runoff discharged from the development will be restricted to 11.94 l/s in the north which reflects current greenfield rate, and 3.5 l/s in the south which is below greenfield rate and is stipulated by YW. Surface water flows in excess of this rate will be attenuated on the site up to the 100-year storm event plus a factor for climate change of 30%. Safe exceedance routing will be provided within the highway corridors as part of the detailed design.	**Low**





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OS Ref: SE 311 104
OS Co Ords: 431165 410405

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client: Rouse Homes

Project Title: Colliery Road, Darton

Drawing Title: Location Plan

Drawing No	Revision	Status
4944-FRA-01	0	Final

Flood zone 3

Areas benefiting from flood defences

Flood zone 2

Flood zone 1

Flood defence

Main river

Water storage area

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client: Rouse Homes

Project Title: Colliery Road, Darton

Drawing Title: Flood Zone Plan

Drawing No	Revision	Status
4944-FRA-02	0	Final

Extent of flooding from surface water

High Medium Low Very low

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client: Rouse Homes

Project Title: Colliery Road, Darton

Drawing Title: Surface Water Flood Risk Plan

Drawing No	Revision	Status
4944-FRA-03	0	Final

Surface water flood risk: water depth in a medium risk scenario
Flood depth (millimetres)

Over 900mm | 300 to 900mm | Below 300mm | Locat

MEDIUM RISK - between 30-100 years
LOW RISK - between 100-1000 years

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client: Rouse Homes

Project Title: Colliery Road, Darton

Drawing Title: Surface Water Flood Risk Plan

Drawing No	Revision	Status
4944-FRA-04	0	Final

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client:
Rouse Homes

Project Title:
Colliery Road, Darton

Drawing Title:
Reservoir Flood Risk Plan

Drawing No	Revision	Status
4944-FRA05	0	Final

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Rev	Description	By	Date

Scale	Date
NTS @ A3	April 2022

Client:
Rouse Homes

Project Title:
Colliery Road, Darton

Drawing Title:
Aerial Picture (North)

Drawing No	Revision	Status
4944-FRA06	0	Final

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Rev	Description	By	Date

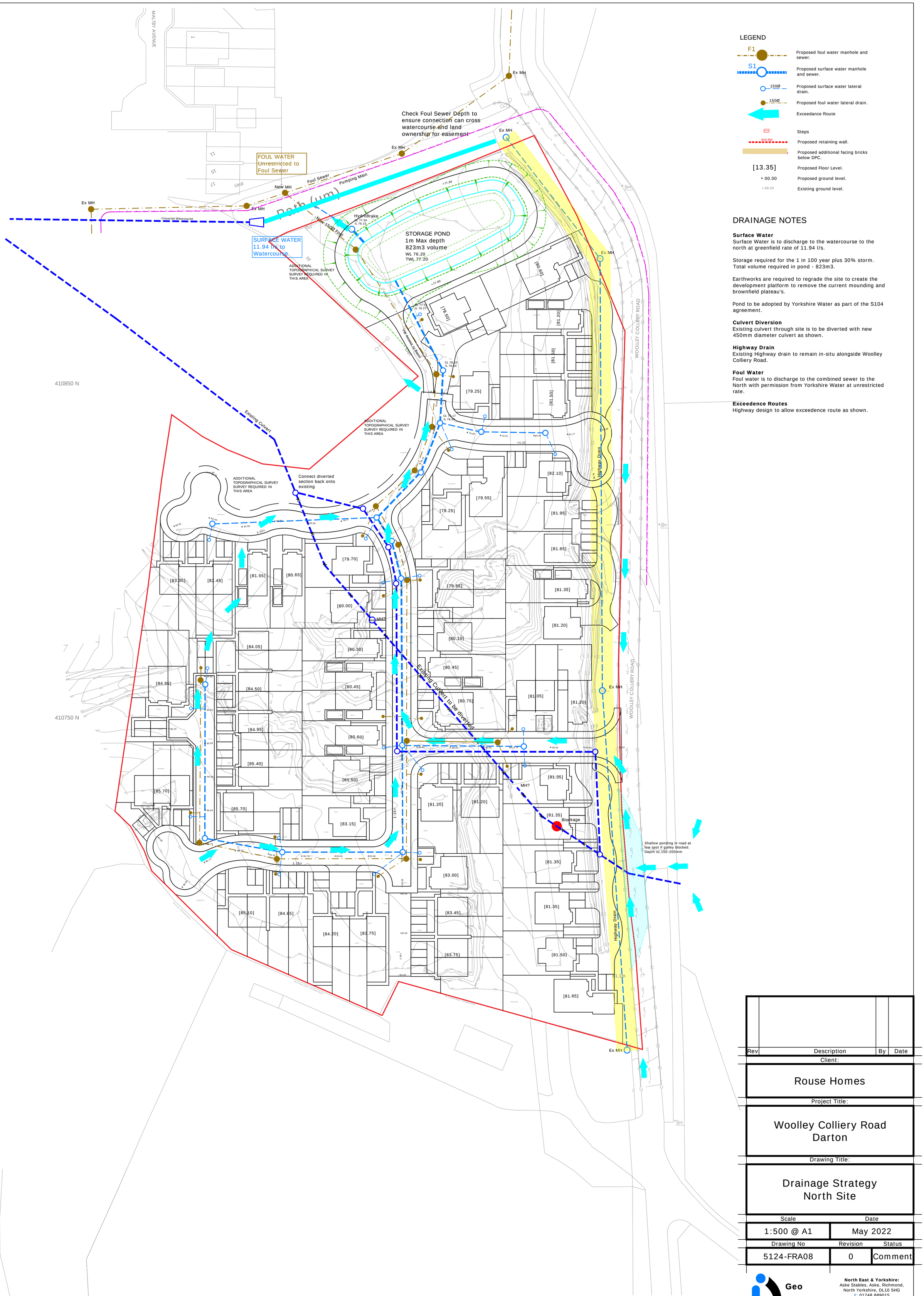
Scale	Date
NTS @ A3	April 2022

Client:
Rouse Homes

Project Title:
Colliery Road, Darton

Drawing Title:
Aerial Picture (South)

Drawing No	Revision	Status
4944-FRA07	0	Final



LEGEND

F1	Proposed foul water manhole and sewer.
S1	Proposed surface water manhole and sewer.
150Ø	Proposed surface water lateral drain.
150Ø	Proposed foul water lateral drain.
	Exceedance Route
	Steps
600 RW	Proposed retaining wall.
	Proposed additional facing bricks below DPC.
[13.35]	Proposed Floor Level.
+ 00.00	Proposed ground level.
+99.09	Existing ground level.

DRAINAGE NOTES

Surface Water
Surface Water is to discharge to the watercourse to the north at greenfield rate of 11.94 l/s.

Storage required for the 1 in 100 year plus 30% storm. Total volume required in pond - 823m3.

Earthworks are required to regrade the site to create the development platform to remove the current mounding and brownfield plateau's.

Pond to be adopted by Yorkshire Water as part of the S104 agreement.

Culvert Diversion
Existing culvert through site is to be diverted with new 450mm diameter culvert as shown.

Highway Drain
Existing Highway drain to remain in-situ alongside Woolley Colliery Road.

Foul Water
Foul water is to discharge to the combined sewer to the North with permission from Yorkshire Water at unrestricted rate.

Exceedence Routes
Highway design to allow exceedence route as shown.

Rev	Description	By	Date

Client:

Rouse Homes

Project Title:

Woolley Colliery Road
Darton

Drawing Title:

Drainage Strategy
North Site

Scale	Date
1:500 @ A1	May 2022

Drawing No	Revision	Status
5124-FRA08	0	Comment

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Health and Safety Notes/CDM Regulations 2015

In line with the above regulations we are obliged to inform the Contractor of the abnormal risks that may be encountered in the construction of these works. As part of the design process all the salient health & safety aspects are given full consideration and these are observed within the designs viewed on this document. Although considerable effort is undertaken to eliminate risks, the very nature of the project gives rise to some hazards and risks.

Significant risks that cannot be eliminated by design and could not be foreseen by a competent contractor are noted in the risk assessment boxes on the drawings.

LEGEND

F1	Proposed foul water manhole and sewer.
S1	Proposed surface water manhole and sewer.
150Ø	Proposed surface water lateral drain.
150Ø	Proposed foul water lateral drain.
	Exceedance Route
	Steps
600 RW	Proposed retaining wall.
	Proposed additional facing bricks below DPC.
[13.35]	Proposed Floor Level.
+ 00.00	Proposed ground level.
+ 99.09	Existing ground level.

DRAINAGE NOTES

Surface Water

Surface Water is to discharge to the combined sewer with permission from Yorkshire Water at a rate of 3.5 l/s

Storage required for the 1 in 100 year plus 30% storm. Total volume required - 431m3. Storage will be provided in the network and the offline basin to the west of the site.

Earthworks are required to regrade the site to create the development platform to remove the current mounding and brownfield plateau's.

Offline basin to be adopted by Yorkshire Water as part of the S104 agreement.

Foul Water
Foul water is to discharge to the combined sewer in Woolley Colliery Road with permission from Yorkshire Water at unrestricted rate.

Exceedence Routes
Highway design to allow exceedence route as shown.

Rev	Description	By	Date

Client:

Rouse Homes

Project Title:

Woolley Colliery Road
Darton

Drawing Title:

Drainage Strategy
North Site

Scale	Date
1:500 @ A1	May 2022

Drawing No	Revision	Status
5124-FRA09	0	Comment

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410950 N

410900 N

410850 N

410800 N

410750 N

410700 N

410650 N

Path (um)

Def

WOOLLEY COLLIERY ROAD

81.1m

Appendix A – Topographical Surveys

431100 E
431150 E
431200 E
431250m
410525 N
410500 N
410475 N
410450 N
410425 N
410400 N
410375 N
410350 N
410450m
410400m
WOOLLEY COLLIERY ROAD
SP

Sports Facility

85m

Y ROAD

The Woolley

BLOOMHOUSE LANE

Path

Pav

Cricket Ground

Path

59m

Longfields

FB

Path

The Gatehouse cottage

Path

Junction 38 Business Park

M1

Sta

Allot Gdns

STATION ROAD

MILL LANE

SCHOOL STREET

BRIDGE STREET

BERRYNE STREET

PO

CHURCH STREET

B6131

Darton Business Park

STATION ROAD

PW

PW

A637

HU

AD

Date Requested : 09/10/2020, 11:12:17

Date Generated : 09/10/2020, 11:12:32

Scale : 1:1250

The position and depth of any YW apparatus shown on this map are approximate only.

UPN: Undefined

Originator: S P Midgley, Waste Water Technical, 75 4486

Appendix B – Sewer Records

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45o and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below)*. Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

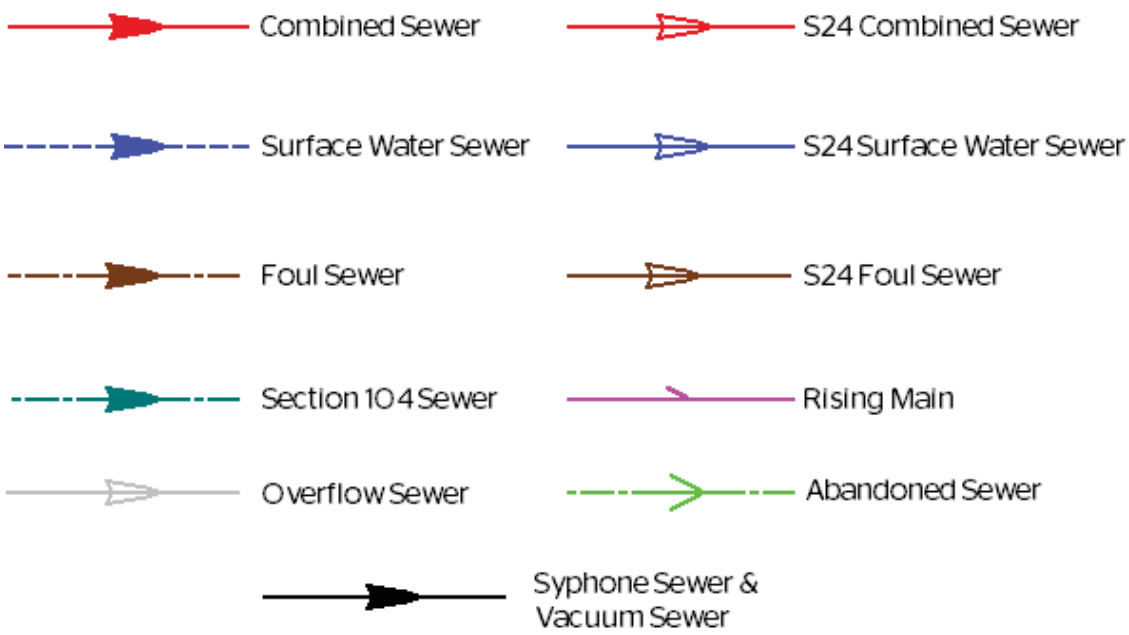
Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.

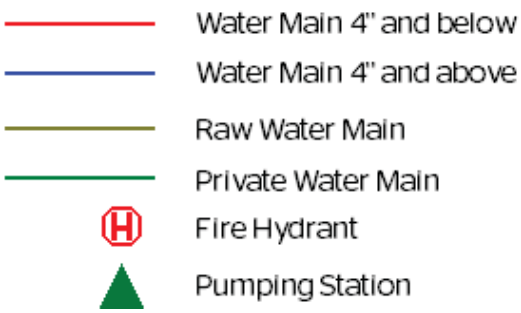
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

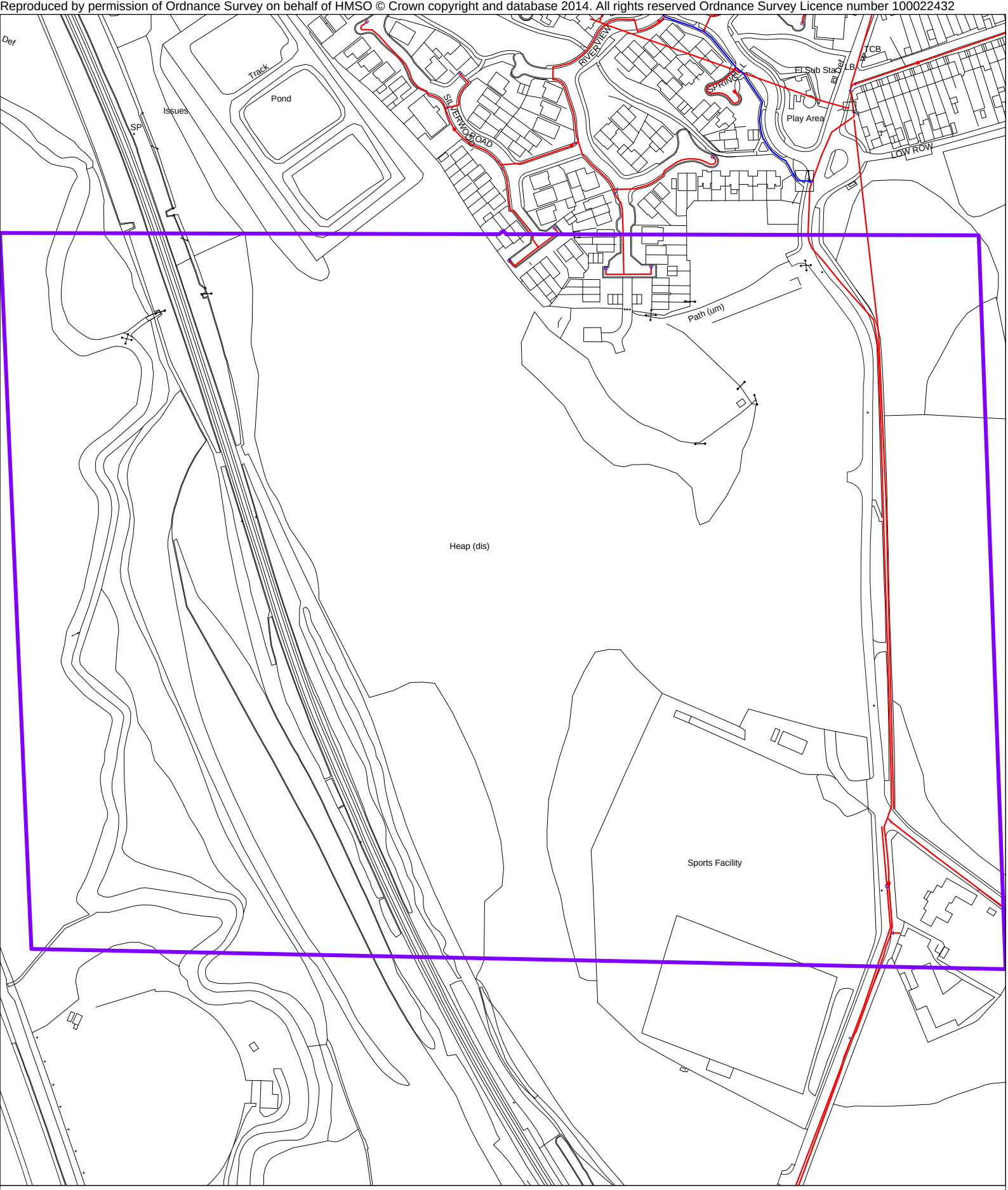
Property Identfier

Sewer Legend

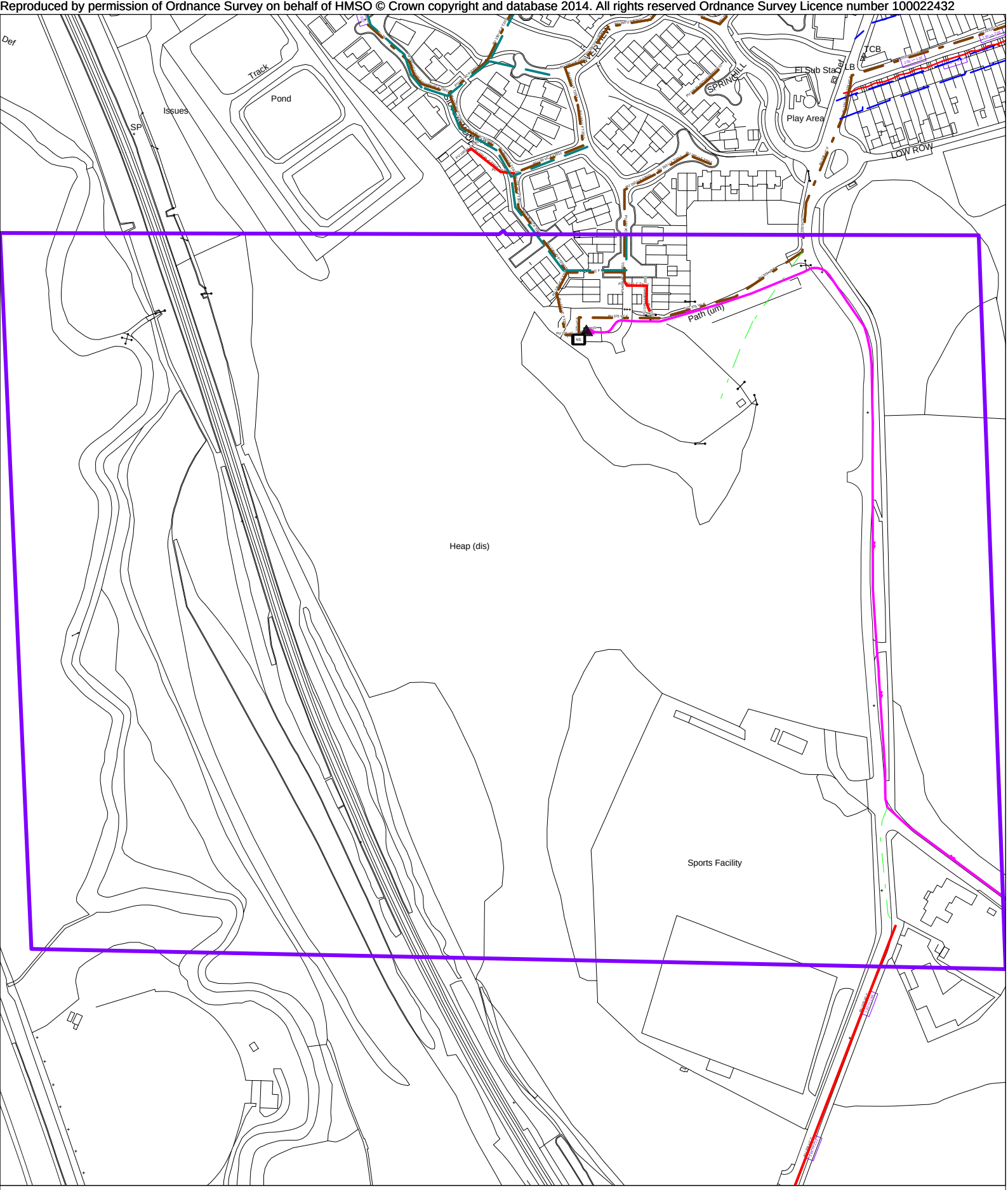


Water Legend





Public Clean Water Network 06/04/2022 10:40:32 OS Grid Coordinates: 430741 : 410391 Map Name : SE3010SE svcGISSafeMovePD



Public Waste Water Network 06/04/2022 10:40:33 OS Grid Coordinates: 430741 : 410391 Map Name : SE3010SE svcGISSafeMovePD

Appendix C – Yorkshire Water

Pre Development Response

YorkshireWater

Mr D Linklater
ID Civils Design Ltd
10 The Stables
Aske Hall
Richmond
DL10 5HG
darren.linklater@id-gsc.co.uk

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

Your Ref:
Our Ref: Y006461

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

2nd May 2022

Dear Mr Linklater,

Woolley Colliery Road, Darton, Barnsley, S75 5HY – Pre-Planning Sewerage Enquiry U627320

Thank you for your recent enquiry. Our charge of £172.00 plus VAT will be added to your account with us, reference MMi096. You will receive an invoice for your account in due course.

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

YorkshireWater

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

North Site - 75 Properties

Foul water domestic waste can discharge to the 375 mm diameter public foul sewer recorded in the northern part of the site.

Southern Site - 40 Properties

Foul water domestic waste can discharge to the 225 mm diameter public combined sewer recorded in the northern part of the site.

Surface Water

North Site - 75 Properties

It is understood that a culverted watercourse is located through the site and all surface water for the north site will discharge here.

Southern Site - 40 Properties

As soakaways will not be viable and the water course is higher thanthe site and pumping will not be agreed by the LLFA curtilage surface water may discharge to the 225 mm diameter public combined sewer recorded in Wooley Colliery Road, at a point to the east of the site.

The surface water discharge from the site to be restricted to not greater than 3.5 (three pointr five) litres/second. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.

Please note further restrictions on surface water disposal from the site may be imposed by other parties.

You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Other Observations

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

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.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the Code for Adoption 2021/22, pursuant to an agreement under Section 104 of the Water Industry Act 1991. We are happy to offer pre-development technical advice on any prospective sites that you would like to put forward for for adoption, prior to submission of your adoption application.

An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Sewer Adoption, Diversion and Requisition (telephone 0345 120 84 82) or email technical.sewerage@yorkshirewater.co.uk or visit - https://www.yorkshirewater.com/developers/sewerage/sewer-adoptions/ for further information.

The site is within an area that may be affected by river, coastal or estuarine flooding. We would advise you to contact the Environment Agency for details.

YorkshireWater

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

Yours sincerely

Chris Roberts
Development Services Technician

Appendix D – IoH 124 Greenfield Rate Calculation

Print | Close Report

HR Wallingford
Working with water

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Darren Linklater
Site name:	Woolley Colliery Road
Site location:	Darton

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:	53.58910° N
Longitude:	1.53083° W
Reference:	1944221324
Date:	May 18 2022 14:21

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 50

Methodology

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

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	681	681
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

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.

(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.

(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):	233.74	233.74
1 in 1 year (l/s):	201.02	201.02
1 in 30 years (l/s):	409.05	409.05
1 in 100 year (l/s):	486.19	486.19
1 in 200 years (l/s):	553.97	553.97

Appendix E – LLFA Pre Development Response and Watercourse Plan


Play Area
Path (um)
Heap (dis)

Appendix F – Site Photographs

Woolley Colliery Road, Darton

Site Photographs

Northern Site – Culverts coming together north west of site

Northern Site - Open Watercourse to northern boundary

Northern Site – Route of culvert between Pumping Station and existing development

Northern Site – View across from north to south from watercourse

Northern Site – View across centre of the site showing hardstandings

Northern Site – Centre of site looking East towards Woolley Colliery Road

Northern Site – Low point in Woolley Colliery Road on overland flood route

Northern Site – inlet headwall east of Woolley Colliery Road at field edge

Northern Site – View looking south from existing access shown low spot in road

Southern Site – View from entrance looking west

Southern Site – View of western end of site