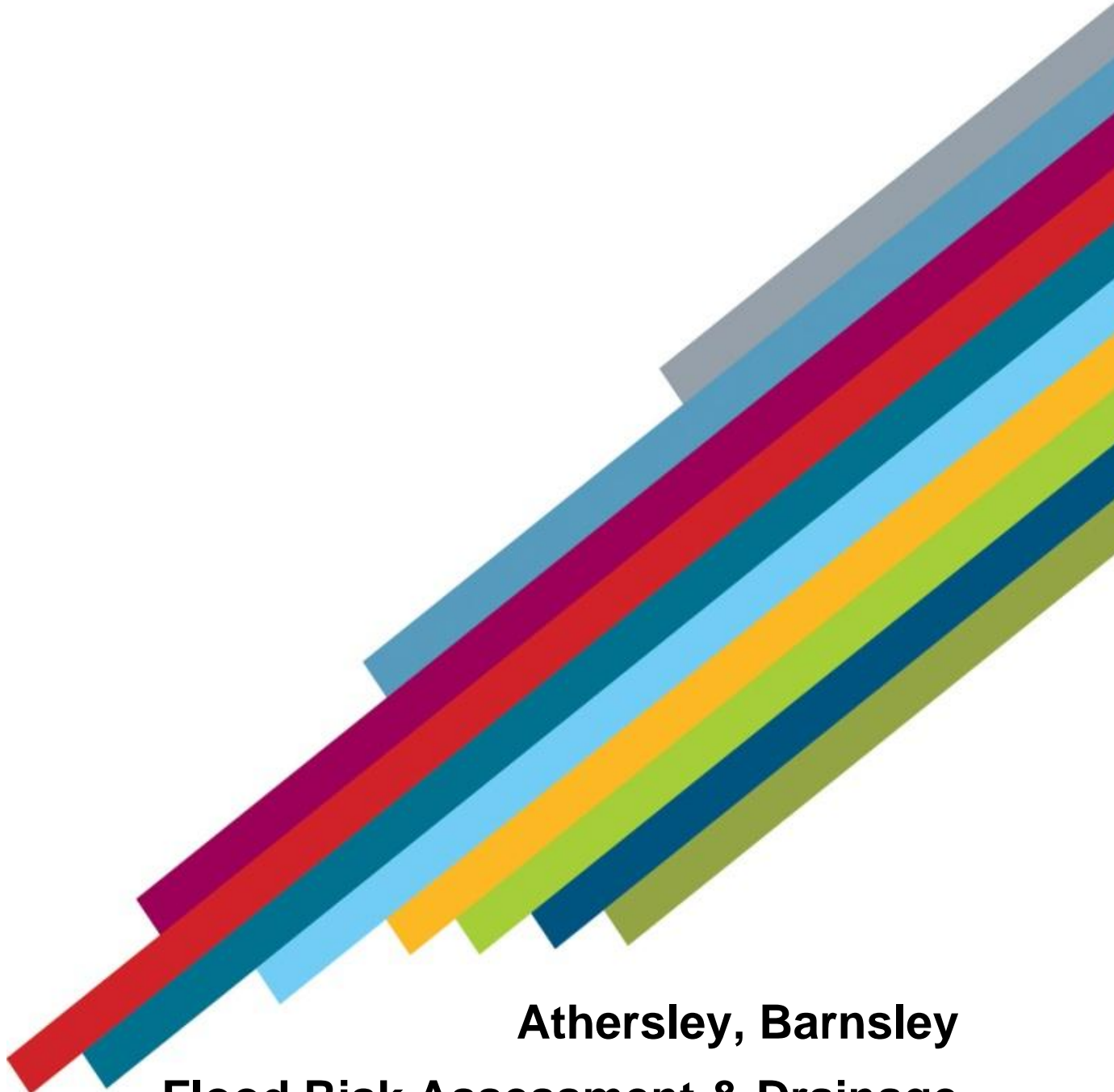




RODGERS LEASK
Consulting Civil & Structural Engineers



Athersley, Barnsley
Flood Risk Assessment & Drainage
Strategy

Athersley, Barnsley

Flood Risk Assessment & Drainage Strategy

For

Harworth Estates

September 2017

P17-172

Revision #

Document History

Prepared by : Alex Parkes
Position : Graduate Engineer
Date : September 2017

Authorised by : Matt Leask
Position : Senior Engineer
Date : September 2017

Document Status : Draft
Revision : #

Revision	Date	Comment	Editor
#	Sep 17	Issued for comment	

Summary

<p>Conclusion</p>	<p>All forms of flood risk have been reviewed for the proposed development site which is located entirely within Flood Zone 1; it is considered that the site and surrounding land would be at a low flood risk following redevelopment. A robust drainage strategy has been proposed to deal with both foul and surface water which would be generated by the redeveloped site, with no surface water flooding occurring for storms up to and including the 1 in 100 year plus climate change event.</p> <p>Flow routing has been considered to ensure that in the event of a blockage, existing adjacent landowners are not subject to an increased flood risk.</p> <p>It is therefore considered that from a flood risk and drainage point of view, the proposed development is appropriate.</p>
<p>Introduction</p>	<p>Rodgers Leask Ltd has been commissioned by Harworth Estates to undertake a Flood Risk Assessment and Drainage Strategy for the proposed development of the parcel of land off Wakefield Road, Athersley, Barnsley.</p> <p>This report has been commissioned in support of an outline planning application to Barnsley Metropolitan Borough Council.</p> <p>This Flood Risk Assessment and Drainage Strategy has been prepared in accordance with the Department for Communities and Local Government (DCLG) National Planning Policy Guidance, and the publication 'National Planning Policy Framework' published 27th March 2012 which supersedes 'Planning Policy Statement 25 (PPS25) Development and Flood Risk' (2010). However this report also conforms to PPS25 and is in line with current guidance and best practice.</p>
<p>Site Location Description and Details</p>	<p>The site has an overall area of approximately 7.73 hectares and is located off Wakefield Road, Athersley, Barnsley; centred at approximate OS GR: E434724 N408742.</p> <p>The site lies west of Wakefield Road, approximately 2.5km north of Barnsley Town Centre; and is currently Greenfield.</p> <p>A topographical survey of the site area has been undertaken. The site slopes generally from north to south with a natural valley formed along the route of a watercourse which flows through the centre of the site. The highest part of the site is located in the north eastern corner and reaches a level of 78.25m AOD. The lowest part of the site is the southernmost point at a level of 56.14m AOD.</p>

Definition of the Flood Hazard and Probability	All means of flood risk at the site have been assessed and it has been demonstrated that the site is not at risk of flooding, nor would it pose a risk to adjacent land following development subject to the recommendations contained within this report being adhered to.										
Predevelopment Surface Water Runoff	<p>The Greenfield runoff rates for the site are as follows:</p> <table border="1" data-bbox="663 495 1265 607"> <tr> <td>Storm Event (yr)</td> <td>QBar</td> <td>1</td> <td>30</td> <td>100</td> </tr> <tr> <td>Discharge (l/s)</td> <td>28.8</td> <td>24.8</td> <td>50.7</td> <td>60.0</td> </tr> </table>	Storm Event (yr)	QBar	1	30	100	Discharge (l/s)	28.8	24.8	50.7	60.0
Storm Event (yr)	QBar	1	30	100							
Discharge (l/s)	28.8	24.8	50.7	60.0							
Development Proposals and Site Surface Water Strategy	<p>The development is approximately 7.73ha and is proposed for up to 220 residential dwellings and associated infrastructure.</p> <p>Rodgers Leask Environmental has carried out permeability testing at various points on the site to assess the viability of soakaways as a drainage solution. None of the locations tested had sufficient percolation rates to support infiltration; furthermore, made ground is present across large areas of the site, which precludes the use of soakaways in these areas.</p> <p>It is therefore anticipated that infiltration would not be suitable as the primary means of disposal of surface water runoff from the proposed development.</p> <p>The site currently drains via overland flow to the unnamed watercourse which runs through the centre of the site. The hydrology map suggests a connection between the watercourse and the land drains to the south of the site; this was believed to be in the form of a culvert underneath the historical railway embankment similar to the culvert observed in the western section of the site.</p> <p>Following site walkovers by Rodgers Leask, Rodgers Leask Environmental and Discovery Surveys on a number of separate occasions, no culvert has been found in this area.</p> <p>For the purposes of proposing a robust drainage strategy, it has thus been assumed that no culvert exists within this area.</p> <p>It is therefore proposed that the development site would discharge surface water runoff to the existing combined public sewer which runs through the site via on-site sustainable drainage networks. Discussions have been held with Catherine Wellham of Yorkshire Water and it has been agreed that a connection into the public sewer is acceptable in principle given the lack of alternative suitable outfalls.</p> <p>Following correspondence with Barnsley Metropolitan Borough Council - the LLFA – it has been agreed that a restricted discharge rate of 5 l/s/ha is acceptable for surface water flows from the site. For the total developable area of 6.65 ha, the overall discharge rate has been calculated as 33.25</p>										

	<p>l/s. The green corridor shown on the proposed site layout has been discounted from the developable area.</p> <p>The site has been split into 3no separate catchments, with each catchment being allocated an allowable discharge rate proportionate to its size in comparison with the overall developable area. The impermeable area within each catchment has been conservatively assumed to be 65% of the overall area to ensure a robust drainage strategy is proposed and to allow for urban creep.</p> <p>The Drainage Strategy drawing (P17-172-200) shows the required attenuation volumes for each catchment along with the respective discharge rates for each feature.</p> <p>It is proposed to attenuate flows using attenuation basins for 2 of the catchments, provided that the ground conditions in the area of the basins are considered to be suitable by Yorkshire Water. Flows up to the 1 in 2-year rainfall event will be attenuated in below ground oversized pipes without entering the basin in accordance with Yorkshire Water requirements. The third catchment will utilise a StormTech underground storage system, or similar approved product.</p> <p>It is considered that by adhering to the strategy outlined above, the additional volumes of surface water runoff generated by the redeveloped site will be managed such that the residual risk to adjacent buildings and land is negligible.</p>
<p>Climate Change</p>	<p>The proposed surface water drainage system should be designed to accommodate the 1:30 year rainfall event without any surface water flooding and should be capable of retaining the 1:100 year plus 40% climate change storm event on site without flooding any buildings.</p>
<p>Pre Development Foul Water Regime</p>	<p>As the site was previously Greenfield, there are currently no provisions for foul water drainage on site.</p>
<p>Proposed Developed Site Foul Water Strategy</p>	<p>A new connection into the existing combined sewer which runs centrally through the site is proposed.</p> <p>A pre-planning enquiry response has been received from Yorkshire Water as well as further correspondence which confirms that a foul connection for the development could be accommodated in the public sewer.</p>

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- A** **Topographical Survey**

- B** **Yorkshire Water Sewer Records**

- C** **Groundsure Enviro Insight Hydrology Map**

- D** **Illustrative Masterplan**

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- F** **LLFA Correspondence**

- G** **Drainage Strategy Drawing**

- H** **Yorkshire Water Correspondence**

1 Introduction

1.1 Terms of Reference

- 1.1.1 Rodgers Leask Ltd has been commissioned by Harworth Estates to undertake a Flood Risk Assessment and Drainage Strategy for the proposed development of the parcel of land off Wakefield Road, Athersley, Barnsley.
- 1.1.2 This report has been commissioned in support of an outline planning application to Barnsley Metropolitan Borough Council.
- 1.1.3 Discussions have been held with Barnsley Metropolitan Borough Council (LLFA), the Environment Agency and Yorkshire Water with regard to flood risk and drainage.
- 1.1.4 This Flood Risk Assessment and Drainage Strategy has been prepared in accordance with the Department for Communities and Local Government (DCLG) National Planning Policy Guidance, and the publication 'National Planning Policy Framework' published 27th March 2012 which supersedes 'Planning Policy Statement 25 (PPS25) Development and Flood Risk' (2010). However this report also conforms to PPS25 and is in line with current guidance and best practice.
- 1.1.5 This report has been produced on behalf of the client, Harworth Estates, and no responsibility is accepted to any third party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of Rodgers Leask Ltd.

1.2 Guidance

- 1.2.1 The Planning Practice Guidance was published on the 6th March 2014 and contains guidance on Flood Risk and Coastal Change (updated on 15th April 2015).
- 1.2.2 The National Planning Policy Framework (NPPF) document was published 27th March 2012.
- 1.2.3 The latest version of PPS 25 was released on the 29th March 2010 and is now superseded by the NPPF.
- 1.2.4 NPPF can be downloaded free of charge from the internet at the following link:
<http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>
- 1.2.5 Flood risk assessments: climate change allowances was published on the 19th February 2016 and can be downloaded free of charge from the internet at the following link:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

2 Background Information

2.1 Site Location, Description and Details

2.1.1 Figure 2.1 below indicates the location of the site.

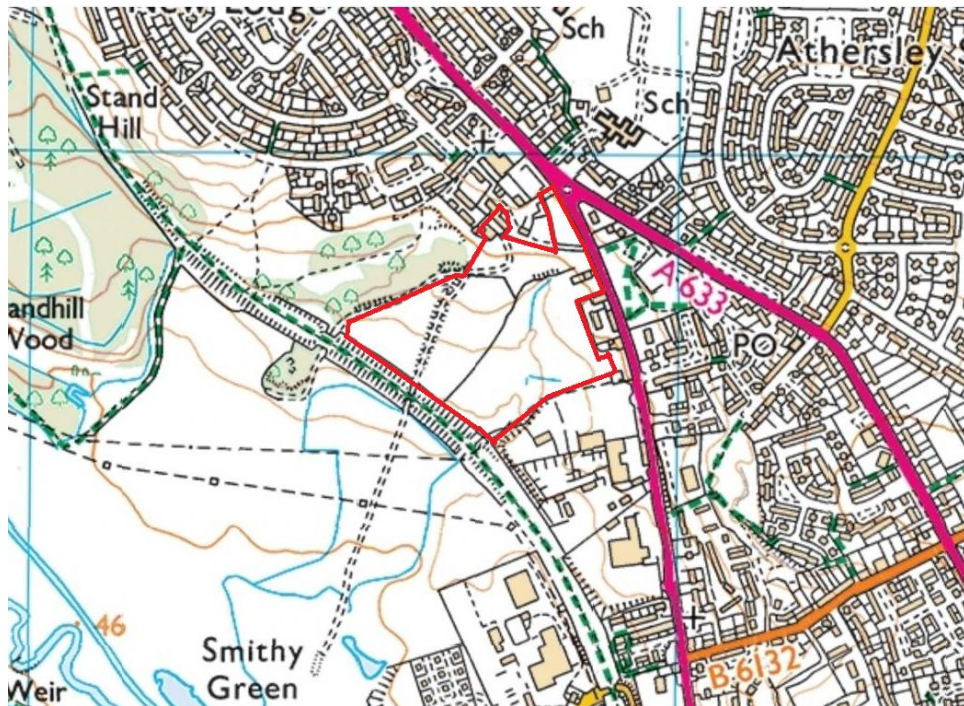


Figure 2.1 Athersley, Barnsley – Site Location Plan

- 2.1.2 The site, as outlined above in Figure 2.1, has an overall area of approximately 7.73 hectares and is located off Wakefield Road, Athersley, Barnsley; centred at approximate OS GR: E434724 N408742.
- 2.1.3 The site lies west of Wakefield Road and approximately 2.5km north of Barnsley Town Centre; it is currently Greenfield.
- 2.1.4 A topographical survey of the site area has been undertaken and is included in Appendix A. The site slopes generally from north to south with a natural valley formed along the route of a watercourse which flows through the centre of the site. The highest part of the site is located in the north eastern corner and reaches a level of 78.25mAOD. The lowest part of the site is the southernmost point at a level of 56.14mAOD.

2.2 Main Drainage Catchment Context

- 2.2.1 The site is currently Greenfield and has an overall area of approximately 7.73 hectares. Surface water runoff generated by the site currently drains via overland flow to a watercourse in the centre of the site that flows from north to south before sinking under the adjacent historical railway embankment and springing on the other side.

- 2.2.2 The Yorkshire Water sewer records are included in Appendix B. The records indicate that public combined sewers enter the site via the northern, eastern and western boundaries before meeting at a combined sewer overflow chamber. The sewer then runs from north to south before leaving the site via the southern boundary. A surface water sewer is also shown to enter the site via the eastern boundary from the commercial/industrial premises located to the southeast, before terminating at an existing pond which forms part of the watercourse within the site.

2.3 Approach to the Assessment

- 2.3.1 This assessment seeks to consider the risks of flooding both to the site and to the wider area as a consequence of the development proposal. This also requires assessment of the development constraints of the site and the opportunities offered by the existing infrastructure and natural environment in order to propose a strategy by which the site can be developed both economically and sustainably. This assessment draws upon our investigations regarding the local area.

3 Flood Risk Assessment

3.1 Definition of the Flood Hazard and Probability

3.1.1 Fluvial Flood Risk:

The site is located within the River Dearne catchment; in the Don and Rother sub-catchment, and is located approximately 635m northeast of the River Dearne itself.

Barnsley Metropolitan Borough Council (Lead Local Flood Authority – LLFA) was contacted regarding the site. There have been no historic flood incidents provided for the site or in the vicinity.

Based upon the Environment Agency Flood Map for Planning (see Figure 3.1 below), the entirety of the site lies within Flood Zone 1, where there is less than a 1 in 1000 (0.01%) chance of flooding each year.

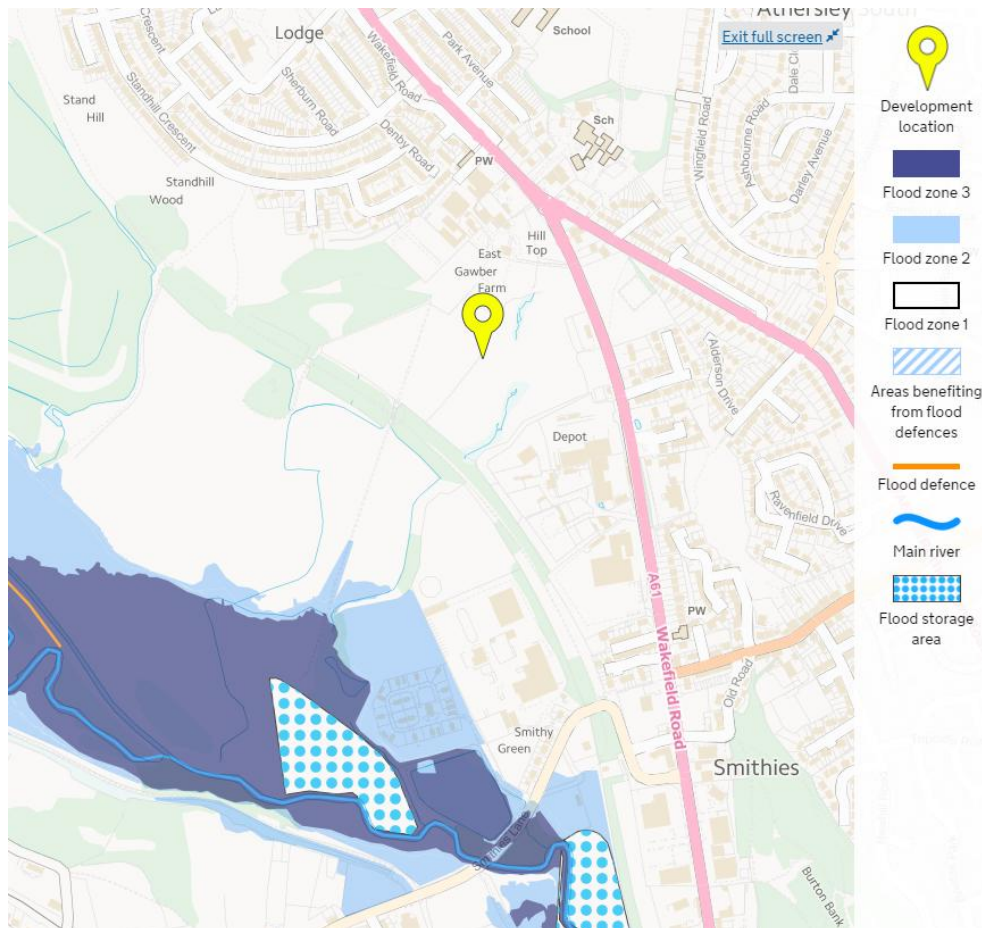


Fig 3.1 Athersley, Barnsley – Environment Agency Flood Map for Planning
 As such, the site is considered to be at a low risk of flooding from fluvial sources.

3.1.2 Tidal Flood Risk:

The site is approximately 56 kilometres from the nearest coastal location and at an average altitude of approximately 65m above mean sea level. The site is therefore not considered to be at risk of flooding from tidal sources.

3.1.3 Surface Water Flood Risk:

A watercourse, shown on the hydrological mapping contained within Appendix C as a partially culverted tertiary river, runs through the centre of the site from north to south. The culvert size and location is unconfirmed and was not visible during the site walkover. It is likely that the area surrounding the existing watercourse will be retained as a landscaped corridor and that overland flow that currently drains into the watercourse will be controlled through the proposed development.

Reviewing the Environment Agency's online flood mapping, the risk of surface water flooding to the watercourse ranges from low risk in the northern section of the site, with a chance of flooding between 1 in 100 (1% AEP) and 1 in 1000 (0.1% AEP), to high risk in the southern section from the surface water sewer outfall to the reed beds, with a chance of flooding greater than 1 in 30 (3.3% AEP). It is considered that following development surface water flows into this watercourse will be restricted to 5 l/s/ha, providing a betterment for the higher category storms such as the 1 in 30 and 1 in 100-year events.

The small portion of the site to the north of the existing access road is at high risk of surface water flooding due to its topography. A low spot exists in the south western corner partly surrounded by steep banks with no positive outfall, allowing overland flows to accumulate during rainfall events. This area will be filled in to allow development, and therefore surface water flows will no longer accumulate, greatly reducing the surface water flood risk.

The entire lengths of the southern and western boundaries of the site are shown as being at low risk of surface water flooding, though a portion of the western boundary is shown as being at high risk in the approximate region of the brick culvert identified during the site walkover. The cutting through the historical railway embankment is also shown as an area of low risk. It is considered that overland flows draining into the ditches along these boundaries would be controlled through the development for the higher category storms such that flood risk in these areas would be effectively reduced.

Additionally, the land drains to the south of the site would also benefit from a reduced flood risk due to the discharge rate originating from the site being reduced for the higher category storms following development.

As such, it is considered that the site will be at a low risk of flooding from either flows generated on-site, or from overland flows from off-site. Furthermore, it is considered that the flood risk to surrounding areas as a result of flows originating from the site will also be reduced.

3.1.4 Flood Risk from Ground Water:

Geological information for the site has been obtained via GroundSure GeolInsight reports, the British Geological Survey's Geology of Britain viewer and intrusive investigations undertaken by Rodgers Leask Environmental. Areas of the site lie on the Pennine Middle Coal Measures and Woolley Edge rock formations with bedrock comprising mudstone, siltstone and sandstone. Localised superficial deposits consisting of Glaciofluvial Deposits are shown just within the northern boundary of the site.

Areas of made ground are shown on geological records across the site, but mainly in the area of a historic railway embankment in the north of the site and an old track that runs through the west of the site.

A Non-Residential Mining Report has been obtained from The Coal Authority. The site is shown to be located within an area that could be affected by historic underground mining with disused mineshafts and adits recorded in the northern section of the site.

Boreholes recorded by the British Geological Survey to the southeast of the site indicate the area to be underlain by mudstone, siltstone and coal measures.

Rodgers Leask Environmental excavated a number of trial pits and window samples across the site. 6no window samples encountered groundwater between 2 – 4m below ground level; 2no trial pits encountered groundwater at approximately 2m below ground level.

The Barnsley Metropolitan Borough Council Preliminary Flood Risk Assessment Report (PFRA) gives little information on areas at risk of groundwater flooding but does mention that groundwater rebound is not believed to be an issue across the borough.

Following development of the site, only small areas of permeable surface will be left over. As such, it is not expected that any significant groundwater emergence will occur.

Flood routing should be provided to deal with any localized groundwater flooding for remaining soft landscaped areas and ground floor levels should be set a nominal 150mm above the general ground level of the site in accordance with best practice.

The site is therefore not considered to be at risk of flooding from ground water, allowing for a typical seasonal fluctuation.

3.1.5 Flood Risk from Infrastructure:

Reviewing the Environment Agency's online flood mapping the site can be seen to be out of the area at risk of flooding from reservoirs.

Yorkshire Water is the statutory sewerage undertaker and is responsible for the maintenance and repair of the public sewer systems within the Barnsley area.

The Barnsley Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA) identifies a number of areas around Barnsley where it is believed that flooding from sewers is more prevalent. Athersley is not included in this list, however.

As such, the site is not considered to be at risk of flooding from infrastructure.

3.2 Development Description and Planning Context

- 3.2.1 The current development proposals are for up to 220 residential units and associated infrastructure. An Illustrative Masterplan showing the developable area and proposed access location is included in Appendix D.
- 3.2.2 In accordance with the NPPF, buildings used for dwellings fall under the More Vulnerable category in terms of flood risk.
- 3.2.3 All forms of development are considered suitable in Flood Zone 1.
- 3.2.4 References have been taken from the Barnsley Metropolitan Borough Council SFRA, however, there is very little information regarding the site specifically within the report.

3.3 Pre Development Surface Water Runoff

- 3.3.1 The site is currently Greenfield and discharges surface water runoff via overland flow to the unnamed watercourse which flows from north to south through the centre of the site.
- 3.3.2 The Greenfield runoff rates are as follows:

Storm Event (yr)	QBar	1	30	100
Discharge (l/s)	28.8	24.8	50.7	60.0

The calculations are contained within Appendix E.

3.4 Design Considerations for Exceedance and Climate Change

- 3.4.1 The proposed surface water drainage system should be designed to accommodate the 1:30 year rainfall event without any surface water flooding and should be capable of retaining the 1:100 year plus 40% climate change storm event on site without flooding any buildings.

3.5 Development Proposals and Surface Water Strategy

- 3.5.1 The development is approximately 7.73ha and is proposed for up to 220 residential dwellings and associated infrastructure.
- 3.5.2 Rodgers Leask Environmental has carried out permeability testing at various points on the site to assess the viability of soakaways as a drainage solution. None of the locations tested had sufficient percolation rates to support

infiltration; furthermore, made ground is present across large areas of the site, which precludes the use of soakaways in these areas.

- 3.5.3 It is therefore anticipated that infiltration would not be suitable as the primary means of disposal of surface water runoff from the proposed development.
- 3.5.4 The site currently drains via overland flow to the unnamed watercourse which runs through the centre of the site. The hydrology map contained within Appendix C suggests a connection between the watercourse and the land drains to the south of the site; this was believed to be in the form of a culvert underneath the historical railway embankment similar to the culvert observed in the western section of the site.
- 3.5.5 Following site walkovers by Rodgers Leask, Rodgers Leask Environmental and Discovery Surveys on a number of separate occasions, no culvert has been found in this area.
- 3.5.6 For the purposes of proposing a robust drainage strategy, it has thus been assumed that no culvert exists within this area.
- 3.5.7 It is therefore proposed that the development site would discharge surface water runoff to the existing combined public sewer which runs through the site via on-site sustainable drainage networks. Discussions have been held with Catherine Wellham of Yorkshire Water and it has been agreed that a connection into the public sewer is acceptable in principle given the lack of alternative suitable outfalls.
- 3.5.8 Following correspondence with Barnsley Metropolitan Borough Council - the LLFA – it has been agreed that a restricted discharge rate of 5 l/s/ha is acceptable for surface water flows from the site. For the total developable area of 6.65 ha, the overall discharge rate has been calculated as 33.25 l/s. The green corridor shown on the proposed site layout within Appendix D has been discounted from the developable area. The correspondence is contained within Appendix F.
- 3.5.9 The site has been split into 3no separate catchments, with each catchment being allocated an allowable discharge rate proportionate to its size in comparison with the overall developable area. The impermeable area within each catchment has been conservatively assumed to be 65% of the overall area to ensure a robust drainage strategy is proposed and to allow for urban creep.
- 3.5.10 The Drainage Strategy drawing (P17-172-200) in Appendix G shows the required attenuation volumes for each catchment along with the respective discharge rates for each feature.
- 3.5.11 It is proposed to attenuate flows using attenuation basins for 2 of the catchments, provided that the ground conditions in the area of the basins are considered to be suitable by Yorkshire Water. Flows up to the 1 in 2-year rainfall event will be attenuated in below ground oversized pipes without entering the basin in accordance with Yorkshire Water requirements. The third

catchment will utilise a StormTech underground storage system, or similar approved product.

- 3.5.12 Past experience has found that at detailed design stage, the actual attenuation volume required tends toward the lower end of the preliminary modelling range.
- 3.5.13 Overland flow routes will be carefully considered for blockage and exceedance events to ensure that routing is away from both existing and proposed buildings.
- 3.5.14 It is considered that by adhering to the strategy outlined above, the additional volumes of surface water runoff generated by the redeveloped site will be managed such that the residual risk to adjacent buildings and land is negligible.

3.6 SuDS

- 3.6.1 SuDS have been considered as part of the drainage solution. Typically, SuDS techniques are used to mimic the natural drainage of the land, infiltrating surface water into the ground or discharging it into a local water course. Where this occurs it is important to ensure that the quality of water is as clean as possible to prevent the spread of any pollutants. This is also the case when discharging surface water to a surface water sewer as in most cases these types of sewers discharge into water courses.
- 3.6.2 Water treatment will generally be provided within development parcels via a combination of methods, which may include swales, permeable paving, filter strips and filter trenches where practicable.
- 3.6.3 It is considered that by adhering to the SuDS strategy above, the necessary treatment could be provided to allow compliance with CIRIA C753 guidance.

3.7 SuDS Maintenance

- 3.7.1 Any swales serving the site will be adopted by a private management company and will require regular maintenance including:
 - Regular litter removal
 - Inlet and outlet inspection quarterly and clearing when necessary
 - Vegetation management including regular mowing as required
 - Sediment removal as required
- 3.7.2 Filter Strips
 - Regular litter removal
 - Vegetation management including regular mowing as required
 - Sediment removal as required

3.7.3 Filter Trenches

- Regular litter removal
- Inlet and outlet inspection quarterly and clearing when necessary
- Sediment removal as required

3.7.4 Any detention basins serving the site will be adopted by Yorkshire Water and will be maintained in accordance with Yorkshire Water policy.

3.8 Pre Development Foul Water Regime

3.8.1 As the site was previously Greenfield, there are currently no provisions for foul water drainage on site.

3.9 Proposed Developed Site Foul Water Strategy

3.9.1 A new connection into the existing combined sewer which runs centrally through the site is proposed. Please refer to the sewer records in Appendix B.

3.9.2 A pre-planning enquiry response has been received from Yorkshire Water as well as further correspondence (see Appendix H) which confirms that a foul connection for the development could be accommodated in the public sewer.

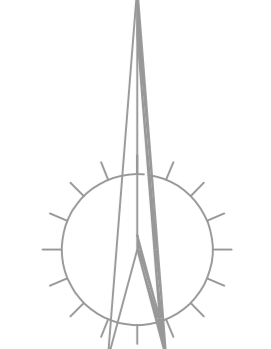
4 Recommendations

4.1 Recommendations

- 4.1.1 All means of flood risk at the site have been assessed and it has been demonstrated that the site is not at risk of flooding, nor would it pose a risk to adjacent land following development subject to the recommendations below being adhered to.
- 4.1.2 An outfall to the unnamed watercourse via on-site sustainable drainage networks incorporating water treatment should be considered as the primary means of surface water discharge.
- 4.1.3 The proposed surface water drainage system should be designed to accommodate the 1:30 year rainfall event without any surface water flooding and should be capable of retaining the 1:100 year plus 40% climate change storm event on site without flooding any buildings.

4.2 Disclaimer

We would note that all comments made in this report are based on the sources stated in Section 1.1. This report and its recommendations are intended for the use of Harworth Estates for the above site only.



Comments:
The plan and digital data should only be used for its original intended purpose at the defined survey scale.
It is for the use only of the party to whom it has been addressed and no responsibility is accepted to any third party for the whole or part of its contents.
This survey has been prepared on the basis that all information and facts which may affect the survey, have been disclosed to us by the parties concerned and no liability nor responsibility can be accepted, unless full disclosure has been made.
All ground features that were visible at the time of the survey have been located, however there may have been items obscured.
Pipe sizes and flow direction have been visually assessed from the surface and should be considered as approximate only.
All data remains the ownership of Oakes Survey Services until full payment has been received.

STATION SCHEDULE			
Station	Easting	Northing	Level
01	434813.752	408942.036	79.991
02	434864.691	408853.276	78.271
03	434882.863	408810.662	77.680
RSP	434730.180	408873.723	76.268

LEGEND	
Air Valve	Av
Balisha Beacon	BB
Borehole	BH
Rubbish Bin	Bin
Bollard	Bol
Bus Stop	Bs
Telecom Point	BT
Camera	Cam
Control Box	Cbox
Closed Circuit TV	Cctv
Cable TV Covers	Clv
Down Pipe	Dp
Eaves Height	Eave
Electric Box	Ebox
Electric Post	Ep
Earth Rod	Er
Fire Hydrant	Fh
Flood light	Fl
Flag Staff	Fs
Gas Marker	Gmkr
Gate Post	Gp
Gas Valve	Gv
Gully	Gy
Illuminated Bollard	IB
Inspection Cover	IC
Inspection Cover Undefined	Icu
Floor Level	IFL
Invert Level	Inv
Letter Box	LBox
Lamp post	Lp
Manholes	MH
Marker Post	Mkr
Pipe Invert	Plnv
Trail Pit	Pit
Parking Meter	PM
Post	Post
Ridge Height	Ridge
Road Name Board	Rnb
Rodding Eye	Rd
Sign Post	Sp
Stile	Stil
Tree Stump	Simp
Stop Tap	St
Stop Valve	Sv
Cable Stay	Sy
Threshold Level	THL
Traffic Light	TL
Telegraph Post	Tp
Traffic Signal	TS
Top of Wall	TW
Unable to Lift	UTL
Valve	Va
Vent Pipe	Vp
Water Level	WL
Water Meter	Wm
Wash Out	Wio

STA1	Survey Station
	Channel Line
	Centre Line
	Edge of Vegetation
	Fence Open
	Fence Panel
	Fence Secure
	Gate
	Hedge
	OH Utilities
	Top of Face

Revisions:		Date:
Ref	Description	

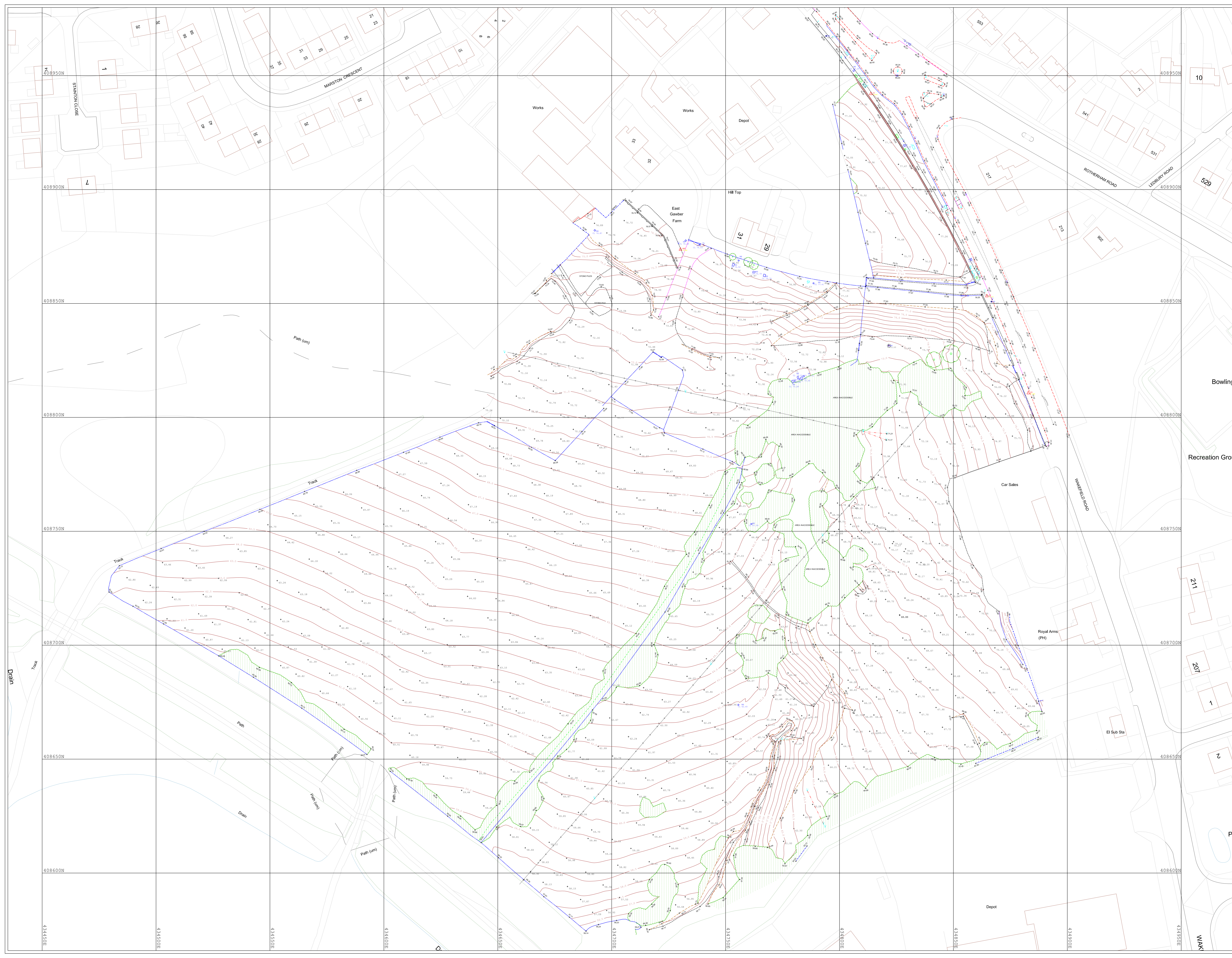


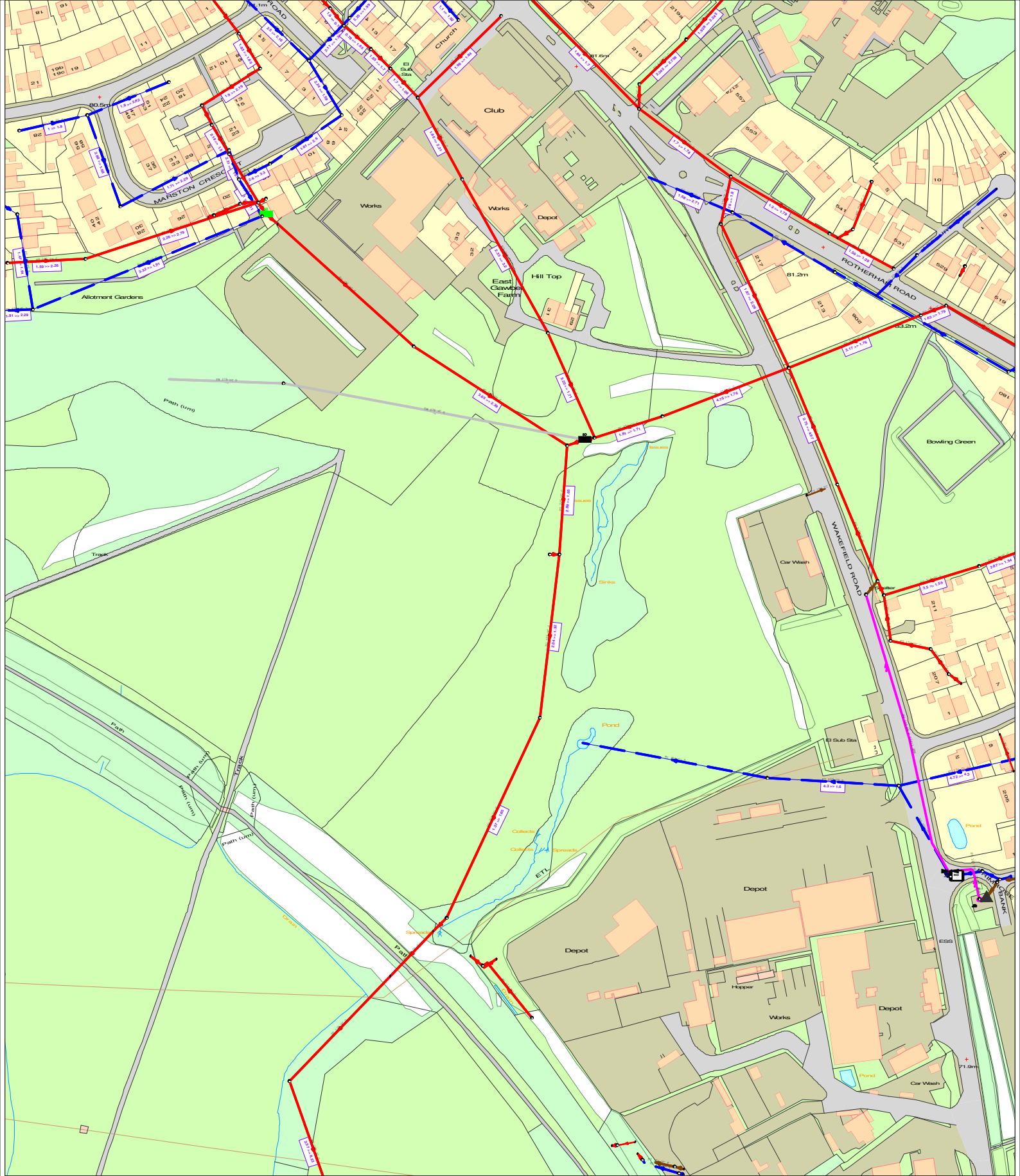
8 The Heritage Business Centre, Derby Road,
Belper, Derbyshire, DE56 1SW
Tel : 01773 820124 Fax : 01773 825407
E: info@oakesurveys.com W: www.oakesurveys.com



HARWORTH ESTATES PROPERTY GROUP LTD, ADVANTAGE HOUSE
POPLAR WAY, ROTHERHAM S60 2JG
LocationSite:
LAND AT WAKEFIELD ROAD
ATHERSLEY, BARNESLEY S71 1NX

Drawing Title:
TOPOGRAPHICAL SURVEY

Level Datum: ORDNANCE SURVEY	
Grid Datum: ORDNANCE SURVEY	
Project Number: 3898	Drawing Reference: 3898_ATHERSLEY-GAWBER_OGL
Surveyor: SRO	Checked: SRO/KDA
Date: 15/05/2017	Scale: 1:500@AO
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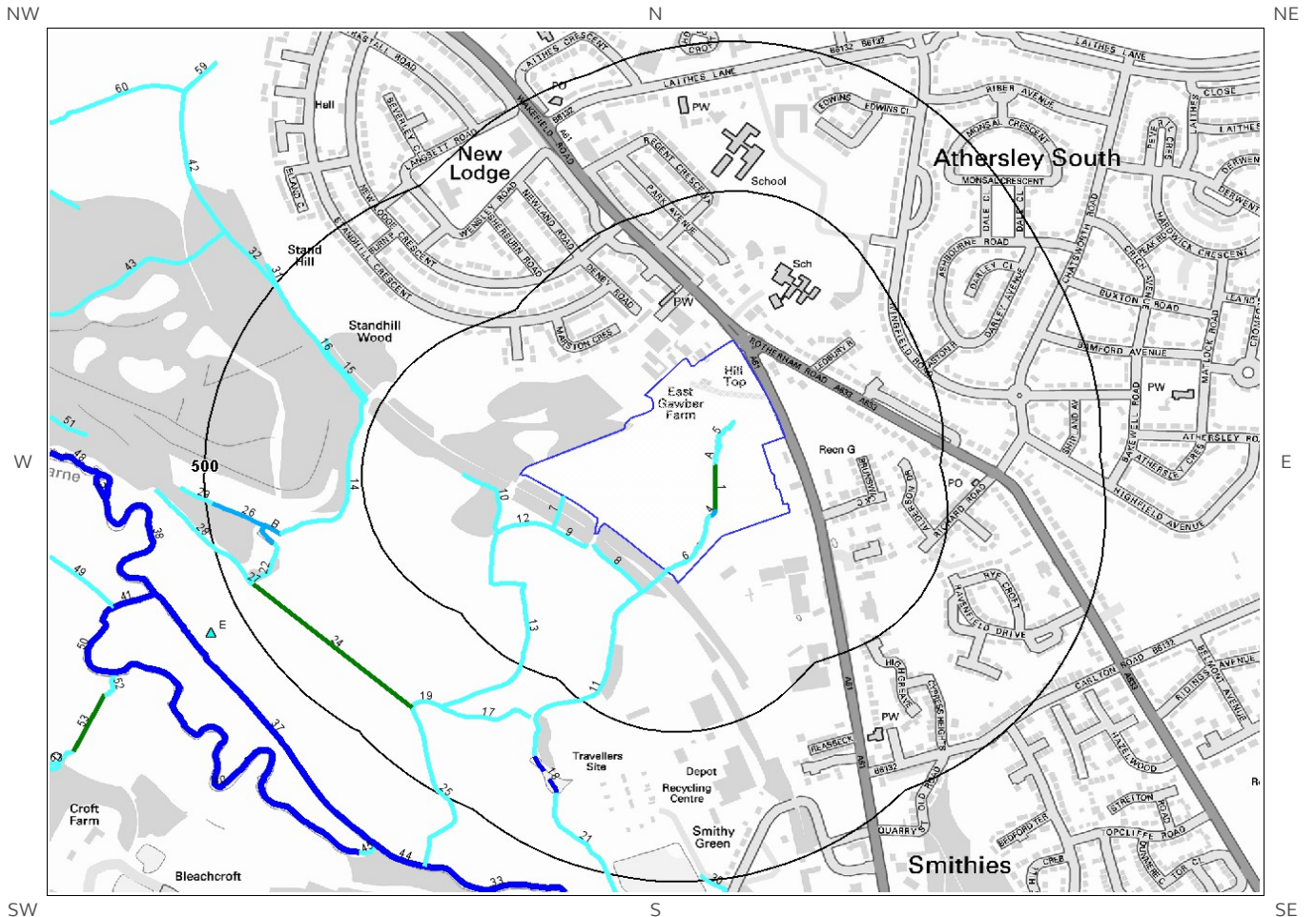




434429 : 408381	Map Name : SE3408SW	Title	
 <p>Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : G Delaney Contact Tel :</p>		Notes	
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		Date Req : 26/05/2017, 15:16:25	 <p>Da Gen 26/05/2017 15:16:25</p>
		Source : Sewer Network Enquiry	



6e. Hydrology – Detailed River Network and River Quality



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- | | | |
|------------------------|---------------------------------------|-------------------------------------|
| Site Outline | Primary River | Canal |
| 250 Search Buffers (m) | Secondary River | Canal Tunnel |
| 500 Search Buffers (m) | Tertiary River | Culvert |
| | Lake/Reservoir | Multiple Channel Culvert |
| | Underground River (inferred) | Underground River (Potential Sewer) |
| | General Quality Assessment: Biology | Underground River (local knowledge) |
| | General Quality Assessment: Chemistry | |



10m WIDTH WOODLAND BUFFER TO REDUCE VISUAL IMPACT OF DEVELOPMENT TO VIEWS FROM THE NORTH AND PROVIDE ECOLOGICAL BENEFIT, MITIGATING THE EFFECTS OF VEGETATION REMOVAL ELSEWHERE ON THE SITE

STREET PATTERN AND ARRANGEMENT OF DWELLINGS DESIGNED TO RUN ALONG THE CONTOURS, MINIMISING GRADIENTS AND STEPS IN BUILT FORM

POTENTIAL CONNECTIONS TO PUBLIC FOOTPATH ON FORMER RAILWAY LINE

SERIES OF STEPPED SURFACE WATER ATTENUATION BASINS POSITIONED IN THE LOWEST PART OF THE SITE, USED IN COMBINATION WITH UNDERGROUND STORAGE TANKS

FOOTPATH LINK TO DEFINITIVE PUBLIC FOOTPATH ROUTE ON BOUNDARY OF SITE

DENSELY VEGETATED FORMER RAILWAY CORRIDOR PROVIDES A SUBSTANTIAL SCREEN TO THE LOWER PARTS OF THE SITE

EXISTING POND RETAINED WITHIN OPEN SPACE

GATEWAY OPEN SPACE - RETAINING VIEWS OF EAST GAWBER HALL FROM THE MAIN ROAD JUNCTION

A MAXIMUM OF 5 PROPERTIES FRONTING WAKEFIELD ROAD TO BE SERVED BY A SHARED PRIVATE DRIVE

EXISTING PRIVATE ACCESS RETAINED TO No's 29 & 30

PRIMARY VEHICLE ACCESS POINT ON WAKEFIELD ROAD, APPROXIMATELY 45m SOUTH OF THE EXISTING ACCESS

EXISTING VEGETATION TO BE RETAINED WITHIN OPEN SPACE WHERE PRACTICAL

DWELLINGS FACING SITE BOUNDARY AND COMMERCIAL USES TO PROVIDE REAR GARDENS PROTECTED FROM NOISE

LOCATION OF PLAY SPACE

AREA OF VALLEY LANDFORM CONTAINING WATERCOURSE TO BE DEDICATED AS OPEN SPACE, RETAINING AND ENHANCING EXISTING ECOLOGICAL FEATURES

SUBSTANTIAL TREE BELT TO SOUTHERN BOUNDARY TO BE RETAINED TO PROVIDE SCREENING OF DEVELOPMENT AND NEIGHBOURING COMMERCIAL LAND USES

03 / ILLUSTRATIVE MASTERPLAN



CLIENT:
HARWORTH ESTATES

PROJECT:
ATHERSLEY

DRAWING:
ILLUSTRATIVE MASTERPLAN

DRAWING NUMBER:
P17 5091 03

SCALE @ A1:
1:1250

DRAWN: LB
DATE: 05.09.17

CHECKED: LB
DATE:



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St James House St Mary's Wharf
Mansfield Road
Derby DE1 3TQ



Date 28/07/2017 11:23
File

Designed by alex.parkes
Checked by

Micro Drainage

Source Control 2016.1.1

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	6.650	Urban	0.000
SAAR (mm)	692	Region Number	Region 3

Results 1/s

QBAR Rural 28.8
QBAR Urban 28.8

Q2 years 27.2

Q1 year 24.8
Q30 years 50.7
Q100 years 60.0

RL

Appendix F – LLFA Correspondence

Alex Parkes

From: Grayson , Ian [iangrayson@barnsley.gov.uk]
Sent: 06 June 2017 15:33
To: Alex Parkes
Subject: FW: Historic flooding information - Athersley

Follow Up Flag: Follow up
Flag Status: Completed

Hello Alex

I can you confirm that a discharge rate of 5l/s/ha is acceptable for this site

Thanks

From: HighwayDrainage
Sent: 06 June 2017 15:31
To: Grayson , Ian
Subject: FW: Historic flooding information - Athersley

From: Alex Parkes [<mailto:alex.parkes@rodgersleask.co.uk>]
Sent: 06 June 2017 15:27
To: HighwayDrainage
Subject: RE: Historic flooding information - Athersley

Good afternoon,

Are you able to comment on the below please?

Thanks,
Alex



Rodgers Leask Limited
St James House • St Mary's Wharf • Mansfield Road • Derby DE1 3TQ

ALEX PARKES BEng (Hons) GMICE
Graduate Engineer

alex.parkes@rodgersleask.co.uk

Tel: 01332 285000 • Fax: 01332 291728
www.rodgersleask.co.uk

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From: Alex Parkes
Sent: 26 May 2017 15:21
To: HighwayDrainage
Subject: RE: Historic flooding information - Athersley

Hello,

Please can you confirm that a discharge rate of 5l/s/ha in accordance with CIRIA C753 guidance will be acceptable when calculating the allowable discharge rate for surface water flows outfalling into the watercourse within the bounds of the below site?

Best regards,
Alex



RODGERS LEASK
Consulting Civil & Structural Engineers

ALEX PARKES BEng (Hons) GMICE
Graduate Engineer

alex.parkes@rodgersleask.co.uk

Rodgers Leask Limited
St James House • St Mary's Wharf • Mansfield Road • Derby DE1 3TQ

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From: HighwayDrainage [<mailto:HighwayDrainage@barnsley.gov.uk>]
Sent: 22 May 2017 12:36
To: Alex Parkes
Subject: RE: Historic flooding information - Athersley

Hello Alex

I have attached a plan of the site that shows

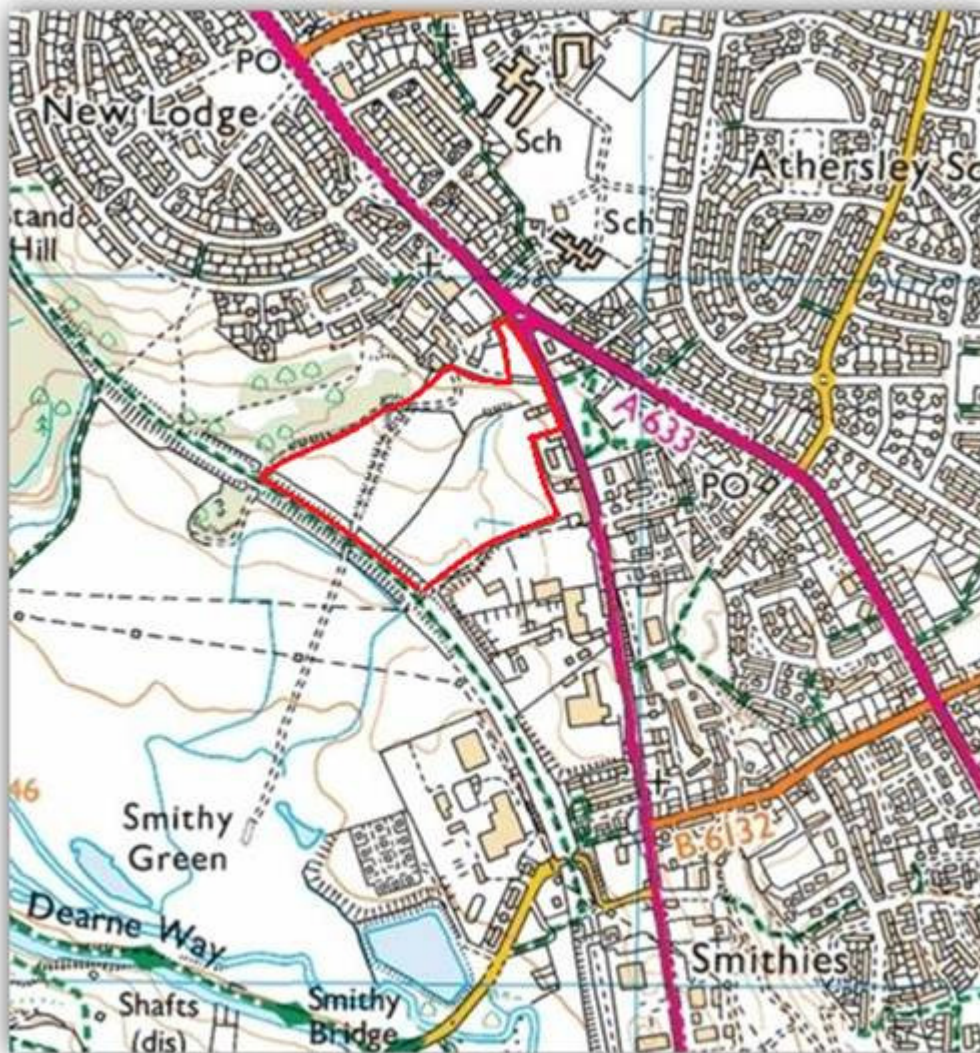
- 1.A Open/Culverted watercourse runs through the site
- 2.Yorkshire Water have a large number of sewers within the site
- 3.I am not aware of flooding on the site but it appears on the EA 30/200 year surface water flooding plans.

Thanks

From: Alex Parkes [<mailto:alex.parkes@rodgersleask.co.uk>]
Sent: 22 May 2017 11:35
To: HighwayDrainage
Subject: Historic flooding information - Athersley

Good morning,

I'm currently working on a flood risk assessment for a site off Wakefield Road, Athersley (Grid Ref: X: 434751 Y: 408763), below is a site location plan for your information.



I would be grateful if you could send any relevant information relating to flooding for the site and vicinity, in particular, any groundwater or surface water flooding which may have occurred in the past.

Best regards,
Alex



RODGERS LEASK
Consulting Civil & Structural Engineers

ALEX PARKES BEng (Hons) GMICE
Graduate Engineer

alex.parkes@rodgersleask.co.uk

Rodgers Leask Limited
St James House • St Mary's Wharf • Mansfield Road • Derby DE1 3TQ

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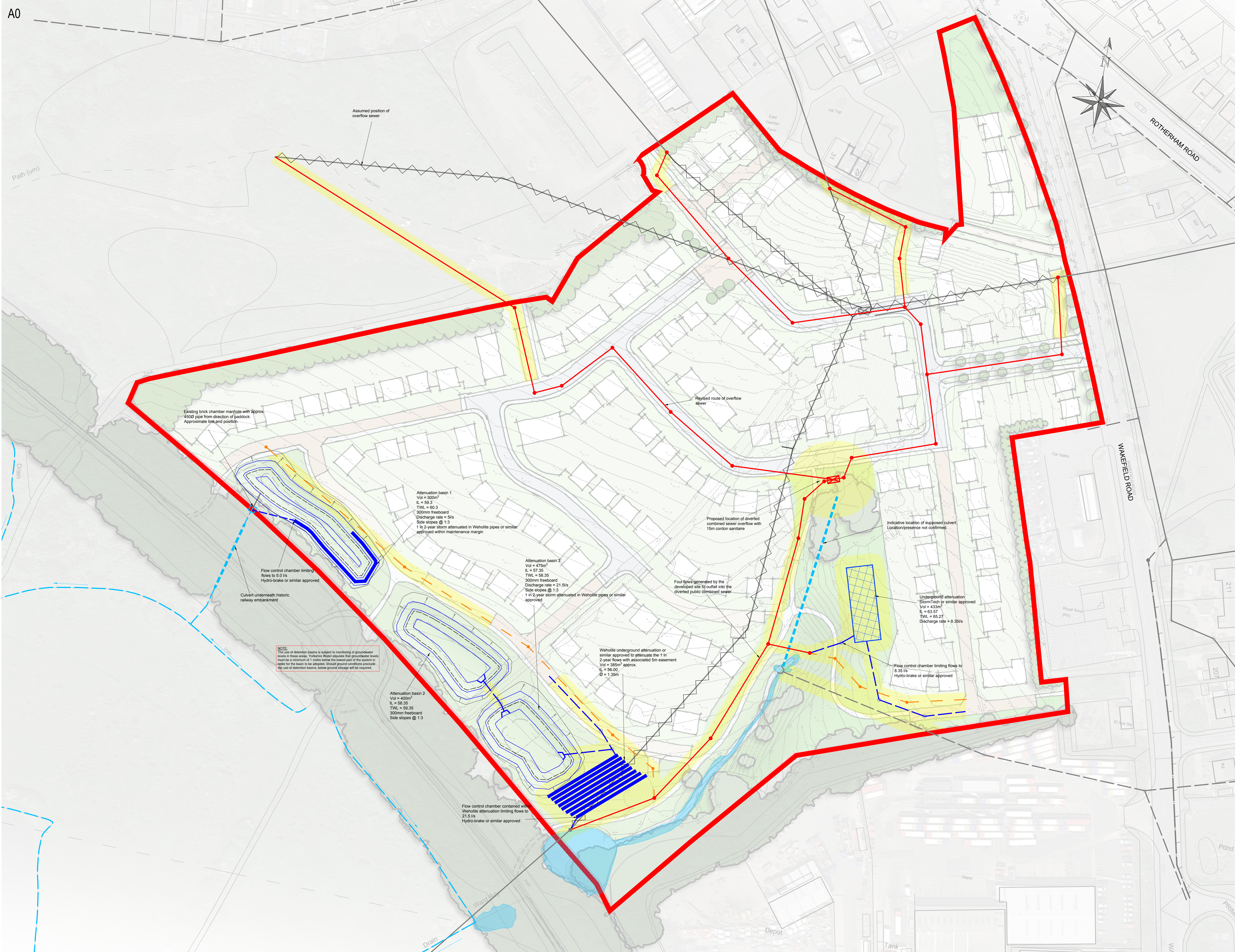
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A0

General Notes

1. Do not scale this drawing. If in doubt, ask.
2. This drawing is to be read in conjunction with all other relevant drawings, Architects and specialist design drawings and details.
3. All dimensions are in metres unless noted otherwise. All levels are in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the Engineer immediately.

Key

- Site boundary
- Existing WW surface water sewer
- Existing WW combined sewer
- Existing WW foul water sewer
- Existing WW foul water rising main
- Proposed surface water sewer
- Proposed foul sewer
- Proposed combined sewer diversion
- Existing WW combined sewer to be grubbed up
- Associated easement
- Culverted watercourse
- Open watercourse approximate extents
- Existing land drainage

HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks associated with the types of work detailed on this drawing please note the following:

Construction:

- 1) Overhead power lines beneath the site
- 2) Foul water is thought to be discharged into the open watercourse on-site
- 3) Hazardous materials and soils are present within the boundaries of the site
- 4) Watercourses - risk of drowning and waterborne diseases such as leptospirosis

Cleaning / Maintenance:

- 1)
- 2)
- 3)

Demolition:

- 1)
- 2)
- 3)

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

NOTE: The use of detention basins is subject to monitoring of groundwater levels in these areas. Yorkshire Water stipulate that groundwater levels must be a minimum of 1 metre below the lowest part of the system in order for the basin to be adopted. Should ground conditions preclude the use of detention basins, below ground storage will be required.

NOTE: The location of existing Yorkshire Water sewers shown on this drawing are indicative only. The exact line and length of any sewers within the boundaries of the site should be surveyed prior to the commencement of any on-site works. Rodgers Leask cannot accept any liability for the accuracy of the provided information.

Rev. Date Amendments By Chk. by

RL RODGERS LEASK
Consulting Civil & Structural Engineers

Client
HARWORTH ESTATES

Project
ATHERSLEY, BARNESLEY

Drawing Title
DRAINAGE STRATEGY DRAWING

Status
PRELIMINARY

Scale Drawn Checked Date
A0@1:500 AP ML 11.09.17

Project No. Drawing No. Rev.
P17-172 200 -

File Path:
P:\2017\1717-172\DWGS

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YorkshireWater

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

**Rodgers Leask Limited
St James House; St Marys Wharf
Mansfield Road
DE1 3TQ**

alex.parkes@rodgersleask.co.uk

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

For telephone enquiries ring:

Jane Phillips on 0345 120 8482

**Your Ref:
Our Ref: T008435**

1st June 2017

Dear Sir,

Wakefield Road, Athersley, Barnsley, S71 1NX - Pre-planning sewerage enquiry on R580243 - Residential

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:

Existing Infrastructure

Please note that as a result of the Water Industry (Scheme for Adoption of Private Sewers) Regulations 2011, there are public sewers not shown on our mapping records. It may be the case that there are unmapped sewers capable of accommodating the proposed foul water discharge in the vicinity of the site. It is recommended that the developer investigates this by visiting the site to establish the location of any transferred public sewers.

There are two 225mm diameter public combined sewers and a 375mm diameter overflow recorded crossing the site. No buildings, or other obstructions, are to be erected within 3 (three) metres, nor trees planted within 5 (five) metres of this public sewer.

There is a 450mm diameter public combined sewers recorded crossing the site. No buildings, or other obstructions, are to be erected within 5 (five) metres, nor trees planted within 5 (five) metres of this public sewer.

There is a 450mm diameter surface water sewer which outfalls to a pond within the site. No buildings, or other obstructions, are to be erected within 4 (four) metres, nor trees planted within 5 (five) metres of this public sewer.

It may not be acceptable to raise or lower ground levels over the sewer, nor to restrict access to the manholes on the sewer. If you wish to have this sewer diverted under Section 185 of the Water Industry Act 1991 an application should be made in writing. To discuss this matter, please telephone 0345 120 84 82.

There is a 225 mm diameter public sewer recorded crossing the site. In this instance, building-over





may take place under the control of Part H4 Building Regulations 2000.

There is also a combined sewage overflow and surface water outfall to watercourse, under the control of Yorkshire Water, located within the site. Vehicular access, including with large tankers, could be required at any time.

The proximity of the existing combined sewer overflow (CSO) outfall to the site may mean a loss of amenity for future residents / workers. In order to minimise the risk of odour, noise and nuisance, industry standards recommend that habitable buildings should not be located within 15 (fifteen) metres of the existing CSO. To reduce the visible impact of the installation, the erection (by the developer) of suitable screening is advised.

The local Waste Water Treatment Works (WWTW) is Lundwood. It is understood that this WWTW may only have limited spare capacity, if any, available. We have contacted the respective treatment team for more information regarding the impact of proposed development and will contact you when an assessment has been made. Please note I could be waiting for up to 14 days for a response.

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 should discharge to the 225 mm diameter public combined sewer recorded within the site.

Surface Water

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

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

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

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

It is understood that various watercourses are located within the site. These appear to be the obvious places for surface water disposal (if SuDS are not viable).

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, 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 obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an



YorkshireWater

agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no right of connection to the public sewer network. No land drainage to be connected/discharged to public sewer.

All the above comments are based upon the information and records available at the present time. 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 faithfully

Developer Services Team

Alex Parkes

From: jane.phillips@yorkshirewater.co.uk
Sent: 13 June 2017 15:44
To: Alex Parkes
Subject: Fw: Wakefield Road, Athersley, Barnsley, S71 1NX - Pre-planning sewerage enquiry on R580243 - Residential

Follow Up Flag: Follow up
Flag Status: Completed

Rodgers Leask Limited
St James House, St Marys Wharf
Mansfield Road
DE1 3TQ

alex.parkes@rodgersleask.co.uk

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

Tel: 0345 120 8482
Fax: (01274) 372 834
For telephone enquiries ring:

Jane Phillips on 0345 120 8482

Your Ref:
Our Ref: T008435

Date: 13/06/2017

Dear Alex,

Wakefield Road, Athersley, Barnsley, S71 1NX - Pre-planning sewerage enquiry on R580243 - Residential

I have been advised that The local Waste Water Treatment Works (WWTW) is Lundwood

The anticipated domestic foul flows can be accommodated at the WWTW, however it is imperative that a separate outfall is provided for surface water.

Yours faithfully

Developer Services Team

Spotted a leak?

If you spot a leak please report it immediately. Call us on 0800 57 3553 or go to <https://www.yorkshirewater.com/leaks>

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Rodgers Leask Limited

St James House St Mary's Wharf Mansfield Road Derby DE1 3TQ

Tel: 01332 285000 Fax: 01332 291728

rll Derby@rodgersleask.co.uk

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