DRAINAGE & FLOOD RISK STATEMENT

Circa 100 Dwellings on Land off Hawshaw Lane Hoyland

Reference	**AMF/DFS/5003.d.v1**
Date	**December 2016**
Version	**1**

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APPENDICES

CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Hoyland Developments
2 Duchy Road
HARROGATE
North Yorkshire
HG1 2EP

This report has been prepared for the sole use and reliance of the above named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

VERSION	PURPOSE/DESCRIPTION	DATE
1	Final – For issue to Client	December 2016

1.0 INTRODUCTION

JPG (Leeds) Limited has been instructed by Hoyland Developments Ltd to carry out a Drainage and Flood Risk Statement for a residential development on land off Hawshaw Lane, Hoyland.

The report will review the drainage and flood risk issues associated with the proposed development and recommend any mitigation which should take place as part of the development.

This document is prepared in accordance with the requirements of and in response to the Planning Practice Guidance & National Planning Policy Framework (NPPF) which states that those proposing particular developments are responsible for:

- Providing an assessment of whether any proposed development is likely to be affected by flooding and whether it will increase the flood risk elsewhere and of the measures proposed to deal with these effects and risks; and
- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect, to ensure that the site can be developed and occupied safely.

NPPF defines flood zones as follows:

- Zone 1 – Low Probability – less than 1 in 1000 annual probability (< 0.1%) of river or sea flooding in any year.
- Zone 2 – Medium Probability – between a 1 in 100 and 1 in 1000 annual probability (1% - 0.1%) of river flooding or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.
- Zone 3a – High Probability – 1 in 100 or greater annual probability (> 1%) of river flooding or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Zone 3b – Functional Floodplain – 1 in 20 or greater annual probability (5%) of river flooding in any year. This is land on which water has to flow or be stored in times of flood.

A Flood Risk Assessment is required for all sites in excess of 1ha within Zone 1 and all sites within Zones 2 and 3.

2.0 THE SITE

The site is located to the north east of Junction 36 of the M1 motorway, on the north side of Hawshaw Lane, approximately 1.5km northwest of Hoyland town centre. The approximate centre of the site is located at NGR 435973, 400624.

The site has an irregular shape and covers an area of approximately 3.90ha.

Vehicular access to the site is from the east, via a double field gate along Hawshaw Lane. Another potential pedestrian access to the site lies along Hoyland Road and is currently blocked off by two tall hedges and a private garden.

The site is open along its north western and south western boundaries and bounded beyond by wood fences. A footpath, oriented east to west, lies behind the northern fence. The north western boundary follows the line of overhead electrical cables. The site is bounded to the north east by metal fencing, beyond which, football pitches are located. The site is bounded to the south east by gardens attached to detached and semi-detached houses. All of the site has a cover of grass.

Site levels rise from south to north and fall from west to east and east to west toward a depression line within the west part of the site.

A topographic survey is provided in Appendix B.

3.0 EXISTING DRAINAGE AND SEWER NETWORK

A Yorkshire Water public sewer plan is provided in Appendix C, this indicates the following public sewers in close proximity to the site:

- There are a number of public foul, surface and combined sewers in the residential areas to the east and south of the site.
- There is a waste water sewage pumping station, under the control of Yorkshire Water, located to the west of the site.

An open watercourse/pond exists to the west of the site, this being a tributary of the downstream watercourse known as Short Wood Dike.

4.0 DEVELOPMENT PROPOSALS

It is proposed to redevelop the site with a residential development, access roads and landscape areas. A development plan is referenced below and contained in Appendix D.

- KPP Architects. Phase 1 Masterplan Coloured Revised.

5.0 FLOOD RISK ASSESSMENT

Publicly available information on flooding obtained from the Environment Agency (EA) website database is provided in Appendix E.

The site is indicated to fall within Flood Zone 1 which comprises land assessed as at a low risk of flooding from watercourse and/or sea with less than a 1:1000 annual probability of river or sea flooding.

NPPF Technical Guidance states all uses of land are appropriate in Flood Zone 1.

As the site area is greater than 1ha other sources of flooding need to be considered.

These include:

- Adjoining land.
- Ground water.
- Flooding from sewers.
- Flooding from reservoirs, canals and other artificial sources.

5.1 Flooding from Adjoining Land

The site sits in an elevated position above the surrounding land to the north, south and west therefore flooding from these locations is considered unlikely.

5.2 Flooding from Groundwater

The Phase 1 Environmental Desk Study report prepared by JPG advises the site lies within an area which is susceptible to flooding due to groundwater. This classification is based on the limited geological information available to the BGS for the site at the present time. The susceptibility and the risk of groundwater flooding occurring at the site should be assessed based on site specific information.

However give the sites elevated position flooding from ground water is considered unlikely.

5.3 Flooding from Sewers

The sewers in close proximity to the site are public sewers owned by Yorkshire Water and will be subject to regular maintenance and inspection, therefore blockage of these sewers is unlikely.

The risk of flooding from sewers is considered to be low.

The measures to mitigate the risks of flooding from new drainage are as detailed in Section 6.0.

5.4 Flooding from Reservoirs, Canals and Other Artificial Sources

There are no known reservoirs, canals or artificial sources within the vicinity of the site. The site is therefore not at risk from such sources.

6.0 SURFACE AND FOUL WATER DRAINAGE

The proposed site drainage will comprise of a separate surface and foul water drainage system.

The following summarises the requirements for the discharge of surface and foul water from the site.

6.1 Sustainable Urban Drainage Systems (SUDS)

The following geological publications were consulted as part of the Phase 1 Environmental Desk Study report prepared by JPG:

- British Geological Survey. Sheet 87. Barnsley. 1:50,000 Scale. Bedrock and Superficial Geology. Dated 2008.
- British Geological Survey. Sheet SE30SE. Wombwell. 1:10,000 Scale. Bedrock and Superficial Deposits. Dated 2005.

No superficial deposits are shown to be present on the site.

The underlying bedrock is shown to comprise Pennine Middle Coal Measures Formation, which comprises mudstone, siltstone and sandstone, with bands of distinct sandstone.

Three named sandstone units and coal seams are shown to outcrop on the site.

- The Barnsley Rock and Barnsley Coal seam (2.39m to 2.64m thick) are shown in the southern part of the site.
- The Kents Rock is shown to cross the central part of the site, the Kents Thin Coal seam (0.86m to 2.26m thick) is shown to outcrop adjacent to the southern boundary of the site (this is terminated against the unnamed fault).
- The Abdy Rock and Abdy or Winter Coal seam (0.79m to 0.86m thick) are shown in the eastern part of the site.

Infilled ground, comprising backfilled opencast workings, are shown to the north east of the outcrop of the Barnsley Coal Seam. This infilled ground extends to the north, beyond the site boundary.

An extensive area of made ground is shown immediately beyond the northwest boundary of the site, this encroaches for a small distance onto the site, immediately west of the outcrop of the Barnsley Coal seam.

Historical borehole information has been obtained from the BGS. There are records of two boreholes on the site. These boreholes record the strata between the Silkstone Coal seam and the Whinmoor Coal seam, which occur at depth beneath the site.

A third borehole log, located 60m to the east of the site in Upper Hoyland records made ground to 0.25m, underlain by weathered silty sandstone to 1.20m and sandstone bedrock to 6.63m.

Given the underlying ground strata the use of infiltration methods for the discharge of surface water is deemed unsuitable due to potential settlement issues associated with the made ground becoming inundated with surface water.

Sustainable Urban Drainage System (SUDS) may be used in conjunction with conventional drainage systems to improve water quality as well as manage surface water discharge.

The following audit has been carried out relating to suitability of SUD's systems.

Drainage Method	Description/Suitability	Proposal/Feasibility
1. Infiltration.	Methods not deemed suitable due to underlying ground strata	Not applicable.
2. Ponds and wetlands.	May be suitable if land is allocated	Applicable.
3. Infiltration Basins.	Methods not deemed suitable due to underlying ground strata	Not applicable.
4. Detention Basins.	May be suitable if land is allocated.	Applicable.
5. Swale.	May be utilised convey water.	Applicable.
6. French/Filter drain.	May be utilised convey water.	Applicable.
7. Pervious/Permeable Pavement.	Methods not deemed suitable due to underlying ground strata	Not applicable.
8. Geocellular Systems/Tank systems.	May be used as surface water attenuation.	Applicable.
9. Oversized pipes.	May be used as surface water attenuation.	Applicable.
10. Box culverts.	May be used as surface water attenuation.	Applicable.
11. Purpose designed tanks.	May be used as surface water attenuation.	Applicable.

6.2 Surface Water Drainage

The disposal of surface water shall be in accordance with the Requirement H3 of Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway/infiltration system, watercourse and public sewer in that priority order.

As noted in Section 6.1 the discharge of surface water drainage via infiltration methods is not feasible, therefore the second consideration should be discharge to watercourse.

The nearest watercourse is a tributary of the downstream watercourse known as Short Wood Dike which passes to the west of the site. Following consultation with Barnsley MDC drainage officer they have confirmed they are satisfied with a proposal to discharge to the watercourse on the basis of a greenfield discharge rate of 4.4 litres/second/hectare. On the basis of 60% impermeable surface for the site the total discharge rate to watercourse will be 10.3 litres/second (3.9ha by 0.6 by 4.4 l/s/Ha.

Correspondence with Barnsley MDC is provided in Appendix F and a greenfield run-off calculations prepared on Windes Microdrainage software is provided on Appendix G.

Given the restricted surface water discharge rate on-plot surface water attenuation will be required, it is proposed this will be provided in oversized pipes or concrete box culverts. The following provides a brief calculation of the approximate volumes of attenuation using the 'Quick Storage Estimate' element of Windes Microdrainage:

Attenuation Volumes

Storage Design Parameters

- Restricted discharge rate = 10.3 litres/second.
- Site area = 3.90ha.
- Proposed Impermeable area = 2.34 Ha. (60% impermeable).
- M5-60 = 19.0.
- Ratio R = 0.363.
- 1:30 Year Return Period = circa 890m^3.
- 1:100 Year Return Period (+30% cc) = circa 1700m^3.

The proposed onsite drainage system shall be designed in accordance with the requirements of Sewers for Adoption and shall demonstrate that:

- No surcharge of pipes occurs in the 1 in 2 year rainfall event.
- No surface flooding occurs in 1 in 30 year rainfall event.
- No flooding to buildings and adjacent properties occurs in 1 in 100 year rainfall event (including an allowance of 30% for the effects of future climate change), as defined in NPPF Technical Guidance.

6.3 Foul Water Drainage

Following earlier consultation with Yorkshire Water an enquiry for a larger overall site with 1350 units was submitted and they advised the 375mm diameter public combined sewer recorded in Hoyland Road, at a point to the south of the site does not have capacity to take the 1350 domestic properties but it will be able to take a percentage of the development. They will require a build rate to establish what percentage we may allow.

However the build proposal has been updated and Yorkshire Water have been provided with the following information:

- Circa 800 houses in total.
- Foul flow = 37 l/s (based on 4000 l/dwelling/day).

- Build period – 200 houses between 2017and 2020, 600 houses between 2020 and 2028.

It is therefore proposed to discharge domestic foul water to the 375 mm diameter public combined sewer recorded in Hoyland Road, at a point to the south of the site. Due to the site levels it is likely a portion of the site may need to be pumped.

7.0 CONCLUSIONS

This assessment has looked at the drainage and flood risk issues to support a proposed residential development on land immediately to the west of Hoyland.

The site lies within Flood Zone 1 and is therefore at low risk of flooding from river or sea. NPPF Technical Guidance states all uses of land are appropriate in Flood Zone 1.

Other sources of flooding have been assessed and the risk of flooding from these sources is considered to be low.

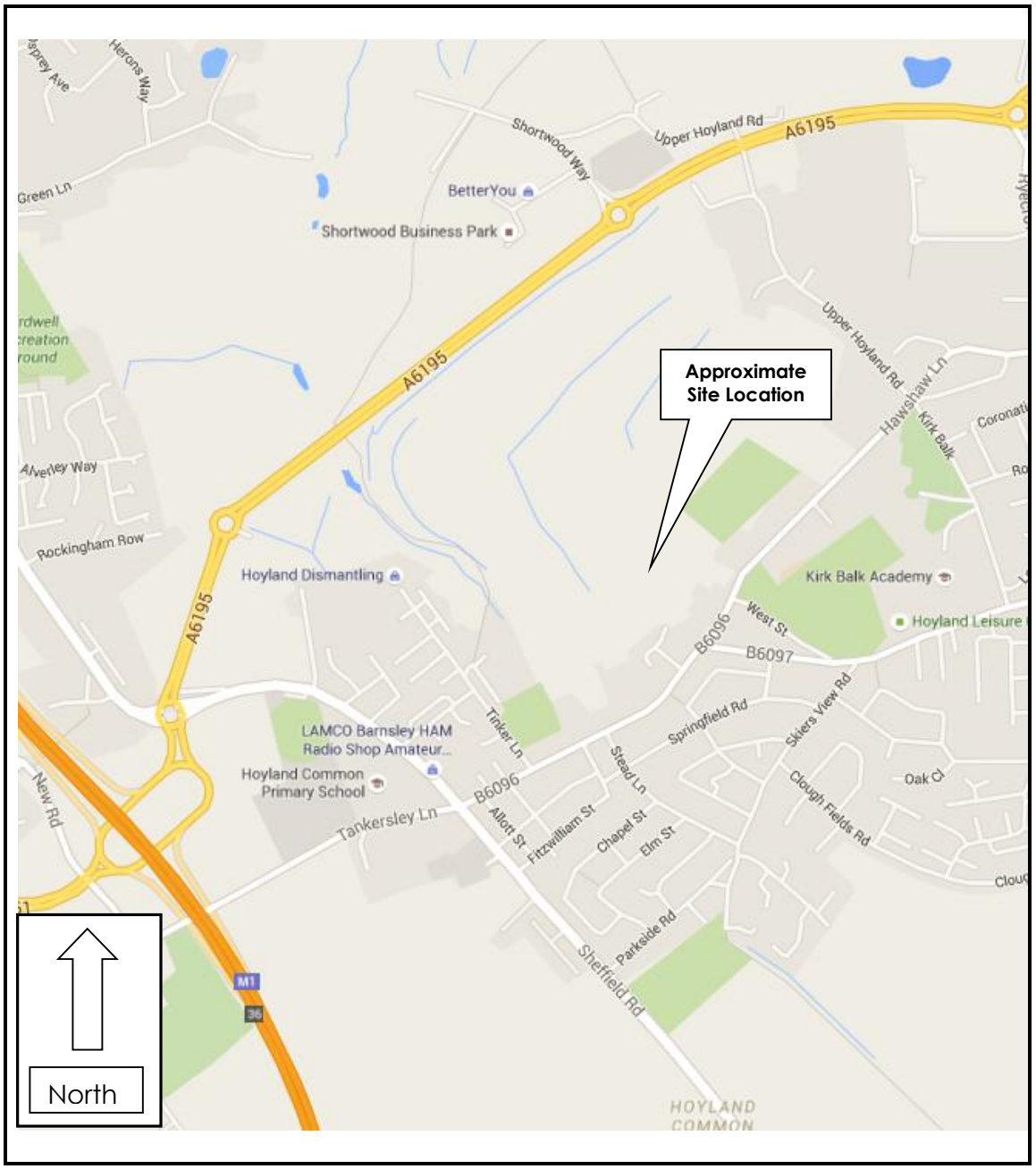
Surface water shall discharge to tributary of the downstream watercourse known as Short Wood Dike which passes to the west of the site at the existing greenfield rate of be 10.3 litres/second.

Domestic foul water shall discharge to the 375 mm diameter public combined sewer recorded in Hoyland Road.

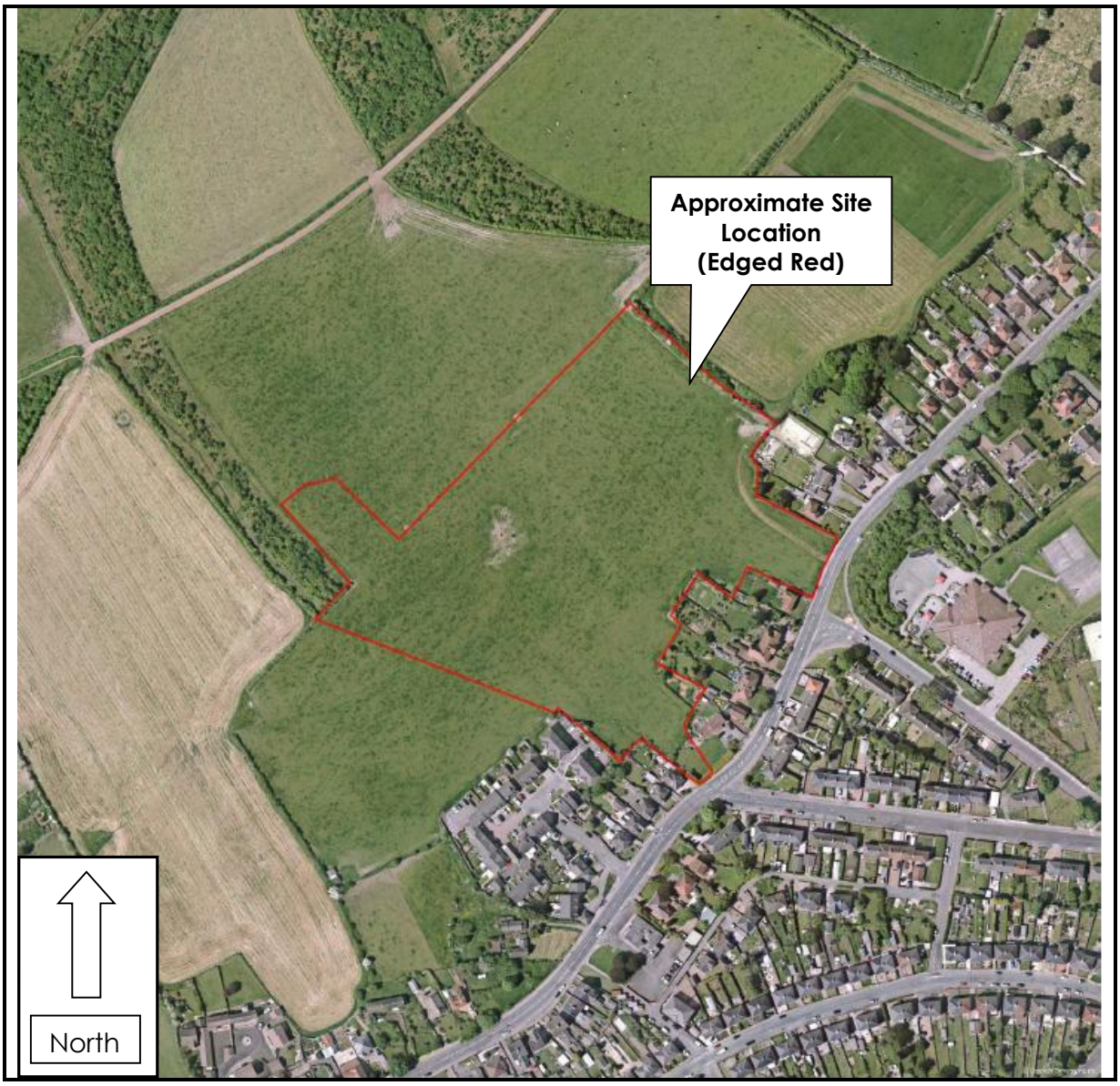
Andrew Fairburn
For and behalf of JPG (Leeds) Limited

December 2016

Appendix A Site Location Plan and Aerial Photograph

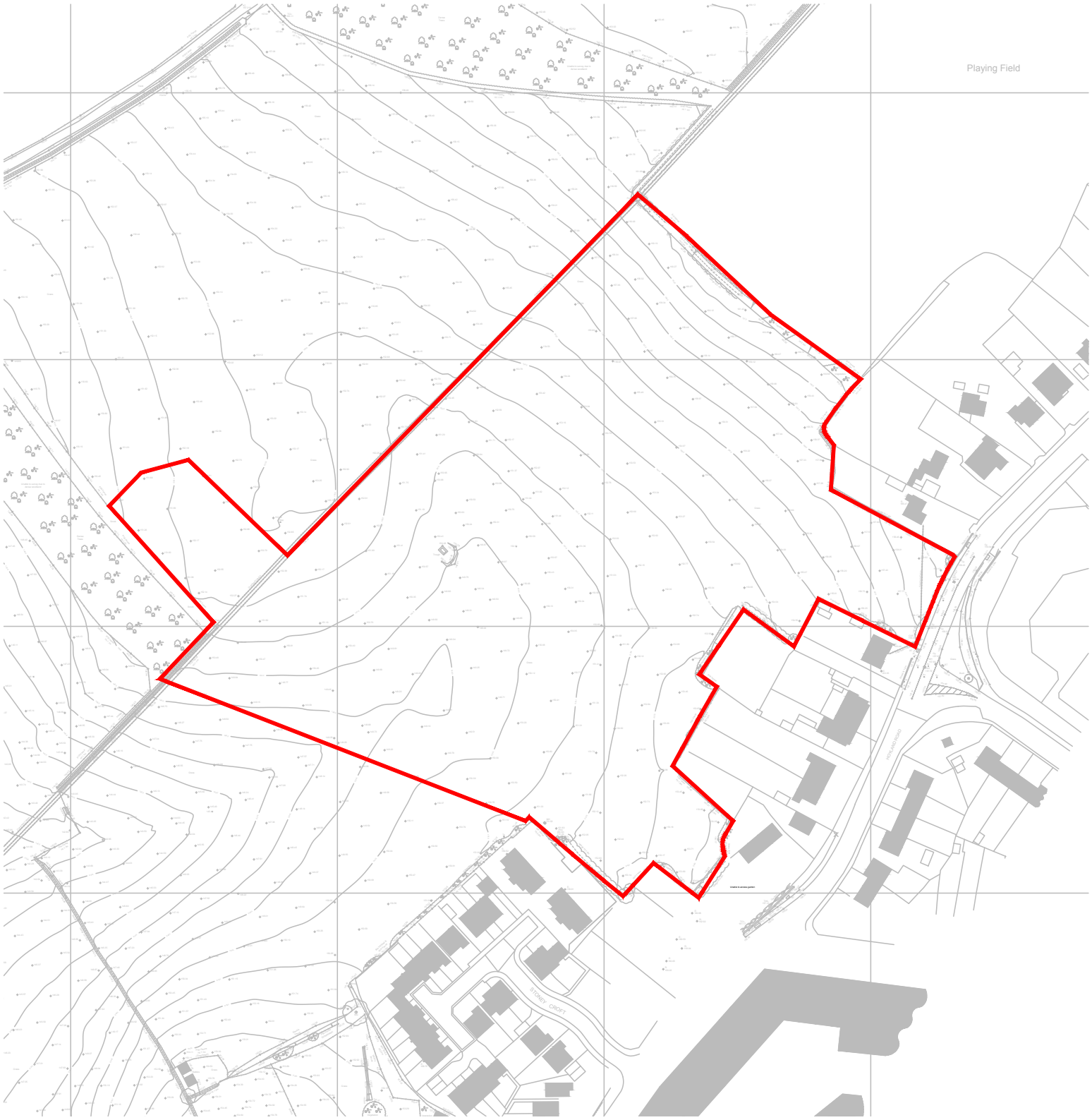


Site Location Plan	
Site	**Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland**
Client	**Hoyland Developments Ltd**
Job Number	**5003-d**
Scale	**NTS**



Aerial Photograph	
Site	**Circa 100 Dwellings on Land off Hawshaw Lane, Hoyland**
Client	**Hoyland Developments Ltd**
Job Number	**5003-d**
Scale	**NTS**

Appendix B Topographic Survey


Playing Field
STONEY CROFT

Appendix C Yorkshire Water Correspondence

Andrew Fairburn

From: Chris.Roberts@yorkshirewater.co.uk on behalf of Technical_Sewerage@yorkshirewater.co.uk
Sent: 20 March 2016 10:33
To: Andrew Fairburn
Subject: Re: Hawshaw Lane Hoyland Barnsley - Pre Planning Sewerage Enquiry On R100989
Attachments: Hawshaw.pdf; roberts4_rad67A97.PNG; image003.png; location plan.png; 20160223 - Yorkshire Water Enquiry Form - 5003.pdf

Dear Andrew,

Please find production asset planning teams response below.

The anticipated domestic foul flows can be accommodated at the WWTW, however it is imperative that a separate outfall is provided for surface water. Please also be aware that this is a large development and I would recommend limiting the number of properties built in a year so the development is spread over a couple of amps.

Regards

Chris Roberts

|---------->
| From: |
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>----------|
|Technical Sewerage |
>----------|
|---------->
| To: |
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>----------|
|Andrew Fairburn <AndrewFairburn@jpgleeds.com>,
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|---------->
| Date: |
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>----------|
|07/03/2016 10:00 |
>----------|
|---------->
| Subject: |
|---------->
>----------|
|Hawshaw Lane Hoyland Barnsley - Pre Planning Sewerage Enquiry On R100989
|
>----------|

Dear Andrew,

Please find my response below.

(See attached file: Hawshaw.pdf)(See attached file: roberts4_rad67A97.PNG)

YorkshireWater

Mr A Fairburn
JPG (Leeds) Limited
Bremner House
5 John Charles Way
Leeds
West Yorkshire
LS12 6QA

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

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

Email:
Technical.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

Your Ref: JPG027
Our Ref: S002769

7th March 2016

Dear Mr Fairburn,

Hawshaw Lane Hoyland Barnsley - Pre Planning Sewerage Enquiry On R100989

Thank you for your recent enquiry. Our charge of £150.00 (plus VAT) will be added to your account with us, reference . 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.

Existing Infrastructure

There is a 375 mm diameter public combined water sewer 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. 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 waste water sewage pumping station, 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 sewage pumping station (SPS) 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 must not be located within 15 (fifteen) metres from the edge of the SPS wet well. 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 Wombwell. 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:- due to the change in legislation on 01/10/2011 there may be public sewers within the site boundary which is not recorded on the Statutory Sewer Map the presence of which should be taken into account in the design of the scheme)

YorkshireWater

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.

The 375 mm diameter public combined sewer recorded in Hoyland Road, at a point to the south of the site does not have capacity to take the 1350 domestic properties but it will be able to take a percentage of the development. We will require a build rate to establish what percentage we may allow.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer network. Discharege rate to be agreed.

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 for discharge.

It is understood that watercourses are locateded around the site. This appears to be the obvious place 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.

An off-site foul and surface water sewer may be required which may be provided by the developer and considered 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 WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

YorkshireWater

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.

As a last resort, highway drainage may be accepted under certain circumstances. If it can be demonstrated, through satisfactory evidence, that SUDS are not a viable option, there are no watercourses or highway drains available and if capacity is available within the public sewer network, highway drainage discharges to the public sewer network may be permitted. In this event, the developer may be required to enter into a formal agreement with Yorkshire Water Services under Section 115 Water Industry Act 1991 to discharge non-domestic flows into the public sewer network.

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 sincerely

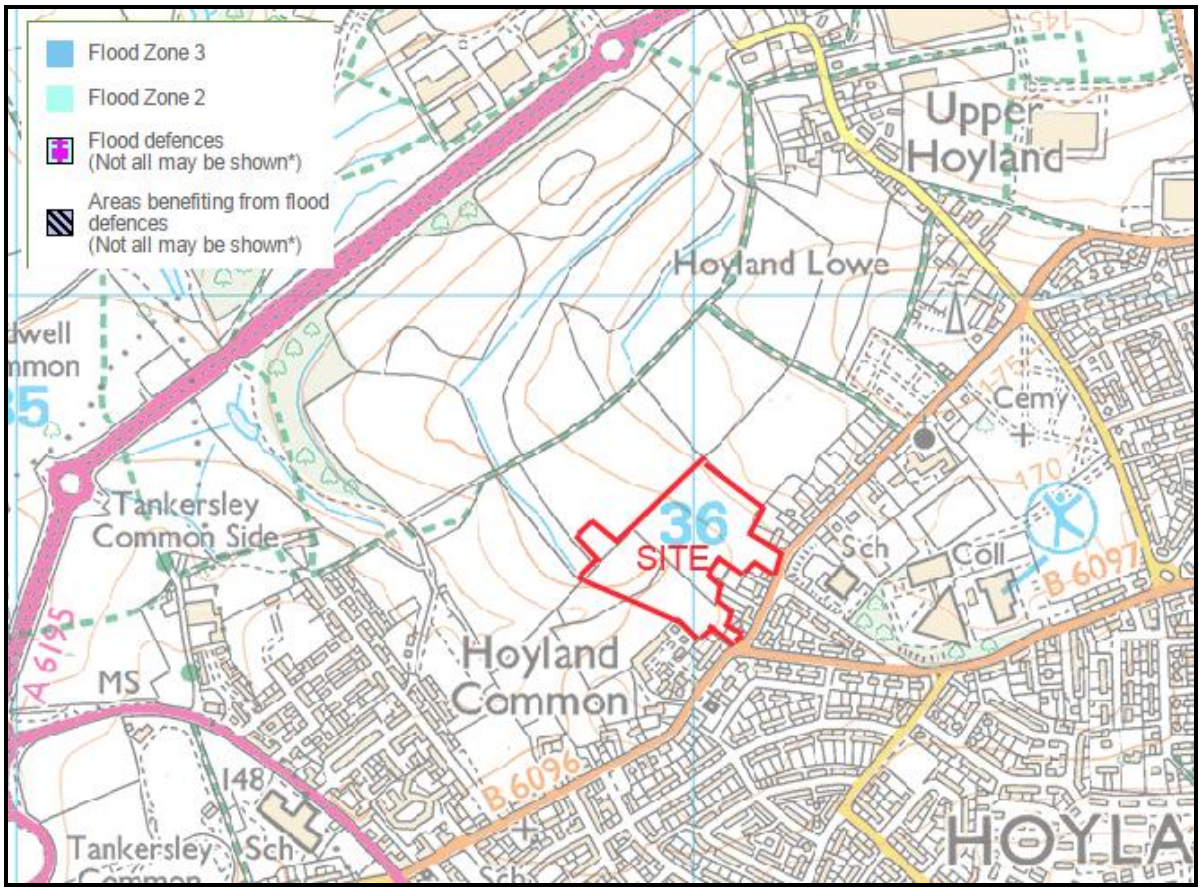
Chris Roberts
Sewerage Technician
Developer Services


A 6185
HOYLAND COMMON

Appendix D Proposed Site Layout Plan


HOYLAND ROAD
HOYLAND COMMON
HAWSHAW LANE
SPRINGFIELD CRESCENT
WEST STREET
West Hoyland Primary School

Appendix E Environment Agency Flood Map



Flood Map obtained from Environment Agency website (December 2016)

Appendix F Barnsley MDC Correspondence

Andrew Fairburn

From: Bell , Derek <DerekBell@barnsley.gov.uk>
Sent: 05 August 2016 11:32
To: Andrew Fairburn
Subject: RE: 5003 - Development at Hoyland - Barnsley

Andrew,

Please accept my sincere apologies as this one appears to have slipped through the net. With regards to your query I'm happy to confirm your indicative strategy for surface water disposal and the greenfield discharge rate of 4.4ltrs/sec/ha is acceptable.

You should be aware that the Council is currently formulating its SuDS Policy and with this in mind you should note that the Council will not seek to adopt any SuDS. Therefore the ongoing management and maintenance of all SuDS and all associated surface water drainage features would be the responsibility of the developer and NOT the Council. Appropriate maintenance plans and schedules would need to be submitted as an integral part of the drainage proposal prior to drainage conditions being signed off for the planning application. You should also note that any relevant legal agreements required for the establishment of a Management Company undertake the management/maintenance of the SuDS would also need to be submitted, where applicable.

You should take the above into account when developing your surface water drainage proposal for this site and with this in mind I look forward to your receiving a more detailed proposal for this site in the near future.

Regards ~ Derek

Derek Bell
Principal Network Resilience Manager
Environment & Transport
Barnsley Metropolitan Borough Council, Westgate Plaza 1, PO Box 601, Barnsley, S70 9FA*

** Sat Nav Reference - **S70 2DR***

Tel: Ext - 01226 787654 Int - 6654
Mob: 07773 783184
Fax: 01226 772196
E-mail: DerekBell@barnsley.gov.uk

From: Andrew Fairburn [mailto:AndrewFairburn@jpgleeds.com]
Sent: 25 July 2016 10:11
To: Bell , Derek
Subject: RE: 5003 - Development at Hoyland - Barnsley

Derek

I dropped you an email earlier in the year regarding at site at Hoyland (copy below), which I don't appear to have received a response.

I would be grateful if you could review and respond when you have a moment.

Thank you

Kind Regards

Andrew Fairburn – Director

E: andrewfairburn@jpgleeds.com

Appendix G Microdrainage Greenfield Discharge Calculations

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	50.000	Urban	0.000
SAAR (mm)	700	Region Number	Region 3

Results l/s

QBAR Rural	219.7
QBAR Urban	219.7
Q1 year	188.9
Q1 year	188.9
Q2 years	207.3
Q5 years	274.6
Q10 years	318.5
Q20 years	360.7
Q25 years	374.7
Q30 years	386.1
Q50 years	416.0
Q100 years	456.9
Q200 years	518.4
Q250 years	538.2
Q1000 years	667.8

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