FLOOD RISK ASSESSMENT

Barnsley West

Reference	**4848-JPG-XX-XX-RP-D-0620-S2-P01**
Date	**20 May 2021**
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APPENDICES

CONFIDENTIALITY STATEMENT

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

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DOCUMENT HISTORY

Rev	Date	Revision Details	Status	Author(s)	Approved
P01	20.05.2021	First Issue	Preliminary	JDM	RMR

1.0 INTRODUCTION

JPG (Leeds) Limited has been instructed by Strata Sterling Barnsley West Limited to prepare a Flood Risk Assessment for a proposed mixed-use development at Barnsley West.

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

A separate Drainage Impact Assessment document will cover the detailed drainage strategy.

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 must 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.

Other document we have reviewed and referred to in compiling this flood risk assessment report area detailed below.

These include both technical, nontechnical, legislation, codes, and guidance document at both national and local level.

- National Planning Policy Guidance.
- Defra's Non-Statutory Technical Standards for SuDS.
- CIRIA C753 SUDS Manual and various other CIRIA guidance.
- Building Regulations: Approved Document H - Drainage and Waste Disposal 2015 edition.
- BS 8582:2013 Code of Practice for Surface Water Management for Development Sites.
- BSEN 752:2017 Drain and sewer systems outside buildings - sewer system management.
- Barnsley Strategic Flood Risk Assessment.
- Barnsley Metropolitan Borough Council Preliminary Flood Risk Assessment Report.
- Design and Construction Guidance "Codes" for Adoption.

2.0 THE SITE

The site is located approximately 3km to the west of Barnsley town centre. The approximate centre of the site is located at NGR 431800 407100.

The site is located between Higham and Gawber, with the M1 motorway located to the west and south of the site. The A635 Barugh Green Road is located to the north of the site.

A site location plan is provided in Appendix A.

The site predominantly consists of undulating arable and grazing farmland, which is separated into fields by hedgerows, fences, and small watercourses. Hermit Lane, aligned approximately east to west, bisects the site.

A steep sided valley with a watercourse at its base extends from the south-western boundary and trends towards Hermit Lane to the north. Another steep sided valley, with an associated watercourse, trends from the central-eastern half of the site to Redbrook Farm, north of Hermit Lane.

A raised plateau of arable farmland is present adjacent to the residential suburb of Pogmoor in the eastern extent of the site. To the west of this plateau, the topography falls steeply forming the valley in the centre east. Evidence of local landslide instability is noted in the central-eastern portion of the site, south of Hermit Lane, to the east of Hermit House Farm and alongside the steep sided valley.

The gradient of Hermit Lane undulates from west to east, with a steep gradient from the western boundary down into the valley bottom before rising steeply towards Hermit House Farm and again upwards to Gawber/Pogmoor to the east. The two watercourses within the two steep valleys are culverted below Hermit Lane and continue as streams and ponds to the north of Hermit Lane. The stream in the central part of the site is culverted in parts and joins the eastern stream close to Redbrook Farm. Both valleys are heavily wooded and overgrown to the north of Hermit Lane.

Adjacent to the culvert and a sharp bend in Hermit Lane, to the east of Hermit House Farm, an intact coal seam was noted within the watercourse.

Hermit House Farm is located to the south of Hermit Lane in the centre-east of the site. It consists of two single storey residential properties, several agricultural buildings and associated hard standing. The farm buildings are typically constructed with concrete blocks, timber and roofing of possible asbestos cement sheeting.

Redbrook farm is located adjacent to the north-eastern boundary, with access gained from Redbrook Road. The farm is made up of a large dilapidated agricultural barn, containing livestock, several outbuildings and a large silo.

The northern site boundary is formed by Barugh Green Road and, in part, adjacent grazing farmland, beyond which lies the Metro Trading Centre and Claycliffe Business Park. Redbrook Plantation and residential properties (Gawber and Pogmoor) are present beyond the eastern boundary. Residential properties (Hunters Farm and Cottages) are located adjacent to the southern tip of the site. The south-western boundary is formed by the M1 motorway, beyond which lies further farms and woodland. The residential areas of Higham and Barugh Green are located to the west and northwest, respectively.

A topographic survey is provided in Appendix B.

3.0 EXISTING DRAINAGE NETWORK

There are a number of visible existing water courses located within the site boundary or immediately outside the site adjacent to the boundary.

The nearest named water course is Silkstone Beck which is some 1.5km to the west of the site. This flows in a south to north direction out falling into Cawthorne Dike (located 2.2km north west) before combining with the River Dearne (located 1.75km north).

There is no direct access to any of the above watercourses from the site.

The Environment Agency data shows watercourses located within the site; these can be seen on the topographical survey also. A series of smaller ditches combine into two watercourses south of Hermit Lane before being culverted underneath the highway and combining around the Craven Wood area. The watercourse then runs in a north easterly direction towards Redbrook Road where it enters a series of weirs before being culverted under the highway. Based on discussion with BMBC LLFA it is understood that this culverted watercourse then runs under the highway and through Zenith Park industrial estate (the route of which is unknown) before out-falling into a ditch to north east of Zenith Park.

The exact route of this culvert is not known, and Barnsley LLFA highlighted that there are known issues with this culvert and suggested that the developer should carry out a survey of the culvert. A survey has been commissioned but at the time of writing this report the information was not available.

Watercourses/land drainage ditches are also indicated running parallel to the south of Barugh green Road within the hedge line. It is believed this ditch falls west to east before entering a chamber and then turning north in a culvert beneath Barugh Green Road just before Claycliffe Avenue. This culvert would appear to outfall at the rear of the Aldi supermarket into a ditch. There is limited access to this open ditch section.

From the culvert running in a westerly direction upstream the ditch looks to decrease in size and by the time this get to the garden centre and residential properties on Barugh Green Road it is pretty much non-existent. This in noted on the EA mapping as a drain.

This same ditch is also shown to exist to the west of the properties with a depression observed adjacent to the boundary wall of the last property. This was full of detritus and debris and there was no evidence of a culvert under the properties linking this with the ditch to the east of the properties.

Moving further west along the highway boundary the ditch has completely disappear by the time it gets to the next set of properties and the ground is higher than the back of highway.

Further investigation will be required into this land drainage ditch which will need to be cleaned out then a connectivity survey carried out.

In addition to the previously described drain/ditch there is a slight depression shown on the topographical survey running round the rear of the properties and the garden centre. This is also indicated as a drain on the EA mapping.

The upstream extent is unclear on the topographical survey, but it appears to extend beyond the first field boundary which is also the development site boundary.

While there are no public sewers shown within the site boundary, public sewer infrastructure and networks are indicated outside the site boundary and can be seen in an extract from the Yorkshire Water sewer record plan that is provided in Appendix C.

From consultation with the Barnsley Council Highways department, it is believed Highway drains are located within Higham Common Road and Barugh Green Road, however no records of these sewers were available at the time of consultation.

Some limited survey work had been carried out on the drain in the vicinity of the proposed roundabout on Barugh Green Road (note works to the roundabout are outside of this planning application). Due to difficulties with access and the poor state of repair of the drains limited information was gained. Further investigation into the drainage system would be recommended in this location.

4.0 DEVELOPMENT PROPOSALS

It is proposed to develop the site for a mixed end use, comprising residential with school in the northern two thirds of the site, industrial/commercial land use including a pub/hotel in the southern third and residential in the east (land adjacent to Pogmoor). The development also includes attenuation basins (SUDS), public open space landscaping zones and associated road infrastructure network.

A copy of the proposed development plan has been provided and referenced below, and a copy is containing in Appendix D.

- Bond Bryan Architects Proposed Site Plan drawing BWM-BBA-ZZ-XX-DR-A-1004 Revision P04 dated 10 May 2021.

5.0 FLOOD RISK ASSESSMENT

Flooding information was obtained from the Environment Agency (EA) website, which confirms the site lies within Flood Zone 1.

The Environment Agency Flood Mapping for surface water is in Appendix E.

Flood Zone 1 comprises land assessed as at a low risk of flooding from a watercourse and/or sea with less than a 1:1000 annual probability of river or sea flooding.

NPPF Technical Guidance states that residential use is appropriate in Flood Zone 1.

NPPF Technical Guidance states that flood risk should be considered from all sources, including:

- Rivers and sea Fluvial.
- Adjoining land Pluvial.
- Groundwater.
- Flooding from sewers and drains.
- Flooding from reservoirs, canals and other artificial sources.

5.1 Flooding from Rivers and Sea (Fluvial)

The site is located inland and some distance of a major river and as such the risk to the development from potential flooding source is considered to be **low**.

An extract from the Environment Agency flood mapping is below.

5.2 Flooding from Adjoining Land (Pluvial)

Overland flow/surface water flooding typically arises because of intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding.

An extract from the Environment Agency mapping showing the extent of flooding from surface sources can be found below.

Review of the Environment Agency Flood Risk Mapping from Surface Water indicates that the site is generally in an area of very low risk of surface water flooding.

There is some surface flooding shown throughout the site, specifically where watercourses are shown to be located however, levels here are considerably lower than the proposed plateau levels and as such risk of flooding is considered **low** from this source.

In addition, there are a number of field/land drainage ditches in the southern area. The majority of these coincide with field boundaries and are thought to be field drainage ditches. During a site walk over there was evidence of a number of springs in this area.

Levels are to be amend across the site and where existing drainage features are encountered, they will either be diverted and/or intercepted and connecting into the proposed site wide land drainage system. This will ultimately be connected back into the water courses within the site.

Details of the land drainage strategy can be found in the accompanying DIA report.

Based on the above the risk to the development from any such potential flooding source is considered to be **low**.

5.3 Flooding from Groundwater

The published information indicates that majority of the site is underlain by large areas of infilled ground associated with historical opencast coal sites (OCCSs).

Ground conditions vary throughout the site and have been broken down into three areas:

- Employment Land (southern Third), the ground conditions comprise reworked topsoil overlying localised pockets of cohesive made ground, firm medium strength residual soils and extremely weak mudstone of the Pennine Middle Coal Measures Formation, outside of the OCCSs. Cohesive and granular colliery spoil was encountered in the central part of the employment land to depths of between 1.50m bgl (TP109) and 13.00m bgl (BH108).

- Residential Land Adjacent to Pogmoor in the East, the ground conditions comprise reworked topsoil overlying localised pockets of cohesive made ground and colliery spoil. The cohesive and granular colliery spoil was encountered to depths of between 2.00m bgl (BH124) and 11.50m bgl (BH113). The underlying natural strata comprised stiff residual soils overlying interbedded mudstone, sandstone and coal seams.
- Residential land (remainder of site), the ground conditions comprise reworked topsoil overlying localised pockets of cohesive made ground (a possible capping layer), cohesive and granular colliery spoil and natural strata consisting of firm to very stiff residual soil and interbedded mudstone, sandstone and coal seams.

During the site investigation, groundwater was not generally encountered in the trial pits within the shallow natural ground. Perched groundwater was noted in TP109 at 1.00m bgl, 1.50m bgl and 3.00m bgl and in TP110 from 2.50m bgl.

The majority of rotary open holed boreholes encountered groundwater strikes from depths between 3.00m bgl to 31.00m bgl.

For details of the exploratory hole location plan and further details of the monitored groundwater levels refer to the JPG Preliminary Geoenvironmental Ground Investigation "4848-JPG-SW-XX-RP-G-0603".

The risk to the development from groundwater flooding will be mitigated by the implementation of a permanent land drainage scheme which will deal with any ground water by directing this into the existing on-site watercourse network.

Details of the land drainage strategy can be found in the accompanying DIA report 4848-JPG-XX-XX-RP-D-0621.

As such the risk to the development from any such potential flooding source is considered to be **low**.

5.4 Flooding from Sewers and Drains

Based on the Yorkshire Water sewer record drawings there are no public sewers recorded within the site other than a surface water outfall for from the existing residential development to the south east (Pogmoor area).

However, there are public sewers within close proximity to the site which are maintained by Yorkshire Water and will be subject to regular inspection and maintenance as part of their asset management programme, therefore blockage of these sewers is unlikely.

If a sewer were to fail in the vicinity of the site, flood waters would follow paths indicated by the surface water flood risk mapping and would not affect the proposed development.

It would be expected that there are private assets located within close proximity to the development boundary serving third party properties.

These drains should be subject to some form of maintenance regime by the owner and as such failure/blockage of these drains is considered to be low and likely to be local to the third-party property.

If a drain were to fail and not be contained in the vicinity of the property, flood waters would follow paths indicated by the surface water flood risk mapping and would not affect the proposed development.

A copy of the map produced by the Environment Agency showing the extent of flooding from surface sources is shown in section 5.2.

The risk to the development from any such potential flooding source is considered to be **low**.

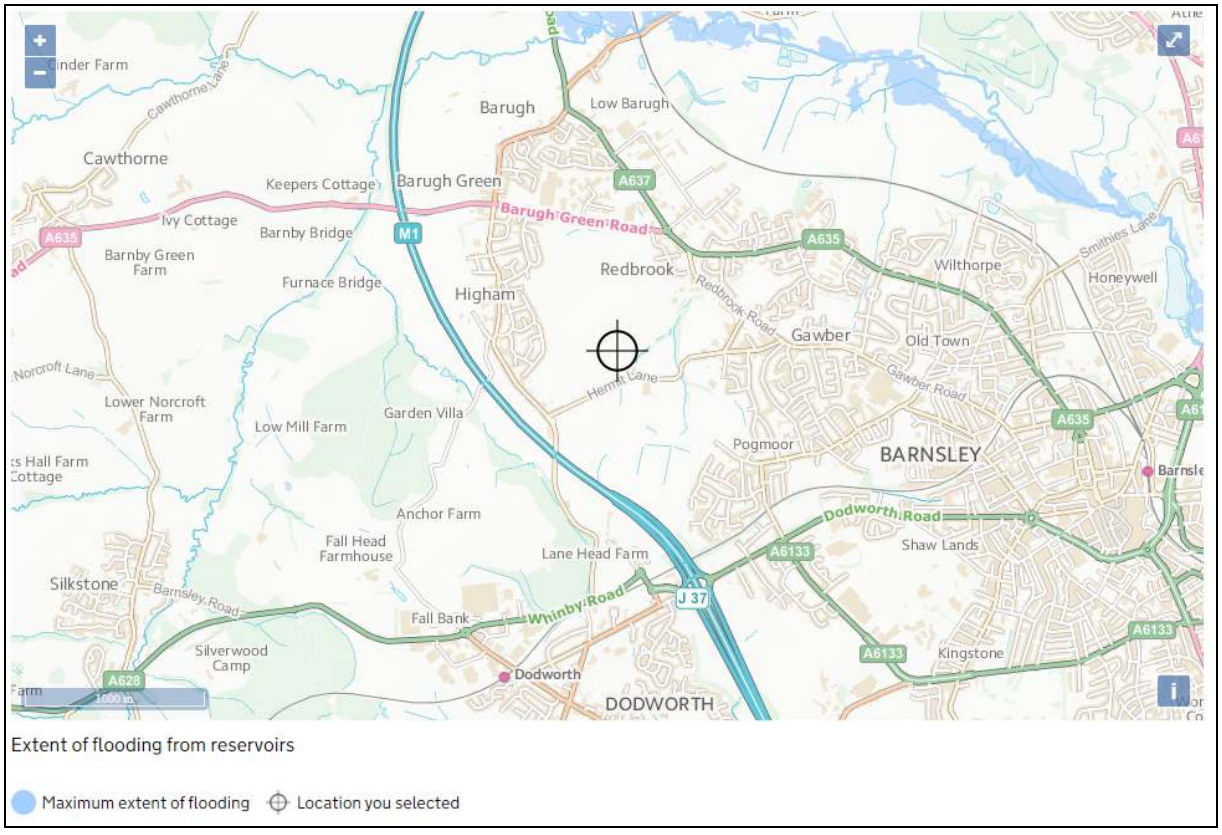
5.5 Flooding from Reservoirs, Canals and Other Artificial Sources

Review of the Environment Agency flood risk mapping from reservoirs shows that the site is not in an area at risk from failure of a reservoir.

A copy of the map produced by the Environment Agency showing the extent of flooding from reservoirs and other artificial sources is below.

The map shows that the development is not considered at risk.

This risk to the development from any such potential flooding source is considered to be **low.**



6.0 DRAINAGE ASSESSMENT

6.1 General

From a more detailed analysis of the drainage proposals for the development refer to the Drainage Impact Assessment report reference 4848-JPG-XX-XX-RP-D-0621. However, the proposals are summarised below.

Consultation has been sent out to the LLFA, EA and Yorkshire Water and responses can be found in the DIA report 4848-JPG-XX-XX-RP-D-0621.

Meetings have been held with both the LLFA (Barnsley MBC) and the local Water Company Yorkshire Water to discuss the project at a high level and agree parameters. Minutes from these meetings can be found in the DIA 4848-JPG-XX-XX-RP-D-0621.

This report should be read in conjunction with the DIA report. It is likely further discussions will be required, and this report and the DIA 4848-JPG-XX-XX-RP-D-0621 will be reviewed and update in accordance with the outcomes of any further discussions.

6.2 Surface Water Drainage

Requirement H3 of the Building Regulations establishes a preferred hierarchy for the disposal of surface water. Consideration should firstly be given to soakaway/infiltration, watercourse, and sewer in that priority order.

On site ground investigation has been carried out and confirm the site is mixed underlaying material consisting of rock, cohesive and fill material to old open cast workings which would be unsuitable for infiltration drainage methods on this site. A high level description can be found in section 5.3 for the three main areas.

For further details of the underlaying ground conditions which are complex and varied refer to the JPG Preliminary Geo Environmental Ground Investigation "4848-JPG-SW-XX-RP-G-0603".

Based on the above statement and drainage hierarchy connection to watercourse should be consider next.

There are a number of existing water courses located within the development site toward the east and existing greenfield run off from the south and middle of the site would generally discharge into these watercourses.

Some area to north falls towards Barugh Green Road and a suggested land drainage ditch/drain located to the south of the highway and running parallel.

This ditch is not well defined, but it may be possible to discharge limited areas into this ditch from the early stages of the development and prior to constructing the large attenuation basins to the east. This would also potentially avoid pumping of surface water from these northern areas.

Based on drainage hierarchy the most logical place for disposal of surface water from the development is into the existing land drainage/water course network.

Preplanning enquiry and predevelopment discussions have been carried out with Yorkshire Water and the LLFA Barnsley MBC. Responses from these can be found in the DIA report 4848-JPG-XX-XX-RP-D-0621.

Early discussions with the LLFA Barnsley MBC confirmed that the site should be restricted to greenfield run off rates calculated using a recognised method such as IH124 or ICPSUDs.

Initial greenfield run off calculations can be found in the DIA report 4848-JPG-XX-XX-RP-D-0621 and the agreed discharge rate is detailed below.

Agreed greenfield run off rate is 3.900l/s/ha. Based on the preliminary calculations the total greenfield run for the entire development site would be in the order of 233.404 l/s subject to finalised plot impermeable areas.

Should the catchment areas change as the development progresses then the restricted discharge shall be revised accordingly in line with the agreed discharge parameters and revised drainage areas.

As a result of the restricted discharge, surface water attenuation will be required on site. This is to be provide in attenuation basins and the piped network. The basins are generally located adjacent to the existing watercourses and to the east of the development. Discharge would be into the watercourse/land drainage network adjacent to the basins.

Preliminary run off rates and attenuation calculations for each catchment are detailed in the DIA report 4848-JPG-XX-XX-RP-D-0621. The basins and network are subject to detailed design and further discussions with the LLFA and YW.

Exceedance routing from the attenuation basins will be provide for storm events above the design storm event of 1 in 100-year event plus climate change. Any flows generated above this event will be directed into the existing water course system in a controlled manor at unrestricted discharge rate.

For new developments, an additional allowance for climate change resulting from global warming must be applied.

The proposed allowance for climate change for this development is 40% for the 1 in 100-year event.

Where levels dictate the surface water infrastructure drainage will be a gravity system. However, some areas may need to be pumped due to proposed levels.

As mentioned above some areas to the north toward Barugh Green Road may require surface water pumping.

This would only be required if a gravity connection is not feasible or agreeable with the LLFA into the existing land drainage ditch/drain running parallel with Barugh Green Road. Further investigation of the existing land drainage system in this location will be required.

The proposed drainage infrastructure will be put forward for adoption via a Section 104 agreement where local Water Company criteria is met.

A large proportion of the site will remain unsurfaced in the form of landscaping and will not be positive drained.

It is proposed to install a network or land drainage to control the runoff from these areas and also pick up any existing land drainage features encountered during construction of the development plateaus.

A number of springs were identified towards the southern area of the site. These will be investigated further as part of the earthwork strategy and detailed land drainage design and connected up into the land drainage system, as necessary.

It was agreed with the LLFA that discharge from the proposed land drainage system could be unrestricted into the existing water course system and was spread out around the catchment and not all directed to one location where possible to do so.

The LLFA also stipulated that once development plateaus have been formed a system of temporary drainage would need to be installed to deal with run off from undeveloped plateaus. This system should remain in place until such a time they are developed.

Controlling of the runoff and suitable silt collection would be required with final discharge connected into the proposed land drainage system or directly into the water course.

The appointed contractor would need to produce the temporary plateau drainage design in conjunction with their proposed earthworks strategy, phasing and method of working.

In summary, if surface water discharges are limited to greenfield runoff rates and excess flows balanced in line with the above principles, flood risk from surface water flows from the proposed scheme can be taken as low.

6.3 Foul Water Drainage

Preplanning enquiry and predevelopment discussions have been carried out with Yorkshire Water. Responses from these can be found in the DIA report 4848-JPG-XX-XX-RP-D-0621.

YW confirm the closest practicable point of discharge for foul will be the 600dia. combined public sewer in Barugh Green Road. At present it does not have adequate capacity available to accommodate the anticipated foul water discharge from the proposed site.

Subject to the submission of a Formal Planning Application Yorkshire Water will look to carry out a feasibility study to determine available capacity in the public sewer network together with timescales for any potential upgrading works required.

All cost will be borne by Yorkshire Water up-front and recouped via the Infrastructure Charges at a later date.

A detailed schedule of the build out programme including time scales and start dates when various element would come online will need to be provide by the developer when submitting the formal planning statement.

Based on Yorkshire Water comments discharge for the foul water from the site would be unrestricted into the 600dia. combined public sewer.

Where levels dictate the foul water infrastructure drainage will be a gravity system. However, some areas will need to be pumped due to the proposed levels.

The proposed drainage infrastructure will be put forward for adoption via a Section 104 agreement where local Water Company criteria is met.

High level foul water calculations have been produced and these can be found in the DIA report 4848-JPG-XX-XX-RP-D-0621.

These calculations are based upon 1760 dwellings and up to 43 hectares of employment land understood to equate to 127,091 sqm of employment floorspace plus a new primary school. Note final numbers of dwelling and floor space will be subject to detailed planning application for the individual elements.

A summary of the anticipated flow rate is detailed below.

Residential development	= 81.483 l/s design foul flow.
Commercial development	= 14.814 l/s design foul flow.
Schools	= 2.567 l/s design foul flow.
Total design foul water flow	= **98.864 l/s** design foul flow.

The calculations are based upon Sewer for Adoption methodology and design foul water flow 6xDWF+10%. Thus, 1xDWF would be **14.830 l/s**.

It is considered that discharge would not have any impact on the off-site foul drain/sewer network as this would be upgraded by Yorkshire Water to accommodate the anticipated flows.

7.0 CONCLUSIONS

This assessment has looked at the flood risk issues to support a planning application for a proposed mixed-use development at Barnsley West.

This report should be read in conjunction with the Drainage Impact Assessment report 4848-JPG-XX-XX-RP-D-0621.

The site is located within Flood Zone 1 and NPPF Technical Guidance states that residential and Industrial/Commercial uses are considered Less Vulnerable in terms of flood risk and are appropriate in Flood Zone 1.

This report has considered all potential sources of flood risk at the site and concluded these to be low for all sources.

On site ground investigation has been carried out and confirm the site is mixed underlaying material consisting of rock, cohesive and fill material which would be unsuitable for infiltration drainage methods on this site. A high-level description is in section 5.3 for the three main areas.

Based on drainage hierarchy the most appropriate location for discharge of surface water from the development would be into an onsite watercourse and land drainage ditch system.

Where levels dictate the surface water infrastructure drainage will be a gravity system. However, some areas may need to be pumped due to the levels.

Surface Water Discharge from the site will be restricted to greenfield run off rate of 3.900 l/s for all storms up to the 1 in 100-year event plus climate change.

Attenuation storage will be provided on site in attenuation basins and the pipe network.

Foul water drainage will discharge into the existing off-site 600 dia. combined water public sewer in Barugh Green Road at unrestricted discharge with YW upgrading the existing off site network to accommodate the anticipated flows.

Where levels dictate the foul water infrastructure drainage will be a gravity system. However, some areas will need to be pumped due to the levels.

No works are proposed which would suggest that flooding will be made worse on adjacent land as a result of the development.

Overall, this report demonstrates that the flood risk to the development is reasonable and acceptable.

Appendix A Site Location Plan

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DO NOT SCALE

NOTES

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP IS TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.

KEY:

DENOTES APPROXIMATE LOCATION OF SITE.

SITE INFORMATION

SITE ADDRESS - HERMIT HOUSE FARM, HERMIT LN, HIGHAM, BARNSLEY
NEAREST POSTCODE - S75 2RW
OS SHEET/TILE - SE317073
OS CO-ORDINATES - E431762, N407312

REV	DESCRIPTION	DATE	BY
P01	FIRST ISSUE.	27.03.20	LSG

Project
BARNSLEY WEST
BARNSLEY

Drawing Title
SITE LOCATION PLAN

INFORMATION ISSUE

Architect
BOND BRYAN

JPG
www.jpg.group
Leeds London Birmingham 0113 263 1155

JPG Project Ref	Scale at A1	Date	Checked	Drawn
4848	1:10000	27.03.20	JDM	LSG

4848 - JPG - SW - XX - DR - D - 1450 | S2 | P01

Appendix B Topographic Survey

Appendix C Yorkshire Water Sewer Records

431603 : 406735	Map Name : SE3005NE	Title
	Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : YorMap Advisor C ROBERTS Contact Tel : 87 2582	Notes

Partial Key
Foul Sewer = F
Combined Sewer = C
Surface Water Sewer = SW
Trade Sewer = TD
Partially Separate = PS

This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.

Date Req : 03/02/2021, 09:19:59
Date Gen : 03/02/2021, 09:21:07
Source : Sewer Network Enquiry

UPN: Undefined
Originator: C ROBERTS, YorMap, 87 2582

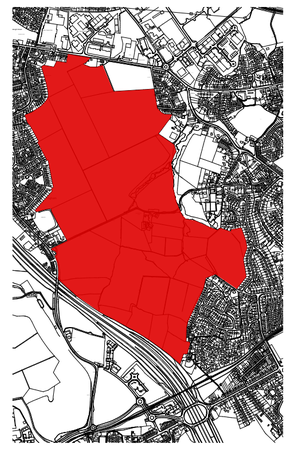
Appendix D Proposed Site Layout Plan

This document is © Bond Bryan Architects Ltd.
If in doubt ASK. Drawing measurements shall not be obtained by scaling. Verify all dimensions prior to construction.
Immediately report any discrepancies on this document to the Originator. This document shall be read in conjunction with associated models, specifications and related consultants' documents.

Native model: 19028-BBA-ZZ-ZZ-M3-A-0002_Site Model_Reshared_A

North

Key Plan



Site Area: 116.50 ha

Key

- Local Plan Boundary
- Private Garden
- Public Landscape
- Highway - Roads & Side Walk
- Homezone
- Formal Play
- Informal Play
- Existing Pedestrian Access
- Proposed Pedestrian Access

1 Commercial
2 School
3 Employment Zone

0 20 40 60 80 100 120m
1:2500

Note:
The drawing is based upon survey information provided by others, no guarantee of its accuracy can be given

rev	description	drawn	checked	date
P04	Consultation issue.	YF	TR	10/05/21
P03	Revised layout to suit proposed levels	AG	TR	11/09/19
P02	Consultation issue	AG	TR	12/08/19
P01	First issue	AM	TR	02/08/19

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w www.bondbryan.co.uk

Strata Sterling Barnsley West Ltd

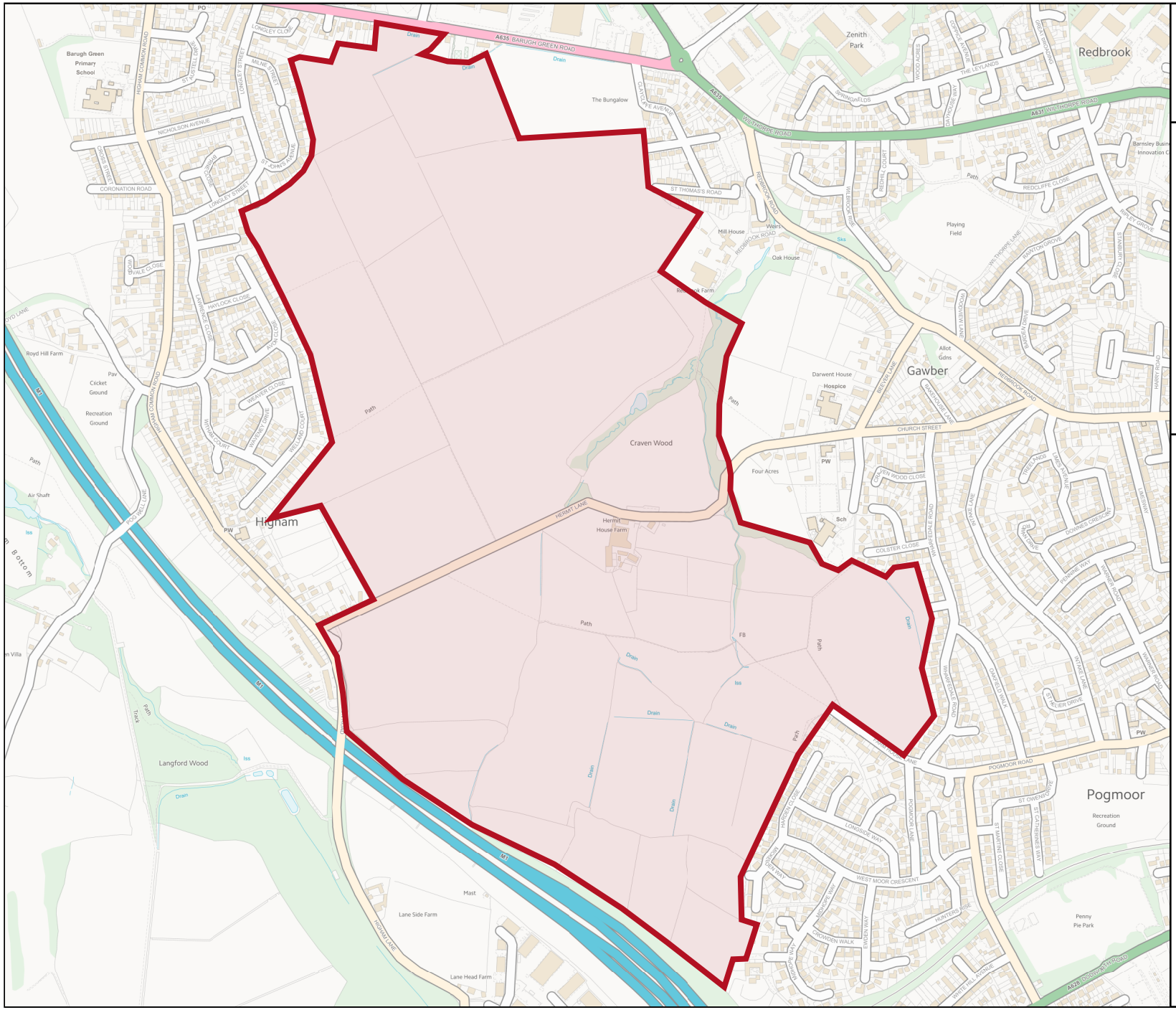
Barnsley West Masterplan

Proposed Site Plan

Originator project ref **19028**	Purpose of Issue **CONSULTATION**
Scale(s) **1:2500**	Status **S2 SUITABLE FOR INFORMATION**
Paper size **A1**	Revision **P04 PRELIMINARY**

project	originator	volume	level	type	role	number	status	revision
BWM	BBA	ZZ	XX	DR	A	1004	S2	P04

Appendix E Environment Agency Flood Mapping



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
431846/407078

Scale
1:10000

Created
16 Dec 2020 15:58

- Selected area
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 100 200 300m

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