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architecture : engineering : building consultancy

CAPITOL PARK – PHASE 2, BARNSLEY, SOUTH YORKSHIRE

CARNELL MANAGEMENT SERVICES LTD

DRAINAGE ASSESSMENT

11933-WMS-ZZ-XX-RP-39201-S8-P1

JUNE 2019

DOCUMENT CONTROL

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Contract: Capitol Park – Phase 2, Barnsley, South Yorkshire

Document Title: Drainage Assessment

Our Ref: 11933-WMS-ZZ-XX-RP-39201-S8-P1

Prepared by: W. P. Dixon BSc (Hons) MSc FGS **Date:** June 2019

RECORD OF AMENDMENTS TO DOCUMENT

Ref	Description	Date

Verified by: Chris Melton IEng MCIHT MICE MIHE **Date:** June 2019

William Saunders is the trading name of Wm. Saunders Partnership Limited Liability Partnership which is registered in England and Wales (Registration Number OC308323). The Registered Office is Sheppard Lockton House, Cafferata Way, Newark on Trent, Nottinghamshire. NG24 2TN. The Partners are the Members of the LLP.

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1.0 INTRODUCTION

William Saunders have been commissioned by Carnell Management Services Ltd to prepare a Drainage Assessment to support a light industrial development at Capitol Park, Barnsley.

2.0 PROPOSED DEVELOPMENT

2.1 Site Location

The site consists of the south-eastern plot of the Capitol Park complex, Dodworth, Barnsley. The plot entrance is south of the end of Capitol Court.

The site is approx. 160m north of Dodworth and 2.5km west of Barnsley centre. The M1 Junction 37 slip road is approx. 45m north-east and a rail line is present immediately beyond the southern boundary.

The site is approximately 1.15 hectares in area. The National Grid Reference for the site is 431948E, 406009N or SE319060, the postcode is S75 3TZ. A location plan and proposed site plan are given in Appendix A.

2.2 Site Description

The development site comprises undeveloped, levelled plot on the business park. The site has been recently part surfaced in compressed hardcore and used as a construction site car park.

Existing business units are present on the rest of Capitol Park, to the north is a similar light-industrial development, to the north-west a large office block with larger warehousing/distribution units beyond. South of the site beyond the rail line is a hotel.

The site lies at around 149m AOD and is almost flat apart from a linear mound of <0.5m towards the centre of the site. The eastern and southern boundaries rapidly fall away from the general site level (up to 2.7m and generally 4m respectively), the western boundary rapidly rises by around 2m to meet the road level at the adjacent roundabout on Whinby Road.

2.3 Development Proposals

The proposed development comprises the construction of 2 light industrial units and associated external works, for an indicative plan see Appendix B.

3.0 FLOOD RISK

3.0.1 A site-specific flood risk assessment has been written by William Saunders as the site is over 1 hectare in area.

3.1 Fluvial Flooding

3.1.1 The closest surface water feature is a drain approx. 300m to the west, this watercourse along Higham Lane is at the eastern base of a localised hill and has a very small catchment. Initially it trends NW-SE but changes course to flow away from the site towards Whinby Road where is it taken southwards by an extended culvert.

3.1.2 The Environment Agency's Flood Map for Planning, Appendix C, indicates that the entire site is located within Flood Zone 1 (annual probability of river or sea flooding of less than 1 in 1000 (<0.1%)).

There are no areas of Flood Zone 2 (annual probability of river flooding of between 1 in 100 and 1 in 1000 (0.1 - 1%) or Flood Zone 3 (annual probability of river flooding of greater than 1 in 100 (>1%) within 1km of the site.

3.2 Pluvial Flooding

3.2.1 According to Environment Agency mapping the entire site is indicated to be at very low risk of pluvial flooding (<0.1% annual probability of occurrence), Appendix C.

3.2.2 Existing off-site pluvial risk is generally very low (<0.1% annual probability of occurrence) in the vicinity of the site. An area of low (0.1-1% annual probability of occurrence) to medium (1-3.3% annual probability of occurrence) risk is indicated in the carriageway of Capitol Court north-west of the site's entrance, the depth is indicated to be up to 300mm in a 1 in 1000-year event. It is considered that off-site areas do not add to the flood risk at the site.

3.3 Groundwater Flooding

3.3.1 British Geological Survey data indicates the site is split between being classified as not susceptible to groundwater flooding and having a limited potential for groundwater flooding to occur.

3.3.2 Borehole records from a ground investigation for the initial Carnell Management Services development on Capitol Park cover the area to the north with the boundary of the investigation being the northern boundary of this site. Groundwater was not encountered in standpipes

which were sunk to 5m bgl and monitored for 3 months. 5 rotary boreholes were sunk to 20-22m bgl and did not encounter groundwater.

3.3.3 It is considered that the risk of groundwater flooding to the surface and shallow sub-surface structures is very low.

3.4 Reservoir Flooding

3.4.1 Environment Agency data indicates the site is not at risk of reservoir flooding.

4.0 DRAINAGE STRATEGY

4.1 Foul Drainage

4.1.1 The development is anticipated to produce foul discharges of a domestic nature only.

4.1.2 A pre-development enquiry was sent to Yorkshire Water, existing public sewer records were received with the response as well as a Section 104 plan, Appendix D. Yorkshire Water records indicate the presence of:

- A 150mm diameter public foul sewer in Capitol Court.
    - A Section 104 plan supplied by Yorkshire Water indicates the presence of a stub within the site entrance which connects to the 150mm diameter foul sewer.

4.1.3 Yorkshire Water's pre-development enquiry response, Appendix D, confirms a foul discharge can be accommodated in the 150mm diameter foul sewer in Capitol Court.

4.1.4 The topography of the site and the depth to invert level of the foul manhole and stub suggest a gravity discharge will be achievable from all areas of the site.

4.1.5 The preliminary drainage layout can be seen in Appendix F.

4.2 Surface Water Drainage

4.2.1 Discharge to Infiltration

In accordance with requirement H3 of the Building Regulations 2000 all possible options for disposal of surface water have been considered using the preferred hierarchy i.e.

- Soakaways
- Infiltration
- Watercourse
- Sewer

British Geological Survey 1:50,000 scale mapping indicates the bedrock beneath the site is comprised of mudstone, siltstone and sandstone of the Pennine Middle Coal Measures Formation (Carboniferous). A wedge-shaped deposit of sandstone of the Haigh Moor Rock may be present in the central north-western area of the site. No superficial deposits are present, Appendix E.

Borehole records from a ground investigation for the initial Carnell Management Services development on Capitol Park cover the area to the north, with the boundary of the investigation being the northern boundary of this site. These boreholes indicate the presence of firm clay or gravelly made ground over extremely weak, highly weathered mudstone, in places the mudstone was directly beneath topsoil. Groundwater was not encountered in standpipes which were sunk to 5m bgl and monitored for 3 months.

The anticipated ground conditions are not considered suitable for infiltration drainage. The sewers in Capitol Court were designed and constructed specifically for development of this plot and the surrounding plots, carrying out infiltration tests is not considered necessary.

4.2.2 Discharge to Watercourse

The closest watercourse is a drain approx. 300m to the west. Initially it trends NW-SE but changes course to flow away from the site towards Whinby Road where is it taken southwards by an extended culvert. A surface water discharge to this watercourse is not considered to be feasible due to the large distance and third-party land between the watercourse and the site.

4.2.3 Discharge to Sewer

A pre-development enquiry was sent to Yorkshire Water, existing public sewer records were received with the response, Appendix D. Yorkshire Water records indicate the presence of:

- A 450mm diameter public surface water sewer in Capitol Court.
  - Along Capitol Court this is 450mm diameter becoming 525mm before the roundabout, between the roundabout and the junction with Capitol Close this becomes 750mm diameter. It then becomes 900mm diameter as it enters the existing junction to the south-west of Capitol Close, then 1050mm before entering a box culvert. The outlet of the box culvert is a 1050mm pipe which is reduced to 225mm before entering the surface water sewer in Whinby Road.
  - A Section 104 plan supplied by Yorkshire Water indicates the presence of a stub within the site entrance which connects to the 450mm diameter surface water sewer, the allowable impermeable catchment area to the stub is 7725m^2.

Yorkshire Water's pre-development enquiry response, Appendix D, confirms that a surface water discharge can be accommodated in the 450mm diameter public surface water sewer at a maximum discharge rate 107l/s. Any exceedance of this rate is to be attenuated on site.

The on-site drainage system should be designed so that a 1 in 30-year flood is contained beneath the ground with no flooding and a 1 in 100-year event (accounting for climate change) is contained within the site with no flooding to the built environment.

The on-site drainage system will consist of a series of gullies and/or channel drains, the location of these is to be determined alongside a detailed levels strategy.

4.3 Connection to Public Sewer

Surface water and foul connections to the public sewer would each require Section 106 applications to be completed.

Yorkshire Water have stated that surface water run-off from communal parking (greater than 800m^2 or more than 50 car parking spaces) and hardstanding must pass through an oil, petrol and grit interceptor/separator of adequate design before any discharge to the public sewer network.

4.4 Allowable Discharge Rate

As mentioned in section 2.2, Yorkshire Water have stated in their pre-development enquiry response that the surface water discharge should be restricted to a maximum rate of 107l/s.

4.5 Attenuation Volumes

The attenuation requirement for the design storm is to be confirmed though detailed design. Attenuation volumes are to be based on the proposed impermeable area of 0.86ha and a maximum discharge rate of 107l/s with climate change accounted for in accordance with the requirements of Table 2 of the NPPF-PPG.

The following attenuation requirements have been calculated from a quick storage estimate carried out on Micro Drainage:

Storm Return Period	Attenuation Requirement (m^3)
1	0 – 21
30	27 – 109
100	63 – 167
100+40%	131 - 272

Table 1. Quick storage estimate attenuation volumes.

Attenuation is to be provided within the below ground network for the 1 in 30-year return period with consideration for additional attenuation volumes within the network to minimise any flooding to an acceptable level for the 1 in 100-year (plus climate change) return period event.

4.6 Drainage Strategy

In order to reduce the run off from the developed site and accommodate future climate change, the detailed design of the surface water drainage system will need to include the following: -

- Attenuation
  - Attenuation will be required for the roof and service yard areas. This is to be provided in the form of a below ground storage tank.
- Flood Flow Routes
  - To address the residual risks of surface water flows and potential infrastructure failure, flow routes for such waters are to be analysed and demonstrated to not present a hazard to the development or adjacent properties.

- Plot Level

  - Finished floor levels are to be set to 150mm above the proposed external ground level to mitigate the risk from surface water flooding. Ground levels should be profiled to direct surface water away from the built environment.

The proposed drainage layout can be view in Appendix F.

Private drainage should be designed in accordance with part H of the Building Regulations. The connections to the public sewers should be designed in accordance with Yorkshire Water's guidance and will require a S106 application.

5.0 CONCLUSIONS

5.1 The proposed development is within EA Flood Zone 1, is at very low risk of pluvial flooding and is not at risk of reservoir flooding, a separate Flood Risk Assessment has been produced by William Saunders.

5.2 Ground conditions are considered unsuitable for surface water to be discharged. There is a large area of third-party land between the site and the nearest watercourse.

5.3 There is an existing 450mm diameter public surface water sewer in the carriageway of Capitol Court to the north of the site entrance. A surface water discharge can be accommodated in the surface water sewer at a maximum rate of 107l/s. A final connection is to be confirmed with Yorkshire Water.

5.4 There is an existing 150mm diameter public foul sewer in the carriageway of Capitol Court to the north of the site entrance. A foul discharge can be accommodated in the foul sewer at an unrestricted rate. A final connection is to be confirmed with Yorkshire Water.

5.5 The surface water runoff generated by the proposed development will be managed in a manner which will ensure no risk of flooding or increased risk to surrounding properties, at present and considering allowances for future climate change.

5.6 The residual risks from surface water flooding will be addressed by consideration of flood flow routes through the development.

APPENDIX A

Site Location Plan

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Cafferata Way, Newark-on-Trent, Nottinghamshire NG24 1BQ
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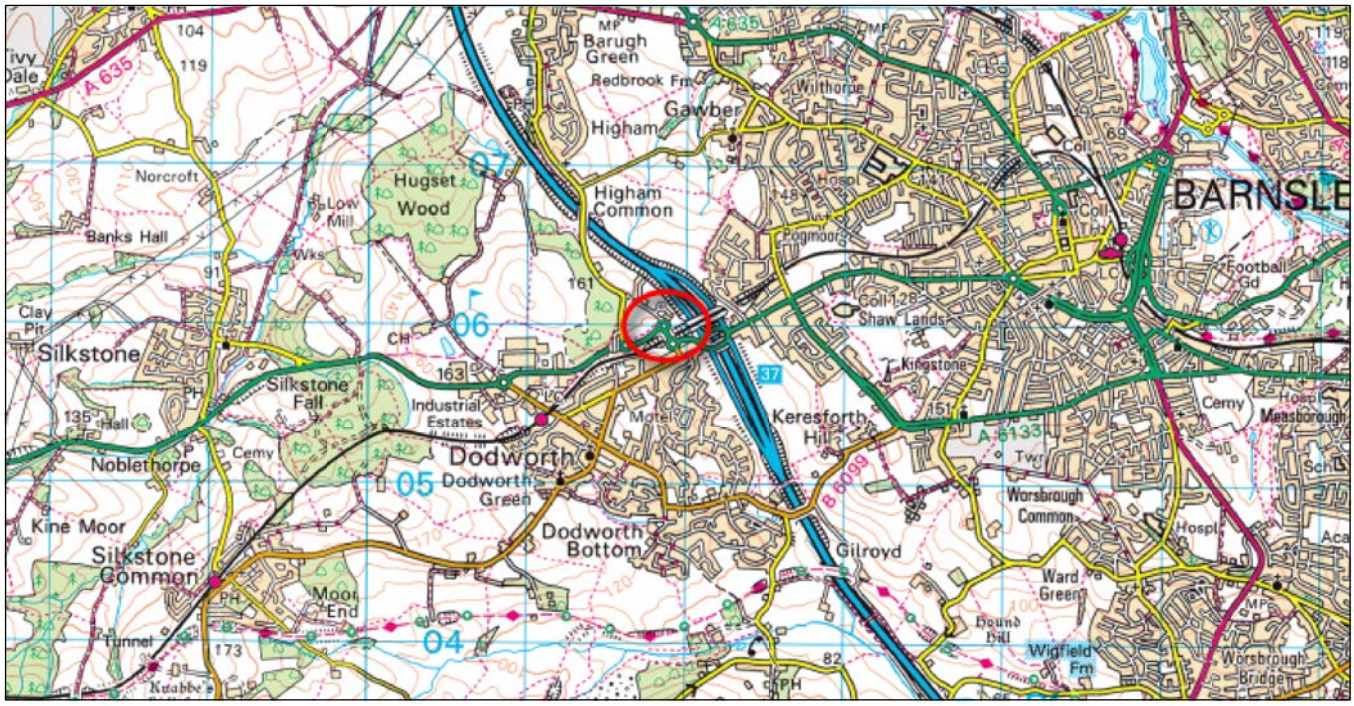
NOT TO SCALE



SCALE 1:50000

NGR: 431948, 406009

In accordance with CDM Regulations 7, 11 and 18, any significant risks (as defined in the Approved Code of Practice paragraph 133) relating to the design features shown on this drawing have been identified and are annotated thus: !

☒ No significant risks have been identified.

☐ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.

Refer to the current Designer's Risk Assessment sheets for further details.

Designer's Signature		Date	
Rev.	Description	Vf'd	Date
1 -	Initial Issue	AG	April19
2			
3			

Project	Capitol Park Phase 2, Barnsley
Client	Carnell Management Services Ltd
Title	Site Location
Drawing Status	Information

Project Ref.	Drawn	Date	Scale
11933	WD	Apr 19	As shown @A4

Drawing/Document Reference
Project Originator Zone Level Type Role Number Status Rev.
11933-WMS-ZZ-XX-DR-C-30001-S1-P1

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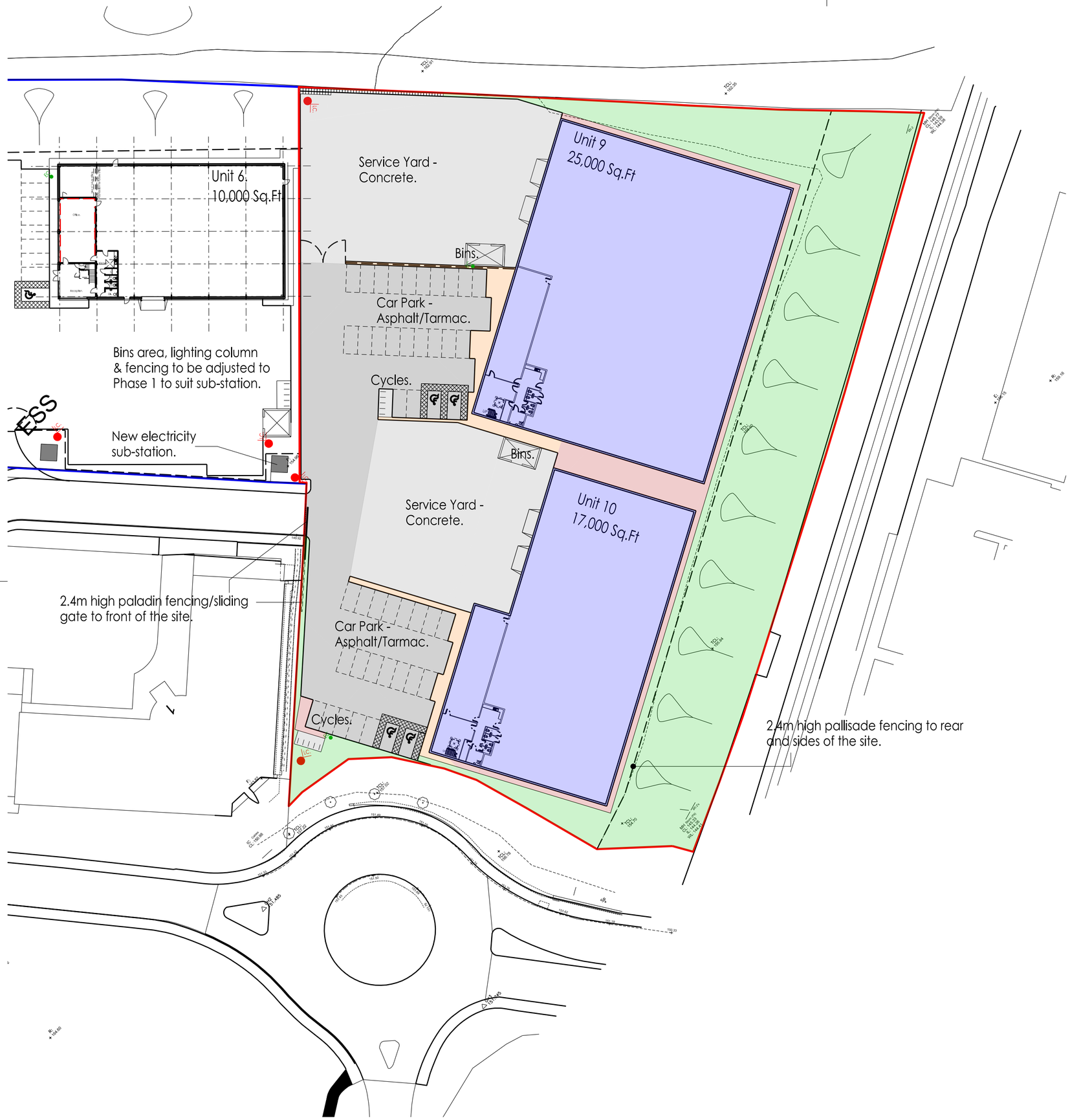
APPENDIX B

Development Proposals



Service Yards/ Bin Store/ Cycle Parking
Concrete, brush finish with trowelled margins.

Car Park Areas/ Roadway
Asphalt or Tarmacadam, to suit use by articulated vehicles.

Footways to Front of Units
Oakdale Centurian paving
300 x 300mm - 1500mm wide path.

Footways to rear of Units
Pre-cast concrete paving slabs - 1200mm wide path.

Grass / Soft Landscape
Refer to consultants drawing for soft landscaping layout

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This drawing is subject to Building Regulations Approval.

Site plan and extent of site based on topographical survey by Greenhatch Group, drawing no. 33114_T, Rev 0.

Building Areas are footprint areas.

Rev	Description	Drn	Vf'd	Date
P1	Issued to Planning.	SW	SW	06/19

As outlined in section 2.3 of the CITB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8, 9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus: [!]

☒ No significant risks have been identified.

☐ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.

Refer to the current Designer's Risk Assessment sheets for further details.

Designer's Signature SW Date 06/19

Drawing Status
PLANNING

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Also at Leeds, Lincoln, Wirksworth

Project
Proposed Development,
Capitol Park, Dodworth.
Phase 2.

Client
Carnell Management Services Ltd.

Title
Proposed Site Plan - Surfacing.

WmS Project Ref.	Drawn	Date	Scale
11933	SW	June 2019	1:500 @ A2

Drawing/Document Reference

Project	Originator	Zone	Level	Type	Role	Number	Status	Rev.
11933	WMS	ZZ	ZZ	DR	A	**10012**	**S8**	**P1**

APPENDIX C

Environment Agency

Flood Map for Planning & Pluvial Flood Risk Map

williamsaunders

Flood map for planning

Your reference	Location (easting/northing)	Created
11933	**431961/406007**	**3 May 2019 4:39**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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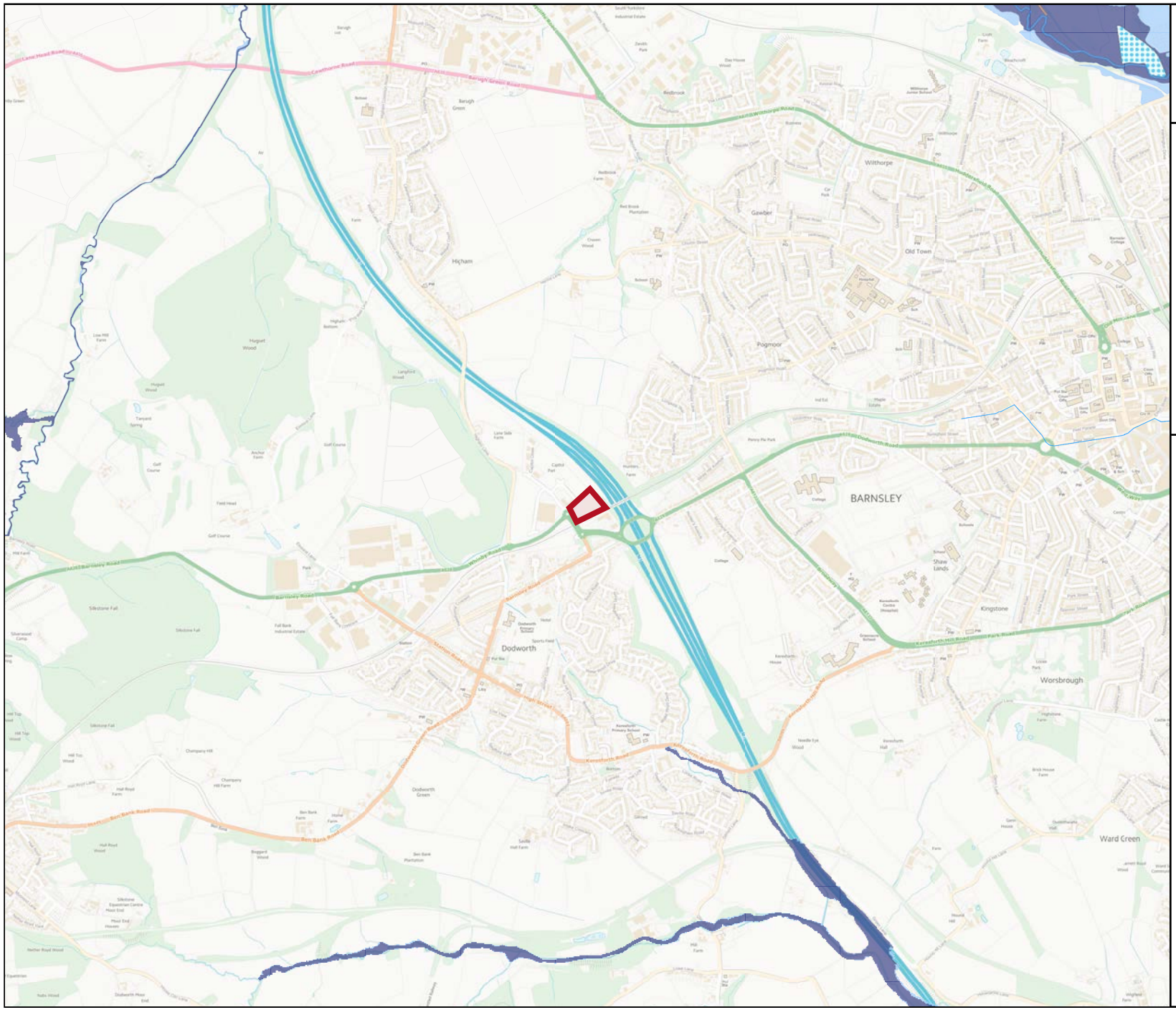
https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/



Environment Agency

Flood map for planning

Your reference
11933

Location (easting/northing)
431961/406007

Scale
1:25000

Created
3 May 2019 4:39

- 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

0 200 400 600m

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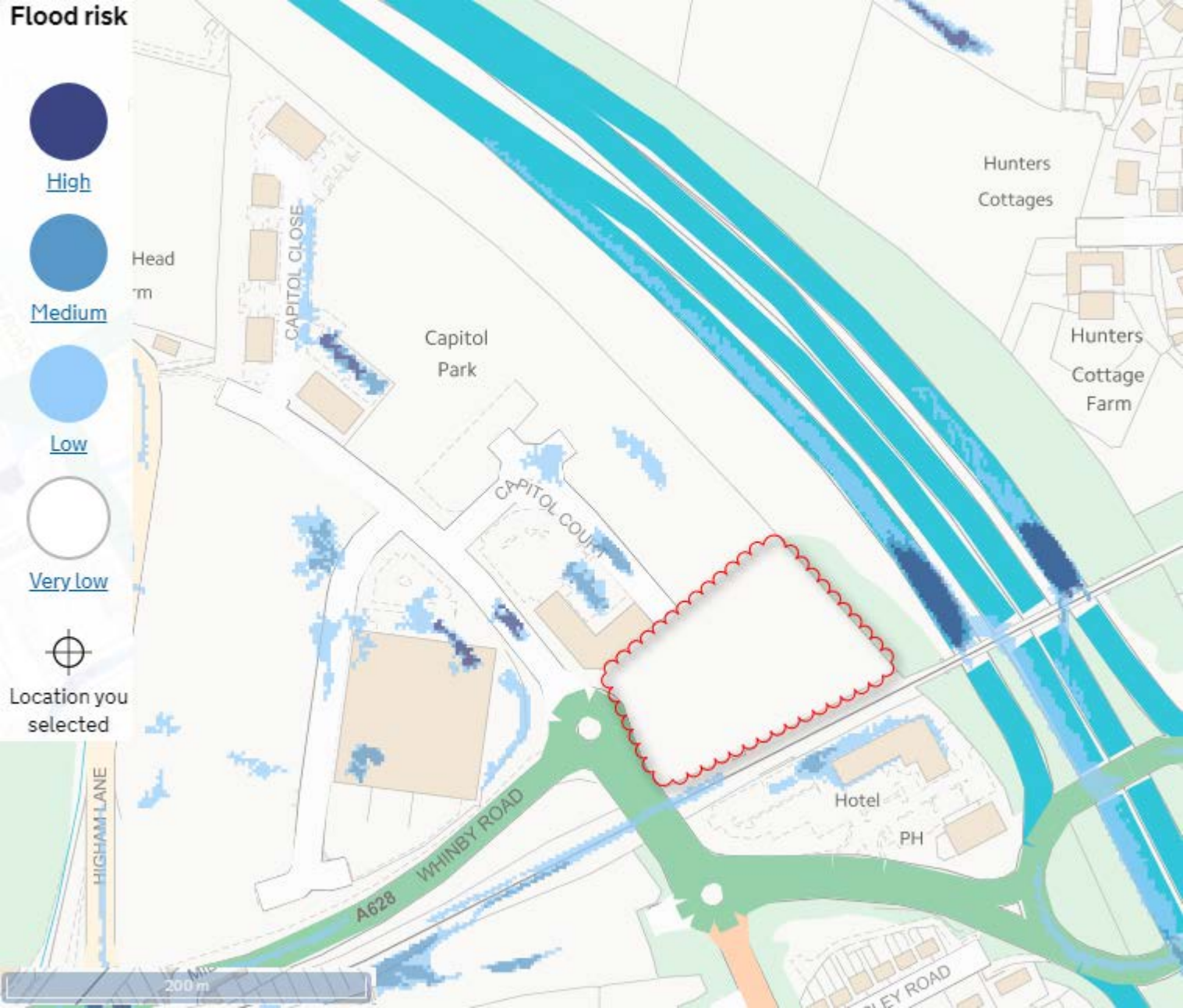

Flood risk
High
Medium
Low
Very low
Location you selected
Head
CAPITOL CLOSE
Capitol
Park
CAPITOL COURT
Hunters
Cottages
Hunters
Cottage
Farm
Hotel
PH
WHINBY ROAD
A628
HIGHAM LANE
200 m

APPENDIX D

Yorkshire Water

Pre-Development Enquiry Response, Sewer Records & Correspondence

williamsaunders

YorkshireWater

Mr W Saunders
William Saunders
Sheppard Lockton House
Cafferata Way
Newark
Notts
NG24 2TN

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:
Our Ref: V007166

13th May 2019

Dear Mr W Saunders,

Land Off Capitol Court, Dodworth, Barnsley, S75 3TZ - Pre-Planning Sewerage-Enquiry-Industrial T397891

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.

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

Foul water domestic waste should discharge to the 150 mm diameter public foul sewer recorded in Capitol Court, at a point to the north of the site.

Foul water from kitchens and/or food preparation areas of any restaurants and/or canteens etc. must pass through a fat and grease trap of adequate design before any discharge to the public sewer network.

Surface Water

As previously agreed curtilage surface water may discharge to the 450 mm diameter public surface water sewer recorded in Capitol Court, at a point to the north of the site. The surface water discharge from the site to be restricted to not greater than 107 (one hundred and seven) litres/second. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.

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

The surface water discharge from the site to be restricted to not greater than 107 (one hundred and seven) litres/second or the area of 7725m2. This permission is not an acceptance in respect to any planning conditions imposed under the Grant of Planning Permission.

YorkshireWater

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

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

Other Observations

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

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

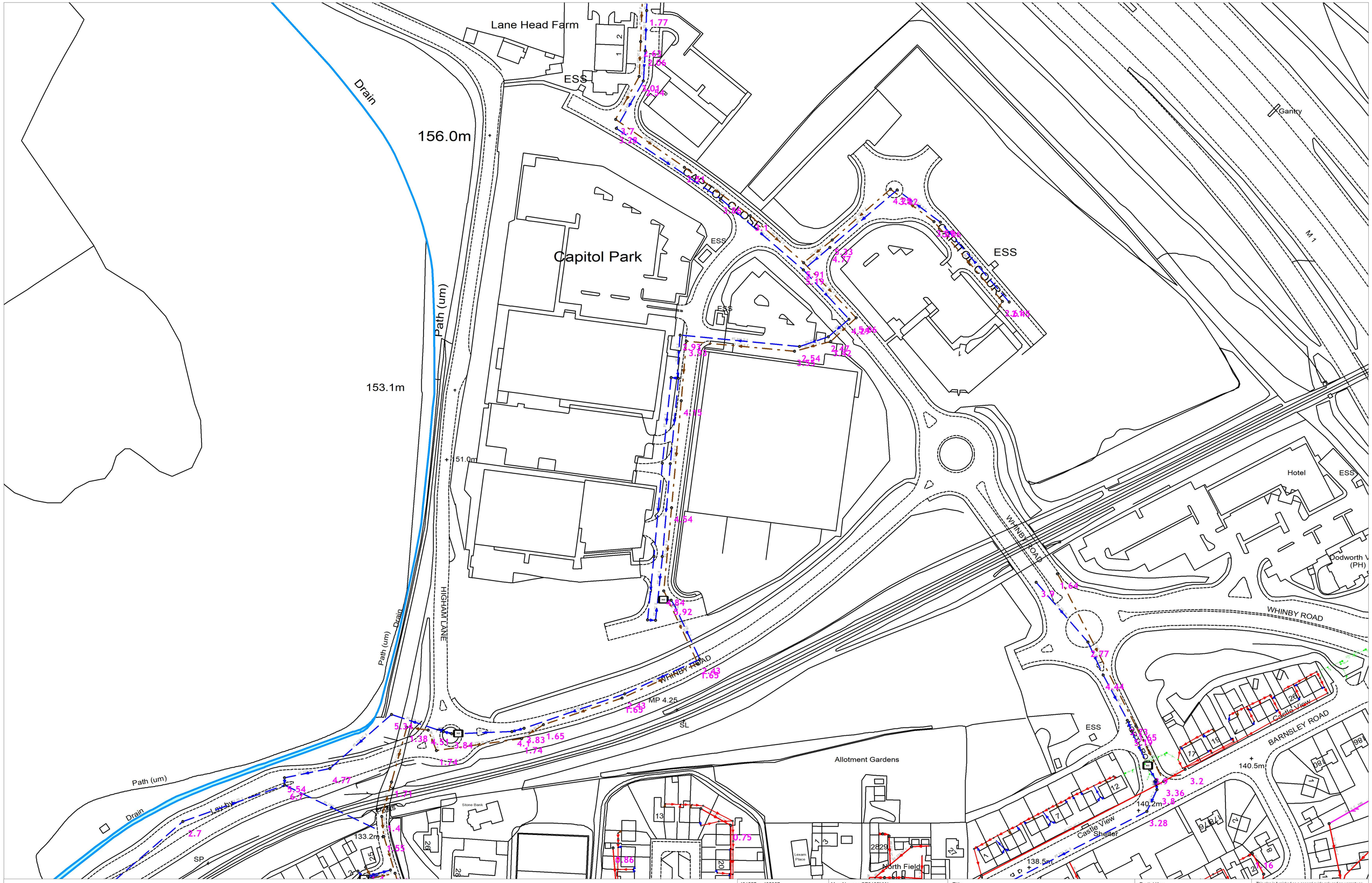
An off-site foul and surface water sewer may be required which may be provided by the developer and considered for adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able 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.

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

Yours sincerely

Chris Roberts
Sewerage Technician
Developer Services



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		(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2014. All rights reserved Ordnance Survey Licence number 100022432	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 : 13/05/2019, 08:09:29 — Date Gen : 13/05/2019, 08:11:33
			Source : Sewer Network Enquiry

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