Technical Note

Project: Manor Grove, Royston, Barnsley

Client: NPS Group

Date: 15.02.2018

Reference: 40234_TEN02

By: Dave Last

Checked: Tom Wilkinson

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1. Introduction

A residential development comprising the construction of 4 properties on a brownfield site has been proposed off Manor Grove, Royston, Yorkshire. Alan Wood & Partners have been commissioned to provide a drainage statement by way of a technical note to consider the drainage elements for the proposals.

2. Sources of Information

The information collected to assess the existing and proposed drainage is derived from a number of sources, which are summarised below:

- General mapping of the site and wider vicinity, from free issue sources
- Topographic survey
- Yorkshire Water Services (YWS) PPE Response (ref: T017874)
- Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment (ref: 23-24-18-1-6007/DSR1)
- NPS Group proposed development details

3. Existing Site Assessment

The proposed development is situated to the west of Manor Grove to the west of Royston. The total site is approximately 2286m2 in area. The existing site is shown to have a relatively smooth surface on the topographical drawing, with a constant fall from north west to south east. At the high point to the north, ground levels are up to 72.63m AOD with the low point towards the south at a level of 70.78m AOD.

The site is shown to be a grassed site, however it is classed as brownfield as 2no two storey buildings were demolished between 2002 and 2008, however, the existing drainage infrastructure remains within the site. Figure 1 below identifies the site and location. The existing site has no known existing drainage and is entirely permeable land.

Figure 1 Former Site Layout

3.1 Site Geology

A review of the British Geological Survey (BGS) information shows no recorded superficial deposits with a boundary between Sandstone (Mexborough Rock) and Mudstone (Pennine Middle Coal Measures) sat on bedrock as shown in Figure 2 below.

Figure 2 British Geological Survey Geology Map

Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment Report (Ref: 23-24-18-1-6007/DSR1) identified the site to contain firm or stiff clays derived from weathering of the mudstone bedrock with Coal Measures bedrock at Shallow depth.

3.2 Soakaway Testing

There has been no soakaway testing undertaken as part of the initial development. This testing will be required to confirm to Yorkshire Water that this is not a viable option.

Given the known ground conditions it is likely that soakaways will not prove to be a viable option.

3.3 Existing Site Run Off

The development site is shown to be a brownfield development land with no existing structures or hardstanding areas, however, existing drainage infrastructure is located within the site which has capacity for the previously demolished buildings. therefore the run off rate for the site has been calculated relative to this previous development impermeable area.

The development proposes to reduce the overall historic impermeable area within the site from an area of 776m^2, down to a proposed development area of 758m^2.

The runoff rate can be estimated by using BS EN 752 Part 4: 1998 ’11.3.2 Methods of Calculating Runoff from Small Development Schemes’, which is an applicable method for sites up to 200ha in area and is based on the following formula:

$$Q = \Psi i A$$

where: Q = Peak Runoff Rate (l/s)

Ψ = Permeability factor (1 being wholly impermeable)

i = Rainfall Intensity (l/s.ha) = 140l/s.ha for 1 in 30 year storm, 210l/s.ha for a 1 in 100 year storm

A = Area (ha)

Based on the known impermeable area, the existing run off from site has been calculated and summarised in Table 1 below.

Site Impermeable Area (m^2)	M30 Runoff Rate (l/s)	M100 Runoff Rate (l/s)
776	10.86	16.30
30% Betterment Rate	7.60	11.41

Table 1 Existing Site Run-off Rates

Given the brownfield rate for calculated above is based on the previous development impermeable area, we propose a discharge rate restricted to 5l/s as per the lowest recommended rate. This rate is subject to agreement with Yorkshire Water and has been lowered to account for an overall discussion regarding the wider development proposals within Royston.

3.4 Existing Site Drainage

Yorkshire Water sewer records indicate the presence of both surface water and foul water drainage within the site which remain live due to the adjacent developments to the north and west of the site. This drainage is also believed to have been utilised by the previous development on this site.

There is an existing 150mm diameter pipe located along the eastern boundary of the site and a 100mm diameter surface water pipe which crosses north-south through the centre of the site.

Due to their proximity to the proposed dwellings, both the existing surface and foul water drainage runs will require diversion around the proposed properties to account for the easement requirements of Yorkshire Water. Both of the diversions will be subject to S185 agreements with Yorkshire Water.

All connections into the Yorkshire Water network required by the proposed development will be subject to a S106 connection agreement.

At this stage, no further surveys have been undertaken on the network to confirm its condition, it is recommended that a CCTV be undertaken on the existing network on and around the site prior to commencing any constriction work. There are also manholes that were unable to be lifted which will require confirmation of inverts to more accurately evaluate the existing drainage.

The location and depth of the existing drainage runs within the site has been estimated from information provided by Yorkshire Water and form the topographic survey.

3.4.1 Existing Surface Water Drainage

The existing site was a development previously, but has since been cleared above ground. As per the Yorkshire Water pre development response, there is an existing 100mm diameter surface water pipe running north-south through the site.

It is believed that this network was originally installed for the previous development of the site and surrounding area, and has therefore has capacity within the network to account for the previous impermeable area on the site.

The existing pipe runs beneath he footprint of the proposed western houses on the development and will require diversion to enable the development to continue. This service will require an easement of 3.0m either side of the pipe for Yorkshire Water to gain access and maintain the infrastructure.

The surface water drainage is assumed to be able to connect into the existing Yorkshire Water surface water network within the boundary of the site.

It is anticipated that further private drainage on the surface water network will be found within the site, however, due to the location of the previous buildings on the site, this drainage is likely to be outside of the footprint of the proposed housing.

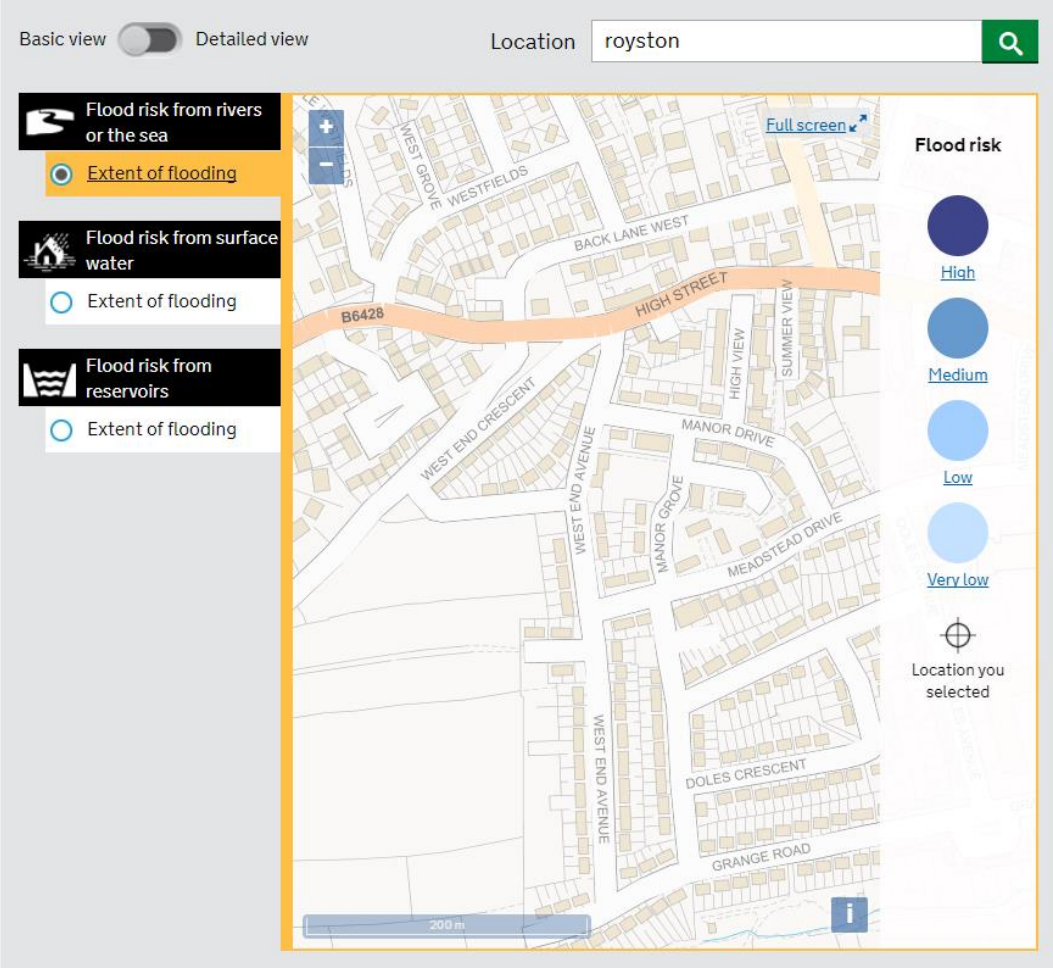


Figure 3 Environment Agency Long Term Flood Risk from Rivers and the Sea Map (August 2017)

3.4.2 Existing Foul Water Drainage

As mentioned in section 3.4 above, there is an existing Yorkshire Water foul sewer located within the eastern boundary of the site. The location of this service is crossing the south-east corner of the eastern building and will therefore require diverting to allow the development to progress and account for Yorkshire Water easement requirements. ensure is crossing the site to the south of the land.

As the site was previously developed, it is possible that further private foul drainage will be located within the site, however due to the location of the previous buildings, it is likely that any additional drainage will not be found within the footprints of the proposed buildings.

It is anticipated that the private foul drainage can be connected into the existing Yorkshire Water network within the site boundary either as part of, or once the S185 Agreement is in place.

3.5 Flood Risk

The area of proposed development is situated in in Flood Zone 1, indicating low risk of fluvial (river) flooding as indicated in Figure 3 below. Long term surface water flood risk maps produced by the Environment Agency indicate that there is no records of flooding within the site, however there is a record of low/medium risk of surface water flooding in the road to the east of the development as indicated in Figure 4 below.

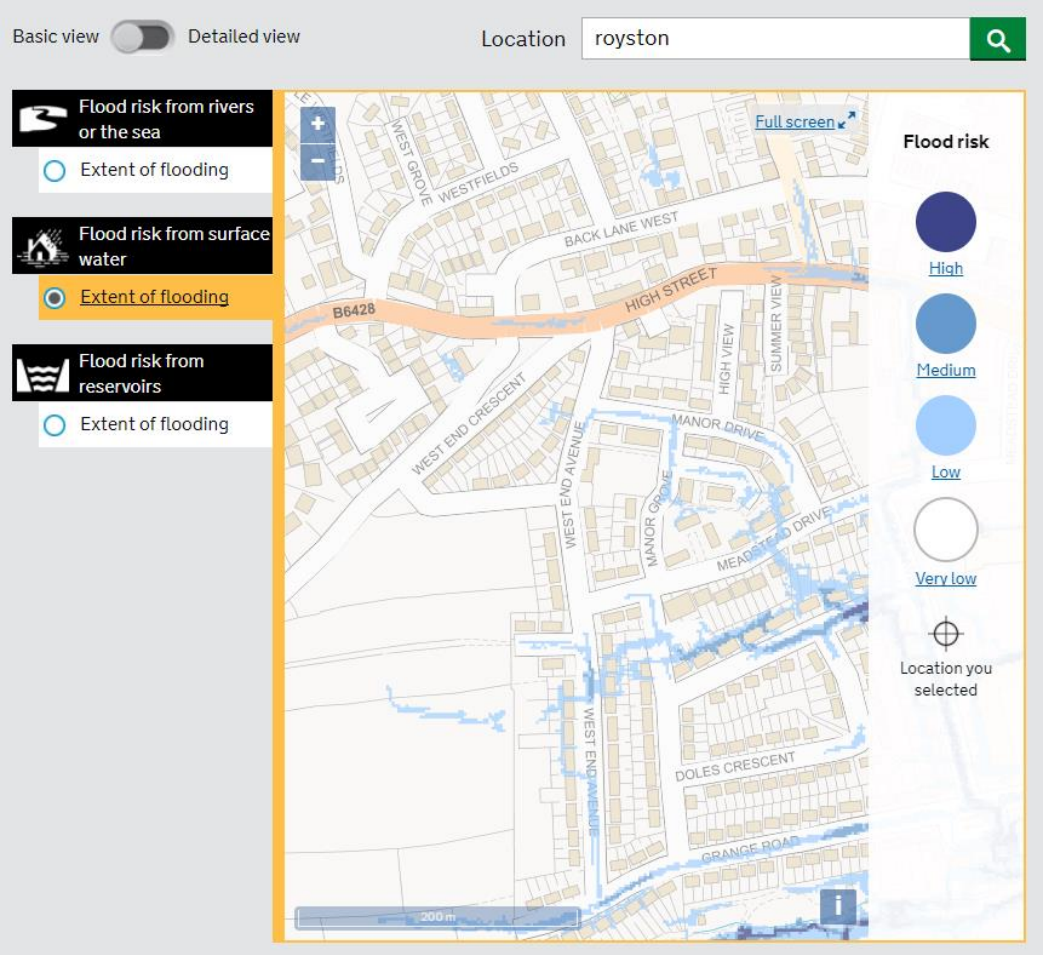


Figure 4 Environment Agency Long Term Surface Water Flood Risk Map (August 2017)

4. Proposed Development

The proposed development comprises the construction of 4 new residential properties, off street parking, an access road to the properties and associated infrastructure. A new separate surface water and foul water drainage system is proposed in order to suitably drain the development. An indicative drainage layout is enclosed in Appendix B.

Information provided within the Yorkshire Water Pre-Planning Enquiry (ref:T017874) has identified that that an unrestricted foul water connection is acceptable.

The Pre-Planning Enquiry also highlights that the public surface water sewer network will accept discharge that matches the existing site discharge less a 30% reduction. A copy of the PPE response can be found in Appendix D.

As outlined in section 3.4, there are both existing surface and foul water networks within the bounds of the site which will require diversion within the proposed development to enable construction of the properties. Both diversions will require S185 agreements to be in place prior to commencing development of the housing and on the site.

4.1 Foul Drainage

A new foul water drainage system is required to serve the proposed 4 new properties. Yorkshire Water have confirmed that foul water flows can discharge into the existing YWS foul water sewer network. It is proposed that foul water drainage waste should discharge to the 150mm diameter public combined sewers running along the eastern boundary of the site.

Based on Sewers for Adoption 7 guidance of 4000 litres/dwelling/day, average foul water flows from the site will be **0.19 l/s**, assuming a peak factor of 6, the resultant peak flow from the site would be **1.11 l/s**.

4.2 Surface Water

In accordance with UK Building Regulations H3 SUDS guidance, the method of discharge of surface water from the site has been considered in the order of preference:

- Discharge to the Ground
- Discharge to a Watercourse
- Discharge to a Public Sewer

Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment (Ref: 23-24-18-1-6007/DSR1) shows the site to grey mudstone, siltstone, pale grey sandstone overlaying bedrock. At this stage no soakaway testing has been completed but this will be required to confirm viability to Yorkshire Water.

Infiltration testing has been completed within the site and indicates that soakaways are not a viable option for the site.

Therefore the development will require connection into the Yorkshire Water network which, pending receipt of confirmation above, is anticipated to be accepted.

For either of the above options, flow restriction from the site will be required by means of a flow control manhole (Hydrobrake or similar approved). The volume of storage required will be dictated by Land Drainage Authority / Internal Drainage Boards / Yorkshire Water.

Further liaison is required with Yorkshire Water to confirm the final discharge from the site. Due to the nature of this development and sites elsewhere in Royston (refer to: Meadstead Avenue – 40234 – TEN01, Manor Grove – 40234 – TEN02 and West End – 40234 – TEN 04). Further liaison is required to confirm an overall discharge philosophy within Royston in order to achieve an amicable solution for all the developments.

5. Conclusion and Recommendations

Existing Environment Agency flood maps indicate that the proposed development site lies within Flood Zone 1. Long term surface water flood risk maps indicate that the development is not at risk of surface water flooding. Based on the above information, the risk of flooding to the development is believed to be low and acceptable.

There is both an existing Yorkshire Water surface and foul water network on the site. Due to their location, both of these will require diversion of the existing infrastructure under a S185 agreement.

Based on the drainage assessment undertaken, it is assumed that there is a current foul water drainage system to the east of the development which can be utilised for a connection once the foul water Section 185 diversion has been agreed.

Infiltration has been confirmed as not a possible option within the site and due to the distance to the nearest watercourse, this is also a largely non-viable solution.

The surface water drainage proposes to utilise the existing surface water drainage within the site, which is confirmed to have capacity. These proposals outline that a flow of 5l/s with attenuated storage is suitable for the development The discharge rate for this development site has been reduced to account for further proposed developments within Royston and subject to agreement with Yorkshire Water.

Appendix Summary:

Appendix A - Site Location Plan and Indicative Site Layout

Appendix B - Proposed Drainage Layout

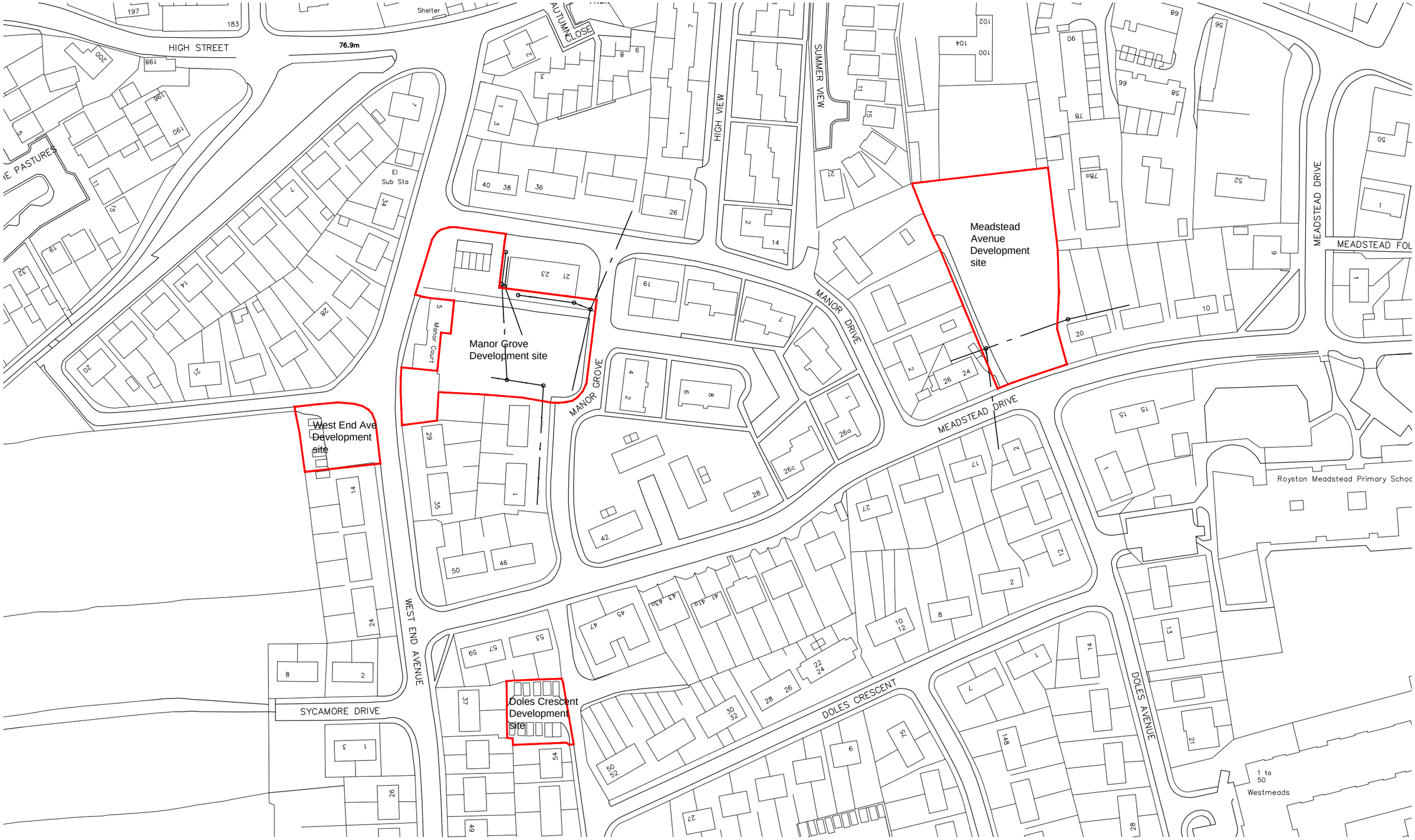
Appendix C - Micro Drainage Storage Calculations

Appendix D - Yorkshire Water PPE Response

Appendix E - Robson Liddle Ground investigation Extract

Appendix A

Site Location Plan and Indicative Site Layout



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ORIGINAL SHEET SIZE
A3

FIRST ISSUE						
P1						
COMMENT						
REV	DRAWN	DATE	CHECKED	DATE	APPROVED	DATE

CLIENT
Berneslai Homes

PROJECT
Manor Grove, Meadstead Drive and West End Avenue Proposed Bungalow Development

TITLE
Existing Site Location Plan

nps group

NPS Barnsley Ltd
Gateway Plaza, Sackville St, Barnsley, South Yorkshire, S70 2RD,
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web:www.nps.co.uk

SCALES	DISCIPLINE	PROJECT NUMBER
1:1250	ARCH	17-1-1283

DRAWING NUMBER	REV CODE
NPS-DR-A-(00)-010	P 1

STATUS CODE	PURPOSE OF ISSUE	DRAWN
S0	PRELIMINARY	GH

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Date Plotted: 18 May 2017 15:40:33

01 **Site Plan**

1:100

KEY PLAN

Notes:

Proposed Materials

Walls - Wienerberger Ashley Red Multi Brick
Roof - Marley Eternit Duo Modern Interlocking roof tile, Colour: Smooth Grey
Windows/French Doors - UPVC, Colour: Grey
Doors - Composite Front Door, Colour TBC
Rainwater goods - Black PVCU gutters and downpipes
Canopies - Proprietary GRP canopy, Colour Grey with tiled roof to match main roof.
Suntubes - Keylight Sunlite

FIRST ISSUE							
P1							
COMMENT							
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1:200

ORIGINAL SHEET SIZE A1

CLIENT
Berneslai Homes

TITLE
Manor Drive Proposed Site Plan

PROJECT
Manor Grove, Meadstead Drive and West End Avenue
Proposed Bungalow Development

nps group
NPS Barnsley Ltd
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SCALES	DISCIPLINE	PROJECT NUMBER
1:100	ARCHITECT	17-1-1283
DRAWING NUMBER		REV CODE
NPS-DR-A-(00)-023		P1
STATUS CODE	PURPOSE OF ISSUE	DRAWN BY
S0	INFORMATION	GH

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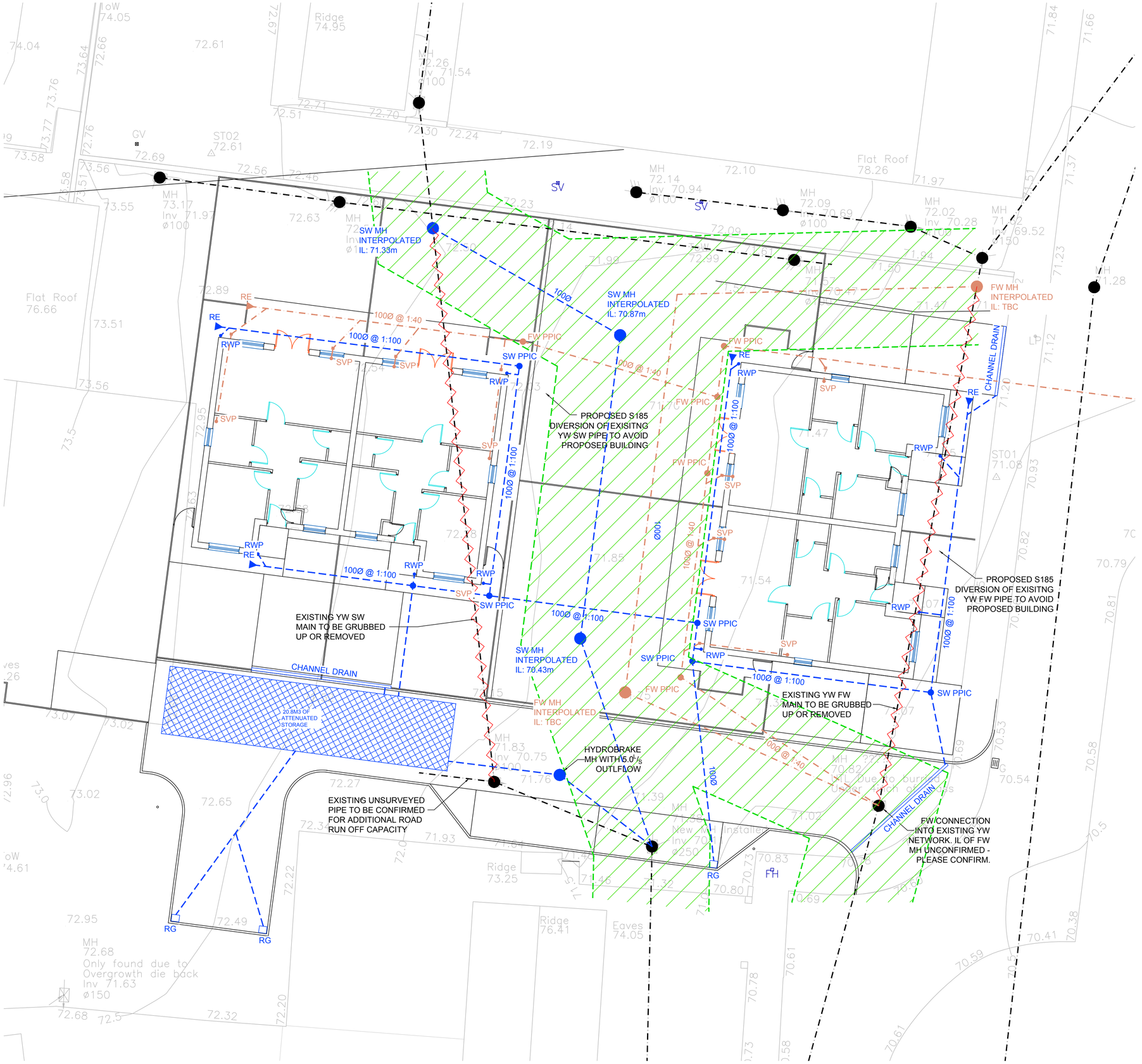
Date Plotted: 18 September 2017 19:15:24

Appendix B

Proposed Drainage Layout



HEALTH & SAFETY RISKS

IN ADDITION TO THE STANDARD HAZARDS AND RISKS NORMALLY ASSOCIATED WITH THE TYPE OF WORK DETAILED ON THIS DRAWING, PLEASE NOTE THE FOLLOWING RESIDUAL HEALTH AND SAFETY RISKS

CONSTRUCTION RISKS

CR 01 ADD TEXT DEFINING RESIDUAL RISKS HERE.

CR 02 ADD TEXT DEFINING RESIDUAL RISKS HERE.

CR 03 ADD TEXT DEFINING RESIDUAL RISKS HERE.

OPERATION & MAINTENANCE RISKS

MR 01 ADD TEXT DEFINING OPERATION & MAINTAINANCE RISKS HERE.

MR 02 ADD TEXT DEFINING OPERATION & MAINTAINANCE RISKS HERE.

MR 03 ADD TEXT DEFINING OPERATION & MAINTAINANCE RISKS HERE.

DEMOLITION RISKS

DR 01 ADD TEXT DEFINING DEMOLITION RISKS HERE.

DR 02 ADD TEXT DEFINING DEMOLITION RISKS HERE.

DR 03 ADD TEXT DEFINING DEMOLITION RISKS HERE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING IN ACCORDANCE WITH THE REQUIREMENTS DEFINED IN THE CDM REGULATIONS.

NOTES:

1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS WHICH MAY BE NECESSARY, SUCH MATERIAL REMAINING THE THE PROPERTY OF THE CONTRACTOR ON COMPLETION, AND FOR ENSURING THAT THE WORKS AND ANY ADJACENT PROPERTIES ARE SAFE IN THE TEMPORARY CONDITION.

KEY

- FWPPIC — PROPOSED FW PPIC
- BIG — PROPOSED BACK INLET GULLY
- SVP — PROPOSED SOIL VENT PIPE
- RWP — PROPOSED RAIN WATER PIPE
- RE — PROPOSED SW RODDING EYE
- RE — PROPOSED FW RODDING EYE
- PROPOSED SW MH
- EXISTING FW MAIN
- EXISTING SW MAIN
- EXISTING PIPEWORK TO BE REMOVED
- PROPOSED SW ATTENUATION TANK: 14.85 x 3.5m x 0.4m = 20.8m³
- YORKSHIRE WATER 3.0M EASEMENT
- PROPOSED ROAD GULLY
- PROPOSED CHANNEL DRAIN

PROPOSED ROAD GULLY

Rev	Description	Date	By	Chk	App
P1	FIRST ISSUE	15.02.18	KJH	JP	DJL

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Project: RESIDENTIAL DEVELOPMENT, MANOR GROVE SITE, ROYSTON, BARNSLEY

Client: BARNSLEY MBC

Drawing: PROPOSED DRAINAGE

Role: CIVIL ENGINEER

Drawing Status: PRELIMINARY

Job. no. 40234 | Scale@ A1: 1:100 | Rev. P1

Project Originator Volume Level Type Role Number

ROY - AWP - ZZ - XX - DR - C - 0007

100mm at A1

Appendix C

Micro Drainage Storage Calculations

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	70.480	0.280	5.0	14.6	O K
30 min Summer	70.535	0.335	5.0	17.4	O K
60 min Summer	70.555	0.355	5.0	18.5	O K
120 min Summer	70.535	0.335	5.0	17.4	O K
180 min Summer	70.494	0.294	5.0	15.3	O K
240 min Summer	70.451	0.251	5.0	13.1	O K
360 min Summer	70.383	0.183	5.0	9.5	O K
480 min Summer	70.341	0.141	5.0	7.3	O K
600 min Summer	70.319	0.119	4.8	6.2	O K
720 min Summer	70.307	0.107	4.3	5.5	O K
960 min Summer	70.291	0.091	3.5	4.7	O K
1440 min Summer	70.275	0.075	2.6	3.9	O K
2160 min Summer	70.262	0.062	1.9	3.2	O K
2880 min Summer	70.254	0.054	1.5	2.8	O K
4320 min Summer	70.245	0.045	1.1	2.4	O K
5760 min Summer	70.240	0.040	0.9	2.1	O K
7200 min Summer	70.236	0.036	0.7	1.9	O K
8640 min Summer	70.234	0.034	0.6	1.7	O K
10080 min Summer	70.231	0.031	0.6	1.6	O K
15 min Winter	70.519	0.319	5.0	16.6	O K
30 min Winter	70.582	0.382	5.0	19.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	123.586	0.0	17.6	16
30 min Summer	81.128	0.0	23.1	30
60 min Summer	50.758	0.0	28.9	46
120 min Summer	30.706	0.0	35.0	80
180 min Summer	22.590	0.0	38.6	114
240 min Summer	18.066	0.0	41.2	144
360 min Summer	13.108	0.0	44.8	204
480 min Summer	10.446	0.0	47.6	258
600 min Summer	8.753	0.0	49.9	314
720 min Summer	7.572	0.0	51.8	374
960 min Summer	6.019	0.0	54.9	492
1440 min Summer	4.350	0.0	59.5	736
2160 min Summer	3.138	0.0	64.4	1100
2880 min Summer	2.487	0.0	68.0	1468
4320 min Summer	1.789	0.0	73.4	2200
5760 min Summer	1.415	0.0	77.4	2928
7200 min Summer	1.179	0.0	80.6	3632
8640 min Summer	1.015	0.0	83.3	4352
10080 min Summer	0.895	0.0	85.6	5000
15 min Winter	123.586	0.0	19.7	17
30 min Winter	81.128	0.0	25.8	30

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	70.600	0.400	5.0	20.8	O K
120 min Winter	70.564	0.364	5.0	18.9	O K
180 min Winter	70.502	0.302	5.0	15.7	O K
240 min Winter	70.435	0.235	5.0	12.2	O K
360 min Winter	70.344	0.144	5.0	7.5	O K
480 min Winter	70.311	0.111	4.5	5.8	O K
600 min Winter	70.297	0.097	3.8	5.0	O K
720 min Winter	70.288	0.088	3.3	4.5	O K
960 min Winter	70.276	0.076	2.7	3.9	O K
1440 min Winter	70.262	0.062	1.9	3.2	O K
2160 min Winter	70.252	0.052	1.4	2.7	O K
2880 min Winter	70.246	0.046	1.1	2.4	O K
4320 min Winter	70.238	0.038	0.8	2.0	O K
5760 min Winter	70.234	0.034	0.6	1.7	O K
7200 min Winter	70.231	0.031	0.5	1.6	O K
8640 min Winter	70.228	0.028	0.5	1.5	O K
10080 min Winter	70.227	0.027	0.4	1.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	50.758	0.0	32.4	48
120 min Winter	30.706	0.0	39.2	86
180 min Winter	22.590	0.0	43.2	124
240 min Winter	18.066	0.0	46.1	154
360 min Winter	13.108	0.0	50.2	206
480 min Winter	10.446	0.0	53.3	258
600 min Winter	8.753	0.0	55.8	316
720 min Winter	7.572	0.0	58.0	376
960 min Winter	6.019	0.0	61.4	500
1440 min Winter	4.350	0.0	66.6	736
2160 min Winter	3.138	0.0	72.1	1092
2880 min Winter	2.487	0.0	76.2	1460
4320 min Winter	1.789	0.0	82.2	2200
5760 min Winter	1.415	0.0	86.7	2880
7200 min Winter	1.179	0.0	90.3	3624
8640 min Winter	1.015	0.0	93.3	4304
10080 min Winter	0.895	0.0	95.9	5112

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.300	Shortest Storm (mins)	15
Ratio R	0.402	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.076

Time (mins) From:	To:	Area (ha)
0	4	0.076

Appendix D

Yorkshire Water PPE Response

YorkshireWater

Mr K J Holt
Alan Wood & Partners
341 Beverley Road
Hull
HU5 1LD

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

Your Ref: AWP054/ HC-00693/SITE2/47
Our Ref: T017874

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

30th October 2017

Dear Mr Holt,

46 Meadstead Drive Royston Barnsley S71 4LJ - Pre Planning Sewerage Enquiry On R740804

Thank you for your recent enquiry. Our charge of £153.00 (plus VAT) will be added to your account with us, reference AWP054. 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 are small diameter public sewer recorded crossing the site. In this instance, building-over may take place under the control of Part H4 Building Regulations 2000.

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 150 mm diameter public foul sewer recorded around 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.

YorkshireWater

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.

If other methods of surface water disposal are not viable and subject to providing satisfactory evidence as to why they have been discounted, curtilage surface water discharges to the public sewer will be restricted to the level of run-off - i.e. same rate of discharge - to that from the existing use of the site less a 30% reduction in the existing discharge. Any discharge of surface water from the site should discharge to similar points of connection to that of the existing use of the site. You will need to demonstrate positive drainage, based on a 1 in 1 year storm, to the public sewer to Yorkshire Water by means of investigation and calculation carried out at your expense.

To do this, Yorkshire Water requires to see existing and proposed drainage layouts with pipe sizes, gradients and connection points, measured impermeable areas of the present and proposed use of the site, along with the calculations that show the existing and proposed discharge rate from the site to the public sewer.

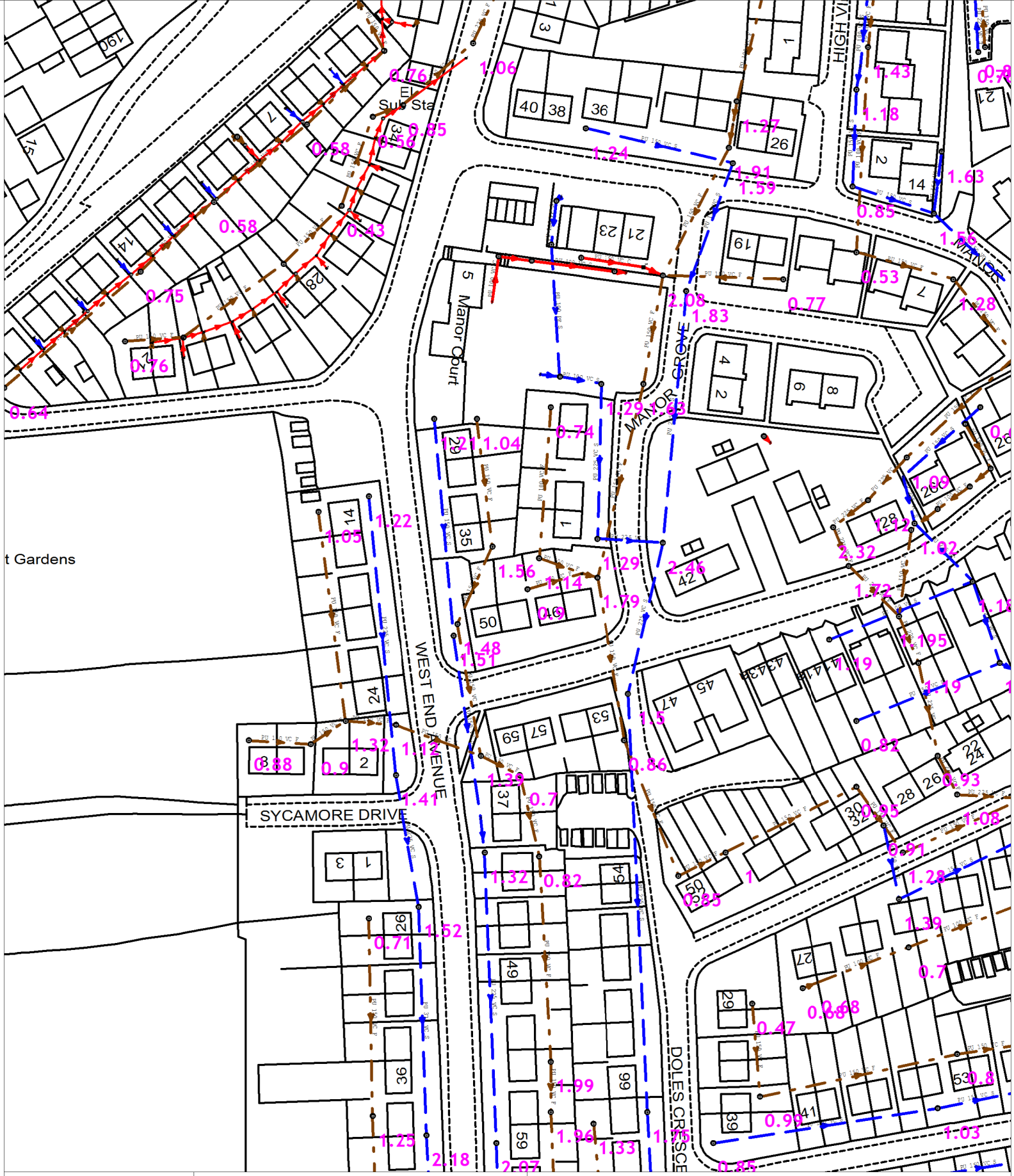
Other Observations

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.

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



435328 : 411127	Map Name : SE3511SW	Title
YorkshireWater 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 : 30/10/2017, 13:03:17	Date Gen : 30/10/2017, 13:05:15
		Source : Sewer Network Enquiry

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

Appendix E

Hamson Barron Smith Ground Investigation Extract

Architecture
Surveying
Building Services Engineering
Engineering
Strategic Development & Consultancy

Doles Crescent
Barnsley

Preliminary Land Contamination and Geotechnical Risk Assessment

On behalf of Barnsley Metropolitan Borough Council

Report 23-24-18-1-6007/DSR1
July 2017

Report Issue Record

Project No.:	23-24-18-1-6007
Project Title:	Doles Crescent
Site Location:	Royston, Barnsley
Client:	Barnsley Metropolitan Borough Council
Report Title:	Preliminary Land Contamination and Geotechnical Risk Assessment
Issue Date:	13 July 2017
Report No.:	23-24-18-1-6007/DSR1
Revision:	-

	Written	Reviewed and Approved
Name	**Catherine Riley** BEng, BSc, CEng, CEnv, MCIWEM	**Craig Roberts** BSc, FIEnvSc, CEnv
Signature		
Position	Senior Geo-Environmental Engineer	Technical Director

Contents

Appendices

Executive Summary

SITE INFORMATION	
Client	Barnsley Metropolitan Borough Council.
Site	Doles Crescent
Location	Royston, Barnsley, S71 4LA. NGR 435506,411247.
Approximate area	0.05Ha
Topography	Elevation 65m OD.
Current land use	Private garages.
Proposed development	Low rise residential. Demolish existing garages and replace with one detached bungalow.

SITE SETTING	
Geology	Pennine Middle Coal Measures (mudstone, siltstone and sandstone). No superficial Deposits shown.
Radon	No radon protective measures are required.
Hydrogeology	Secondary A Aquifer. The site does not lies within a source protection zone.
Hydrology	An unnamed tertiary river lies circa 200m south.
Landfill sites	No landfills located within 500m of the site.
History	The site was undeveloped agricultural land until the 1970s, when the existing garages were constructed.
Previous site investigations	Hamson Barron Smith have not been made aware of any previous investigations, which may have been undertaken at this site.
Anticipated ground conditions	Firm or stiff clays derived from weathering of the mudstone bedrock. Coal Measures bedrock at shallow depth.

GEOTECHNICAL	
Foundations	Shallow spread foundations should be suitable. Bearing capacity to be determined from site investigation, but are likely to be sufficient for conventional low rise structures.
Shrinkable soils	Soils may be shrinkable.
Buried concrete	Significant concrete protection measures unlikely to be required.
Floor slabs	Suspended floor slab may be required.
Slope stability	Site and adjacent area are level and therefore no risks.
Pavement	CBR values likely to be adequate for road and car park construction.
Soakaways	Underlying geology may not be suitable for soakaway drainage, subject to full scale testing to confirm and calculate infiltration rates.
Natural cavities	None expected.
Mining	Royston coal seam (circa 0.50m thick locally) is conjectured to outcrop to the north of the site, as dip is generally to the north and east it is unlikely to be present at shallow depth beneath the site. The SYMAS report indicates that the shallow coal seam in this area is historically rarely worked in the wider vicinity. Therefore, the likelihood of historical ground workings being present is considered to be negligible.

CONTAMINATION	
Human health	Potential localised hydrocarbons and solvents associated with car maintenance and potential asbestos containing roofing sheets have been identified. If present, it is considered that these may pose a low to medium risk to identified human receptors.
Controlled waters	Potential localised sources of hydrocarbons and solvents associated with car maintenance pose low to medium risk to the underlying a Secondary A Aquifer. Risks to the surface water, are given the distance from the site considered low.
Gas protection	Risks from ground gases are considered to be low. No radon protection measures required.