Report No. **800/120r2**

FLOOD RISK ASSESSMENT REPORT

ON LAND

O F F T H E A 6 1 W A K E F I E L D R O A D
M A P P L E W E L L, B A R N S L E Y

ON BEHALF OF

P U R I C O U K L T D

SEPTEMBER 2013

C O N T E N T S

APPENDICES

1.0 INTRODUCTION

1.1 Dacres Commercial are considering making a Planning Application, on behalf of Purico UK Ltd, for allocation of land off the A61 Barnsley Road at Mapplewell for residential dwellings. To assist in the viability of the project, it was decided that a Flood Risk Assessment Report should be undertaken.

1.2 It is within the general development strategy of the country for development in areas where there is a risk of flooding to be assessed to avoid unnecessary increase in the requirement for flood defence. Under the National Planning Policy Framework (NPPF) and the accompanying Technical Guidance (TG), consultation is required with the Environment Agency, Land Drainage Authority and Water Authority and a Flood Risk Assessment Report should be prepared considering the development proposals and make recommendations for any flood mitigation measures.

1.3 ARP Associates were originally appointed in October 2011 to carry out an assessment of the site, implement appropriate consultations and prepare a Flood Risk Assessment Report. At that time, the report complied with Planning Policy Statement 25 to satisfy the requirements of the Planning Authority. Since that time, the site has been under consideration and a Planning Application is now to be submitted. This report updates the previous Flood Risk Assessment to present day criteria compliant with the NPPF.

1.4 The consultations and walkover survey were originally carried out between October 2011 and March 2012, and these are still relevant and applicable to this Flood Risk Assessment Report.

1.5 This assessment has been prepared for the sole use and reliance of the Appointee and shall not be relied upon or transferred to any other parties without the written authorisation of ARP Associates. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

2.0 WALKOVER SURVEY

General

2.1 The site is located approximately 2 miles to the north of Barnsley in the district of Mapplewell, and is located generally within an area of agricultural and residential dwellings. The site is an irregular shaped piece of land equating to an area of approximately 11ha and is centred on Ordnance Survey Grid Reference SE336 321.

2.2 A site location plan is presented in Appendix A.

Current Use

2.3 Apart from a farmhouse with associated farm buildings and small holdings located towards the eastern and northeastern corner and some allotments adjacent the central southern area, the site is unused.

Boundaries

2.4 The site is bounded by a series of hedges, fences and walls with residential development to the north and south and partly to the west. The remaining western boundary abuts a recreational ground. The eastern boundary abuts the A61 Wakefield Road highway with residential development and agricultural fields beyond.

Topography and Vegetation

2.5 The site slopes relatively steeply from north to south with the A61 located above the eastern boundary, whilst the land is above the western boundary and slopes down steeply to meet boundary levels.

2.6 A topographical survey is presented in Appendix B.

2.7 The site is covered generally in unmaintained bushes, ryegrass, brambles and other similar vegetation with some isolated mature trees to the northwestern and southwestern areas.

Drainage

2.8 There is no indication of positive drainage on the site, and surface water run-off will either be retained within the grassland or run-off following the natural slope of the land. There is indication of several overgrown drains or open watercourses on the southern part of the site and anecdotal evidence from residents that a watercourse ran through the new housing development which abuts the southern boundary. Surface water discharge from the site will be to the drains and eventual outfall to the culverted watercourse to the south.

2.9 It was noted that the rainwater downpipes to the farm building discharged direct to ground.

3.0 ENVIRONMENT AGENCY CONSULTATION

3.1 A consultation was requested from the Environment Agency and a copy of their e-mail response, reference RFI/2011/20689 dated 9th November 2011, is presented in Appendix C for reference.

3.2 The Environment Agency have confirmed that the site lies within Flood Zone 1, which is land outside the 1 in 1000 year flood plain and deemed to be safe from flooding in the event of a flood with a 0.1% probability of occurring in any one year.

3.3 There are several unnamed drains crossing the site which are classified as ordinary watercourses under the terms of The Land Drainage Act 1991. Recommendation is made to contact The Local Authority Main Drainage Department for more information on these details.

3.4 The Flood Risk Assessment will need to demonstrate that the development does not increase the risk of flooding to others and would not be at risk of flooding itself. All potential sources of flooding will need to be considered and an assessment of the existing and proposed surface water drainage from the site. Surface water discharge should ideally "mimic" the predevelopment situation with the discharge restricted to the greenfield 1 in 1 year flow rate or lower than the existing rate of run-off for a proposed development site. Acceptable greenfield run-off rate is normally 5l/s/ha for this area.

3.5 Sustainable Urban Drainage Systems (SUDS) should be used to tackle surface water run-off wherever possible.

4.0 WATER AUTHORITY CONSULTATION

4.1 A consultation was requested from Yorkshire Water, who are the Water Authority for this area, and a copy of their response, reference M007675 dated 21st November 2011, is presented in Appendix D for reference purposes.

4.2 There are small diameter public sewers crossing the site, but building over may take place under the control of Part H4 Building Regulations 2000.

4.3 The local Waste Water Treatment Works (WWTW) is at Darton and there may only be limited spare capacity. Yorkshire Water have contacted the Area Asset Management for more information, but no responses have been received since the consultation in November 2011 and it is understood that the WWTW is satisfactory to receive foul discharge from this additional residential development.

4.4 Foul water can discharge to the 225mm diameter public foul sewer crossing within the site. It is not possible to determine if the whole site will drain by gravity to the public sewer and, if a sewage pump is required, foul water discharge must not exceed 8l/s.

4.5 In respect of surface water, recommendation is made to Requirement H3 of Building Regulations 2000 and Sustainable Drainage Systems.

4.6 The local public sewer network does not have capacity to accept any discharge of surface water from the proposal site and the Developer is advised to contact the Environment Agency/Local Land Drainage Authority with a view to establishing a suitable watercourse for discharge. Yorkshire Water understand that watercourses are located through/adjacent to the site and these appear to be the obvious place for surface water disposal.

5.0 LAND DRAINAGE AUTHORITY CONSULTATION

5.1 A consultation was requested from Barnsley Metropolitan District Council, who are the Land Drainage Authority for this area, and a copy of their e-mail response, dated 8th March 2012, is presented in Appendix E for reference purposes.

5.2 There are unnamed open watercourses crossing the site which will require protection and an easement width of 3m measured from the top of the bank on each side of the watercourse will need to be provided through the site.

5.3 Whilst there are no flooding issues associated with the site, there have been incidents of flooding from these watercourses further downstream.

5.4 Recommendation is made to control surface water run-off by Sustainable Urban Drainage Systems and details will need to be submitted of investigations so that the use of SUDS has been fully explored.

5.5 In relation to surface water discharge from the new site, there should be no increase in surface water run-off from the new development. If connection to a watercourse is proposed, then flows must be attenuated to a maximum of 5l/s/ha.

5.6 Surface water attenuation will be required to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site, including an allowance for 30% for climatic change, without causing any flooding to buildings.

6.0 MATERIAL CONSIDERATION IN RESPECT OF PPS25

Flood Classification

6.1 The consultation with the Environment Agency has identified that the site falls within land assessed as having less than a 1 in 1000 annual probability of river or sea flooding in any year (less than 0.1%). In accordance with Table 1 of the TG, the site falls within Flood Zone 1 "low probability".

6.2 However, there are local watercourses or drains passing through the site and localised flooding may be possible from this source, although this is considered unlikely. It will be necessary to provide easements for a width of 3m on either side of the watercourses to meet the requirements of The Land Drainage Authority.

6.3 All uses of land are appropriate within this Flood Zone, but an assessment of the effect of surface water run-off will need to be incorporated in any Flood Risk Assessment.

End Use

6.4 The development proposal is for the construction of residential development on the site. Whilst there is no detailed layout of the development at this time, a masterplan showing the indicative layout is presented in Appendix F for reference purposes.

6.5 When applying Table 2 of the TG, the flood risk vulnerability classification shows that the proposed end use will fall into a "more vulnerable" classification.

Sequential Test

6.6 As set out in the NPPF, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding (Zone 1).

6.7 When the site is evaluated in accordance with Table 3 of the TG, the development shows that the Sequential Test is satisfied and the Exception Test is not required in this instance.

Flood Sources

6.8 Flooding from Rivers - There are no rivers maintained by the Environment Agency within the vicinity of the site and the Environment Agency consultation confirms that there is no flooding from this source.

6.9 Flooding from Local Watercourses - There is evidence of overgrown open watercourse channels or drains within the development site, and these will need to be maintained as part of the development layout. Whilst there is no indication that flooding occurs from the open watercourses, these will need to be cleared as part of the development, and it will be necessary to make allowance for overflow from any potential blockage and comply with any local Bye laws imposed by The Land Drainage Authority.

6.10 Flooding from the Sea - The site is not located near enough to the sea to cause a problem of flooding from this source.

6.11 Flooding from Land - The site is situated adjacent to residential development to the north and northwest and has the main A61 Wakefield Road to the east. All these built-up areas will be serviced by a positive drainage system and it is highly unlikely that flooding will occur from overland run-off into the development. The land to the south and west is lower than the site and there will be no run-off from these locations. Flooding from this source is low risk.

6.12 Flooding from Groundwater - Whilst no intrusive ground investigation has been undertaken, the Geological Survey of Great Britain, Sheet 87 shows that the site is located on the Middle Coal Measures of the Upper Carboniferous Period with the bulk of the site showing undifferentiated siltstones, sandstones and mudstones at the surface. The Woolley Edge Rock (a sandstone) is located immediately to the north of the site and there are several coal seams shown to be outcropping in the vicinity. The Woodward,

Wathwood or Malton Field coal seam appears to be outcropping close to the site and there may be a fault either within or just outside the southeastern boundary. It is considered unlikely that the natural strata will be permeable and the presence of the coal seams are likely to prevent any issues of groundwater. The presence of the unnamed watercourses within the site boundary would confirm the interpretation that the natural ground is impermeable. Therefore, flooding from this source is considered to be low risk.

6.13 Flooding from Sewer - A new drainage system will be introduced onto the site and it is possible, therefore, that any blockage of the sewers will result in flooding from the lowest cover level of manholes or gullies and this will need to be considered as part of any proposed development.

6.14 Flooding from Reservoirs, Canals or Artificial Sources - There are no other reservoirs, canals or artificial sources which will result in flooding on the site.

Climatic Change

6.15 The NPPF and TG has indicated that the Global sea level will continue to rise, depending on greenhouse gas emissions, and the sensitivity of the climate system and there will be an increase in rainfall across the country. Table 5 of the TG makes an assessment of the increase in peak rainfall intensity and that this is likely to increase by 20% between 2055 and 2085 and by 30% between 2085 to 2115.

6.16 The site falls from north to south and slightly from east to west. However, whilst the residential development and adopted highways within these areas are above site levels, there will be positive drainage and, therefore, run-off into the site from these areas is unlikely. Land to the west and south is lower than the development site. Therefore, any run-off from outside the site will be insignificant and, on this basis, only rainfall falling within the site boundaries will need to be considered in respect of climatic change.

6.17 In accordance with the TG, the published figures show that, for an expected life of greater than 50 years for any new development, the anticipated increase in rainfall will be around

30%. It will be necessary to design any new positive drainage system with a 30% increase in capacity to accommodate this requirement.

Flood Mitigation

6.18 The site falls within Flood Zone 1 and there is no flooding anticipated from the local watercourses passing through the site. However, in the event of a catastrophic storm, and blockage of the watercourse or the proposed sewers, then it will be necessary to consider some precautionary mitigation measures, as follows:-

6.18.1 Floor levels to the proposed properties shall be a minimum 150mm above ground level and 300mm above any adjacent bank level of the local ditches or watercourses passing through the site.

6.18.2 Properties shall be designed without any basements and shall be constructed with solid concrete ground floors to prevent water ingress to subfloor voids.

6.18.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from first floor level.

6.18.4 It will be necessary to ensure that there is a route for floodwater through the site to the watercourses towards the southern boundary without causing flooding of buildings. To achieve this, all external levels shall be a minimum of 150mm, or preferably 300mm, below the ground floor level of the properties and the proposed alignment across the site shall be designed to ensure there is always a route for water through the site without causing flooding to buildings.

Sustainable Drainage

6.19 In order to comply with the requirements of NPPF, it will be necessary to consider aspects of Sustainable Drainage techniques for the new development. Whilst no intrusive investigation of ground conditions has been carried out, it is known that the site is located on the Middle Coal Measures of the Upper Carboniferous Period with undifferentiated siltstones, sandstones and mudstones at the surface. There are also coal seams present below the site which may or may not be shallow or outcrop. Therefore, it is highly unlikely that the natural soils will be permeable and the presence of the coal seams will prevent the use of infiltration techniques for surface water drainage. Furthermore, the presence of the ditches and watercourses through the site confirms that the natural ground conditions are impermeable. Therefore, soakaway or other sustainable infiltration systems are not considered suitable at this location. It will be necessary to carry out an intrusive investigation and determine the permeability of the soils with a report issued to the Planning Authority for approval prior to construction on site and an assessment made of other sources of SUDS. However, for the purposes of this report, it is assumed that a full positive drainage system will be required with discharge to the existing watercourses within the site.

Drainage

6.20 It is a requirement to ensure that surface water run-off from any proposed development has negligible consequence on downstream areas either in sewer capacity or discharge to watercourse.

Existing Surface Water Run-Off

6.21 There is no development on the existing site and the Environment Agency and Land Drainage Authority consultations have confirmed that the existing run-off to watercourse will be no greater than 5l/s/ha. Based on a site area of 11ha, the allowable existing discharge rate equates to 55l/s.

Proposed Surface Water Drainage

6.22 There is no detailed layout of the proposed residential development at this time and, therefore, an assessment of the likely impermeable areas has been made to assess the implications of surface water discharge from the development. If it is assumed that there is approximately 1ha of Public Open Space allocated on the site and that the proposed impermeable area will be around 50% of the remaining area, it is reasonable to assume that the contributing area for surface water run-off to watercourse will be in the order of 5ha. Indicative calculations using the WinDES Source Control Computer Program, making an allowance for 30% increase in rainfall for climatic change and restricting discharge to 55l/s, on site storage will be 1879m³ for a 1 in 30 year storm. This can be achieved by several methods, including oversized pipes, underground tanks, box culverts or balance ponds. One such option would be to provide a balance pond approximately 1880m² in area with an overflow depth of 1.0m or equivalent to achieve the necessary attenuation. However, an assessment of the available land, when the proposed layout is finalised, is recommended to assess the possibility providing this open pond storage to meet the requirement for surface water attenuation. It will also be necessary to ensure that the drainage system can accommodate a 1 in 100 year storm, plus climatic change, without causing flooding of property, third party land or overflow back into the watercourse. The balance pond, if used, may need to be increased to an area of 2640m² to accommodate this requirement. The indicative surface water calculations are presented in Appendix G. However, detailed calculations and proposals will need to be prepared and submitted to the Planning Authority for approval prior to construction.

Watercourse Conditions

6.23 The discharge of surface water drainage will be to the ordinary watercourses within the site and the introduction of any headwalls or work to the watercourse will need the consent of the Land Drainage Authority by submitting an Application for "Consent to Work Within a Watercourse". This will include any diversion or culverting of the watercourse to provide access for highways etc. There is also a requirement to comply with local drainage Bye laws, to ensure that there is no development or trees planted

within 3m of the bank of the watercourse on either side without the consent of the Land Drainage Authority.

Foul Drainage

6.24 Foul drainage will discharge to the existing foul drainage system either on the western or eastern boundary of the site, but it is probable that levels will prevent a gravity discharge from the southeastern corner and an adopted pump system will need to be introduced. The pump station will need to comply with the requirements of Yorkshire Water for adoption and have a 15m off-set from any dwelling. The discharge of the foul pump should not exceed 8l/s.

Existing Sewers

6.25 The existing sewers through the site will need to remain or an application made for diversion under Section 185 of the Water Industry Act 1991.

Emergency Egress During Times of Flood

6.26 It is a requirement under the TG that occupants should be able to egress any building during times of flood, without being trapped by flood conditions.

6.27 As the site falls within Flood Zone 1 and there is no flooding from the local watercourse, no mitigation measures are required for emergency egress during times of flood.

7.0 COMMENT

7.1 The site falls within Flood Zone 1 and it is unlikely that there will be any flooding from the ordinary watercourses passing through the site. Therefore, the Sequential Test is satisfied. However, in order to accommodate the possibilities of flood from extreme storm or blocked watercourse or sewers, the following mitigation measures are recommended:-

7.1.1 Ground floors to the properties are to be constructed at a minimum level of 150mm above external ground level or 300mm above the nearest embankment to the watercourses passing through the site.

7.1.2 Properties shall be designed without any basements and ground floors shall be constructed using solid concrete slabs to prevent water ingress to subfloor voids.

7.1.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from first floor level.

7.1.4 The proposed development will be designed with external levels below proposed ground levels in all circumstances and with a sufficient slope to ensure that any overland floodwater will pass through the site to the watercourse on the southern boundary without causing flooding to buildings, third party land or overflow into the watercourse.

7.2 Climatic change for a 30% increase in rainfall shall be incorporated into any new positive drainage designs.

7.3 Sustainable Drainage Systems of infiltration techniques are considered to be unsuitable on this particular site and, for the purposes of this report, it is assumed that a positive drainage system will be used. However, an intrusive investigation of the permeability of the ground conditions and any proposals for Sustainable Drainage Techniques shall be submitted to the Planning Authority for approval prior to construction on site.

7.4 Surface water discharge will be restricted to greenfield run-off at a rate of 5l/s/ha.

7.5 The proposed surface water drainage systems shall be designed with an allowance for climatic change and restricted to the agreed discharge rate with appropriate attenuation proposals incorporated into the design. The design, detail and calculations shall be submitted to the Planning Authority for approval prior to construction on site.

7.6 Any requirements for diverting, regrading or culverting of the open watercourses, or construction of headwalls will require the consent of the Environment Agency prior to construction on site.

7.7 No properties or other restrictions shall be constructed within 3m of the watercourse banking and the development shall comply with all land drainage Bye laws.

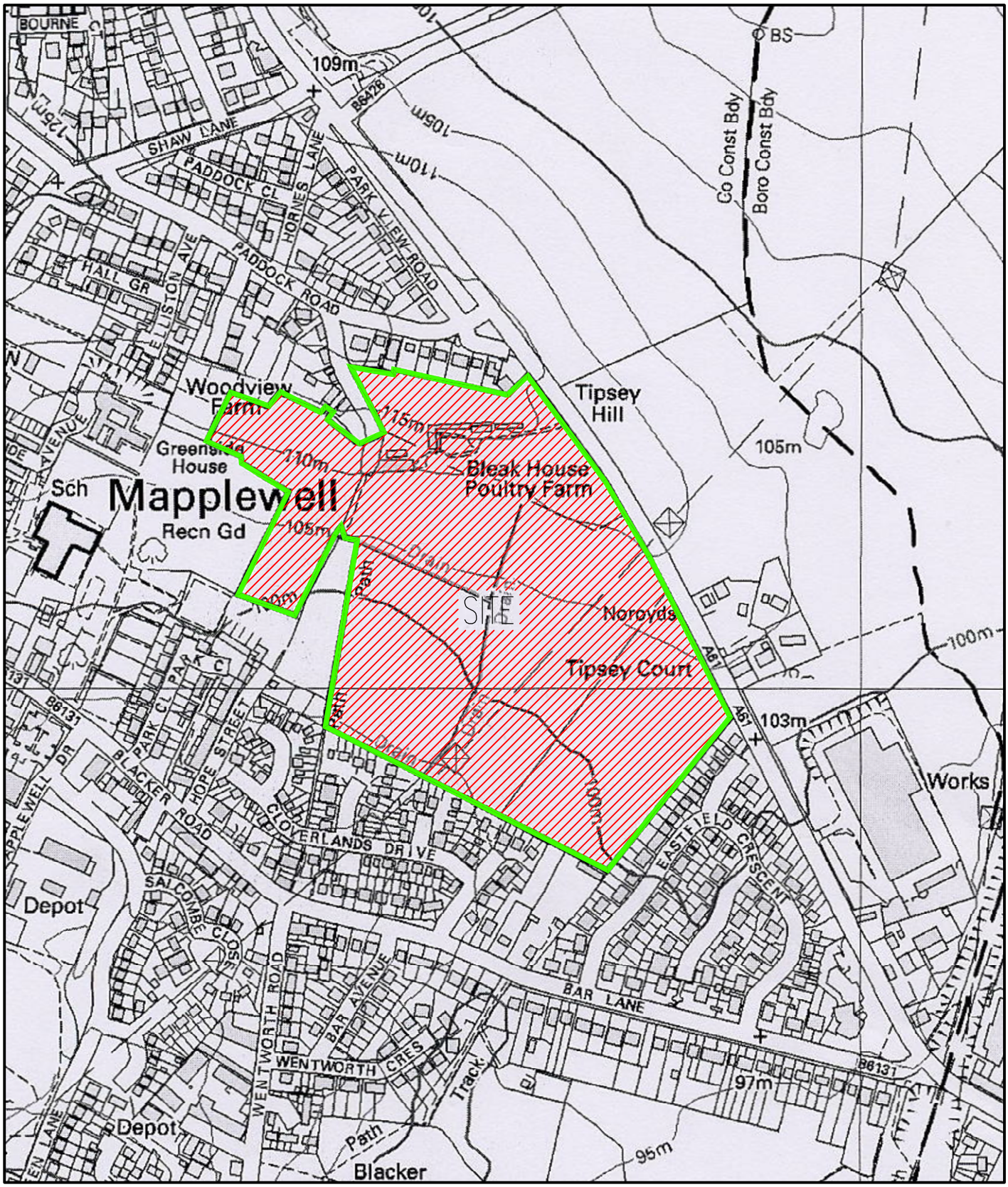
7.8 The existing sewers on the western and eastern boundaries shall remain in place or be diverted under Section 185 Agreement of the Water Industry Act 1991.

7.9 No special mitigation measures are required for emergency egress during times of flood.

7.10 Subject to the compliance with the above, the proposed development can satisfy the requirements of the National Planning Policy Framework and its accompanying Technical Guidance in relation to flood risk.

A P P E N D I X A

SITE LOCATION PLAN



OS Datum = COORDINATE GRID IS BASED ON GPS DATA

Grid Reference = SE 41327 32060

Rev	By	Date	Amendment	Chk
	MTO	13.03.12	Issued for approval	ARP

Title

SITE LOCATION PLAN

Project/Client

A61 WAKEFIELD, MAPPLEFIELD ROAD
PURICS UK LTD

ARP ASSOCIATES
CHARTERED CONSULTING ENGINEERS
Northwest House • 5/6 Northwest Business Park
Servia Hill • Leeds LS6 2QH
Telephone : 0113 245 8498 • Fax : 0113 244 3864
E-Mail : leeds@arpassociates.co.uk

Scale	Drawn
1:5000 @ A4	MTO
Date	**Chk.**
MAR'12	ARP

Drg. No. **800/120/FR01** Rev

A P P E N D I X B

TOPOGRAPHICAL SURVEY

ELLAM LAND SURVEYS
Land, Engineering & Building Surveys

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TEL . (01924) 467821   FAX . (01924) 459970
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LOCATION
WAKEFIELD ROAD, MAPPLEWELL

CLIENT
DACRES COMMERCIAL

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LEGEND

		CC	CONCRETE COVER	FWS	FOUL WATER SEWER	LP	LAMP POST	ST	STOP TAP
		CDC	DRAINAGE CHANNEL	G	GULLY	MC	METAL COVER	SV	STOP VALVE
		CP	CATCH PIT	GV	GAS VALVE	MH	MANHOLE	SWS	SURFACE WATER SEWER
		CTV	CABLE TV I.C	HV	HIGH VOLTAGE	MDC	DRAINAGE CHANNEL	TL	TRAFFIC LIGHTS
AV	AIR VALVE	DP	DOWN PIPE	IC	INSPECTION COVER	P	POST / POLE	TP	TELEGRAPH POLE
B	BOLLARD	ECP	ELEC. CABLE PIT	JB	JUNCTION BOX	RE	RODDING EYE	TH	THRESHOLD
BH	BOREHOLE	EP	ELEC. POLE/PYLON	KW	KERB WEIR	RS	ROAD SIGN	VP	VENT PIPE
BS	BUS STOP	ER	EARTH ROD	LB	LITTER BIN	S	STAY	WM	WATER METER
BT	BRITISH TELECOM	FH	FIRE HYDRANT	LH	LAMP HOLE	SC	STOP COCK	WO	WASH OUT

SHEET	1 OF 1	LEVEL DATUM	GPS
SCALE	1 : 500	GRID DATUM	GPS
DRAWN	J.G.WHITE SENIOR SURVEYOR	B.M. USED	GPS
DATE	JAN 2012		

DRAWING NO. 6523/1

A P P E N D I X C

ENVIRONMENT AGENCY CONSULTATION

Allan Poyser

From: Beech, Cheryl [Cheryl.Beech@environment-agency.gov.uk]
Sent: Wednesday 9 November, 2011 11:12 am
To: Allan Poyser
Subject: Your Enquiry: RFI/2011/20689
Attachments: Standard Notice.pdf; RFI 20689 Map.pdf; VAT Receipt.pdf

Our Ref: RFI/2011/20689

Your Ref:

Dear Allan

Provision of Product 3 for Wakefield Road, Mapplewell, Barnsley

Thank you for your request of 31 October 2011 to use Environment Agency data, Product 3, in the development of the above site. The information is attached.

If you have requested this information to help inform a development proposal, then you should note the detail in the attached advisory text on the use of Environment Agency Information for Flood Risk Assessments / Flood Consequence Assessments.

Supporting Information

Flood Zones

Under Planning Policy Statement 25 Development and Flood Risk (PPS25) land is divided into three zones with regard to flood risk.

Zone 1, little or no risk, this is land outside the 1 in 1000 year flood plain, land deemed to be safe from flooding in the event of a flood with a 0.1% probability of occurring in any one year.

Zone 2, medium risk; land between the 1 in 1000 and 1 in 100 year fluvial (1 in 200 year tidal) flood plain. Between 0.1% and 1.0% (0.5%) probability of occurring in any one year.

Zone 3, high risk, land within the 1 in 100 year fluvial (1 in 200 year tidal) flood plain, at risk in the event of a flood with a 1.0% (0.5%) probability of occurring in any in year.

These zones do not take account of any flood defences that may exist as these could be overtopped or breached by a more severe flood event than designed for or maintained against.

Site Assessment;

From the supplied map the site lies in flood zone 1 on the Environment Agency Flood Map. I have attached a map confirming this. There several un-named drains crossing the site which are classified as an ordinary watercourses, as defined under the terms of the Land Drainage Act 1991, and as such the Agency has no powers under the aforementioned Act to carry out improvement works to the watercourse.

We have no information relating to the watercourses, I would suggest you contact the local authority main drainage department as they are the responsible drainage authority

for the watercourse at this location. They may hold more detailed flood level information for the watercourse.

Flood Risk Assessment

A flood risk assessment (FRA) must be submitted with a planning application on any proposed development site over 1ha within Flood Zone 1 or shown within Zone 3 on the Flood map. The FRA assessment would need to demonstrate that the development would not increase the risk of flooding to others and would not be at risk of flooding itself. All potential sources of flooding will need consideration including; river flooding, groundwater flooding, surface water runoff and flooding from sewers etc. It should also assess the existing and proposed surface water drainage from the site.

Further information on producing a FRA and where a FRA is required can be found on the Environment Agency's website on the Flood Risk Standing Advice pages which can be found at: http://www.environment-agency.gov.uk/research/planning/82587.aspx

A more comprehensive guide on FRA's can be found in CIRIA Report C624 'Development and flood risk - guidance for the construction industry' available through their website: http://www.ciria.org.

Your Local Planning Authority should have undertaken a Strategic Flood Risk Assessment, where information on flood risk locally has been collated which may inform your FRA. Please contact your Local Planning Authority to determine what additional information may be available.

Flood Proofing

The Environment Agency would recommend that in areas at risk of flooding consideration be given to the incorporation into the design and construction of the development of flood proofing measures. These include barriers on ground floor doors, windows and access points, bringing in electrical services into the building at a high level so that plugs are located above possible flood levels and the use of solid or concrete beam floors.

Further information can be found at:
http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx

Additional guidance can be found in the Environment Agency Floodline publication "Damage Limitation". A free copy is available by telephoning 0845 988 1188 or can be found on our website.

Reference could also be made to the Department for communities and local Government publication "Preparing for Floods". Please email: communities@twoten.com to request a copy.

Floor Levels

Setting the ground floor level above site ground level will provide a measure of protection against any flooding. Where available we would recommend that flood levels be set 600mm above the 1 in 100 year event with an allowance for climate change made.

Surface Water Runoff

Surface water discharge from new development should ideally 'mimic' the pre-development

situation using a sustainable drainage system so that flow in watercourses is not increased. In normal circumstances surface water discharge from new development should be attenuated to the 'greenfield' 1 in 1 year flow from site, or lower than the existing rate of runoff for a pre-developed site.

Greenfield sites

The acceptable greenfield runoff rate is normally 5 litre/second/hectare, but you should consult with the Lead Local Flood Authority for variances in their district.

Brownfield sites

Surface water runoff should be attenuated to provide a minimum 30% reduction of surface water discharge when compared with the existing site outflow prior to redevelopment, unless otherwise agreed with the relevant drainage authority.

If a new discharge is required to a watercourse should be limited to the acceptable greenfield runoff rate, also it must be ensured that any additional volume of surface water to the receiving watercourse will not cause flooding problems.

The attenuation system needs to be designed so there is no flooding to properties on or off site for rainfall events up to 1 in 100 year return period.

Any conventional adopted balancing facility should be designed to accommodate volume storage for at least the 1 in 30 year flow from the site below ground, with the 1 in 100 year flow retained within the site (including an allowance for climate change), without causing any flooding to buildings.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the Environment Agency where ground conditions are suitable.

Sustainable Urban Drainage techniques (SUDs) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements. The Environment Agency seeks to promote the use of SUDs techniques to this site and expects the developer of the site to submit detailed investigations such that the use of SUDs has been fully explored.

More information on SUDs can be found at: http://www.ciria.org.uk/suds/

For information on Green Roofs in particular, please visit: www.thegreenroofcentre.co.uk

Please note that the view expressed in this letter by the Environment Agency is a response to a pre-application enquiry only and does not represent our final view in relation to any future planning application made in relation to this site. We reserve the right to change our position in relation to any such application.

You should seek your own expert advice in relation to technical matters relevant to any planning application before submission.

If you wish to discuss the site with the officer dealing with the Barnsley area Lesley Slaney can be contacted on (0113) 213 4779.

This information is provided subject to the enclosed notice, which you should read.

If you have any queries or would like to discuss the content of this letter further please do not hesitate to contact us on the number below.

Yours sincerely

Cheryl Beech
External Relations Team
Direct Dial 0113 2134732
Email neyorkshire@environment-agency.gov.uk

Please note: I job share with Stacey Riley. I cover Tuesday, Wednesday & Thursday - Stacey covers Monday & Friday.

Environment Agency
Phoenix House
Global Avenue
Leeds LS11 8PG

Part of the Environment Agency's Yorkshire and North East Region

Encs Basic FRA/FCA Map

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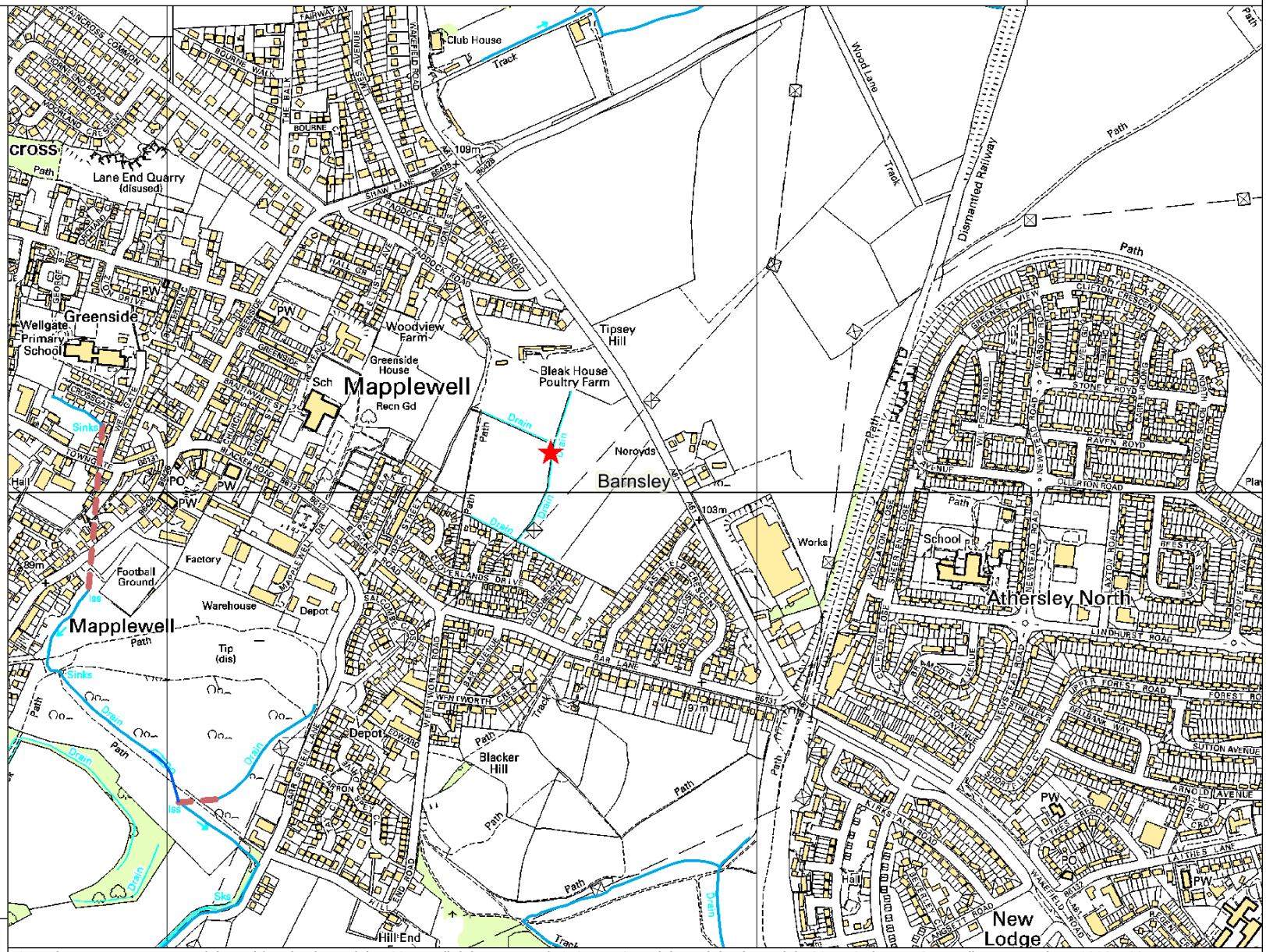
RFI20689 Map

Environment Agency

Legend

- Sealed Main Rivers
- Detailed River Network
- Primary River
- Secondary River
- Tertiary River
- D/S of High Water Mark
- D/S of Seaward Extension
- Lake / Reservior
- Canal
- Extended Culvert (greater then 50m)
- Canal Tunnel
- Underground River (inferred)
- Underground River (local knowledge)
- Flood Event Outlines
- Flood Map - Defences
- Areas Benefiting from Flood Defences
- Flood Map - Flood Storage Areas
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2
- Historic Flood Map
- Local Authorities



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A P P E N D I X D

WATER AUTHORITY CONSULTATION

YorkshireWater

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

Tel: 0845 120 8482
Fax: (01274) 372 834

Email:
Planning.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:

Kashif Khan on (0845)120 8482

21st November 2011

ARP
CHARTERED CONSULTING ENGINEERS
RECEIVED
23 NOV 2011
REF NO. 10358
ARP
800/120

ARP Associates
5/6 Northwest House
Northwest Business Park
Servia Hill
LEEDS
LS6 2QH

For the attention of Mr A Poyser

Your Ref:
Our Ref: M007675

Dear Sir,

Land off Wakefield Road, Mapplewell, Barnsley. - Pre-Planning Sewerage Enquiry - Residential on J745710

Thank you for your enquiry received 1st November 2011. Our charge of £83.76 (plus VAT) will be added to your account with us, reference ARP013. You will receive an invoice for your account in due course. Please find enclosed a complimentary extract from the Statutory Sewer Map. This indicates the recorded position of the public sewers. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site:

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.

The local Waste Water Treatment Works (WWTW) is Darton. It is understood that this WWTW may only have limited spare capacity, if any, available. We have contacted the Area Asset Manager for more information regarding the impact of proposed development and will contact you when an assessment has been made.

Development of the site should take place with separate systems for foul and surface water drainage. The separate system should extend to the public sewer.

Foul water domestic waste should discharge to the 225 mm diameter public foul sewer recorded crossing/within the site.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer network. If sewage pumping is required foul water discharge must not exceed 8 (eight) litres per second.

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

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

INVESTING IN VOLUNTEERS FOR EMPLOYERS
CUSTOMER SERVICE EXCELLENCE CSE

Where appropriate, soakaways, swales and infiltration trenches (SUDS) may be adopted as part of the public sewer network. For general conditions for the adoption of SUDS please see the attached sheet. Further information may be seen in the DEFRA publication 'Interim Code of Practice for Sustainable Drainage Systems' (ISBN 0-86017-904-4). If the developer is considering adoption of SUDS they should contact our Developer Services Team on 0845 120 84 82.

The local public sewer network does not have capacity to accept any discharge of surface water from the proposal site. The developer is advised to contact the Environment Agency/local Land Drainage Authority with a view to establishing a suitable watercourse for discharge.

It is understood that watercourses are located through/adjacent to the site. These appear to be the obvious place for surface water disposal.

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

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 0845 120 84 82) for further information.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no right of connection to the public sewer network. Highway drainage, however, may be accepted under certain circumstances; for instance, if SUDS are not a viable option and there is no highway drain available and if capacity is available within the public sewer network. In this event, the developer will be required to enter into a formal agreement with Yorkshire Water Services under Section 115 Water Industry Act 1991 to discharge non-domestic flows into the public sewer network.

No land drainage to be connected/discharged to public sewer.

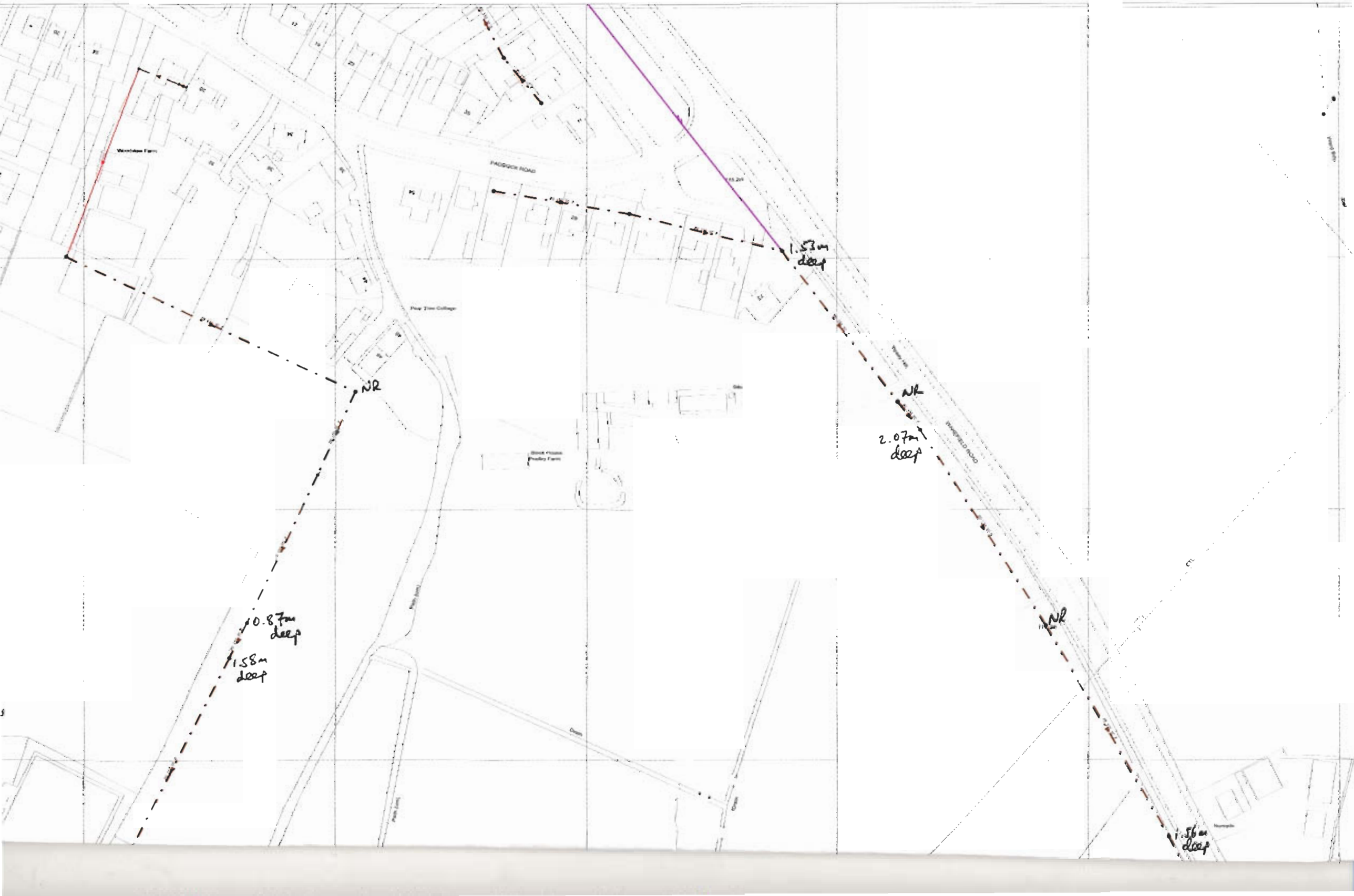
Any new connection to an existing public sewer will require the approval of Yorkshire Water. You may obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0845 120 84 82.

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 faithfully

Developer Services Team


1.56m deep
1.61m deep
GLOSSOP WAY
PINE LODGE GROVE
SILKSTONE WAY
SILKSTONE CRESCENT
HOPE STREET
Drain
STL
433459 408986
Map Name : SE3306NW
YorkshireWater
Yorkshire Water,
PO Box 500,
Halifax Road,
Bradford BD6 2LZ
Contact Name :
KKHAN
Contact Tel :


FAGGOCK ROAD
NR
1.53m deep
NR
2.07m deep
NR
0.87m deep
1.58m deep
NR
1.56m deep

A P P E N D I X E

LAND DRAINAGE AUTHORITY CONSULTATION

Allan Poyser

From: Atkins , Wayne [WayneAtkins@barnsley.gov.uk]
Sent: Thursday 8 March, 2012 9:59 am
To: Allan Poyser
Subject: FW: Wakefield Road, Mapplewell

Allan

I apologise for the delay in responding to your enquiries, Mr Kilner has now retired from the authority and I have been asked to respond to your enquiry.

There are un-named open watercourses crossing the site which will require protection, the authority would require an easement width of 3 metres measured from the top of the bank on either side of the watercourse.

I am not aware of any flooding issues associated with the site, however there have been incidents of flooding caused by this watercourse further downstream. I would confirm that to my knowledge it is not affected by any flood plains from major watercourses in the area.

There are foul public sewers adjacent to the site. Yorkshire Water should be consulted with regard to the discharge of flows from the proposed development to the Public Sewerage network.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the authority where ground conditions are suitable. Sustainable Urban Drainage techniques (SUD's) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements.

The authority seeks to promote the use of SUD's techniques to this site and the authority expects the developer of the site to submit detailed investigations such that the use of SUD's has been fully explored.

If this watercourse crossing the site is chosen by the developer as a point of discharge for surface water from the site the developer's attention is drawn to the following:

There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed.

if a new connection to the watercourse is proposed, then flows must be attenuated to a maximum of 5 litres/second/hectare.

Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site (including an allowance of 30% for climate change), without causing any flooding to buildings.

Should you wish to discuss this matter further please contact me on the telephone number below.

Regards

Wayne Atkins
Senior Engineer - Drainage and Highways
Barnsley Metropolitan Borough Council
Environmental Services
Network Resilience and Asset Management
Westgate Plaza 1
PO Box 603
S70 9FA

A P P E N D I X F

MASTERPLAN LAYOUT OF PROPOSED DEVELOPMENT

PIPESTONE LTD

PROPOSED RESIDENTIAL DEVELOPMENT
LAND WEST OF WAKEFIELD ROAD, MAPPLEWELL

CLIENT :

PIPESTONE LTD

PROJECT :

LAND WEST OF WAKEFIELD ROAD, MAPPLEWELL

DRAWING OF :

DRAFT LAYOUT

DRAWING NO :

D09 4198 100

DRAWN BY :

JRP

SCALE: **1 : 1250**

DATE : **23.03.2012**

■ architectural design
■ town planning
■ landscape architecture

John R Paley Associates

www.jrpassoc.co.uk, tel - 01924 383322

A P P E N D I X G

INDICATIVE SURFACE WATER DRAINAGE CALCULATIONS

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow Σ (l/s)	Max Volume (m³)	Status
15 min Summer	100.432	0.432	51.7	0.0	51.7	813.0	O K
30 min Summer	100.563	0.563	54.8	0.0	54.8	1058.9	O K
60 min Summer	100.692	0.692	54.9	0.0	54.9	1301.8	O K
120 min Summer	100.804	0.804	54.9	0.0	54.9	1510.9	O K
180 min Summer	100.847	0.847	54.9	0.0	54.9	1592.2	O K
240 min Summer	100.861	0.861	54.9	0.0	54.9	1619.4	O K
360 min Summer	100.872	0.872	54.9	0.0	54.9	1638.8	O K
480 min Summer	100.870	0.870	54.9	0.0	54.9	1635.3	O K
600 min Summer	100.860	0.860	54.9	0.0	54.9	1617.1	O K
720 min Summer	100.845	0.845	54.9	0.0	54.9	1589.1	O K
960 min Summer	100.807	0.807	54.9	0.0	54.9	1517.9	O K
1440 min Summer	100.720	0.720	54.9	0.0	54.9	1354.5	O K
2160 min Summer	100.599	0.599	54.9	0.0	54.9	1126.0	O K
2880 min Summer	100.505	0.505	54.0	0.0	54.0	949.5	O K
4320 min Summer	100.386	0.386	49.3	0.0	49.3	725.8	O K
5760 min Summer	100.320	0.320	43.9	0.0	43.9	601.2	O K
7200 min Summer	100.279	0.279	39.0	0.0	39.0	525.0	O K
8640 min Summer	100.250	0.250	34.8	0.0	34.8	470.0	O K
10080 min Summer	100.229	0.229	31.6	0.0	31.6	431.1	O K
15 min Winter	100.485	0.485	53.5	0.0	53.5	912.6	O K
30 min Winter	100.634	0.634	54.9	0.0	54.9	1191.1	O K
60 min Winter	100.782	0.782	54.9	0.0	54.9	1469.4	O K
120 min Winter	100.913	0.913	54.9	0.0	54.9	1715.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	89.917	0.0	815.5	0.0	22
30 min Summer	59.725	0.0	1089.4	0.0	37
60 min Summer	38.009	0.0	1414.8	0.0	66
120 min Summer	23.489	0.0	1750.4	0.0	126
180 min Summer	17.530	0.0	1960.2	0.0	184
240 min Summer	14.174	0.0	2113.6	0.0	224
360 min Summer	10.475	0.0	2343.5	0.0	284
480 min Summer	8.449	0.0	2520.5	0.0	348
600 min Summer	7.147	0.0	2664.9	0.0	416
720 min Summer	6.231	0.0	2787.8	0.0	486
960 min Summer	5.015	0.0	2991.0	0.0	620
1440 min Summer	3.688	0.0	3296.3	0.0	884
2160 min Summer	2.709	0.0	3650.9	0.0	1260
2880 min Summer	2.174	0.0	3905.7	0.0	1620
4320 min Summer	1.593	0.0	4283.9	0.0	2336
5760 min Summer	1.277	0.0	4593.0	0.0	3008
7200 min Summer	1.075	0.0	4831.9	0.0	3744
8640 min Summer	0.934	0.0	5035.5	0.0	4488
10080 min Summer	0.829	0.0	5210.6	0.0	5152
15 min Winter	89.917	0.0	915.7	0.0	22
30 min Winter	59.725	0.0	1222.4	0.0	36
60 min Winter	38.009	0.0	1585.5	0.0	66
120 min Winter	23.489	0.0	1961.3	0.0	122

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow Σ (l/s)	Max Volume (m³)	Status
180 min Winter	100.968	0.968	54.9	0.0	54.9	1819.2	O K
240 min Winter	100.989	0.989	54.9	0.0	54.9	1859.4	O K
360 min Winter	100.990	0.990	54.9	0.0	54.9	1861.3	O K
480 min Winter	100.983	0.983	54.9	0.0	54.9	1847.5	O K
600 min Winter	100.964	0.964	54.9	0.0	54.9	1812.8	O K
720 min Winter	100.939	0.939	54.9	0.0	54.9	1764.8	O K
960 min Winter	100.876	0.876	54.9	0.0	54.9	1647.5	O K
1440 min Winter	100.738	0.738	54.9	0.0	54.9	1386.7	O K
2160 min Winter	100.557	0.557	54.7	0.0	54.7	1046.4	O K
2880 min Winter	100.437	0.437	51.9	0.0	51.9	821.7	O K
4320 min Winter	100.315	0.315	43.4	0.0	43.4	592.6	O K
5760 min Winter	100.259	0.259	36.1	0.0	36.1	486.2	O K
7200 min Winter	100.224	0.224	30.8	0.0	30.8	421.8	O K
8640 min Winter	100.201	0.201	27.0	0.0	27.0	377.7	O K
10080 min Winter	100.184	0.184	24.2	0.0	24.2	345.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
180 min Winter	17.530	0.0	2196.3	0.0	180
240 min Winter	14.174	0.0	2368.2	0.0	234
360 min Winter	10.475	0.0	2625.7	0.0	308
480 min Winter	8.449	0.0	2823.8	0.0	376
600 min Winter	7.147	0.0	2985.6	0.0	452
720 min Winter	6.231	0.0	3123.3	0.0	530
960 min Winter	5.015	0.0	3350.8	0.0	678
1440 min Winter	3.688	0.0	3693.3	0.0	956
2160 min Winter	2.709	0.0	4089.7	0.0	1324
2880 min Winter	2.174	0.0	4375.4	0.0	1676
4320 min Winter	1.593	0.0	4800.5	0.0	2340
5760 min Winter	1.277	0.0	5144.6	0.0	3056
7200 min Winter	1.075	0.0	5412.3	0.0	3752
8640 min Winter	0.934	0.0	5640.9	0.0	4496
10080 min Winter	0.829	0.0	5839.1	0.0	5240

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 5.000

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.000	4	8	5.000

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Model Details

Storage is Online Cover Level (m) 102.000

Tank or Pond Structure

Invert Level (m) 100.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1880.0	0.700	1880.0	1.400	0.0	2.100	0.0
0.100	1880.0	0.800	1880.0	1.500	0.0	2.200	0.0
0.200	1880.0	0.900	1880.0	1.600	0.0	2.300	0.0
0.300	1880.0	1.000	1880.0	1.700	0.0	2.400	0.0
0.400	1880.0	1.100	0.0	1.800	0.0	2.500	0.0
0.500	1880.0	1.200	0.0	1.900	0.0		
0.600	1880.0	1.300	0.0	2.000	0.0		

Hydro-Brake® Outflow Control

Design Head (m) 1.000 Hydro-Brake® Type Md5 SW Only Invert Level (m) 100.000
Design Flow (l/s) 55.0 Diameter (mm) 286

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.3	1.200	56.6	3.000	85.3	7.000	130.2
0.200	26.9	1.400	59.6	3.500	92.1	7.500	134.8
0.300	41.6	1.600	62.9	4.000	98.5	8.000	139.2
0.400	50.1	1.800	66.3	4.500	104.4	8.500	143.5
0.500	53.9	2.000	69.8	5.000	110.1	9.000	147.7
0.600	54.9	2.200	73.1	5.500	115.5	9.500	151.7
0.800	54.2	2.400	76.3	6.000	120.6		
1.000	54.6	2.600	79.4	6.500	125.5		

Weir Overflow Control

Discharge Coef 0.544 Width (m) 3.000 Invert Level (m) 101.000

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