Report No. **374/24**

FLOOD RISK ASSESSMENT REPORT

ON SITE OFF

BAMFORD CLOSE
DODWORTH, BARNSLEY

ON BEHALF OF

STRATA GROUP PLC

JULY 2012

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1.0 INTRODUCTION

1.1 The Strata Group PLC are considering purchase of land off Barnford Close, Dodworth, Barnsley for redevelopment with residential dwellings. As part of the viability assessment, a Flood Risk Assessment was required.

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 of 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 have been appointed by to carry out an assessment of the site, implement appropriate consultations and prepare a Flood Risk Assessment Report, in accordance with NPPF, to satisfy the requirements of the Planning Authority.

1.4 The consultations and walkover survey have been carried out in June and July 2012.

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 a rhomboidal shaped piece of land equating to an area of approximately 1.4ha. The site is situated to the west of Barnsley in the suburb of Dodworth. The Ordnance Survey Grid Reference is SE 312 052.

2.2 A site location plan is presented in Appendix A.

Current Use

2.3 The site is presently greenfield with unkempt ryegrass covering over the whole area. It does not appear that there has been any use of the land for agricultural purposes for some time.

Boundaries

2.4 The site is bounded by a mixture of hedges, fences and walls of rear gardens to residential property on the northern, eastern and western sides of the site. Bamford Close and Haddon Close abut the northern and eastern boundaries respectively, whilst Briery Gardens is set back from the boundary on a newer estate to the west. The southern boundary is formed by a raised banking with overgrown nettles and similar bushes with an area of land abutting railing to an adjacent cemetery. There appears to be a track along the southern boundary which may be a public right of way.

Topography and Vegetation

2.5 The land slopes from north to south and east to west with the lowest point on the southeastern corner. A topographical survey is presented in Appendix B.

2.6 The site is covered in unkempt ryegrass with only isolated trees generally along the southern boundary, although there are some trees growing along the boundary with the adjacent residential dwellings, particularly on the northern boundary. There is a mature hawthorn bush adjacent to Bamford Close preventing access at this location and only pedestrian access is available off Haddon Close where there is a break in a timber fence across the back of the highway.

Drainage

2.7 There is no obvious positive drainage system on the site although it is possible that there are land drains which will be running towards the southern boundary. There is a ditch along the boundary which appears to collect water and divert this to a gully which presumably discharges to watercourse. There is a brick chamber adjacent to the boundary edge where water was running out of the 100mm diameter pipe at the time of the visit, even though the weather was fine. This is presumed to accommodate flow of water from the site to this location.

2.8 Photographs of the outfall structure and grate are presented in Appendix C.

2.9 There is a watercourse to the south of the cemetery and it is anticipated that the gully in the ditch near to the centre of the southern boundary of the site discharges to this watercourse via a pipe through third party land.

3.0 ENVIRONMENT AGENCY CONSULTATION

3.1 A consultation was requested from the Environment Agency and a copy of the response, reference RFI/2012/22637 dated 4th July 2012, is presented in Appendix D for reference.

3.2 The Environment Agency confirm that the site falls within land outside the 1 in 1000 year flood plain and is 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 Recommendation is made to contact the Local Authority Main Drainage Department for additional information relating to the site.

3.4 Surface water discharge from the new development should mimic the pre-development situation using Sustainable Drainage Systems so that flows to watercourses is not increased. The surface water discharge should be attenuated to the greenfield 1 in 1 year flow from the site. This would normally be 5l/s/ha for greenfield sites.

3.5 Recommendation is made to use Sustainable Urban Drainage techniques wherever possible.

4.0 WATER AUTHORITY CONSULTATION

4.1 A consultation was requested by RAB Engineering Design from Yorkshire Water, who are the Water Authority for this area, and a copy of their response, reference N001382 dated 22nd February 2012, is presented in Appendix E for reference. Furthermore, a planning consultation from Yorkshire Water, under reference N004899 dated 11th May 2012 to Barnsley Metropolitan Borough Council is also appended in Appendix E for reference.

4.2 Foul water can discharge to the 225mm diameter public foul sewer in Haddon Close, approximately 100m from the site.

4.3 In respect of surface water, reference is made to Requirement H3 of Building Regulations 2000 and Sustainable Drainage Systems. The Yorkshire Water consultation refers to a culverted watercourse to the north of the site and that this would appear to be the obvious place for surface water disposal. However, to achieve an outfall to this location, connection to the existing surface water sewer will be required.

4.4 Land and highway drainage has no right of connection to the public sewer, but highway drainage may be acceptable if there is capacity within a public sewer network and Sustainable Drainage is not a viable option.

5.0 LAND DRAINAGE AUTHORITY CONSULTATION

5.1 A consultation was requested by the Strata Group Plc from Barnsley Metropolitan District Council, who are the Land Drainage Authority for this area, and a copy of their e-mail response, dated 9th February 2012, is presented in Appendix F for reference.

5.2 Reference is made to an unnamed watercourse approximately 70m to the south of the development adjacent to the cemetery and, for the purposes of the Land Drainage Act 1991, this is in Riparian ownership. It will be necessary to cross third party land to connect to this watercourse.

5.3 There should be no increase in surface water run-off from the new development and any flows must be attenuated to a maximum of 5l/s/ha.

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

5.5 Recommendation is made to use Sustainable Urban Drainage techniques wherever possible.

6.0 MATERIAL CONSIDERATION IN RESPECT OF NPPF AND TG

Flood Classification

6.1 The Environment Agency has confirmed that the site falls within land 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 Therefore, all uses of land are appropriate within this zone, but an assessment of the effective surface water run-off will need to be incorporated in a Flood Risk Assessment.

End Use

6.3 The development proposal is for new residential dwellings and a copy of the proposed layout is presented in Appendix G for reference purposes.

6.4 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

6.5 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).

6.6 When the site is evaluated in accordance with Table 3 of the TG, the development shows that the Sequential Test is satisfied.

Flood Sources

6.7 Flooding from Rivers – There are no rivers maintained by the Environment Agency within the vicinity of the site and, therefore, there is no flooding from this source.

6.8 Flooding from Local Watercourses – There is an unnamed watercourse to the south of the cemetery which is much lower than the site and any flooding from this source is unlikely. Yorkshire Water refer to a culverted watercourse on the northern boundary. However, water will be retained in the culvert and is unlikely, therefore, to cause any flooding on the site. It is concluded that flooding from this source is low risk.

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

6.10 Flooding from Land – The site is situated adjacent to residential development on the northern and western boundaries, where the levels outside the site will be slightly above those within the development. However, these developments will have positive drainage systems and the possibility of run-off into the site is considered to be insignificant from this source. However, if water does run into the site, a land drain cut-off trench, which is directed through to the ditch and outfall on the southern boundary, will be required.

6.11 Flooding from Groundwater – Whilst no intrusive investigation of the site conditions has been undertaken, the Geological Survey of Great Britain plan shows that the site is located on undifferentiated strata, normally sandstones, siltstones and mudstones of the Upper Carboniferous Period with a fault crossing the site. The Flockton Thick Coal Seam outcrops to the south and is likely to lie underneath the site. Whilst there is no evidence of drift over the site, the upper strata is likely to be weathered to a clay material and this will be generally impermeable. The possibility of groundwater issues on the site is unlikely and the risk of flooding from this source is considered to be low.

6.12 Flooding from Sewer – There will be a new surface water drainage system for the development and it is possible that any blockage of the sewers will result in flooding from the lowest cover level of manholes or gullies. This will need to be considered as part of the proposed development.

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

Climate Change

6.14 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.

6.15 Whilst levels to the north and west are slightly above site, the adjacent built up residential development areas will have positive drainage throughout. 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 climate change.

6.16 In accordance with the TG, the published figures show that, for an expected life of greater than 2085 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

6.17 As the site falls within Flood Zone 1, flood mitigation measures are only required in the event of a catastrophic storm or blockage of the proposed sewers. The following precautionary mitigation measures are, therefore, recommended:-

6.17.1 The finished floor levels to the properties shall be raised above external levels by a minimum of 150mm.

6.17.2 The proposed dwellings shall be designed without any basements and shall be constructed with solid concrete ground floors to prevent access to any subfloor void.

6.17.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper level, where practical and necessary.

6.17.4 In the likely event of flooding of the site, it will be appropriate to design external levels with falls to the southern boundary of the site, where there is a ditch along this boundary, which collects water into a specific location with discharge to the watercourse to the south.

Sustainable Drainage

6.18 In order to comply with the requirements of NPPF, it will be necessary to consider aspects of Sustainable Drainage techniques for the new development. No intrusive investigation of the ground conditions has been undertaken, but the Geological Survey Map shows the site is located on the undifferentiated strata of the Upper Coal Measures with no drift cover. These materials are likely to be sandstones, siltstones and mudstones, with weathering of the natural soils to a clay cover. The Flockton Thick coal seam outcrops close to the south and will be located under the site. The surface strata are likely to have very low infiltration rates, and it is assumed that the soils will be unsuitable for soakaway or other similar infiltration systems on the site. The presence of the coal seam under the site and the unnamed watercourses to the south, would confirm this assessment. For the purposes of the report, it is assumed that a full positive drainage system will be required with discharge to the existing outfall on the southern boundary with eventual outfall into the unnamed watercourse to the south.

Drainage

6.19 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 and Outfall for Proposed Development.

6.20 The site walkover shows that the site is greenfield and it is has been agreed that a discharge rate of 5l/s/ha is acceptable to both the Environment Agency and the Land Drainage Authority. For a site area of 1.4ha, a discharge rate equates to 7.0l/s. In order to assess the outfall from the gully adjacent to the southern boundary, EDS were requested by the Strata Group to carry out a CCTV Survey of the pipe and justify the outfall. A copy of the plan prepared by EDS is presented in Appendix H and, whilst the survey had to be abandoned at certain locations and the outfall location was only approximated, this clearly discharged land drainage water from the site to unnamed watercourse to the south of the cemetery. However, for the outfall to be confirmed, there will be significant further investigation works, improvement to pipework on third party land and justification that there is sufficient gradient to provide gravity outfall to the watercourse. Therefore, if the proposed surface water system cannot outfall to the existing watercourse, it will be necessary to negotiate with Yorkshire Water to agree an outfall to the existing surface water sewer on Haddon Close to the east of the development. Scheme levels will need to be designed to show that a gravity system can be provided to this location.

Proposed Surface Water Drainage

6.21 The indicative site layout is presented in Appendix G and assuming that this shows a 50% impermeable area for the whole site, this gives an area of 0.70ha. Using the WinDES Source Control computer program, with an allowance for 30% increase in rainfall for climate change, on-site storage will be 362.2m³ for a 1 in 100 year storm with discharge restricted to 7.0l/s. This can be achieved by several methods, including

oversize pipes, underground tanks, balance ponds or a combination of some or all of these. Whilst detailed calculations and proposals will be required, one such option will be to provide 68m of 3.6m x 1.5m Box Culvert or equivalent to achieve the necessary attenuation. This option will need to be assessed in relation to the proposed layout and the existing outfall before considering an option of this nature. The indicative surface water calculations are presented in Appendix I, but detailed calculations and proposals will be prepared and submitted to the Planning Authority for approval prior to construction.

Foul Drainage

6.22 Yorkshire Water have identified that foul drainage can discharge to the existing foul sewer in Haddon Close.

Emergency Egress During Times of Flood

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

6.24 As the site falls within Flood Zone 1, no special mitigation measures are required for emergency egress during times of flood.

7.0 COMMENTS

7.1 The site falls within Flood Zone 1 and the Sequential Test is satisfied. However, in order to accommodate the possibilities of flood from extreme storm or blocked sewers, the following mitigation measures are recommended.

7.1.1 The ground floor to the proposed dwelling shall be set above external levels by a minimum of 150mm and preferably 300mm, if possible.

7.1.2 The new dwelling shall be designed without any basements and the ground floor shall be constructed using solid concrete slabs to prevent access 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 If possible, the external alignment of the road and hard paved area shall be designed to direct any flood water to the southern boundary and into the existing ditch and collection point with eventual outfall into the watercourse to the south.

7.2 A 30% increase in rainfall shall be incorporated into any new positive drainage design to satisfy the requirements of climate change for development extending beyond 2085.

7.3 Sustainable Drainage Systems of infiltration techniques are considered to be unsuitable on this particular site.

7.4 Surface water discharge shall be restricted to a rate of 5l/s/ha for greenfield run-off with outfall directed to either the existing point of discharge for the field at the present time to the gully along the southern boundary or the existing surface water sewer in Haddon Close to the east with the agreement of Yorkshire Water. If the outfall can be proved to the watercourse to the south of the cemetery, replacement of some of the pipes will be required.

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

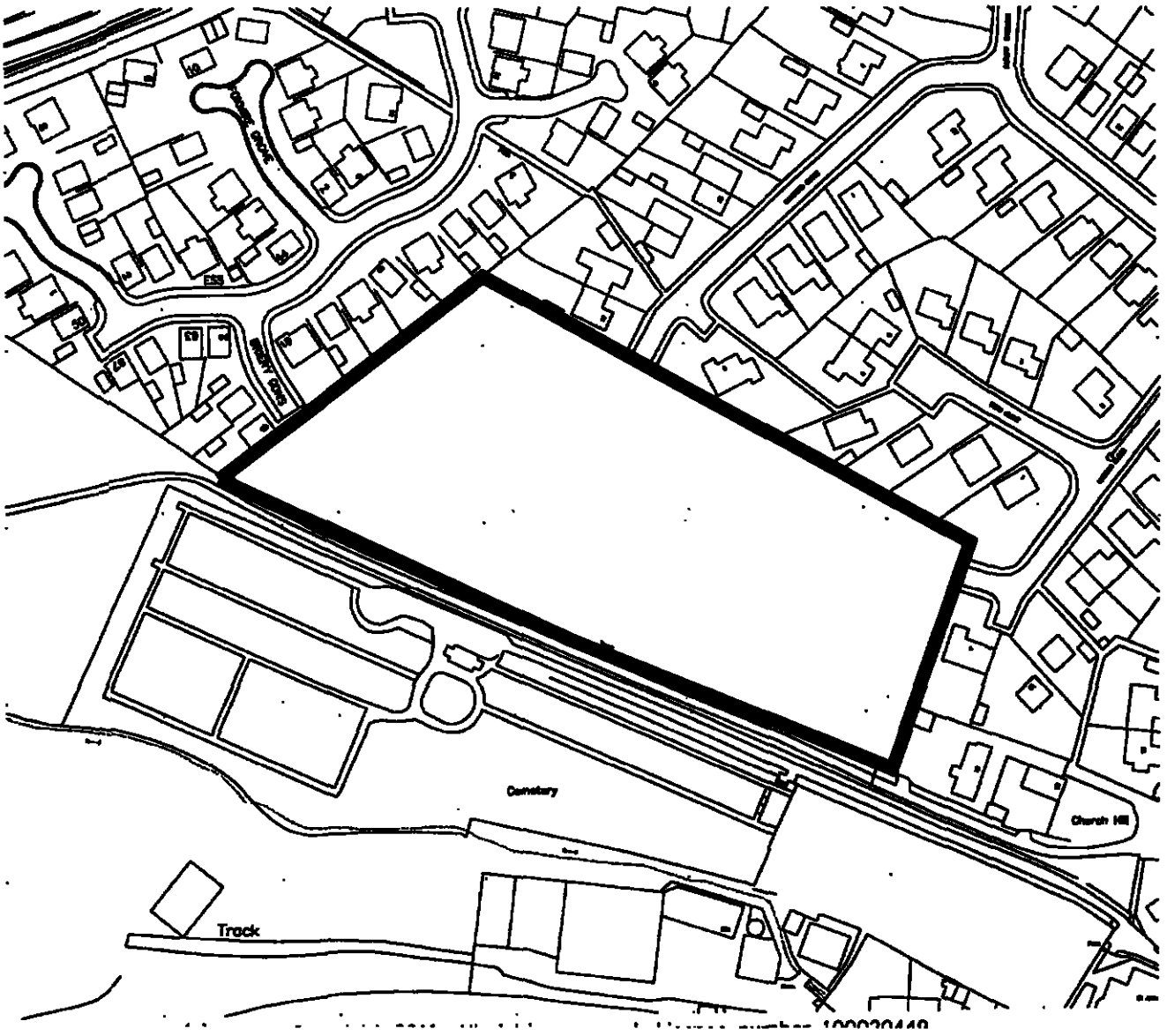
7.6 In respect of foul drainage, outfall will be to an existing foul sewer in Haddon Close.

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

7.8 Subject to compliance with the above, the proposed development can satisfy the requirements of the National Planning Policy Framework and its accompanying Technical Guidance.

APPENDIX A

SITE LOCATION PLAN



Rev	By	Date	Amendment	Chk
/			Issued for approval	

Title

SITE LOCATION PLAN

Project/Client

BAMFORD CLOSE, DODWORTH.
STRATA GROUP PLC.

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Telephone : 0113 245 8488 • Fax : 0113 244 3864
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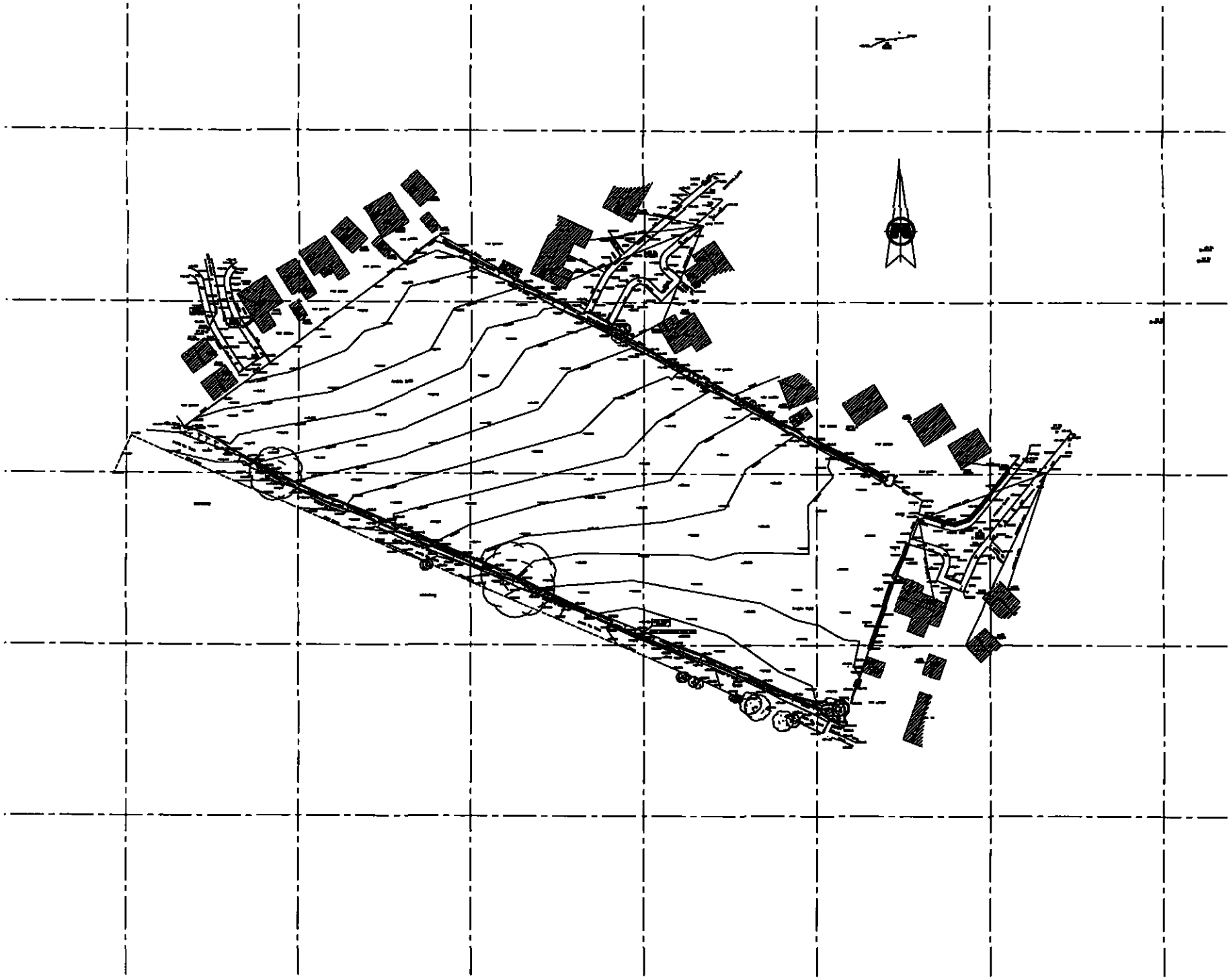
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APPENDIX B

TOPOGRAPHICAL SURVEY



DODWORTH TOPOGRAPHICAL SURVEY

BLOOR HOMES

.SURVEYING DEPARTMENT.

DWT_002

.SURVEYING DEPARTMENT.

APPENDIX C

PHOTOGRAPHS OF DRAINAGE OUTFALL


11 07 2012


11 07 2012


11 07 2012

APPENDIX D

ENVIRONMENT AGENCY CONSULTATION

Allan Poyser

From: Beech, Cheryl [Cheryl.Beech@environment-agency.gov.uk]
Sent: Wednesday 4 July, 2012 3:22 pm
To: Allan Poyser
Subject: Your Enquiry: RFI/2012/22637
Attachments: Standard Notice.pdf; RFI 22637 Map.pdf; VAT Receipt.pdf

Our Ref: RFI/2012/22637

Your Ref:

Dear Allan

RE: Bamford Close, Dodworth, Barnsley

Thank you for your request of 15 June 2012 regarding the above.

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;

We confirm that the site lies in flood zone 1 according to the Environment Agency Flood Map. Please find attached map confirming this. The site may also be subject to flooding from a number of different sources (small or culverted watercourses, public sewers, highway drains, overland surface water flow) and it may be worthwhile contacting the local authority main drainage department who may hold more detailed information for the site and may be able to advise further.

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 attached notice which you should read.
We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:

http://www.surveyshack.com/link/a3d10

If you require any further help, please do not hesitate to contact me.

Yours sincerely

Cheryl Beech
Customer and Engagement 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.

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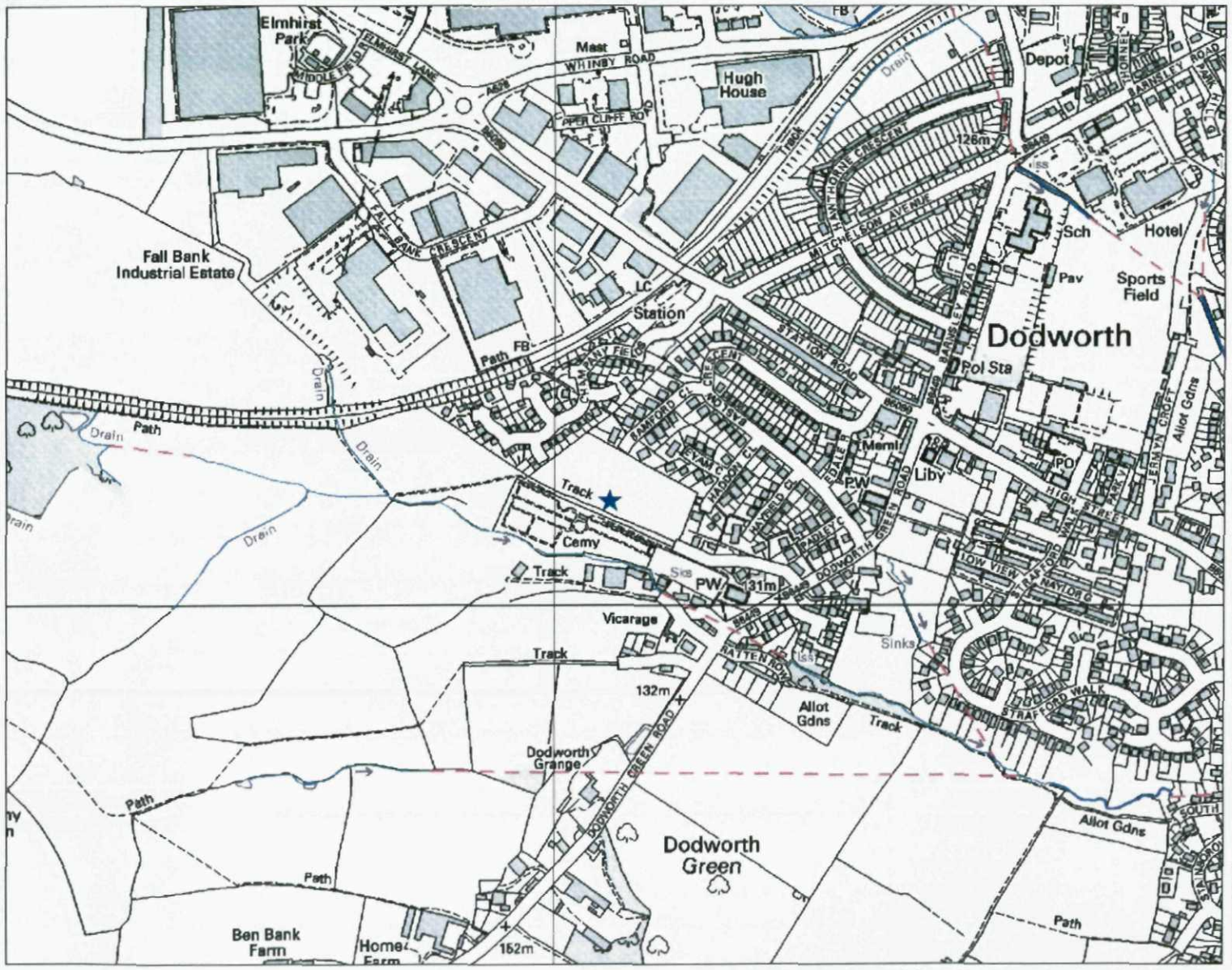
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RFI 22637 Map



Environment Agency

Scale 1:7,460

N W E S

Sealed Main Rivers

Detailed River Network

- **Primary River**
- **Secondary River**
- **Tertiary River**
- **Lake / Reservior**
- **Canal**
- **Culvert**
- **Canal Tunnel**
- **Underground River (inferred)**
- **Underground River (local knowledge)**
- **Underground River (Potential Sewer)**

River Obstructions

- **Lock**
- **Dam**
- **Barrage**
- **Mill**
- **Waterfall**

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- *or from a river with a 1 in 100 or greater* chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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Contact: enquiries@environment-agency.gov.uk 08708 506506

APPENDIX E

WATER AUTHORITY CONSULTATION

YorkshireWater

Yorkshire Water Services
Developer Services
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Bradford
BD3 7AY

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Fax: (01274) 372 834

Email:
Planning.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:

Kashif Khan on (0845)120 8482

22nd February 2012

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21 Burncross Drive
Sheffield
S35 1DJ

For the attention of Mr R Bland

Your Ref:
Our Ref: N001382

Dear Sir,

Briery Gnds/Haddon Close, Dodworth, S75 3SQ - Sewerage Pre-Planning Sewerage Enquiry on J885405

Thank you for your enquiry received 7th February 2012. Our charge of £62.82 (plus VAT) will be added to your account with us, reference RAB028. 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:

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 in Haddon Close, at a point approximately 100 metres from the site.

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.

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.

It is understood that a culverted watercourse is located to the north of the site. This appears 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.

An off-site sewers 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 0845 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 0845 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 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.

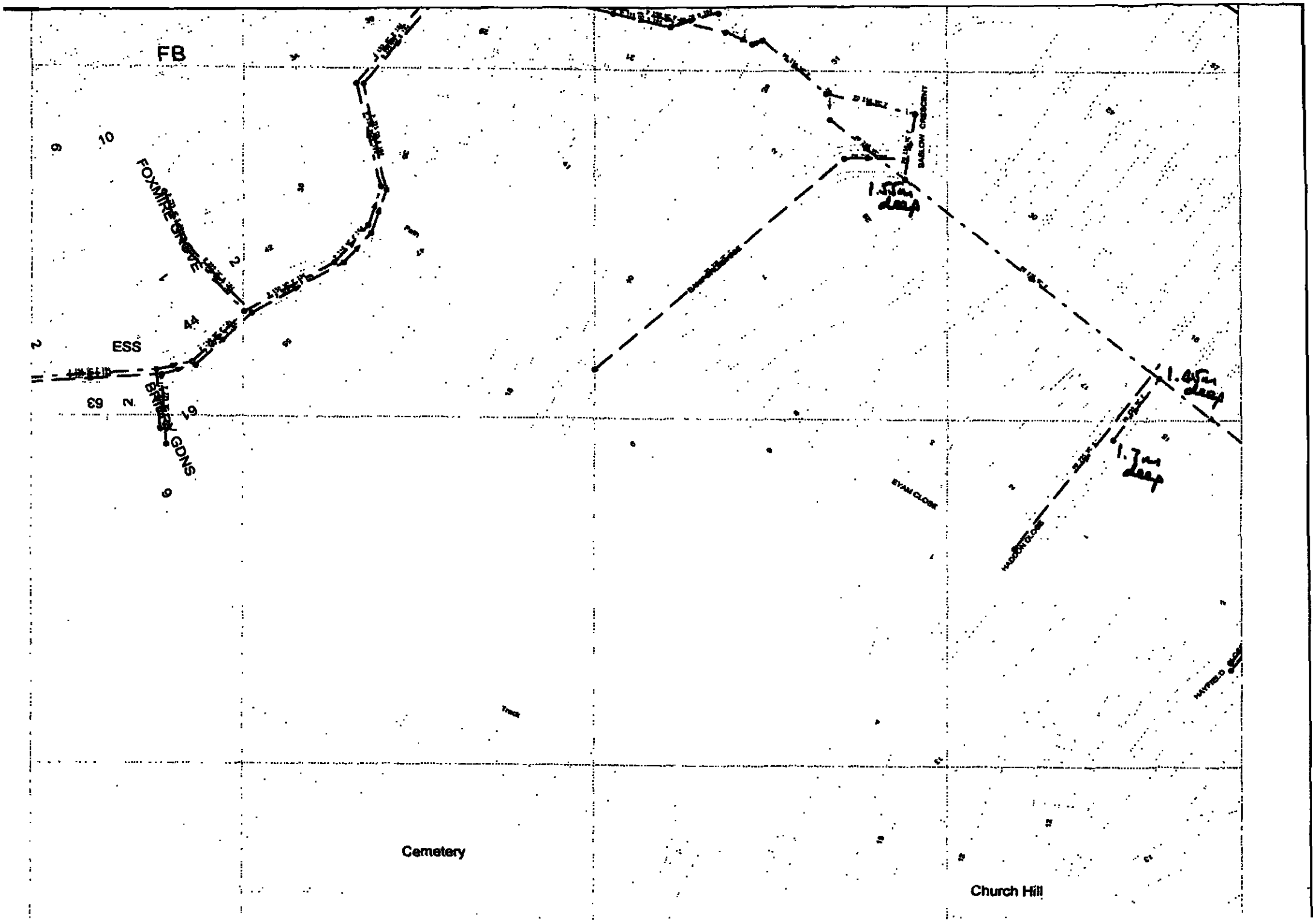
No land drainage to be connected/discharged to public sewer.

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


FB
FOXMIRE GROVE
ESS
BARLOW CRESCENT
STAM CLOSE
HADDENTOWN
Cemetery
Church Hill

YorkshireWater

Land & Planning
Yorkshire Water Services Ltd
PO Box 500
Western House
Western Way
Halifax Road
Bradford
BD6 2LZ

Tel: (01274) 691111
Fax: (01274) 692643

Head of Planning and Transportation
Service
Barnsley Metropolitan Borough Council
PO Box 604
Barnsley
S70 9FE

Your Ref: 2012/ENQ/01174
Our Ref: N004899

For telephone enquiries ring:
Z Fayyaz on (01274) 692072

E-mail Zaffer.Fayyaz@yorkshirewater.co.uk

11th May 2012

Dear Sir/Madam,

Land off Bamford Close Dodworth Barnsley - Proposed residential development of 44 dwellings

Thank you for consulting Yorkshire Water regarding the above pre development enquiry. We have the following comments:

Water Supply

OBSERVATIONS:

A water supply can be provided under the terms of the Water Industry Act, 1991.

Waste Water

The development of the site should take place with separate systems for foul and surface water drainage.

Foul water domestic waste should discharge to the shallow public foul water sewer recorded in Haddon Close at a point approximately 100 metres from the site.

If sewage pumping is required, the peak pumped discharge must not exceed 6 (six) litres per second in either case.

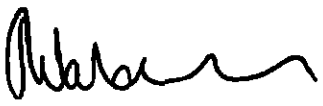
We recommend that the Applicant / Developer investigates surface water disposal to soakaway and / or watercourse.

Off-site sewerage may be required. This may be provided by the developer and considered for adoption by means of a sewer adoption agreement under Section 104 of the Water Industry Act 1991. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991.

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. Land drainage will not be allowed into a public sewer.

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, a formal agreement for highway drainage discharge to public sewer, under Section 115 of the Water Industry Act 1991, will be required.

Yours faithfully



Stephanie Walden
Land Use Planning Manager

APPENDIX F

LAND DRAINAGE AUTHORITY CONSULTATION

Allan Poyser

From: Kenny Mawson [KennyMawson@strata.co.uk]
Sent: Wednesday 13 June, 2012 2:39 pm
To: Allan Poyser
Cc: Richard Bland; Ian Corner
Subject: FW: Proposed Development off Haddon/Bamford Close, Dodworth
Attachments: Dodworth.pdf

Al,

As discussed can you please provide a fee quote for the FRA. The FRA will be required for a mid July planning submission.

Richard & I are currently investigating the offsite drain that runs through the cemetery for a SW outfall.

Below is the Land Drainage Authority response and have already sent you the YW consultation, site layout and recent drainage survey.

If you need anything else please feel free to speak to Ian, Richard or myself.

Thanks

Kenny

From: Atkins , Wayne [mailto:WayneAtkins@barnsley.gov.uk]
Sent: Thursday 09 February 2012 14:49
To: Kenny Mawson
Subject: RE: Proposed Development off Haddon/Bamford Close, Dodworth

Kenny,

There is an un-named watercourse approximately 70m south of the proposed development site at the opposite side of the adjacent cemetery from the development site as shown on the attached plan. This watercourse is an ordinary watercourse for the purposes of the Land Drainage Act, 1991, and is in riparian ownership. The developer would have to cross third party land to connect to this watercourse.

If this watercourse 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 a 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.

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 you have any queries please contact me on the telephone number below.

If not see you on Tuesday!

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
Telephone: 01226 772182
Fax: 01226 772196
E-mail: wayneatkins@barnsley.gov.uk

From: Kenny Mawson [mailto:KennyMawson@strata.co.uk]
Sent: 03 February 2012 14:31
To: Atkins , Wayne
Cc: 'Richard Bland'
Subject: Proposed Development off Haddon/Bamford Close, Dodworth

Wayne,

I tried to phone you today; please find attached a copy of YW records for the above proposed site.

Originally Bloor Homes were looking to develop the site but we have now had a bid accepted on the site adjacent the cemetery, and whilst there are issues relating to planning, I have to progress my engineering enquiries.

To this end I understand that there is a watercourse crossing/adjacent to the site and presume that we will need to connect to this for SW discharge. I would appreciate it if you could confirm any information you have on the watercourse; its designation, easement requirements, history of localised flooding, as well the discharge rate (inc climate change) and point of discharge.

Also if there any requirements that we need to allow for, e.g. surveying or upgrading of parts of the watercourse, it would be greatly appreciated.

regards

Kenny
Senior Engineer

strata homes yorkshire limited
quay point lakeside doncaster DN4 5PL
dd 01302 308553
mob 07970118529
tel 01302 308508

fax 01302 308501

web site www.homesbystrata.com
e-mail enquiries@homesbystrata.com

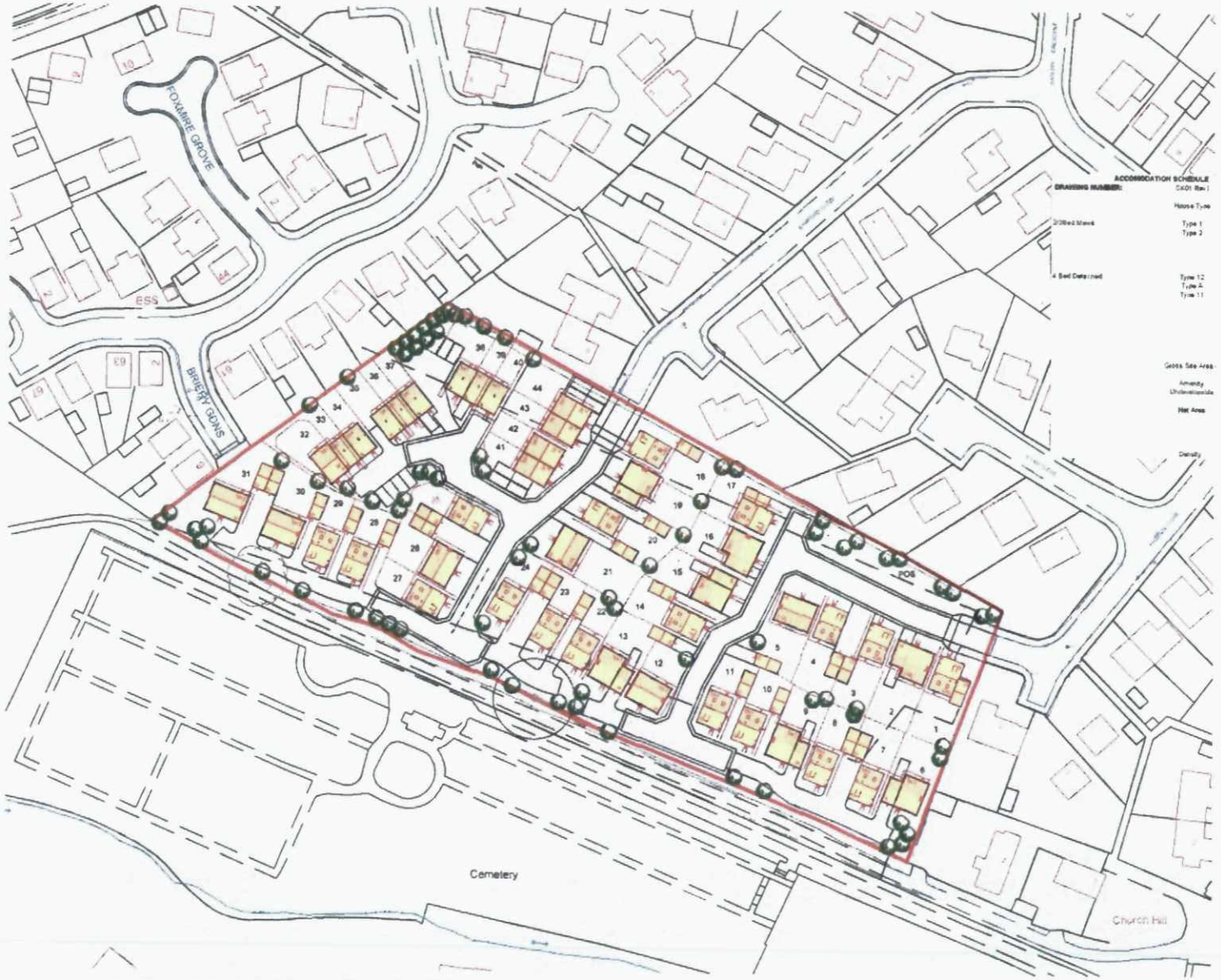
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APPENDIX G

PROPOSED DEVELOPMENT LAYOUT



A	04.07.12	Amended to take account of agreed position						ea
B	08.08.12	replanned with new house types						ea
C	28.08.12	replanned with new house types						ea
D	29.08.12	replanned with new house types						ea
E	23.09.12	reserved with new house types						ea
F	21.10.12	replanned with new house types						ea
G	24.10.12	replanned with new house types						ea
H	15.05.12	amended following average discussion with client						ea
I	01.06.12	amended following pre-app meeting with client						ea

ACCOMMODATION SCHEDULE

DRAWING NUMBER: CSDI Rev I — 15.05.12 — **SITE:** Bamford Close Dodworth

House Type	Apt	No	Bedrooms	Parking	Storey Height	Sq ft	Total sq ft	% age
2/3Bed Mews	Type 1	8	2	PS	2	656	5248	18.18
	Type 2	5	3	PS	2	876	4380	11.36
4 Bed Detached	Type 12	7	4	G	2	1273	8911	15.91
	Type A	18	4	G	2	1366	24592	40.91
	Type 11	6	4	G	2	1207	7242	13.64
	Total	44						

Total Sq Ft 49993

PS= Parking Space Only
G = Integral Garage
Gr Detached/Pergola or Attached Garage

Gross Site Area	14601	m2	
Amenity	423	m2	
Undevelopable	0	m2	
Net Area	13878	m2	3.365 acres
	1.3878	Ha	
	44892	sq ft/acre	
Density	32.4	dwellings/Ha	

homes by strata

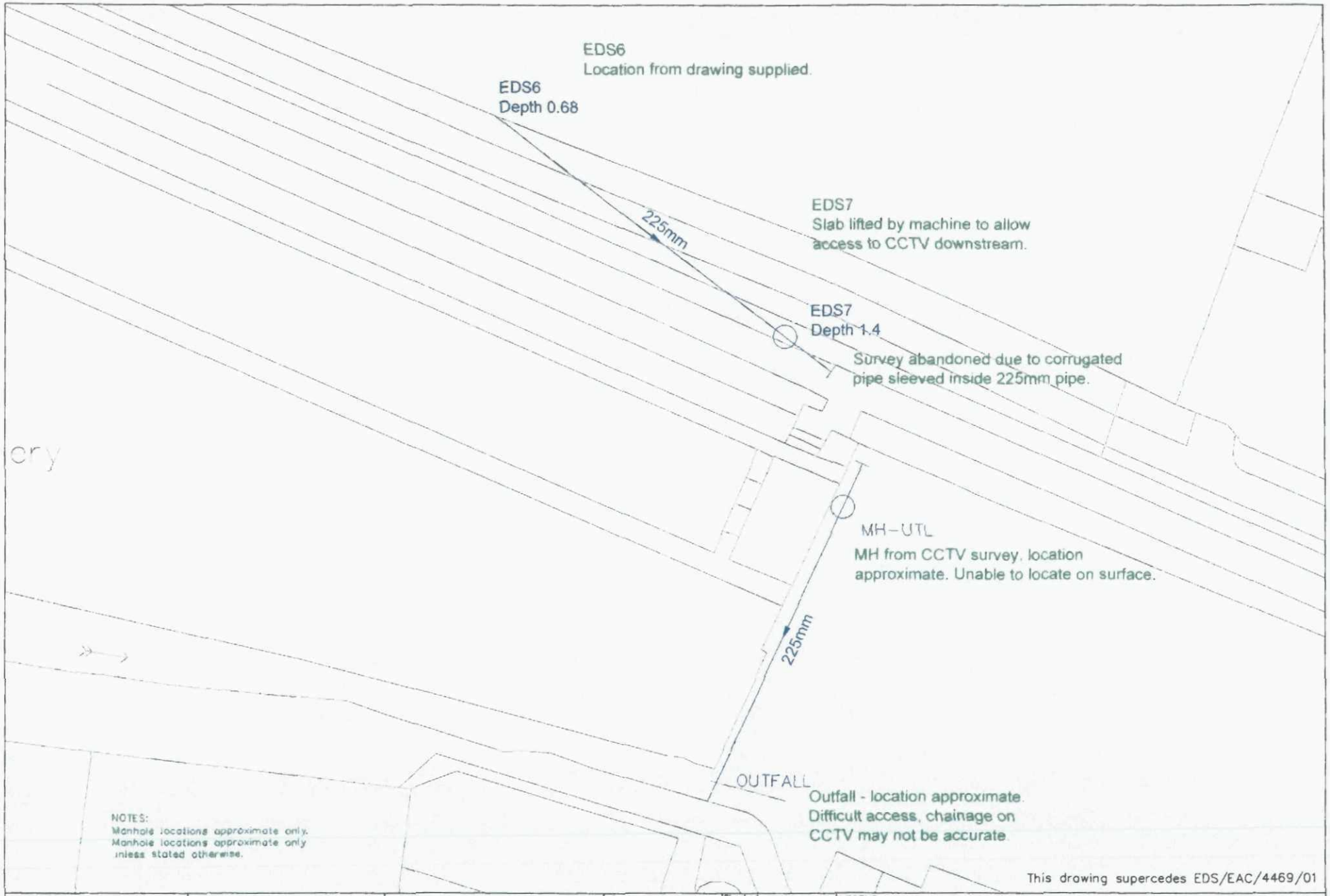
Bamford Close
Dodworth

Sketch Layout

BC/SK01

APPENDIX H

OFF-SITE INVESTIGATION OF LAND DRAIN



Corus Mills
Sheffield Rd
Rotherham S60 1BN
Tel 0845 2300 939
Fax 0845 2300 949
email ops@eds.uk.net
Web www.eds.uk.net

Client: HOMES BY STRATA

Title: BAMFORD CLOSE
DODWORTH

Drawn	LD	Checked	GEC
Date	01/06/12	Scale	NTS
Drawing No.	EDS/EAC/4504/01		

LEGEND

Foul Drain/Sewer
Surface Water Drain/Sewer
Watercourse/culvert
Combined Drain/Sewer

Manhole (Colour denotes use)
Gully (Colour denotes use)
Rainwater Pipe / Gully
Soil Vent Pipe

EDS1
G
RWP RWG
SVP

APPENDIX I

INDICATIVE SURFACE WATER DRAINAGE CALCULATIONS

ARP ASSOCIATES
AND GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH
Tel: 0113 245 8498
Fax: 0113 244 3864
E-Mail: leeds@arpassociates.co.uk

Client: STRATA GROUP	Project No. 374/24	Sheet. 1 of 5
Project: BAMFORD CLOSE, DODWORTH	Calc By. ARP	Date. 19/07/12
Element: SURFACE WATER DRAINAGE	Chkd By.	Date.

EXISTING DISCHARGE (Q_{EX})

Using greenfield Run-off of 5 l/s/ha
for Site Area of 1.4 ha

$Q_{EX} = 1.4 \times 5$

$Q_{EX} = 7.0$ l/sec

PROPOSED ATTENUATION

Using the WinDES Source Control Computer Program with the following criteria :-

Proposed Discharge (Q_{PROP})	= 7.0 l/sec
Climate Change	= +30%
Proposed Imp. Area (I_{PROP})	= 1.4 x 50% = 0.7 ha
Storm Duration	= 1 in 100 year

The calculated Attenuation = 68 m^3

This equates to 68m of 3.6m x 1.5m Box Culvert or equivalent.

Computer Output Sheets are presented on pages 2 - 5

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

Storm Duration (mins)	Maximum Control (l/s)	Maximum Overflow (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Overflow Volume (m^3)	Maximum Volume (m^3)	Status
15 Summer	4.7	0.0	4.7	100.6828	0.6828	0.0	151.2	O K
30 Summer	5.2	0.0	5.2	100.8748	0.8748	0.0	198.4	O K
60 Summer	5.7	0.0	5.7	101.0658	1.0658	0.0	245.3	O K
120 Summer	6.1	0.0	6.1	101.2353	1.2353	0.0	287.0	O K
180 Summer	6.3	0.0	6.3	101.3072	1.3072	0.0	304.7	O K
240 Summer	6.4	0.0	6.4	101.3367	1.3367	0.0	311.9	O K
360 Summer	6.4	0.0	6.4	101.3412	1.3412	0.0	313.0	O K
480 Summer	6.4	0.0	6.4	101.3277	1.3277	0.0	309.7	O K
600 Summer	6.3	0.0	6.3	101.3102	1.3102	0.0	305.4	O K
720 Summer	6.3	0.0	6.3	101.2897	1.2897	0.0	300.4	O K
960 Summer	6.2	0.0	6.2	101.2473	1.2473	0.0	289.9	O K
1440 Summer	6.0	0.0	6.0	101.1608	1.1608	0.0	268.7	O K
2160 Summer	5.7	0.0	5.7	101.0443	1.0443	0.0	240.0	O K
2880 Summer	5.4	0.0	5.4	100.9388	0.9388	0.0	214.1	O K
4320 Summer	4.9	0.0	4.9	100.7553	0.7553	0.0	169.0	O K
5760 Summer	4.6	0.0	4.6	100.5993	0.5993	0.0	130.7	O K
7200 Summer	4.6	0.0	4.6	100.4562	0.4562	0.0	95.5	O K
8640 Summer	4.6	0.0	4.6	100.3262	0.3262	0.0	63.5	O K
10080 Summer	4.6	0.0	4.6	100.2397	0.2397	0.0	42.3	O K
15 Winter	4.9	0.0	4.9	100.7583	0.7583	0.0	169.7	O K
30 Winter	5.5	0.0	5.5	100.9753	0.9753	0.0	223.1	O K
60 Winter	6.0	0.0	6.0	101.1933	1.1933	0.0	276.7	O K
120 Winter	6.5	0.0	6.5	101.3907	1.3907	0.0	325.1	O K
180 Winter	6.7	0.0	6.7	101.4792	1.4792	0.0	346.9	O K
240 Winter	6.8	0.0	6.8	101.5222	1.5222	0.0	357.0	O K
360 Winter	6.9	0.0	6.9	101.5507	1.5507	0.0	362.2	O K
480 Winter	6.8	0.0	6.8	101.5332	1.5332	0.0	359.2	O K
600 Winter	6.8	0.0	6.8	101.5042	1.5042	0.0	353.0	O K
720 Winter	6.7	0.0	6.7	101.4817	1.4817	0.0	347.6	O K
960 Winter	6.6	0.0	6.6	101.4267	1.4267	0.0	334.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	118.34	23
30 Summer	78.70	37
60 Summer	49.94	68
120 Summer	30.63	126
180 Summer	22.69	186
240 Summer	18.23	246
360 Summer	13.32	360
480 Summer	10.66	412
600 Summer	8.97	474
720 Summer	7.78	538
960 Summer	6.21	672
1440 Summer	4.51	954
2160 Summer	3.28	1364
2880 Summer	2.61	1764
4320 Summer	1.88	2556
5760 Summer	1.50	3344
7200 Summer	1.25	4040
8640 Summer	1.08	4672
10080 Summer	0.95	5344
15 Winter	118.34	23
30 Winter	78.70	37
60 Winter	49.94	66
120 Winter	30.63	124
180 Winter	22.69	182
240 Winter	18.23	240
360 Winter	13.32	350
480 Winter	10.66	454
600 Winter	8.97	494
720 Winter	7.78	566
960 Winter	6.21	718

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

Storm Duration (mins)	Maximum Control (l/s)	Maximum Overflow (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Overflow Volume (m^3)	Maximum Volume (m^3)	Status
1440 Winter	6.3	0.0	6.3	101.3037	1.3038	0.0	303.8	O K
2160 Winter	5.9	0.0	5.9	101.1308	1.1308	0.0	261.3	O K
2880 Winter	5.5	0.0	5.5	100.9778	0.9778	0.0	223.7	O K
4320 Winter	4.8	0.0	4.8	100.7178	0.7178	0.0	159.7	O K
5760 Winter	4.6	0.0	4.6	100.4827	0.4827	0.0	102.0	O K
7200 Winter	4.6	0.0	4.6	100.2598	0.2597	0.0	47.2	O K
8640 Winter	4.3	0.0	4.3	100.1842	0.1843	0.0	28.6	O K
10080 Winter	3.8	0.0	3.8	100.1543	0.1543	0.0	21.3	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
1440 Winter	4.51	1028
2160 Winter	3.28	1472
2880 Winter	2.61	1904
4320 Winter	1.88	2728
5760 Winter	1.50	3512
7200 Winter	1.25	4040
8640 Winter	1.08	4504
10080 Winter	0.95	5248

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Rainfall Details

Region	ENG+WAL	Cv (Summer)	0.750	Summer Storms	Yes
Return Period (years)	100	Cv (Winter)	0.840	Winter Storms	Yes
M5-60 (mm)	19.000	Shortest Storm (mins)	15	Climate Change %	+30
Ratio-R	0.373	Longest Storm (mins)	10080		

Time / Area Diagram

Total Area (ha) = 0.700

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.700

©1982-2008 Micro Drainage

Box Culvert Details

Height (m) 1.500 Width (m) 3.600 Invert Level (m) 100.000
Length (m) 68.000 Slope (1:x) 500.0 Cover Level (m) 103.000

Hydro-Brake Outflow Control

Design Head (m) 1.636 Hydro-Brake Type MD6 Invert Level (m) 100.000
Design Flow (l/s) 7.0 Diameter (mm) 98

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	3.0	0.60	4.4	1.60	7.0	2.60	8.9	5.00	12.4	7.50	15.1
0.20	4.6	0.80	5.0	1.80	7.4	3.00	9.6	5.50	13.0	8.00	15.6
0.30	4.4	1.00	5.5	2.00	7.8	3.50	10.3	6.00	13.5	8.50	16.1
0.40	4.2	1.20	6.1	2.20	8.2	4.00	11.1	6.50	14.1	9.00	16.6
0.50	4.3	1.40	6.5	2.40	8.6	4.50	11.7	7.00	14.6	9.50	17.0

Weir / Flume Overflow Control

Discharge Coef 0.544 Width (m) 3.600 Crest Level (m) 101.636

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