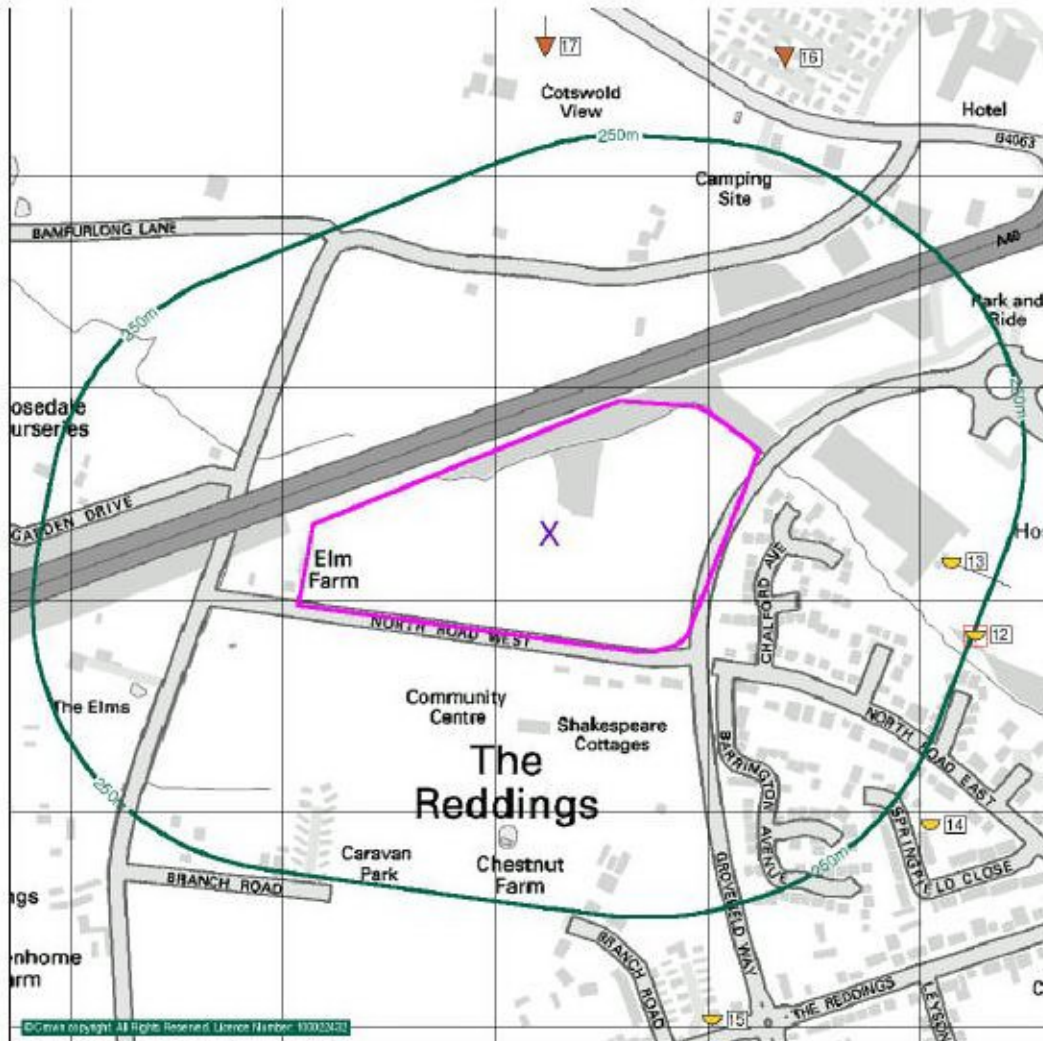


Sources	Ref No.	Search Buffer	Direction
Discharge Consents			
Discharge Consents			
Lucas Engine Control Systems, Dowty Fuel Systems Ltd, Arle Court, CHELTENHAM, Surface Water Discharge, Reference: S/20/04461/T/1, Version: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m, Contact Ref: 1	5	0-250m	SE
Woodward Diesel Systems, Woodward Aircraft Controls, Arle Court, Cheltenham, Gloucestershire, Trade Discharge, Reference: S/20/25107/T, Version: 1, Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995), Positional Accuracy: Located by supplier to within 10m, Contact Ref: 1	6	250-500m	E
Lucas Aerospace Ltd, Woodward Aircraft Controls, Arle Court, Cheltenham, Gloucestershire, Trade Discharge, Reference: S/20/25107/T, Version: 1, Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995), Positional Accuracy: Located by supplier to within 10m, Contact Ref: 1	6	250-500m	E
Lucas Aerospace Ltd, Woodward Aircraft Controls, Arle Court, Cheltenham, Gloucestershire, Trade Discharge, Reference: S/20/25107/T, Version: 2, Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995), Positional Accuracy: Located by supplier to within 10m, Contact Ref: 1	6	250-500m	E
Cheltenham Office Park Limited, Woodward Aircraft Controls, Arle Court, Cheltenham, Gloucestershire, Trade Discharge, Reference: S/20/25107/T, Version: 2, Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995), Positional Accuracy: Located by supplier to within 10m, Contact Ref: 1	6	250-500m	E
Cheltenham Office Park Limited, Delphi Diesel Systems Limited, Hatherley Lane, Cheltenham, Gloucestershire, Trade Discharge, Reference: S/20/25631/T, Version: 1, Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995), Positional Accuracy: Located by supplier to within 10m, Contact Ref: 1	-	250-500m	E

Potentially Contaminative Uses	Ref No.	Search Buffer	Direction
Contemporary Trade Directory Entries			
A1 Car Air Conditioning, Kestrel House, North Road East, The Reddings, Cheltenham, Gloucestershire, GL51 6RE, Air Conditioning & Refrigeration Contractors, Status: Inactive, Positional Accuracy: Automatically positioned to the address	7	0-250m	SE
D W Taylor, Branch Cottage, Branch Road, The Reddings, Cheltenham, Gloucestershire, GL51 6RH, Garage Services, Status: Active, Positional Accuracy: Automatically positioned to the address	8	250-500m	SW
Easy Mix Ltd, Golden Valley, Gloucester Rd, Cheltenham, Gloucestershire, GL51 0TT, Concrete & Mortar Ready Mixed, Status: Inactive, Positional Accuracy: Manually positioned to the address or location	9	250-500m	NE
Easy Mix Ltd, Golden Valley, Gloucester Rd, Cheltenham, Gloucestershire, GL51 0TT, Concrete & Mortar Ready Mixed, Status: Active, Positional Accuracy: Manually positioned to the address or location	9	250-500m	NE
Keittruck Ltd, Golden Valley, Gloucester Road, Cheltenham, Gloucestershire, GL51 0TT, Commercial Vehicle Dealers, Status: Active, Positional Accuracy: Automatically positioned to the address	9	250-500m	NE

Sources	Ref No.	Search Buffer	Direction
Potentially Contaminative Uses			
Contemporary Trade Directory Entries			
Easy Mix, Golden Valley, Gloucester Road, Cheltenham, Gloucestershire, GL51 0TT, Concrete & Mortar Ready Mixed, Status: Inactive, Positional Accuracy: Automatically positioned to the address	9	250-500m	NE
Cheltenham & Gloucester Concrete Pumping Ltd, Golden Valley, Gloucester Road, Cheltenham, Gloucestershire, GL51 0TT, Concrete Pumping Services, Status: Active, Positional Accuracy: Manually positioned to the address or location	9	250-500m	NE
Frost Engineering, Gloucester Road, Staverton, Cheltenham, Gloucestershire, GL51 0SS, Precision Engineers, Status: Inactive, Positional Accuracy: Automatically positioned to the address	10	250-500m	N
The Nuffield Hospital, Hatherley Lane, Cheltenham, Gloucestershire, GL51 6SY, Hospitals, Status: Active, Positional Accuracy: Automatically positioned to the address	-	250-500m	E
Harry Buckland, Cotswold View, Gloucester Road, Staverton, Cheltenham, Gloucestershire, GL51 0SS, Car Breakers & Dismantlers, Status: Active, Positional Accuracy: Automatically positioned to the address	10	250-500m	N
Paul Passey (International) Ltd, 19, Springfield Close, The Reddings, Cheltenham, Gloucestershire, GL51 6SE, Road Haulage Services, Status: Inactive, Positional Accuracy: Automatically positioned to the address	11	250-500m	SE
Challenge Power, Cheltenham Film Studios, Hatherley Lane, Cheltenham, Gloucestershire, GL51 6PN, Electricity Companies, Status: Inactive, Positional Accuracy: Manually positioned to the address or location	-	250-500m	E
Hengerow, Cheltenham Film Studios, Hatherley Lane, Cheltenham, Gloucestershire, GL51 6PN, Soft Drinks - Manufacturers, Status: Inactive, Positional Accuracy: Manually positioned to the address or location	-	250-500m	E
Oven Busters, The Briars, The Reddings, Cheltenham, Gloucestershire, GL51 6RL, Oven cleaning, Status: Active, Positional Accuracy: Automatically positioned to the address	-	250-500m	S



General	Potentially Contaminative Use	Potentially Infilled Land
Site Boundary	Point Feature	Point Feature (High Risk)
Search Buffer	Area Feature	Area Feature (High Risk)
Bearing Reference Point	Line Feature	Line Feature (High Risk)
Reference Number	Area Feature (High Risk)	Area Feature (High Risk)
	Line Feature (High Risk)	Line Feature (High Risk)

Sources	Ref No.	Search Buffer	Direction
Potentially Contaminative Uses			
Historical Tanks And Energy Facilities			
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1955 - 1971	12	250-500m	E
Tanks, Scale of Mapping: 1:2,500, Date of Mapping: 1955	12	250-500m	E
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1967 - 1971	13	250-500m	E
Electrical Sub Station Facilities, Scale of Mapping: 1:1,250, Date of Mapping: 1971	14	250-500m	SE
Electrical Sub Station Facilities, Scale of Mapping: 1:1,250, Date of Mapping: 1971	-	250-500m	E
Electrical Sub Station Facilities, Scale of Mapping: 1:2,500, Date of Mapping: 1974	15	250-500m	S
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1971	-	250-500m	E
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1967	-	250-500m	E
Tanks, Scale of Mapping: 1:2,500, Date of Mapping: 1955	-	250-500m	E
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1955	-	250-500m	E
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1971	-	250-500m	E
Tanks, Scale of Mapping: 1:1,250, Date of Mapping: 1971	-	250-500m	E
Electrical Sub Station Facilities, Scale of Mapping: 1:1,250, Date of Mapping: 1955	-	250-500m	E
Electrical Sub Station Facilities, Scale of Mapping: 1:2,500, Date of Mapping: 1955	-	250-500m	E

Potentially Infilled Land	Ref No.	Search Buffer	Direction
Potentially Infilled Land (Water)			
Unknown Filled Ground (Pond, marsh, river, stream, dock etc), Date of Mapping: 1954	16	250-500m	NE
Unknown Filled Ground (Pond, marsh, river, stream, dock etc), Date of Mapping: 1954	17	250-500m	N

Map Details

The following maps have been analysed for Historical Tanks and Energy Facilities

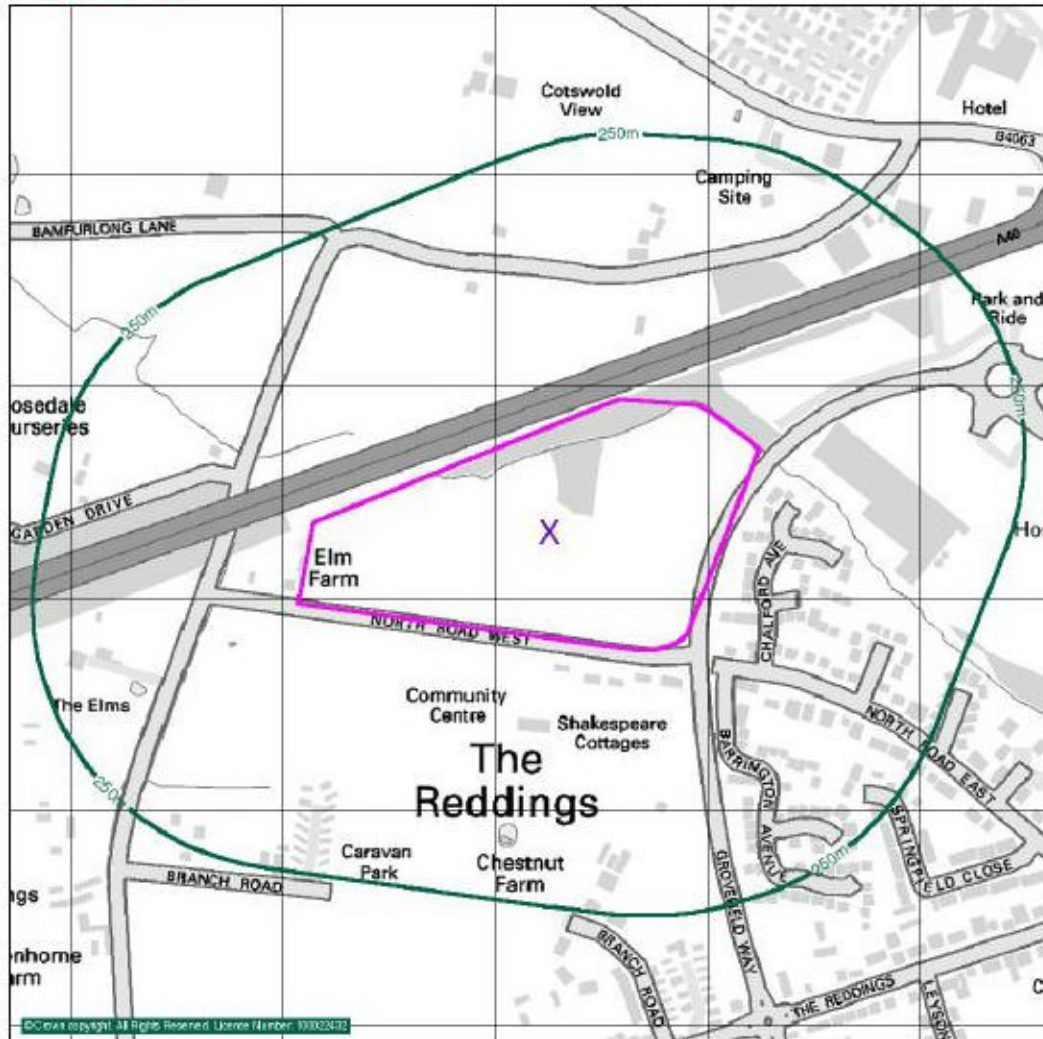
1:2,500	Mapsheet	Published
Ordnance Survey Plan	SO9021	1974

The following maps have been analysed for Potentially Contaminative Uses and Potentially Infilled Land information

1:10,000	Mapsheet	Published
Ordnance Survey Plan	SO92SW	1991

1:10,560	Mapsheet	Published
Gloucestershire	026_NW	1889
Gloucestershire	026_SW	1889
Gloucestershire	026_NW	1903
Gloucestershire	026_SW	1903
Gloucestershire	026_NW	1924
Gloucestershire	026_SW	1924
Gloucestershire	026_NW	1938
Gloucestershire	026_SW	1938
Ordnance Survey Plan	SO92SW	1954

Flood Map



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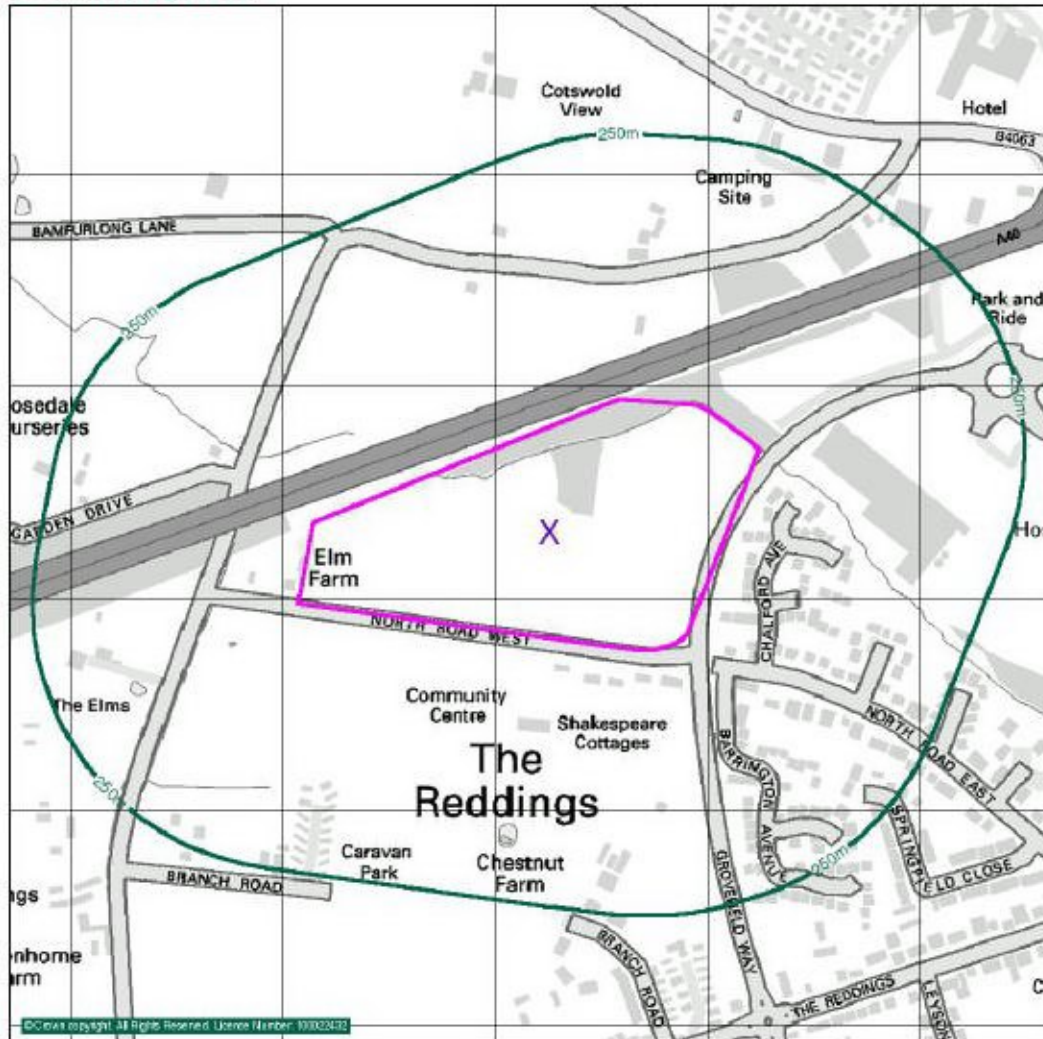
General

- Site Boundary
- Search Buffer
- Bearing Reference Point
- Reference Number

Area of Floodplain

- Areas Benefiting from Flood Defences
- Flood Water Storage Areas
- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Flood Defences

Sensitivity Map



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General	Environmentally Sensitive Land Use	Protected Countryside Areas
Site Boundary	Area of Outstanding Natural Beauty	Site of Special Scientific Interest
Search Buffer	Environmentally Sensitive Area	Special Area of Conservation
Bearing Reference Point	Local Nature Reserve	Special Protection Area
Reference Number	Marine Nature Reserve	Nearest Surface Water Feature
	National Nature Reserve	Water Abstractions
	Ramsar Site	
		Forest Park
		National Park
		National Scenic Area

Pathways and Receptors	Ref No.	Search Buffer	Direction
Pathways			
Groundwater Vulnerability			
Geological Classification: Non Aquifer (Negligibly permeable) - Formations which are generally regarded as containing insignificant quantities of groundwater. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants, Soil Classification: Not classified, Map Scale: 1:100,000, Map Name: Sheet 29 Worcestershire, Contact Ref: 1	-	On Site	NE
Drift Deposits			
None	-		-
Extreme Flooding from Rivers or Sea without Defences			
None	-		-
Flooding from Rivers or Sea without Defences			
None	-		-
Areas Benefiting from Flood Defences			
None	-		-
Flood Water Storage Areas			
None	-		-
Flood Defences			
None	-		-

Environmentally Sensitive Receptors	Ref No.	Search Buffer	Direction
Nearest Surface Water Feature			
Distance: 0m	-	On Site	NW

Other Factors	Search Buffer	Direction
Geological		
Brine Compensation Area		
No		-
Coal Mining Affected Areas		
In an area which may not be affected by Coal Mining		-
Non Coal Mining Areas of Great Britain		
No Hazard		-
Radon Potential - Radon Affected Areas		
Affected Areas: The property is in a lower probability radon area, as less than 1% of homes are above the action level, Source: British Geological Survey, National Geoscience Information Service, Contact Ref: 3	On Site	NE
Radon Potential - Radon Protection Measures		
Radon Protection Measures: None, Source: British Geological Survey, National Geoscience Information Service, Contact Ref: 3	On Site	NE
Potential for Collapsible Ground Stability Hazards		
Hazard Potential: Very Low, Contact Ref: 3	On Site	NE
Hazard Potential: No Hazard, Contact Ref: 3	0-250m	NW
Potential for Compressible Ground Stability Hazards		
Hazard Potential: No Hazard, Contact Ref: 3	On Site	NE
Hazard Potential: Moderate, Contact Ref: 3	0-250m	NW
Potential for Ground Dissolution Stability Hazards		
No Hazard		-
Potential for Landslide Ground Stability Hazards		
Hazard Potential: Very Low, Contact Ref: 3	On Site	NE
Hazard Potential: Low, Contact Ref: 3	0-250m	W
Potential for Running Sand Ground Stability Hazards		
Hazard Potential: No Hazard, Contact Ref: 3	On Site	NE
Hazard Potential: Low, Contact Ref: 3	0-250m	NW
Potential for Shrinking or Swelling Clay Ground Stability Hazards		
Hazard Potential: Low, Contact Ref: 3	On Site	NE

Registered Landfill Sites

At present no complete national data set exists for landfill site boundaries, therefore a point grid reference, provided by the data supplier, is used for some landfill sites. In certain cases the point grid references supplied provide only an approximate position and can vary from the site entrance to the centre of the site. Where the exact position of the site is unclear, Landmark construct either a 100 metre or 250 metre "buffer" around the point to warn of the possible presence of landfill. The size of this "buffer" relates to the positional accuracy that can be attributed to the site. The "buffer" is shown on the map as an orange cross-hatched circle and is referred to in the map legend as Potential Landfill Buffer. Where actual boundaries are available, the landfill site area is shown on the map as a red diagonal hatched polygon and referred to in the map legend as Registered Landfill Site.

Local Authority Recorded Landfill Sites

Local Authority landfill data are sourced from individual local authorities that were able to provide information on sites operating prior to the introduction of the Control of Pollution Act (COPA) in 1974. Appropriate authorities are listed under Local Authority Landfill Coverage with an indication of whether or not they were able to make landfill data available. Details of any records identified are disclosed. You should be aware that if the local authority 'Had landfill data but passed it to the relevant environment agency' it does not necessarily mean that local authority landfill data is included in our other Landfill datasets. In addition if no data has been made available, for all or part of the search area, you should be aware that a negative response under 'Local Authority Recorded Landfill Sites' does not necessarily confirm that no local authority landfills exist.

Flooding

The Sitecheck report flood map plots all flood related features revealed within the search area as supplied by the relevant agency. However, to avoid confusion, the text entry in the body of the report only reveals the detail of the nearest feature in each flood data set. This is also reflected in the summary table where only a single entry is included to indicate the search buffer of the nearest occurrence.

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The Sitecheck Assess User guide is available free of charge from our website www.sitecheck.co.uk

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PO Box 544
Templeborough
Rotherham
S60 1BY

Telephone 08708 506 506

enquiries@environment-agency.gov.uk

Please note that the Environment Agency/SEPA have a charging policy in place for enquiries.

2 Cheltenham Borough Council Environmental Health Department

P O Box 12
Municipal Offices
The Promenade
Cheltenham
Gloucestershire
GL50 1PP

Telephone 01242 262626
Fax 01242 227131

www.cheltenham.gov.uk

3 British Geological Survey Enquiry Service

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
Nottinghamshire
NG12 5GG

Telephone 0115 936 3143
Fax 0115 936 3276

enquiries@bgs.ac.uk
www.bgs.ac.uk

4 Gloucestershire County Council

Shire Hall
Westgate Street
Gloucester
Gloucestershire
GL1 2TG

Telephone 01452 425000

www.gloscc.gov.uk

5 Tewkesbury Borough Council Environmental Health Department

Council Offices
Gloucester Road
Tewkesbury
Gloucestershire
GL20 5TT

Telephone 01684 295010 extn 2213
Fax 01684 290139

www.tewkesburybc.gov.uk

Other Contacts**Institution of Civil Engineering Surveyors**

26 Market Street
ALTRINCHAM
Cheshire
WA14 1PF

Telephone 0161 928 8074

www.ices.org.uk/ices.asp

The Association of Geotechnical and Geoenvironmental Specialists

Foreham Street
83 Copers
Cope Road
Beckenham
Kent
BR3 1NR

Telephone 020 86588212

www.ags.org.uk/

The Environmental Auditors Registration Association

Welton House
Limekiln Way
Lincoln
LN2 4US

Telephone 01522 540069

www.greenchannel.com/iea/sarahome.htm

The Environmental Industries Commission

45 Weymouth Street
London
W1N 3LD

Telephone 020 79351675

www.eic-uk.co.uk/

The Institution of Civil Engineers

One Great George Street
Westminster
LONDON
SW1P 3AA

Telephone 0207 222 7722
Fax 0207 222 7500

www.ice.org.uk

The Royal Institution of Chartered Surveyors

12 Great George Street
Parliament Square
London
SW1P 3AD

Telephone 020 7222 7000

www.rics.org.uk/

Wilbourn Associates

30 Jessops Riverside
800 Brightside Lane
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www.environmental-surveyors.com

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Search Code



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- Handle complaints speedily and fairly.
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- Monitor their compliance with the Code.

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The Property Ombudsman Scheme
Beckett House
4 Bridge Street
Salisbury
Wiltshire SP1 2LX
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

Search Code



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The Smith Centre
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Telephone: 0844 844 9966

E-mail: helpdesk@landmark.co.uk

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4. Charges

- VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.
- An Individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's Invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such Invoices. Landmark reserves the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.
- We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.
- Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

- Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:
 - You fail to make any payment due in accordance with clause 4;
 - You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
 - You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.
- If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.
- Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.

6. Liability

- We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.
- Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or willful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.
- As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or willful default and subject to clause 6.o below neither Landmark nor any person providing information contained in any Services shall in any circumstances be liable for any inaccuracies, omissions or errors in the Services, nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.
- Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.
- In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the contract is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.
- Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.
- You acknowledge that:
 - Subject to clause 6.o below You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts or omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Services) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
 - Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
 - no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude exact fitness or unfitness of a Property Site

- for any particular purpose nor should it be relied upon for determining suitability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
- iv. Subject to clause 6.0 below, Landmark shall not be responsible for error or omission in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.
- v. Landmark will not be held liable in any way if a Report on a residential property is used for commercial property or more than the one residential property for which it was ordered.
- vi. the Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content.
- vii. Landmark offer no warranty for the performance of any linked internet services not operated by Landmark.
- viii. You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery.
- ix. Any support or assistance provided to You in connection with these Terms is at Your risk.
- h. All liability for any Insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such Insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.
- i. Professional opinions contained in Reports are provided to Landmark by third parties, and such third parties are solely liable for the opinion provided. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Willmott Associates Limited, and any issues with regard to the provision of such opinion should be taken up with the relevant third party.
- If Landmark provides You with any additional service obtained from a third party, including but not limited to any interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, subject to clause 6.0 below Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties.
- j. In any event no person may rely on a Service more than 12 months after its original date.
- k. If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
- l. This shall not be of the essence with respect to the provision of the Services.
- m. Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Subject to clause 6.0 below, Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
- n. Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not seek or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6l above.
- o. Landmark obtains much of the information contained in its Report from third parties. Landmark will not accept any liability to You for any negligent or incorrect entry, or error or corruption in the Third Party Content supplied to Landmark, but Landmark's Suppliers may be liable for such negligent or incorrect entries, or errors or corruptions, subject to the terms and conditions on which they supply the Third Party Content to Landmark.

7. Contribution

- a. Save where expressly provided, this clause 7 shall apply solely to Environmental Remediation Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
- b. Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution").
- c. In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms:
- the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
 - the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
 - the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
 - the Contribution will not be paid in respect of any of the following:
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures.
 - Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
 - Intentional non-compliance arising from the intentional disregard of or knowing willful or deliberate non-compliance by any owner or occupier of

the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.

Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.

Any condition which is caused by acts of War or an Act of Terrorism.

Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.

Any fines liquidated damages punitive or exemplary damages.

Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.

Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.

Any losses incurred following a material change in use of, alteration or development of the Property Site.

- d. The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £60,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
- e. Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
- f. Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.
- g. In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 3 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.
- h. In the event that the First Purchaser or First Purchaser's Lender resolves any communication from a statutory authority to the effect that there is an intent to serve a notice received under Part II(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7a.
- i. Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.

8. Events Beyond Our Control

- a. You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or downloading data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.

9. Severability

- a. If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.

10. Governing Law

- a. These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts if any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.

11. General Complaints

- a. Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
- b. Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
- c. No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
- d. Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and subject to paragraph 4 below all notices from Landmark to You will be displayed on our Websites from time to time.
- e. Any complaints in relation to the Services should, in the first instance, be in writing addressed to the Customer Service Support Manager at the Landmark registered office. Landmark or its agents will respond to any such complaints in writing as soon as practicable.
- f. A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
- g. Landmark's Privacy Policy as displayed on the Website governs the use made of any Information You supply to Landmark.

APPENDIX G

PAGES 15, 22 & 34 FROM 'SITE INVESTIGATION REPORT', CARRIED OUT BY
STRUCTURAL SOILS, JULY 2008.

H N BAILEY, J A BAILEY & C H HARVEY

**DRAFT
INTERPRETIVE REPORT
on
SITE INVESTIGATION
at**

**GROVEFIELD WAY
CHELTENHAM**

**NOVEMBER 2008
REPORT NO: 722048**

ALDER KING LLP
Pembroke House
15 Pembroke Road
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BRISTOL
BS8 3BA

Tel: 0117 3171049
Fax: 0117 3171001
Email: enquiries@alderking.com
www.alderking.com

STRUCTURAL SOILS LIMITED
The Old School
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Bedminster
BRISTOL
BS3 4EB

Tel: 0117 947 1000
Fax: 0117 947 1004
Email: admin@soils.co.uk
www.soils.co.uk



3 FIELDWORK

8 no. cable percussion boreholes (BH1 to BH8), 14 no. machine dug trial pits (TP1 to TP14), 7 no. California Bearing Ratio (CBR) tests (CBR1 to CBR7) and 3 no. soakaway tests (SA1-SA3) were completed between 31 June and 8 July 2008 at locations shown on the Exploratory Hole Location Plan in Appendix A.

The scope of investigation and choice of investigation equipment was decided by Structural Soils Limited. The positions were selected and set out by Structural Soils Limited.

The positions of exploratory holes BH1-BH8 were selected to target the main areas of construction and the trial pits TP1-TP14 were selected to provide general site coverage. Trial pits TP6 and TP7 were positioned to target the location of the farm buildings, which had been present on the northern part of the site until between 1949 and 1972, which could be a potential area of made ground and source of contamination. The CBRs were placed down the main spine of the proposed access road for the site, and its junction with Grovefield Way. Soakaway tests were carried out around the periphery of the site.

Sampling and in-situ testing details were specified by Structural Soils Limited. Geotechnical samples were taken and returned to the laboratory for classification and potential testing. Samples for contamination testing were placed in appropriate 'contamination sample containers' (supplied by the laboratory and with preservatives for waters, where required). They were then kept in cool boxes with ice packs and were transported to the laboratories (under Chain of Custody documentation) as promptly as possible to maintain sample integrity. Contamination sampling was specified by Structural Soils Limited.

Inspection pits were excavated by hand to 1.20m depth at the cable percussion hole locations prior to the commencement of drilling. The boreholes were drilled using a cable tool percussion drilling rig and were 150mm diameter. The depths of the boreholes were 5.00m to 11.85m. 100mm diameter undisturbed samples were recovered from the cohesive strata in the boreholes and Standard Penetration Tests were carried out at regular intervals in accordance with BS1377: Part 9: 1990: 3.3. Test results are given in detail in tabular format on the Summary of Standard Penetration Tests in Appendix B, and also summarised on the borehole logs.

The trial pits were excavated using a mechanical excavator and were approximately 0.80m x 3.00m in plan area and up to 3.65m deep. Hand vane and hand penetrometer tests were carried out in the cohesive strata in the trial pits.



6.4 Foundations

The proposed three storey office blocks can be constructed on conventional strip and pad foundations. The foundations should be taken down through any made ground to a minimum depth of 1.00m in accordance with NHBC Standards.

Assuming a conservative undrained shear strength of 75kPa, the allowable bearing capacity for a 1.00m wide strip foundation at 1.00m depth or for a 2.00m by 2.00m pad at the same depth would be of the order of 160kPa, which should be adequate for the type of development proposed. However, settlement of a 1.00m wide strip foundation at 1.00m depth loaded to a line load of 160kN/m² run, would be of the order of 25-30mm, using a coefficient of volume compressibility (m_v) of 0.2m²/MN (based on an assessment of the consolidation test results) and a geological factor of 0.70. Therefore the allowable bearing pressure should be reduced to 140kN/m² to keep settlements below the generally accepted value of 25mm.

6.5 Floor Slabs

Lightly loaded ground bearing, floor slabs may be used at this site (designed in accordance with NHBC Standards). For ground bearing slabs the formation must be proof-rolled and any soft spots must be excavated and replaced with suitably compacted granular fill. However where made ground in excess of 600mm was encountered, NHBC Standards requires the use of suspended slabs as a precaution against differential settlement.

6.6 Pavement Design

In-situ CBR tests were carried out using conventional vehicle mounted equipment, at depths of between 0.50m and 0.70m in made ground consisting of firm slightly sandy slightly gravelly clay. Based on these test results we recommend using a CBR value of 2.0% for pavement design provided any soft spots are replaced with a suitably compacted granular fill. It should be noted that the CBR tests were carried out on cohesive soils that were dry and stiff when tested, and lower CBR values would be obtained during wetter weather.

6.7 Soakaway Design

Three soakaway tests were completed in trial pits SA1, SA2 and SA3. Infiltration rates could not be calculated, as none of the water drained away, indicating that the site is not suitable for shallow soakaways. Similar soils are found over the entire site and therefore the same can be assumed for other locations. Soakaways are therefore considered not practical at this site.



proof-rolled and any soft spots must be excavated and replaced with suitably compacted granular fill. However where made ground in excess of 600mm was encountered, NHBC Standards requires the use of suspended slabs as a precaution against differential settlement.

- 7.7** We recommend using a CBR value of 2.0% for pavement design provided any soft spots are replaced with a suitably compacted granular fill. It should be noted that the CBR tests were carried out on cohesive soils that were dry and stiff when tested, and lower CBR values would be obtained during wetter weather.
- 7.8** Shallow soakaways are not practical at this site.
- 7.9** The Aggressive Chemical Environment for Concrete (ACEC) class is AC-4 where concrete could be contact with groundwater and AC-1 if there is no risk of concrete being in contact with groundwater. The designer should utilise these classifications in order to produce the concrete specification.
- 7.10** No radon protection is necessary for this site as less than 1% of homes are above the action level.
- 7.11** TP12 at 0.15 m showed elevated lead in the made ground. Therefore the made ground (0.3m thick) should be replaced in vicinity of TP12 if soft landscaping is proposed in this area. Further testing might be required to delineate the area.
- 7.12** There are several exceedances of the water pipe guidelines, therefore the water company should be contacted as to whether alternative pipe materials are required.
- 7.13** All samples, except for TP12 at 0.15m depth, have not been classed as hazardous for disposal. Trial pit TP12 however was classed as hazardous.
- 7.14** The gas monitoring results to date suggest that protective measures to characteristic situation 2 of CIRIA 665 should be provided. Some further monitoring is advised.

APPENDIX H

RAINWATER HARVESTING ESTIMATE

12/06/2013



6 Wadsworth Road
London UB6 7JJ

info@aqua-lity.co.uk
www.aqua-lity.co.uk

Tel: +44 (0)845 270 7171
Fax: +44 (0)208 991 1442

Cheltenham - BMW Mini

Prepared for: Building Management Technology Ltd

Prepared by: Chris Chardon
Sales Office Manager



WRAS



12/06/2013

Dennis Gaskell

Building Management Technology Ltd
Unit 2 Forest Business Park
Oswin Road, Braunstone
Leicester, LE3 1HR
United Kingdom

Dear Dennis Gaskell,

Rainwater Harvesting Specification & Quotation

<i>Project</i>	<i>Cheltenham - BMW Mini</i>	
<i>Project Number</i>	<i>3443-13</i>	
<i>Quotation Number</i>	<i>DOCQ2170</i>	
<i>Contact</i>	<i>Dennis Gaskell -</i>	
<i>Contact Details</i>	<i>Dennis.Gaskell@bmt-ltd.co.uk</i>	<i>(01162) 440331</i>

Should you have any queries regarding this quote please contact Matt Tickle on (07973) 253 669

We thank you for your recent enquiry and have pleasure in writing with our Specification and Quotation for the supply and delivery of a suitable Aquality Rainwater Harvesting System to meet the project's requirements.



Our industry leading product range has been designed to ensure a quick, simple and cost effective installation process on site and ensure a minimal space requirement within the designated installation area.

Our enclosed quotation and technical data/installation sheets should provide you with the information you require. However, please do not hesitate to contact us with further questions or, should you wish, to arrange a meeting with one of our technical managers who can assist at design, purchasing or installation stage.



6 Wadsworth Road Tel: +44 0845 270 7171
London UB6 7JJ Fax: +44 0208 991 1442

Specification & Quotation

Part Number	Qty	Description
G12661 	1	50000 l GFR tank CL 2 with TF6 filter
G13320 	1	Aqua-Control 1100 SA
G13337	1	Connection set (Accessories for AC1100, 1500)
G13333	1	Supply pump package IV (230)
G15021 	1	Expansion vessel 100l
G11104	1	Y- Mains water filter PP 1 1/4" MBSP
G30001	1	Commissioning for Rainwater Harvesting System

Grand Total: £ 20,285.00

Rainwater Harvesting Totals

SYSTEM TOTAL

£ 20,285.00

Includes delivery to site (UK Mainland) but excludes offloading, installation and VAT.

Payment Terms to be confirmed.

Please note that Lease Purchase Plans are available to commercial purchasers. If this is of interest, please ask for details.

Conditions of Sale – As Aquality general terms and conditions (available on request).

Please note that this quote is only valid for 90 days from the date of this quotation. Please contact us should you require an updated quotation.

Specification and quotation should be read along with our standard installation detail and equipment technical data sheets.

We would always advise a meeting at the next stage to discuss the proposal more fully, thus ensuring that our package satisfies the requirements of the site, the design consultant and ultimately the client.

Unless otherwise stated:

- Pump duties would have to be confirmed at the next stage
- We have assumed the roof surface used is not a Green Roof
- General assumptions will be used to assist specification process
- When quoting against a generic or competitors specification, we will have selected equipment that will most closely provide a similar (or enhanced) specification.
- If used, Sphonic Drainage should have the siphon broken before the rainwater reaches the filter / holding tank.

We trust this proposal is of interest. Please do not hesitate to contact Matt Tickle on (07973) 253 669 to discuss the proposal in more detail or to arrange a meeting if required.

Chris Chardon
Sales Office Manager
chardon@aquality.co.uk



6 Wadsworth Road
London UB6 7JJ

Tel: +44 0845 270 7171
Fax: +44 0208 991 1442

TERMS AND CONDITIONS OF SALE

1. Interpretation

The following shall have the following meanings

- a) "The Company" shall mean AQUALITY Trading & Consulting Ltd.
- b) "The Purchaser" shall mean anyone, whether a person or persons or body corporations who place an order with the Company for a Product
- c) "Product" shall mean the goods to the sale of which these terms apply and any reference thereto shall be deemed to include a part or parts thereof. In the singular shall be deemed to include the plural and vice-versa.
- d) The general headings to the paragraphs herein are for reference only and shall not affect the construction or interpretation of these terms and conditions or any part thereof.

2. General

- a) All products are sold subject to terms and conditions contained herein.
- b) No verbal, written or other addition hereto or variation hereof shall be effective.
- c) In the event of any conflict or inconsistency between Conditions and the terms or conditions of any order or acceptance, these conditions shall prevail.
- d) The giving of any delivery instructions the acceptance of, or payment for, any products or any conduct in confirmation by the purchaser of the transaction hereby contemplated shall constitute unqualified acceptance by the Purchaser of these conditions.

3. Illustrations

All illustrations or descriptive material of any sort including drawings specifications or weight, capacity, dimensions, output and consumption are for information only and shall not form part of the contract. They are approximate only and no warranty or guarantee is given for their accuracy.

4. Design

The Company reserves the right to make at any time such changes in design, construction, composition, materials, arrangement or equipment as it shall think fit without notifying Purchaser.

5. Suitability of Equipment for purchaser's requirements

The Company accepts no liability if the equipment ordered, is in fact, unsuitable for the Purchaser particular requirements unless a full written description of the process in which the equipment is to be used is submitted to the Company with the order.

6. Samples

Samples of products are available for inspection at the Company's offices. The samples are on-stock at the time of viewing and are without guarantee, and are not representations of color, specification or performance at the time of delivery.

7. Price and payment

- a) Payment for products shall be made not later than 30 days from date of Invoice unless otherwise expressly agreed in writing by the Company. The Purchaser shall make no deduction in payment in respect of any set-off or counter claim whether justified or not.
- b) The Company shall be entitled to alter the price charged for any products by such amount as the Company shall think fit at any time before delivery. In the event of an increase in cost to the Company in supplying such products unless a fixed price has been agreed previously in writing between the Company and the Purchaser.
- c) All prices referred to herein exclude Value Added Tax, Purchase Tax, or any other tax duty which is or may be levied or charged; the amount of such taxes or duties calculated at the rate prevailing at the appropriate time will be added to such prices and the Purchaser shall account to the Company for such taxes or duties in the same manner as the price of the products as set out in clause 7a).
- d) Interest at the rate of 2% per calendar month and/or pro rata for any part thereof shall be payable on all outstanding amounts.

8. Delivery

- a) The estimate of time given for delivery shall run from the date on which the order has been accepted by the Company. Time shall not be of the essence of the contract.
- b) If the Company is prevented from or delayed in (directly or indirectly) making delivery of products, or performing or completing any of its obligations by reasons of acts of God, wars, strikes, lockouts, trade disputes, or other industrial action, fires, explosions, breakdowns, interruption of transport, Government or administrative action, delays in delivery to the Company of any goods or materials, or any cause whatsoever (whether or not of the like nature to those specified above) outside its control, the Company shall be under no liability whatsoever to the Purchaser, and shall be entitled to its option (to be notified to the Purchaser in writing) either to cancel the contract or to extend the time of its performance by a period equivalent to that during which performance by the Company has been prevented by the circumstances herein before referred to.
- c) If the products have been received but are in a damaged condition or if the quantity received differs from the quantity ordered by the Company as dispatched, the Purchaser shall immediately give notice in writing to the Company of the relevant facts. If such notice is not received within two days of dispatch by the Company the Company will not be liable to the Purchaser in respect of any loss or damage suffered and the Purchaser shall accept liability as if all the products had been received and shall not claim against the Company in respect of non or short delivery or damage in transit.
- d) Where products are offered for delivery to site the obligation of the Company is to deliver only as far as safe hard roads permits. The customer is to provide to the Company, free of charge, reasonable assistance in unloading.

9. Commissioning & Pre-Commissioning Site Visits

- a) The Company requires a minimum of six weeks notice for commissioning (please note that that commissioning is not considered booked until all relevant documentation has been received).
- b) The Company requires a minimum of six weeks notice for pre-commissioning site visits (please note that that pre-commissioning is not considered booked until all relevant documentation has been received).
- c) The Company will not be liable or responsible for delayed commissioning, late hand over penalties where six weeks notice was not given or where the commissioning failed due to incomplete or incorrect installation.
- d) Where commissioning failed due to incomplete or incorrect installation the purchaser will be liable for all AQUALITY expenses and time on site.

10. Postponement of delivery by customer

Due to the nature of the equipment being supplied, much of the equipment supplied by AQUALITY will be bespoke or manufactured to order.
If the delivery of the equipment is postponed by the customer, irrespective of the reason for postponement, AQUALITY

reserves the right to invoice for the equipment on the day on which delivery had originally been agreed.

11. Transfer of Property

- a) Title to the products shall not pass to the purchaser until either:
- The company has received in cash or cleared funds or monies payable (whether or not due) to the company under this and any other contracts whenever made between the company and the purchaser including contracts made after this contract.
- When the company serves notice on the purchaser in writing specifying that title in the products or any part thereof has passed.
- b) In default of payment within the period specified in clause 7 (7b) hereof the Company may, without prejudice to any other rights or remedies reserve possession of the products.
- c) Until the ownership of the products passes as aforesaid the Purchaser shall be deemed to hold the products as bailee of the Company and shall use all reasonable care to keep the products in the same condition as that in which they were delivered to him.

12. Intellectual property

- a) Any technical documents, drawings and specifications which are supplied to the purchaser relating to the products are confidential, and must not be used for any unauthorised purpose or copied, reproduced, transmitted or communicated to a third party without the Company's written consent.
- b) The Company and its suppliers reserve all design or other intellectual property rights in relation to the products supplied to the purchaser (including any such technical documents, drawings and specifications), which undertakes not to do or authorise any third party to do any act which would or might invalidate or be inconsistent with any of such rights.

13. Guarantee

If during the period of eighteen calendar months from the date of manufacture by the Company or twelve months from the date of commissioning whichever is the shortest of any products shall be proved by the customer to the satisfaction of the Company to be defective by reason of faulty design, or defective materials of manufacture, and the Company is notified within 14 days in writing of the alleged defect becoming apparent and the defective products are returned carriage paid to the Company then the Company shall at its option and without cost to the Purchaser either repair the defective product, provided however that:

- a) all products replaced shall be the property of the Company
- b) failure by the Purchaser to carry out any of its obligations shall relieve the Company of any liability
- c) notwithstanding anything contained in these conditions the sole liability in respect of products not manufactured by the Company but merely re-sold shall be to give the Purchaser the benefit of such claims (if any) recovered by the Company from the manufacturer of such products as the Company shall consider possible.
- d) If without the prior written consent of the Company repairs or replacements are made by the purchaser to a product the Company shall be under no liability whatsoever under this clause 10 and no allowance shall be made for any repairs or alterations so made.
- e) No liability for loss or damage shall attach to the Company until the product has been paid for. The Company shall be under no liability for loss or damage in respect of any product which has not in its absolute opinion been properly installed, maintained and operated as aforesaid. The liability of the Company in respect of products supplied, or any loss or damage, or secondary or remote losses attributable thereto (directly or indirectly) is limited to making good by supplying replacements. At the expiration of the periods mentioned in the Introduction to clause 10 hereof all liability on the part of the Company in respect of any product shall cease. The Company shall in no way be liable for consequential loss or damage. The Company shall be under no liability whatsoever including (but without prejudice to the generality of the foregoing) any liability in tort for defects in, failure of, or unsuitability for any purpose of the product whether the same be due (directly or indirectly) to any act, omission, negligence or wilful default of the Company or its servants or agents or to faulty design manufacture or materials, or to any other cause whatsoever, including (but without prejudice to generality of the foregoing) any breach by the Company its servants or agents of any terms, of the contract to which these conditions relate.

14. Return of products

Products may not be returned to the Company except by prior written permission of an authorized officer of the Company and such return shall be subject to payment by the Purchaser of handling and restocking charges, transport and all other costs incurred by the Company.

15. Implied conditions and warranties

These conditions of Sale contain all terms under the contract of sale are entered into by the Company and any express or implied statement, condition or warranty, statutory or otherwise, not stated herein is expressly excluded.

16. Cancellation

If the purchaser shall make any default in or commit any breach of any of its obligations with respect to payment of any sums due to the Company under any other contract whatever or if any distress, execution or other legal process shall be laid upon or served out against the Purchaser's property or assets or if the Purchaser shall make any arrangements or composition with its creditors or commit any act of bankruptcy or if any petition or receiving order shall be presented or made against the Purchaser or if the purchaser is a company any resolution or petition to wind up shall be passed or presented, or if a receiver of all or any its assets shall be appointed, then in each and every case the Company shall have the right forthwith or at any time thereafter to determine the contract (except insofar as it relates to products title to which shall already have passed to the Purchaser) and to cancel any outstanding delivery or deliveries hereof, payment in respect of any delivery already made shall be immediately due but entirely without prejudice to any remedy which the Company may have against the Purchaser. The Company reserves the right to refuse or ignore countermands for products ready for dispatch or in process of manufacture. The Purchaser shall be liable to the Company for any loss caused to it by the acceptance of any cancellation given by the Purchaser before delivery of any product but it may in any case without prejudice to any of its other rights hereunder in lieu of a claim therefore require a minimum payment to offset any loss caused to the Company.

17. Purchaser's conditions of purchase

Any conditions set out in the Purchaser's enquiries or Purchase Orders are binding on the Company only insofar as they do not conflict with these Terms and Conditions of Sale, and in the event of such conflict these Terms and Conditions of Sale shall prevail.

18. Jurisdiction

These Terms and Conditions are subject solely to English law and any disputes arising shall be settled in accordance herewith.

Method of operation

From the perspective of the direction of flow, the wash water flows through the circulation water treatment plant by passing through the a) pre-treatment tank (which retains sediment and matter in suspension), the b) treatment tank and the c) underground process water storage tank. Surplus water flows through a d) sampling shaft.

The heart of the plant consists of the circulation water treatment tank, which features an adsorption filter, a bio-active stage and contra-flow aeration.

By mechanical-biological means, the wash water is cleaned through the complex interaction of the bio-film process, filtration, adsorption and flotation.

In the process, the wash water slowly seeps through the gravel filter stage at the top and the lava slag at the bottom of the tank. A stream of contra-flowing air is directed through the filter bed by a fan. A robust, maintenance-free aeration unit ensures the fine distribution of the air blown in under the filter bed. A base grid serves as a support for the filter material and separates the filter from the water recycling stage. The aeration unit is mounted in this base grid.

The cleaning mechanisms, present in nature, are copied and implemented in the car wash water recycling plant. Micro-organisms such as bacteria, yeast and fungi precipitate onto the filter grains in an entirely natural way, creating a so-called 'bio-film' around each grain. Cumulatively, this forms an extremely large settlement area in the filter bed, and it is this active area, which provides for the specific decomposition of the substances contained in the wash water.

In the same way that winds or storms oxygenate water courses, the bio film is constantly supplied with oxygen by the aerating process. In this way, the aerobic medium is stabilised while, at the same time, the constant presence of oxygen prevents the development of strong, unpleasant smells. Only foul water, low in oxygen (anaerobic) stinks.

The fine bubbles rising through the filter bed produce a floatation effect with the result that the smallest particles of dirt rise to the surface of the water with the bubbles by the process of adsorption (addition). In this way, the filter bed is automatically cleaned. The solids that have floated to the surface are removed by way of the surface matter extractor (funnel).

At times when no washing is taking place, e.g. at night, during rain storms and on Sundays and public holidays, air is automatically directed into the water treatment plant to prevent the wash water from becoming anaerobic and from starting to smell.

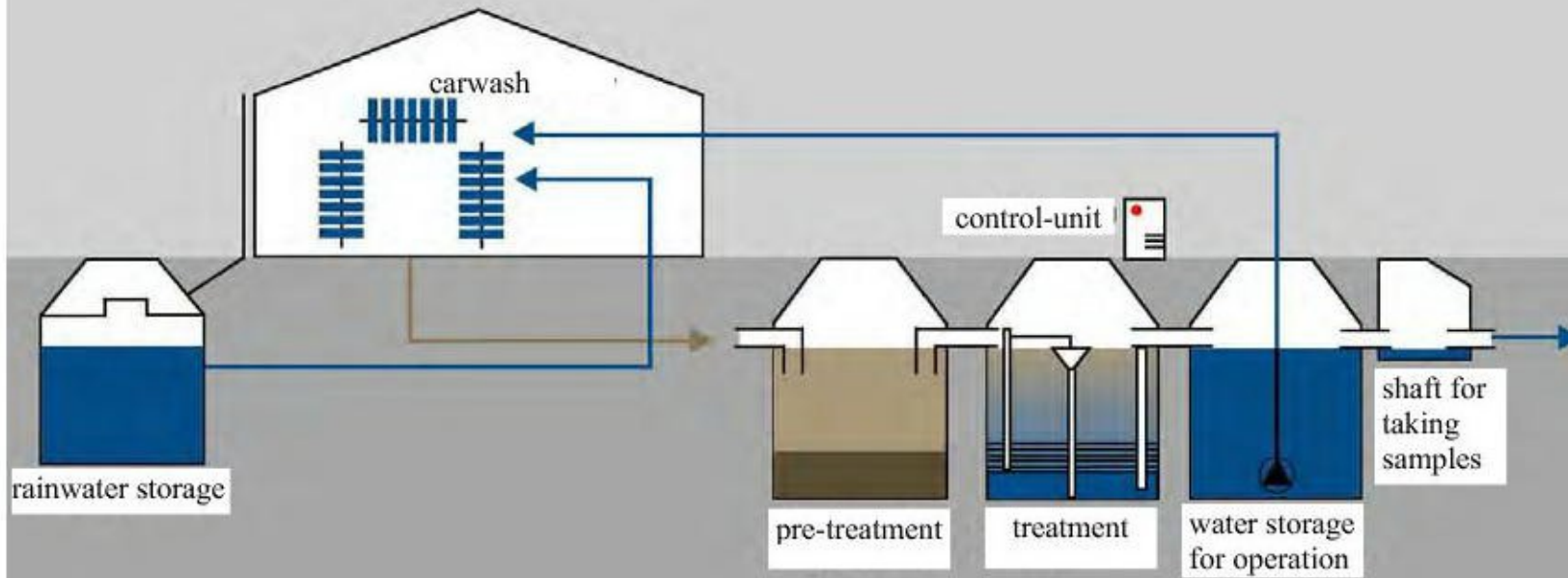
Through the extraction of surface matter via the funnel, oxygen-rich wash water flows into the pre-treatment tank, so that no unpleasant smells can develop even there.

Control system, displays

The control system and fan are housed in the machine enclosure. The control system is of a straightforward design; it controls the fan, which provides the oxygen supply to the plant.


It consists of a main switch, an operating mode selector switch (Manual, 0, Automatic), a white lamp indicating fan operation, a red lamp indicating a fan fault and a timer permitting the adjustment of the running times and inoperative intervals of the fan.

FLOW CHART CARWASH



Grovefield Way, Cheltenham – Addendum to Surface Water Management Plan

1. Pre developments run off rates have been calculated on a pro rata basis from the original figures within the surface water management plan and FRA calculated using ICP SuDS within WinDES. The area of site roads covered by this drainage strategy is 0.374ha and approximately 22.7% of the total site area of 1.65ha. Rates previously calculated for the whole site in the FRA and Surface Water Management Plan included for the original planning consent were Qbar 8l/s. Q1 6.6l/s. Q30 16.0l/s and Q100 20.5l/s and therefore pro rata for the roads (22.7%) would be Qbar 1.8l/s. Q1 1.5l/s, Q30 3.6l/s and Q100 4.6l/s.
2. The post development run-off rates have been calculated using WinDES network design. Refer to attached calculations.
3. The post development run-off rates were calculated as 1.5l/s for Q1, 1.5l/s for Q30 and 1.8l/s for Q100+30% Climate Change.
4. 250m³ of storage is used within the design as originally shown by calculations enclosed within the Surface Water Management Plan and drawing LP01.
5. Although the Q1 event remains unchanged between pre and post development, there is betterment for all events with a lower frequency and higher magnitude than this.
6. British Geological Survey maps included in the FRA for the approved scheme show the ground at the site location to have little or no infiltration. This was backed up by a site investigation report undertaken by Structural Soils Ltd. in July 2008 where no infiltration was recorded in 3 trial holes over the duration of testing undertaken in accordance with BRE365. Therefore, the use of soakaways is not practicable at this site.
7. In the event of exceedance the pond will overtop with the water flowing towards the adjacent watercourse and away from the development.

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	47.247	1.520	31.1	0.012	5.00	0.0	0.600	o	225
1.001	54.284	1.740	31.2	0.061	0.00	0.0	0.600	o	225
1.002	77.336	0.715	108.2	0.114	0.00	0.0	0.600	o	225
2.000	12.171	0.075	162.3	0.187	5.00	0.0	0.600	o	225
1.003	72.102	0.794	90.8	0.000	0.00	0.0	0.600	o	450
1.004	2.909	0.005	606.2	0.000	0.00	0.0	0.600	o	450
1.005	30.958	0.076	406.8	0.000	0.00	0.0	0.600	o	450
1.006	3.071	0.315	9.7	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.33	36.900	0.012	0.0	0.0	0.0	2.36	93.6	0.0
1.001	0.00	5.72	35.380	0.073	0.0	0.0	0.0	2.35	93.5	0.0
1.002	0.00	6.74	33.640	0.187	0.0	0.0	0.0	1.26	50.0	0.0
2.000	0.00	5.20	33.000	0.187	0.0	0.0	0.0	1.02	40.7	0.0
1.003	0.00	7.31	32.700	0.374	0.0	0.0	0.0	2.13	339.4	0.0
1.004	0.00	7.37	31.906	0.374	0.0	0.0	0.0	0.82	130.2	0.0
1.005	0.00	7.88	31.901	0.374	0.0	0.0	0.0	1.00	159.3	0.0
1.006	0.00	7.89	31.825	0.374	0.0	0.0	0.0	6.54	1040.2	0.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
				PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
1	38.400	1.500	1050	1.000	36.900	225				
2	36.660	1.280	1050	1.001	35.380	225	1.000	35.380	225	
3	35.140	1.500	1050	1.002	33.640	225	1.001	33.640	225	
4	34.200	1.200	1050	2.000	33.000	225				
4	34.200	1.500	1350	1.003	32.700	450	1.002	32.925	225	
							2.000	32.925	225	
5	32.430	0.524	1350	1.004	31.906	450	1.003	31.906	450	
6	32.400	0.499	1350	1.005	31.901	450	1.004	31.901	450	
7	32.400	0.575	1350	1.006	31.825	450	1.005	31.825	450	
	32.600	1.090	0		OUTFALL		1.006	31.510	450	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
1.000	o	225	1	38.400	36.900	1.275	1050
1.001	o	225	2	36.660	35.380	1.055	1050
1.002	o	225	3	35.140	33.640	1.275	1050
2.000	o	225	4	34.200	33.000	0.975	1050
1.003	o	450	4	34.200	32.700	1.050	1350
1.004	o	450	5	32.430	31.906	0.074	1350
1.005	o	450	6	32.400	31.901	0.049	1350
1.006	o	450	7	32.400	31.825	0.125	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
1.000	47.247	31.1	2	36.660	35.380	1.055	1050
1.001	54.284	31.2	3	35.140	33.640	1.275	1050
1.002	77.336	108.2	4	34.200	32.925	1.050	1350
2.000	12.171	162.3	4	34.200	32.925	1.050	1350
1.003	72.102	90.8	5	32.430	31.906	0.074	1350
1.004	2.909	606.2	6	32.400	31.901	0.049	1350
1.005	30.958	406.8	7	32.400	31.825	0.125	1350
1.006	3.071	9.7		32.600	31.510	0.640	0

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Setting Out Information - True Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	1	1050		390793.135	221480.338	
1.001	2	1050		390745.888	221480.433	
1.002	3	1050		390693.795	221465.165	
2.000	4	1050		390608.718	221439.696	
1.003	4	1350		390618.709	221446.648	
1.004	5	1350		390594.537	221514.577	
1.005	6	1350		390593.561	221517.317	
1.006	7	1350		390562.932	221512.818	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.006		0		390561.963	221515.733	

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006		32.600	31.510	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Manhole: 7, DS/PN: 1.006, Volume (m³): 5.5

Design Head (m) 0.450 Diameter (mm) 67
 Design Flow (l/s) 1.8 Invert Level (m) 31.825
 Hydro-Brake® Type Md5 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	3.0	3.000	4.7	7.000	7.2
0.200	1.5	1.400	3.2	3.500	5.1	7.500	7.5
0.300	1.5	1.600	3.4	4.000	5.4	8.000	7.7
0.400	1.7	1.800	3.7	4.500	5.8	8.500	7.9
0.500	1.9	2.000	3.9	5.000	6.1	9.000	8.2
0.600	2.1	2.200	4.0	5.500	6.4	9.500	8.4
0.800	2.4	2.400	4.2	6.000	6.7		
1.000	2.7	2.600	4.4	6.500	6.9		

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Storage Structures for Storm

Tank or Pond Manhole: S8, DS/PN: 1.004

Invert Level (m) 31.550

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	225.0	1.000	275.0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%					
1.001	15 Winter	1	0%					
1.002	15 Winter	1	0%	30/15 Summer				
2.000	15 Winter	1	0%	30/15 Summer				
1.003	15 Winter	1	0%					
1.004	15 Winter	1	0%	100/15 Summer				
1.005	15 Winter	1	0%	100/15 Summer				
1.006	240 Winter	1	0%					

PN	US/MH Name	Water		Flooded			Pipe	
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Flow (l/s)	Status
1.000	1	36.917	-0.208	0.000	0.02	0.0	1.4	OK
1.001	2	35.424	-0.181	0.000	0.08	0.0	7.6	OK
1.002	3	33.738	-0.127	0.000	0.39	0.0	18.9	OK
2.000	4	33.132	-0.093	0.000	0.63	0.0	22.0	OK
1.003	4	32.806	-0.344	0.000	0.13	0.0	39.8	OK
1.004	5	32.082	-0.274	0.000	0.32	0.0	40.1	OK
1.005	6	32.066	-0.285	0.000	0.29	0.0	39.3	OK
1.006	7	31.964	-0.311	0.000	0.00	0.0	1.5	OK

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Micro Drainage Network W.12.2

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%					
1.001	15 Winter	30	0%					
1.002	15 Winter	30	0%	30/15 Summer				
2.000	15 Winter	30	0%	30/15 Summer				
1.003	15 Winter	30	0%					
1.004	15 Winter	30	0%	100/15 Summer				
1.005	15 Winter	30	0%	100/15 Summer				
1.006	480 Winter	30	0%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	1	36.929	-0.196	0.000	0.04	0.0	3.5	OK
1.001	2	35.456	-0.149	0.000	0.25	0.0	22.3	OK
1.002	3	34.009	0.144	0.000	1.10	0.0	53.3	SURCHARGED
2.000	4	33.325	0.100	0.000	1.54	0.0	53.8	SURCHARGED
1.003	4	32.879	-0.271	0.000	0.33	0.0	104.3	OK
1.004	5	32.223	-0.133	0.000	0.84	0.0	104.2	FLOOD RISK
1.005	6	32.196	-0.155	0.000	0.75	0.0	103.3	FLOOD RISK
1.006	7	32.092	-0.183	0.000	0.00	0.0	1.5	OK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
 for Storm

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+30%					
1.001	15 Winter	100	+30%					
1.002	15 Winter	100	+30%	30/15 Summer				
2.000	15 Winter	100	+30%	30/15 Summer				
1.003	15 Winter	100	+30%					
1.004	15 Winter	100	+30%	100/15 Summer				
1.005	15 Winter	100	+30%	100/15 Summer				
1.006	960 Winter	100	+30%					

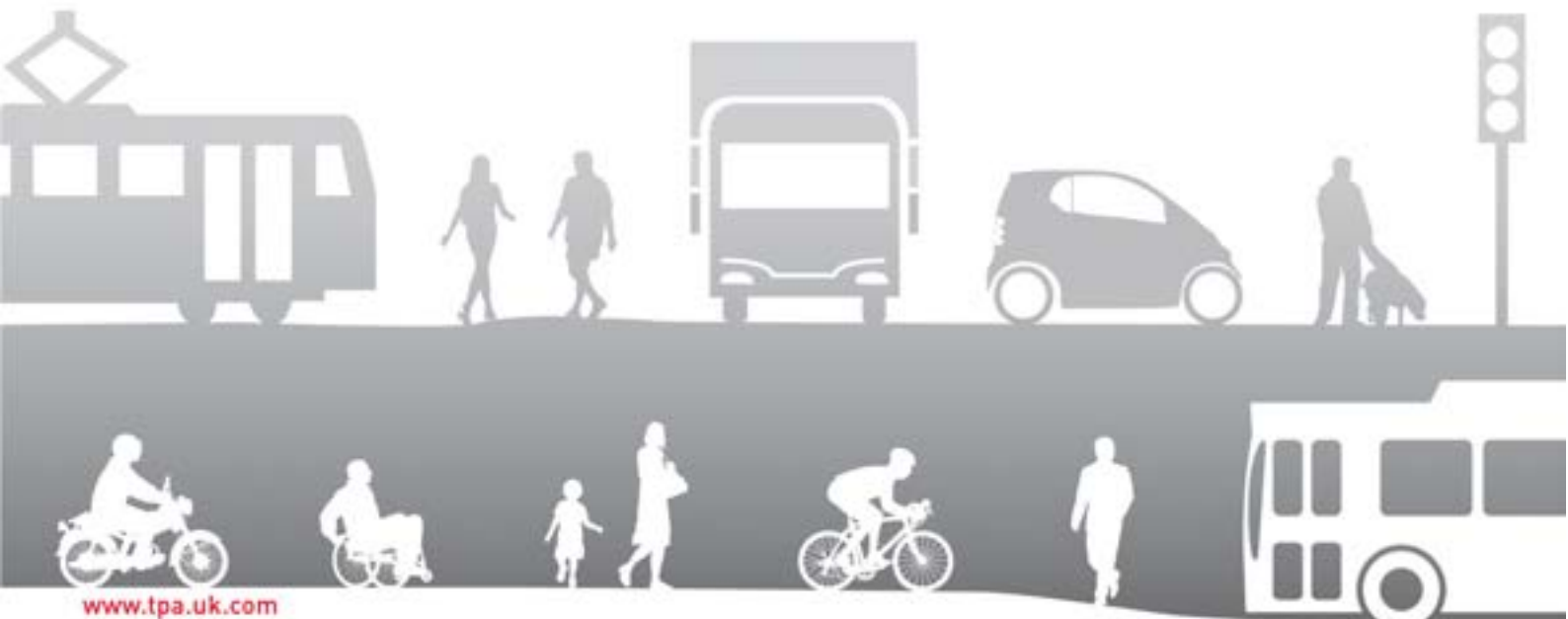
PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	1	36.938	-0.187	0.000	0.06	0.0	5.8	OK
1.001	2	35.482	-0.123	0.000	0.42	0.0	37.5	OK
1.002	3	35.112	1.247	0.000	1.64	0.0	79.9	FLOOD RISK
2.000	4	33.642	0.417	0.000	2.56	0.0	89.4	SURCHARGED
1.003	4	32.932	-0.218	0.000	0.52	0.0	163.9	OK
1.004	5	32.394	0.038	0.000	1.30	0.0	161.1	FLOOD RISK
1.005	6	32.359	0.008	0.000	1.16	0.0	159.8	FLOOD RISK
1.006	7	32.269	-0.006	0.000	0.01	0.0	1.8	FLOOD RISK

A Planning Application by
COTSWOLD BMW GROUP

In respect of
GROVEFIELD WAY, CHELTENHAM




Proposed SuDS Management Plan

February 2016



DOCUMENT SIGNATURE AND REVIEW SHEET**Project Details**

Project Title:	GROVEFIELD WAY, CHELTENHAM		
Project No.:	1402-01	Report No.:	SMP/02
Client:	COTSWOLD BMW GROUP		

	Prepared By:	Checked By:	Approved for issue
Name	Paul Graham	Mark Prosser	Mark Prosser
Signature			
Date	February 2016	February 2016	February 2016

Document Review

Revision	Date	Description	Checked By

Issued by:

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1	INTRODUCTION	1
2	EXISTING SITE	2
3	SUDS OVERVIEW	3

1 INTRODUCTION

- 1.1 Transport Planning Associates (TPA) has been commissioned by Cotswold BMW Group to undertake a SuDS Management Plan for the access road to the constructed development of a car showroom at Grovefield Way, Cheltenham.
- 1.2 This report provides a SuDS overview and considers the management of surface water, the use of SuDS and the maintenance required for those used within the application site.
- 1.3 This SuDS management plan should be read in conjunction with the Surface Water Management Plan dated September 2015 produced by TPA in support of the consented planning application.

2 EXISTING SITE

Site Details

SITE DESCRIPTION

- 2.1 The parcel of land as identified on the site location plan is located approximately 2 kilometres west of Cheltenham town centre, approached by Grovefield Way, a major access road which joins the A40 approximately 800m north from the site. The existing site is located within the business sector of Cheltenham and is surrounded by either agricultural land or business buildings. There are no main rivers running through or in the immediate vicinity of the site, although there is an unnamed ordinary watercourse which runs along the northern boundary of the site before being culverted where it crosses beneath the A40.
- 2.2 The site being drained comprises an access road with an approximate area of 0.374 hectares. There is a level difference of up to 6m.

Drainage Features

- 2.3 The development site is classified as being Greenfield with the site being solely covered in vegetation. The Surface Water run-off for the site is accepted at the Greenfield run-off rate, in accordance with the SuDS Manual.
- 2.4 Windes and the ICP-SUDS was used to calculate the Greenfield Run-off rate for the full onsite development, (IH124 would be used if the development site is greater than 50 ha in area). The full site area, amounts to approximately **2.35 ha** and based on Flood Studies Report (FSR) Figure I.2.4, gives a $Q_{BAR_{rural}}$ (average annual flood) rate of **8 l/s**. The whole proposed development must not generate more runoff than this if it is proposed to discharge to a natural watercourse.
- 2.5 The access road will provide 0.374ha of impermeable area, made up of road and footway construction.

3 SUDS OVERVIEW

3.1 Surface water run-off from the development will discharge at the restricted Greenfield run-off rate, this will be achieved using on-site attenuation in the form of a pond.

3.2 It is proposed that a management company will adopt all SuDS infrastructure.

Proposed SuDS

3.3 The hierarchy of surface water disposal stated within The Building Regulations approved document Part H is as follows:

- An adequate soakaway/infiltration system
- A watercourse
- A sewer

3.4 Infiltration rates of soils are measured by undertaking infiltration/soakaway testing, this should be undertaken in accordance with BRE 365. Soakaways should also be designed in accordance with BRE 365.

3.5 The soakaway test results within the FRA prove that infiltration drainage is not a feasible option of surface water disposal at the site.

Pond

3.6 Ponds provide surface water attenuation, water quality treatment and biodiversity. Surface water run-off from the development will discharge to the pond located along the northern boundary of the application site.

3.7 According to the Gloucestershire SuDS Design and Maintenance Guide, 2 treatment stages are required to treat surface water in areas with medium pollution risk, this includes areas with residential roads, parking areas and commercial sites.

3.8 It is proposed that a pond will provide initial treatment of surface water before discharging to the watercourse, the retention time will promote pollutant removal through sedimentation.

3.9 The ponds within the development have been designed to accommodate runoff from the 1% annual probability plus 30% climate change rainfall event. The calculations within the Surface Water Management Plan confirms that 250m³ of attenuation has been provided for within the ponds, this report also confirms that a hydrobrake will be used for flow control.

Operation and Maintenance Requirements

- 3.10 The pond should be regularly inspected by the management company to ensure effective operation. The table below highlights the frequency of maintenance actions to ensure little disruption to the ponds operation.

Regular/monthly basis maintenance requirements	<ul style="list-style-type: none"> • Removal of litter from the ponds/basin area • Inspection of inlets, outlets and control structures for damage or corrosion • Check and clear any obstructions which may prevent the pond/basin operating efficiently • Check for build-up of vegetation or other obstructions • File Record of Visit and report any defects for repair. • Regular mowing in and around detention basins is required only along maintenance access routes, amenity areas (e.g. footpaths), across embankments and main storage area. The remaining areas can be managed as damp meadow grass, unless additional management is required for landscaping purposes.
--	--

Occasional/annual basis maintenance requirements	<ul style="list-style-type: none"> • Leaves to be removed in autumn to prevent blockages • Inspection of inlets, outlets and control structures for damage or corrosion. • Consult with the EA if action is required for cleaning features • File Record of Visit and report any defects for repair.
Remedial Requirements	<ul style="list-style-type: none"> • Inspection of inlets, outlets and control structures for damage or corrosion – repair when necessary • File Record of Visit and report any defects for repair.

Table 1 – Pond Operation & Maintenance

- 3.11 Easements should be incorporated into development layouts between private or public roads and the pond, also according to the SuDS Manual approximately 3.5m access should be provided to the pond to allow maintenance vehicles to operate where needed.

Construction Requirements

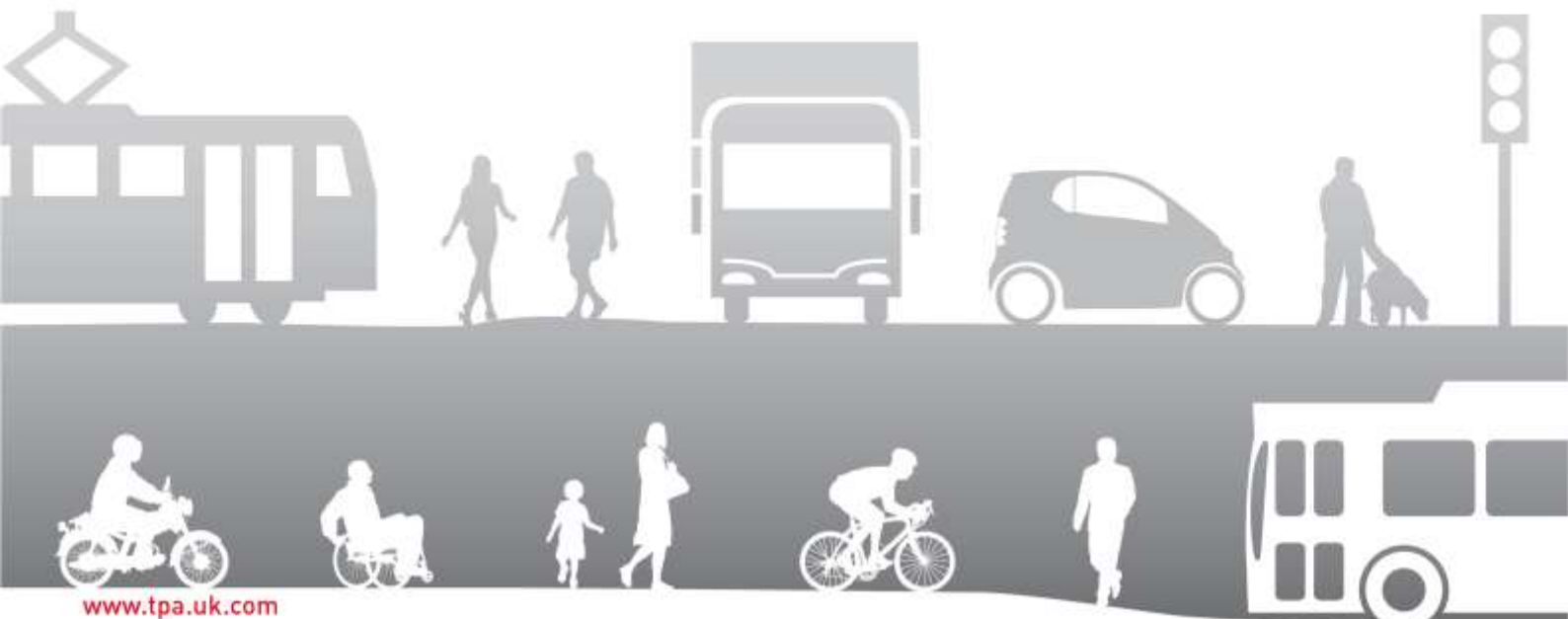
- 3.12 Prior to use the pond should be structurally sound, i.e. embankments should meet design criteria.
- 3.13 Timing of construction should be considered to avoid higher runoff rates during peak seasons.

A Planning Application by
COTSWOLD BMW GROUP

In respect of
GROVEFIELD WAY, CHELTENHAM

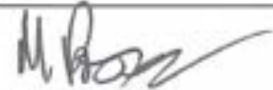
Proposed Surface Water Management Plan

September 2015



DOCUMENT SIGNATURE AND REVIEW SHEET**Project Details**

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Project No.:	1402-01	Report No.:	SMP/01
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	Prepared By:	Checked By:	Approved for issue
Name	Paul Graham	Mark Prosser	Mark Prosser
Signature			
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LIST OF APPENDICES

- APPENDIX A: Site Location Plan
- APPENDIX B: WinDES Calculations
- APPENDIX C: Drainage Drawings

1 INTRODUCTION

- 1.1 Transport Planning Associates (TPA) has been commissioned by Cotswold BMW Group to undertake a Surface Water Management Plan for the access road to the constructed development of a car showroom at Grovefield Way, Cheltenham.
- 1.2 This report provides an overview of the surface water management to be used at the development.
- 1.3 This surface water management plan should be read in conjunction with the Flood Risk Assessment prepared by TPA in June 2013 submitted in support of the consented application covering the development of the showroom.

2 EXISTING SITE

Site Details

SITE DESCRIPTION

- 2.1 The parcel of land as identified on the site location plan is located approximately 2 kilometres west of Cheltenham town centre, approached by Grovefield Way, a major access road which joins the A40 approximately 800m north from the site. The existing site is located within the business sector of Cheltenham and is surrounded by either agricultural land or business buildings. There are no main rivers running through or in the immediate vicinity of the site, although there is an unnamed ordinary watercourse which runs along the northern boundary of the site before being culverted where it crosses beneath the A40. Refer to Appendix A.
- 2.2 The site being drained comprises an access road with an approximate area of 0.374 hectares. There is a level difference of up to 6m.

Drainage Features

- 2.3 The development site is classified as being Greenfield with the site being solely covered in vegetation. The Surface Water run-off for the site is accepted at the Greenfield run-off rate, in accordance with the SuDS Manual.
- 2.4 Windes and the ICP-SUDS was used to calculate the Greenfield Run-off rate for the full onsite development, (IH124 would be used if the development site is greater than 50 ha in area). The full site area, amounts to approximately **2.35 ha** and based on Flood Studies Report (FSR) Figure I.2.4, gives a $Q_{BAR_{rural}}$ (average annual flood) rate of **8 l/s**. The whole proposed development must not generate more runoff than this if it is proposed to discharge to a natural watercourse.
- 2.5 The access road will provide 0.374ha of impermeable area, made up of road and footway construction.

3 SURFACE WATER MANAGEMENT PLAN

- 3.1 Currently the development land is made up of approximately 2.35 ha of green fields on the outskirts of Cheltenham, adjacent to the A40. The site has no evidence of built structures, is bound to the north and east with hedgerows with the south and west boundaries being unbound, forming part of the overall larger site for future development. This SWMP covers the drainage of the new access road off Grovefield Way to serve both a Flagship Dealership comprising a car showroom, servicing building with a 3000m² footprint plus car parking and the main access to the future development site beyond. The developed site will provide approximately 1.65 ha of impermeable area, and the access road will provide approximately 0.374ha of impermeable area.
- 3.2 The introduction of Schedule 3 of the Flood and Water Management Act, 2010, puts the onus of flood risk and the management of surface water onto the Lead Local Flood Authority. The LLFA in this circumstance is Cheltenham Borough Council.
- 3.3 It is anticipated that the presence of a suitable Aquifer is unlikely beneath the site and based on this the SWMP recommends the use SuDS for attenuation purposes only in a manner which actively reduces the discharge rate of the surface water runoff from site.
- 3.4 To achieve this, the drainage strategy recommends the use of the following:-
- Collection of highway surface water runoff in trapped road gullies connected to a piped sewer system in order to provide pre-treatment removal of silts.
 - Provision of a flow control device within the final manhole prior to the discharge pipe in order to limit discharge to existing Greenfield rates.
 - Provision of an attenuation pond to attenuate flows for storm events up to 1 in 100 years (including 30% climate change) and allow for improving the quality of surface water runoff before entering the watercourse.
- 3.5 A detailed design has been undertaken showing that storage of 250m³ is required to accommodate the 1 in 100 year return period for the whole site, refer to Appendix B.
- 3.6 Appendix C shows the location and form of the storage pond.

APPENDIX A

Site Location Plan

A4
ORIGINAL
PLOT SIZE

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PROJECT:
LAND OFF GROVEFIELD WAY, CHELTENHAM

CLIENT:

TITLE:
SITE LOCATION PLAN

Bristol
Cambridge
Cardiff
London
Welwyn Garden City

NOTES:

STATUS:
INFORMATION

tpa
Transport Planning Associates

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Rev	Date	Details	Drawn by	Checked by	Approved by
-	-	-	-	-	-

SCALE: NTS	DATE: 13.05.13	DRAWN: AJH	CHECKED: PCP	APPROVED: CMR
JOB NO: 1303-30		DRAWING NO: Appendix A.1		REVISION: -

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APPENDIX B

WinDES Calculations

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Micro Drainage	Network W.12.2	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.350	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	0	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500


Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	47.250	1.520	31.1	0.012	5.00	0.0	0.600	o	225
1.001	54.300	1.740	31.2	0.061	0.00	0.0	0.600	o	225
1.002	77.300	0.940	82.2	0.114	0.00	0.0	0.600	o	225
2.000	5.000	0.033	151.5	0.187	5.00	0.0	0.600	o	300
1.003	81.850	0.925	88.5	0.000	0.00	0.0	0.600	o	450
3.000	5.000	0.017	294.1	0.000	5.00	0.0	0.600	o	150
3.001	5.000	0.033	151.5	0.000	0.00	0.0	0.600	o	150
1.004	5.000	0.040	125.0	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.33	36.900	0.012	0.0	0.0	0.0	2.36	93.6	0.0
1.001	0.00	5.72	35.380	0.073	0.0	0.0	0.0	2.35	93.5	0.0
1.002	0.00	6.61	33.640	0.187	0.0	0.0	0.0	1.44	57.4	0.0
2.000	0.00	5.07	32.658	0.187	0.0	0.0	0.0	1.27	90.1	0.0
1.003	0.00	7.24	32.475	0.374	0.0	0.0	0.0	2.16	343.9	0.0
3.000	0.00	5.14	31.900	0.000	0.0	0.0	0.0	0.58	10.3	0.0
3.001	0.00	5.25	31.883	0.000	0.0	0.0	0.0	0.81	14.4	0.0
1.004	0.00	7.29	31.550	0.374	0.0	0.0	0.0	1.82	289.0	0.0

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21 Berkley Square Bristol BS8 1HP		
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Micro Drainage		Network W.12.2

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
				PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S1	38.400	1.500	1200	1.000	36.900	225				
S2	36.660	1.280	1200	1.001	35.380	225	1.000	35.380	225	
S3	35.140	1.500	1200	1.002	33.640	225	1.001	33.640	225	
S4	35.100	2.442	1200	2.000	32.658	300				
S5	34.200	1.725	1200	1.003	32.475	450	1.002	32.700	225	
							2.000	32.625	300	
S6	32.700	0.800	1050	3.000	31.900	150				
S7	32.700	0.817	1200	3.001	31.883	150	3.000	31.883	150	
S8	32.900	1.350	1200	1.004	31.550	450	1.003	31.550	450	
							3.001	31.850	150	
	32.600	1.090	0		OUTFALL		1.004	31.510	450	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
1.000	o	225	S1	38.400	36.900	1.275	1200
1.001	o	225	S2	36.660	35.380	1.055	1200
1.002	o	225	S3	35.140	33.640	1.275	1200
2.000	o	300	S4	35.100	32.658	2.142	1200
1.003	o	450	S5	34.200	32.475	1.275	1200
3.000	o	150	S6	32.700	31.900	0.650	1050
3.001	o	150	S7	32.700	31.883	0.667	1200
1.004	o	450	S8	32.900	31.550	0.900	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
1.000	47.250	31.1	S2	36.660	35.380	1.055	1200
1.001	54.300	31.2	S3	35.140	33.640	1.275	1200
1.002	77.300	82.2	S5	34.200	32.700	1.275	1200
2.000	5.000	151.5	S5	34.200	32.625	1.275	1200
1.003	81.850	88.5	S8	32.900	31.550	0.900	1200
3.000	5.000	294.1	S7	32.700	31.883	0.667	1200
3.001	5.000	151.5	S8	32.900	31.850	0.900	1200
1.004	5.000	125.0		32.600	31.510	0.640	0

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Setting Out Information - True Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	S1	1200				●
1.001	S2	1200				●
1.002	S3	1200				●
2.000	S4	1200				●
1.003	S5	1200				●
3.000	S6	1050				●
3.001	S7	1200				●
1.004	S8	1200				●

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.004		0				●

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.004		32.600	31.510	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Manhole: S8, DS/PN: 1.004, Volume (m³): 14.4

Design Head (m) 1.000 Diameter (mm) 57
 Design Flow (l/s) 1.8 Invert Level (m) 31.550
 Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	1.200	2.0	3.000	3.2	7.000	4.9
0.200	1.1	1.400	2.2	3.500	3.5	7.500	5.1
0.300	1.1	1.600	2.3	4.000	3.7	8.000	5.2
0.400	1.2	1.800	2.5	4.500	3.9	8.500	5.4
0.500	1.3	2.000	2.6	5.000	4.1	9.000	5.6
0.600	1.4	2.200	2.7	5.500	4.3	9.500	5.7
0.800	1.7	2.400	2.9	6.000	4.5		
1.000	1.9	2.600	3.0	6.500	4.7		

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Storage Structures for Storm

Tank or Pond Manhole: S8, DS/PN: 1.004

Invert Level (m) 31.550

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	225.0	1.000	275.0

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Summary of Results for 30 minute 1 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	S1	36.915	-0.210	0.000	0.01	0.0	1.3	OK
1.001	S2	35.421	-0.184	0.000	0.08	0.0	6.8	OK
1.002	S3	33.725	-0.140	0.000	0.31	0.0	17.2	OK
2.000	S4	32.776	-0.182	0.000	0.33	0.0	19.6	OK
1.003	S5	32.575	-0.350	0.000	0.11	0.0	36.1	OK
3.000	S6	31.900	-0.150	0.000	0.00	0.0	0.0	OK
3.001	S7	31.883	-0.150	0.000	0.00	0.0	0.0	OK
1.004	S8	31.654	-0.346	0.000	0.00	0.0	0.8	OK

APPENDIX C

Drainage Drawing