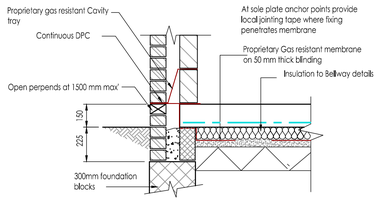
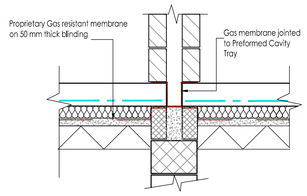
GAS CHARACTERISTIC SITUATION 2



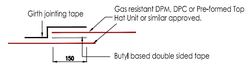
TYPICAL SECTION AT EXTERNAL WALL

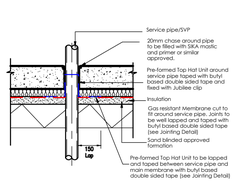


TYPICAL SECTION AT PARTY WALL

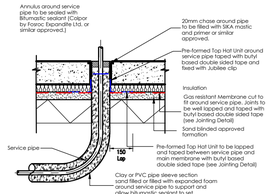
INSULATION TO BE 80 OR 150 mm CELOTEX - REFER TO CfSH SPEC OF SITE

JOINTING DETAIL





SERVICE ENTRY



SLEEVED SERVICE ENTRY

FOR WALL SIZE & CONSTRUCTION INCLUDING INSULATION REQUIREMENTS REFER TO THE ARCHITECTURAL DRAWINGS

CS 2

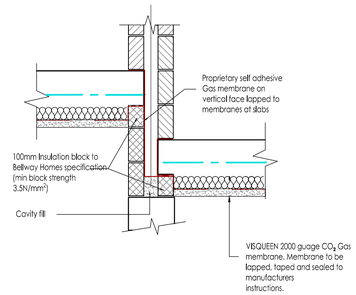
All proprietary gas resistant membranes are to be installed to reasonable levels of workmanship in line with current good practice under CQA with integrity testing and independent validation, in accordance with BS8485 and to the approval of NHBC.

All dpm's to be lapped and sealed at joints using proprietry double sided sealing tape.
All services entries are to incorporate a sealed joint, top hat or similar.

B.S.8485:2007

Chracteristic Gas Situation

CS2 - Equates (approx') to Amber 1 of the NHBC Traffic Light System - requires a gas protection score of 3	Score required	3.0
FLOOR SLAB BARRIER - Reinforced concrete cast insitu suspended slab with minimal service penetrations and water bars around all slab penetrations and at joints	Score achieved	1.5
MEMBRANE - Proprietary gas resistant membrane installed to reasonable levels of workmanship / in line with current good practice under CQA with integrity testing and independent validation	Score achieved	2.0
	TOTAL SCORE ACHIEVED	**3.5**



STEP AT PARTY WALL
This detail is not suitable where there is high groundwater levels/water pressure

GENERAL NOTES :-

This drawing is to be read in conjunction with all relevant Bellway drawings & specifications.

Special care must be taken to ensure that membranes are not snagged, torn, punctured, stretched or in any way damaged during construction.All damaged areas of the membrane must be replaced or repaired to the manufacturers recommendations.

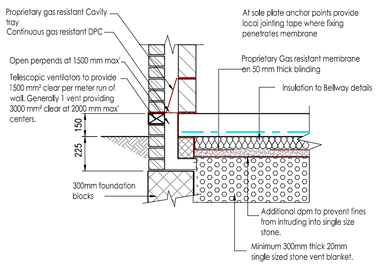
Insulation Details to Bellway Homes Specification and details.

All membranes should be installed to the manufacturers guidelines and recommendations. Consideration should be given to utilising the manufacturers approved contractors for installation wherever possible.

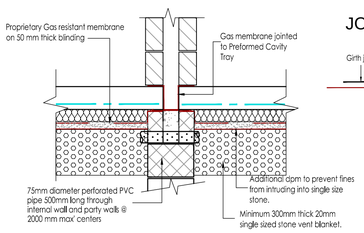
Validation of gas protection system to Bellway Homes Instructions

ALWAYS Obtain Local Authority/NHBC approval on a site specific basis prior to using these details

GAS CHARACTERISTIC SITUATION 3

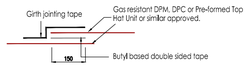


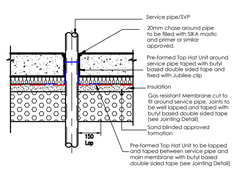
TYPICAL SECTION AT EXTERNAL WALL



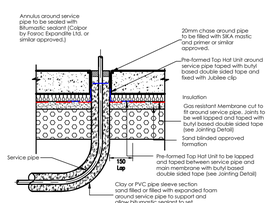
TYPICAL SECTION AT PARTY WALL

JOINTING DETAIL





SERVICE ENTRY



SLEEVED SERVICE ENTRY

CS 3

All proprietary gas resistant membranes are to be installed to reasonable levels of workmanship in line with current good practice under CQA with integrity testing and independent validation, in accordance with BS8485 and to the approval of NHBC.

All dpm's to be lapped and sealed at joints using proprietry double sided sealing tape.
All services entries are to incorporate a sealed joint, top hat or similar.

B.S.8485:2007

Chracteristic Gas Situation

CS3 - Equates (approx') to Amber 2 of the NHBC Traffic Light System - requires a gas protection score of 4	Score required	4.0
FLOOR SLAB BARRIER - Reinforced concrete cast insitu suspended slab with minimal service penetrations and water bars around all slab penetrations and at joints	Score achieved	1.5
MEMBRANE - Proprietary gas resistant membrane installed to reasonable levels of workmanship / in line with current good practice under CQA with integrity testing and independent validation	Score achieved	2.0
VENTILATING - Passive sub-floor ventilation (venting layer to be single sized stone)	Score achieved	1.0
	TOTAL SCORE ACHIEVED	**4.5**

AN ALTERNATIVE TO SINGLE SIZE STONE IS TO USE A PROPRIETARY VOID FORMER EG CORDEK 200 IN CONJUNCTION WITH THE PROPRIETARY MEMBRANE, GAS VENTS AND PREFORMED SECTIONS.

REV	DATE	BY	DESCRIPTION	CHK
C1	25/09/12	CSB	CONSTRUCTION ISSUE	DR
P1	05/01/12	RC	PRELIMINARY ISSUE	DR

DRAWING STATUS: CONSTRUCTION

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Tel: 01244 288178 Fax: 01244 288179 enquiries@betts-associates.co.uk

Bellway
Bellway Homes Ltd
North West Division
2 Alderman Road
Liverpool L24 9LR
Tel: 0151 486 2900 Fax: 0151 336 9393

PROJECT: BELLWAY HOMES STANDARD CATALOGUE TYPICAL SLAB AND FOUNDATION DETAILS

TITLE: GAS PROTECTION DETAILS 2 AND 3 STOREY HOUSES TIMBER UPPER FLOORS

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
30/11/10	1:20		

PROJECT No:	DRAWING No:	REV:
BEL 41	TD 004	C1

APPENDIX V

PIPELINE RISK ASSESSMENT



Supplementary guidance for the selection of water pipes in land potentially affected by contamination

Introduction

In January 2011, UK Water Industry Research (UKWIR) published "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21; the 'UKWIR Guidance'). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as "land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated." The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions "*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development"*.

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the 'UUW Guidance') which includes the Risk Assessment for Water Pipes (the 'RA').

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication "Model Procedures for the Management of Land Contamination" (ref: CLR11) that sets out whether the land through which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be

necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 “Guidance on comparing soil contamination data with a critical concentration” may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment’s Contaminated Land Research Report “Sampling strategies for contaminated land” prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency’s “Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination” (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or

b) more suitable pipe materials; or

c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175:2011 “Investigation of Potentially Contaminated Sites Code of Practice”

CLAIRE/CIEH “Guidance on comparing soil contamination data with a critical concentration” 2008

Department of the Environment Contaminated Land Research Report “Sampling strategies for contaminated land” prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency “Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination” (ref: R&D Technical Report P5-066/TR) 2000

Environment Agency “Model Procedures for the Management of Land Contamination” (ref: CLR11), 2004

Environment Agency P5-080/TR3 “The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils”, 2005

UK Water Industry Research (UKWIR) "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21)” January 2011

Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 “Laying Pipes in Contaminated Land” 2002

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United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

Risk Assessment for Water Pipes (RA)

The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on 0845 026 4296.

When completing this form electronically, the larger text boxes will expand in height if required.

Section 1: Development Details	
Development Name *(if it has one)*	
Development Address	Former Withington Hospital, Cavendish Road, Manchester, M20 1LB
OS Grid Reference *(mid point)*	E383850, N392450
Developers Name	Bellway Homes (Manchester)
UUW reference number *(for UU use only)*	N/A
Please provide details below of the current and historical use of the site and adjacent sites. *If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.*	
The subject site is a roughly rectangular parcel of land located circa 5.5km south of Manchester City Centre and can be segregated into three distinctive sectors; the northern portion comprises a former disablement centre and associated asphalt car parking area, the central (former main hospital building) is void of all structures following recent demolition activities and the southern sector remains in use by NHS services with a furniture factory accessed via a road along the western extent of the site. A review of the pertinent Ordnance Survey mapping dating from circa 1840s to the present day indicates the site was historically utilised as a nursery for plant cultivation with a small track transecting north south at the eastern boundary and a series of small undefined buildings at the southern margin of the site. In the early to mid 20th century, the site was utilised as a recreational ground / playing fields associated with the adjacent school. It is possible that some low level land raising occurred. The first notable development was the construction of the Withington Hospital complex in the 1970's with the three main buildings that remain to the present day.	

Section 2: Preliminary Risk Assessment	
Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection. *If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.*	

N/A

Section 3: Intrusive Site Investigation	
Have you completed any intrusive site investigation?	☒ Yes ☐ No
Date(s) when the site investigation(s) undertaken	March 2015-May 2016
At what level has groundwater been encountered?	0.00-8.7 metres below ground level or ☐ Not encountered

Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing.

If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.

N/A

If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE please provide details below of the rationale behind the intended pipe selection.

If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.

The elevated TPH compounds at TP202 will be delineated, excavated and treated during remediation and enabling works.

Section 4: Site Remediation

Please provide details below of any site remediation (which may include a change in site levels) already completed.

If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.

N/A.

Has the PSRAS (Table 1) been completed using appropriate data after remediation?	☐ Yes ☐ No ☒ N/A

Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection.

If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.

A phase of remediation and enabling works will be required to prepare the development platform. The made ground soils will be lifted, sorted and screened and placed according to the engineering specification. A 600mm clean cover system will be placed over the made ground soils in proposed garden and landscaped areas.

Section 5: Final Use of Site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

None - Residential Development.

What water pipe materials are intended to be used on site?	☒ PE ☐ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B Other (please specify):

Section 6: Additional Information

Please use the section below to provide any additional details to support your intended pipe selection.

If your supporting information has additional information to support your intended pipe selection, please reference below the relevant sections of your report.

N/A

Section 7: Risk Assessor

Name and relevant qualifications of person directing the risk assessment for water pipes	Nicola Sellars MEarthSci (Hons), FGS Geo-Environmental Consultant
Name and address of risk assessor's company	E3P Heliport Business Park Liverpool Road Eccles M30 7RU
Date risk assessment performed	26/09/2016

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.			
Name	Nicola Sellars	Company	E3P
Phone Number	0161 707 9612	Date	26/09/2016

Please e-mail the completed form and supporting information to water.connections@uuplc.co.uk. Alternatively you can fax a paper version to 01925 678926 or post to us at United Utilities Water, Metering and Connections, Ullswater House, Lingley Mere, Warrington, WA5 3LP.

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Registered in England and Wales. Registered Number 2366678.

Table 1 - Pipe Selection Risk Assessment Summary (PSRAS)	
1) *Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.* 2) *If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.*	
What materials have been tested to populate Table 1 below?	☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg								
Test Group	**Testing Required?**	**PE threshold**	**Metal Pipes/ Barrier Pipe**	**Laboratory Detection Limit**	**Testing UKAS accredited Y/N**	**Maximum concentration at proposed pipeline depth** See Note [2]	**Maximum site concentration** See Note [3]	**Locations and depths where concentrations exceed proposed pipeline threshold**
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	0.001	Y	<1.0	<1.0	N/A
Total BTEX & MTBE		0.1	Pass	0.005	Y	<1.0	<1.0	N/A
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	0.01	Y	<0.3	<0.3	N/A
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.1	Y	<1.0	<1.0	N/A
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	10	Y	13	1000	TP202-0.2m, 1.7m, 2.3m
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	10	Y	120	1700	TP202-0.2m, 1.7m, 2.3m
Phenols* (from SVOC analysis)		2	Pass	0.01	Y	<0.3	<0.3	N/A
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	0.01	Y	<0.3	<0.3	N/A
Ethers*	Only where identified	0.5	Pass	-	-	-	-	-
Nitrobenzene*		0.5	Pass	-	-	-	-	-
Ketones*		0.5	Pass	-	-	-	-	-
Aldehydes*		0.5	Pass	-	-	-	-	-
Amines		Fail	Pass	-	-	-	-	-
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	N/A	Y	7.9-8.9	7.1-11.9	N/A

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.