

SOILTECHNICS
GEOTECHNICAL ENGINEERS, ENVIRONMENTAL CONSULTANTS

Date/Time	Location	Atmos-pheric pressure (mB)	Temper- ature (°C)	Methane, CH ₄ (%v/v) Chg		Carbon Dioxide, CO ₂ (%v/v) Chg		Oxygen, O ₂ (%v/v)		Balance	Lower Explosive Limit	Gas Flow (q)
				Peak	Steady	Peak	Steady	Minimum	Average	(%v/v)	(% LEL)	(l/Hr)
20/06/2008 12:10	BH01	1013	16.0	0.0	0.0	2.0	2.0	18.5	18.5	79.5	0.0	0.0
20/06/2008 12:14	BH02	1013	16.0	0.0	0.0	2.0	0.1	18.8	20.5	79.4	0.0	0.0
20/06/2008 10:56	BH03	1013	16.0	0.1	0.0	5.2	5.2	6.7	6.6	88.2	0.0	0.0
20/06/2008 11:41	BH04	1013	16.0	0.0	0.0	0.5	0.4	19.3	19.5	80.1	0.0	0.0
20/06/2008 11:22	BH05	1013	16.0	0.0	0.0	5.0	5.0	0.3	0.3	94.7	0.0	0.0
20/06/2008 11:10	BH06	1013	16.0	0.0	0.0	4.7	4.2	7.4	7.4	88.4	0.0	0.0
08/07/2008 12:32	BH01	1003	18.0	0.0	0.0	0.1	0.0	20.2	20.4	79.6	0.0	0.0
08/07/2008 12:40	BH02	1004	18.0	0.0	0.0	0.0	0.0	0.0	20.3	79.7	0.0	0.0
08/07/2008 12:56	BH03	1004	18.0	0.0	0.0	5.0	5.0	10.4	10.4	84.6	0.0	0.0
08/07/2008 13:10	BH04	1005	18.0	0.0	0.0	1.0	1.0	17.2	17.3	81.7	0.0	0.0
08/07/2008 13:21	BH05	1005	18.0	0.0	0.0	6.1	6.1	0.2	0.2	93.7	0.0	0.0
08/07/2008 13:41	BH06	1005	18.0	0.0	0.0	4.6	4.6	14.9	14.9	80.5	0.0	0.0

0.1	0.0	6.1	6.1	0.0	0.2	94.7	0.0	0.1
0.0	0.0	3.0	2.8	11.2	13.0	84.2	0.0	0.1

Peak hazardous gas flow rate <i>Qhgs</i>		Steady hazardous gas flow rate <i>Qhgs</i>		NHBC Guideline	NHBC Guideline	Characteristic gas situation	Potentially Explosive	Water Level (m)
CH ₄	CO ₂	CH ₄	CO ₂	(Peak)	(Steady)			
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.4
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.33
0.00	0.00	0.00	0.00	AMBER 1	AMBER 1	TWO	NO	1.4
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.6
0.00	0.00	0.00	0.00	GREEN	GREEN	TWO	NO	2.37
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	2.4
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.36
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.33
0.00	0.00	0.00	0.00	GREEN	GREEN	TWO	NO	1.44
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	1.62
0.00	0.00	0.00	0.00	AMBER 1	AMBER 1	TWO	NO	2.38
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	NO	2.54

0.00	0.01	0.00	0.01	AMBER1	AMBER 1	TWO	Worst case scenario
0.00	0.00	0.00	0.00	GREEN	GREEN	ONE	Average site scenario

Additional Considerations

Notes:
Gas Screening Value (GSV) derived by mulitlying the peak gas concentration (%) by the peak flow rate (l/h).

The gas analyser is capable of measuring flow to an accuracy of 0.1l/h. Below this value the analyser records zero flow. Adopting a precautionary approach we have used a flow rate of 0.1l/h when the analyser records zero with this flow rate used to determine the gas screening value.

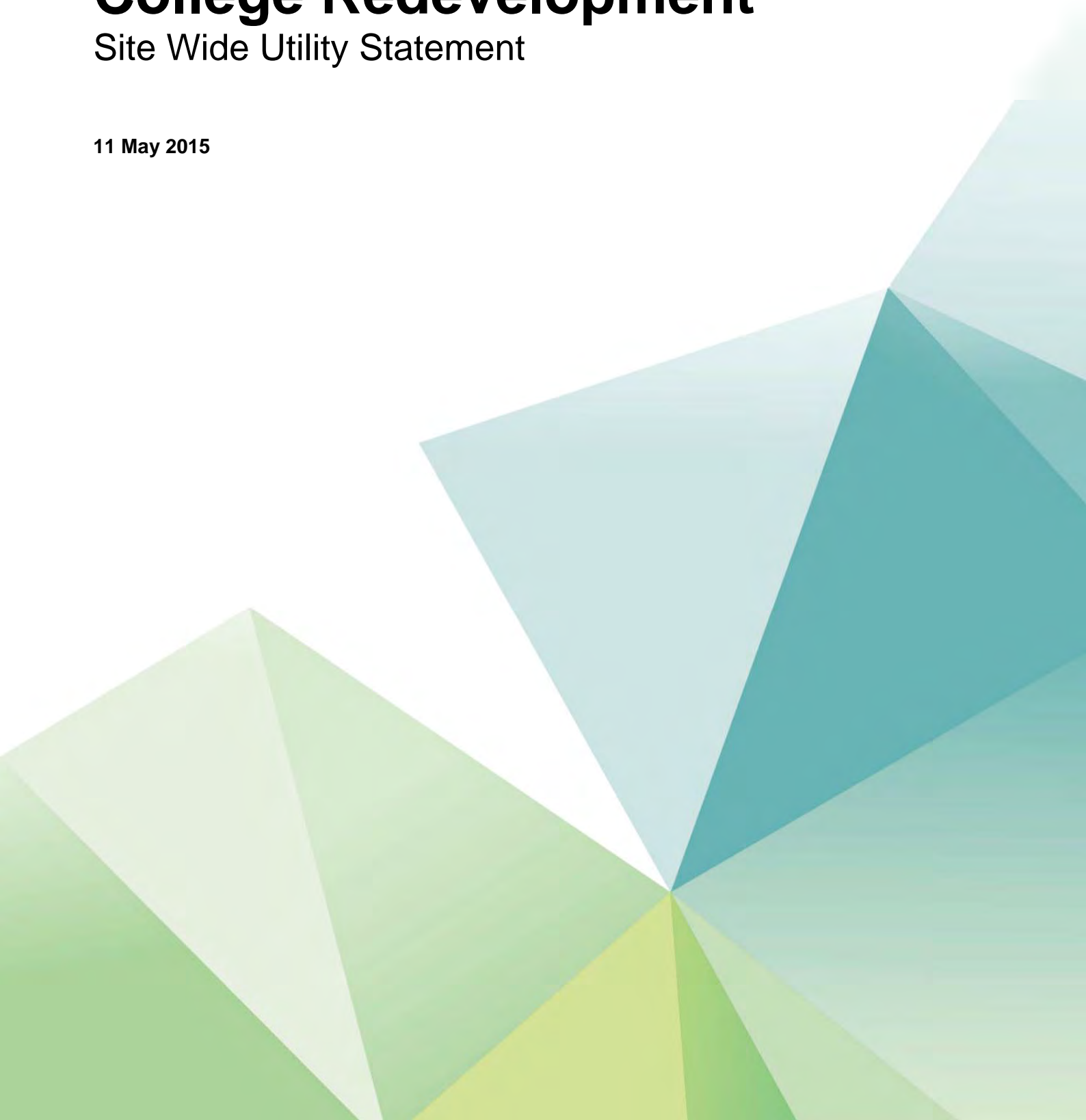
Record of in-situ gas and water level monitoring results	
Project	Richmond-Upon-Thames College, Twickenham
Project Reference	STE1297R
Location Plan or Drawing No.	D-STE1297R-02
Draft	Preliminary
Appendix	K

Appendix 13.3: Utilities Statement

Richmond-Upon-Thames College Redevelopment

Site Wide Utility Statement

11 May 2015



Notice

This document and its contents have been prepared and are intended solely for the client 's information and use in relation to site wide utilities statement.

Atkins assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 17 pages including the cover.

Document history

Job number:			Document ref:			
Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	DRAFT- FOR INFORMATION	ED	KD	MS	MS	11/05/15

Client signoff

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Project	Richmond-Upon-Thames College Redevelopment
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Table of contents

Chapter	Pages
Executive Summary	4
1. Introduction	5
1.1. Background	5
1.2. Purpose of Report	5
1.3. Limitations	5
2. Existing Utilities Infrastructure	6
2.1. Site Description	6
2.2. Statutory Services	6
2.3. Water Supply	6
2.4. Electricity	6
2.5. Gas	6
2.6. Foul and Surface Sewerage	7
2.7. Telecoms	7
3. Utilities Improvements	8
3.1. Development Proposals	8
3.2. BREEAM	8
3.3. Water Supply	8
3.4. Electricity	8
3.5. Gas	8
3.6. Foul and Surface Sewerage	9
3.7. Telecoms	9
3.8. Easements	9
Appendices	10
Appendix A. Site Location	11
Appendix B. Topographical Survey	12
Appendix C. Illustrative Masterplan	13
Appendix D. Existing Infrastructure	14
Appendix E. Correspondence	15
UKPN Correspondence	15
National Grid Application	16

Executive Summary

Atkins has identified the existing infrastructure serving the current site, and summarise the following for the proposed development;

1. UKPN have identified a suitable Point of Connection (POC) for the site.
2. Foul water drainage will follow the existing strategy. A pre-development application will be submitted at RIBA Stage 2.
3. Surface water will follow the principles set out in site wide sustainable design assessment. Shallow infiltration devices will be required. There may need to be a pre-development application at RIBA Stage 2.
4. Atkins is awaiting response from National Grid regarding new gas supplies.
5. Maps have been received by Thames Water identifying existing water supplies. An application for new points of connection is to be submitted in due course.
6. No information other than maps have been sought from telecoms providers.

1. Introduction

1.1. Background

This Utilities Statement has been prepared by Atkins for the Richmond Educational Campus (REEC). It accompanies the outline planning application for the site.

The development consists of a new campus for education and enterprise comprising a college, a school (including a 5FE secondary school, SEN schools; the Clarendon School and Newhouse School), a technical hub (for the Haymarket group including photographic studios and supporting spaces), and sports shared by the school and college, and accessible to the local community.

The proposed project is located on the site of Richmond-upon-Thames College, in Twickenham, in the London Borough of Richmond-upon-Thames. The site currently comprises of the existing Richmond upon Thames College, and recreational land.

1.2. Purpose of Report

The purpose of this report is to establish any potential constraints within the existing infrastructure, to identify possible solutions and to demonstrate that the development can be fully serviced in a sustainable matter.

To this end, Atkins has consulted with the various service providers to assess available capacities within the utilities networks and to identify the likely improvements required to service the development. Where available, indicative cost estimates for upgrading works have been obtained from the service providers and are included.

1.3. Limitations

The scope of this appraisal is limited to a desk top study and is reliant on information received from third parties. The accuracy of information received from third parties cannot be guaranteed and Atkins accepts no liability for errors or omissions in the supplied data.

The exact location and depth of services described in this report will need to be confirmed by survey/investigation prior to the commencement of any works on site.

Where upgrading costs have been provided, it should be noted that they are intended as indicative guidance and will be subject to confirmation as the scheme develops.

2. Existing Utilities Infrastructure

2.1. Site Description

The site currently comprises of the existing Richmond-Upon-Thames College buildings and open recreational land and sports fields. The site is bound by the A316 to the north, Egerton Road to the east, Langhorn Drive to the west and the River Crane to the south. Craneford Way (a road with residential properties) intersects the site running east-west between the existing colleges and the recreational land to the south.

A topographical survey of the site was undertaken by 3 Sixty Measurement in April 2006, under a previous scope of works. This drawing is included in Appendix B.

Demand loadings have been estimated for the proposed development. The surrounding area has a mixed use demand which includes mainly housing, Harlequins Rugby Ground and Nutfield Heath.

2.2. Statutory Services

Asset location plans have been obtained from statutory undertakers in order to identify the type and approximate location of existing below ground infrastructure within the site and surrounding area.

The asset plans are attached in Appendix D.

It should be noted that the location of existing infrastructure shown on the asset records is approximate and for information purposes only. As such no guarantee of accuracy is provided and actual positions should be determined by on-site investigation prior to the commencement of physical site works. All investigative work must be undertaken in strict accordance with the utility company requirements to ensure the protection to both plant and contractors.

2.3. Water Supply

Thames water is the water supplier to the existing college.

The existing site has potable water infrastructure along Egerton Road and Craneford Way. The site is served by a connection that enters the site between Craneford Way and Heathfield South. There is no potable water to the west side of the site, and the water infrastructure along the A316 is located on the opposite side of the road.

2.4. Electricity

South Eastern Power Networks PLC, as a licensed distributor, operate the electricity distribution network in the site surroundings. Scottish and Southern electric are the current electricity providers to the College.

UKPN have indicated that there are HV cables along Craneford Way, Egerton Road, and the west boundary of the site. There is an existing substation in the south-east corner of the site which provides power to the existing college and surrounding residential areas.

Scottish and Southern have electrical infrastructure running down the west boundary of the site.

2.5. Gas

National Grid operates the gas distribution network in the central region. Asset records provided by National Grid indicate that there is existing gas supply infrastructure within the bounds of the site.

The existing college is served by a 6" low pressure gas main which runs the length of Egerton Road and enters the site opposite Heathfield South. The gas main also enters the south-west of the site from Craneford Way. A 36" medium pressure gas main running along the A316 bounds the north side of the site.

2.6. Foul and Surface Sewerage

2.6.1. Foul Water

The existing Richmond College site discharges to the Thames Water (TW) public infrastructure system. The existing site survey indicates 2 x existing pumping stations (presumed private) located towards the west of the site area, which discharge to a combined TW Manhole (MH) 3601 on Craneford Way. There are also 2 x discharges to the east of the site to combined manholes TW 4802 and 5702 on Egerton Road. It is assumed that this area of the site is drained by gravity.

2.6.2. Surface Water

The existing Richmond College site predominately discharges to a number of soakaways around the site. There also appears to be a gravity connection to combined TW MH 5703, serving the eastern portion of the site. It should be noted that some of the existing pipes could not be surveyed during the existing site survey works, due to pipe blockages and the connection to TW MH 5703 could need to be verified.

The site investigation indicates that the site is not located in an Environment Agency Source Protection Zone, however the playing fields area is within a Zone 2 Flood Zone. The rest of the development is outside of Environment Agency Flood Zones. There is also considered a risk from ground water flooding.

Ground conditions indicate generally 0.3m to 1.0m of top soil/made ground, overlaying Kempton Park gravels (generally 4.2m – 5.3m deep and locally 9.3m deep), which overlies London clay. Ground water levels are shallow ranging typically between 1.1m and 3.5m in trial investigation pits, and 1.33 and 2.54m in monitoring standpipes. The site investigation also quotes a risk of encountering ground water in foundation excavations at depths below 1.3m. Permeability tests were undertaken at various trial pits and results indicated rates of between 5×10^{-6} m/s to 5.2×10^{-5} m/s, although these were not undertaken at effective depths to suit the provision of new infiltration systems. In addition, variable head tests were undertaken in two of the boreholes, producing infiltration rates of 3×10^{-5} m/s and 8.4×10^{-7} m/s. Further tests should be undertaken to verify these rates at any proposed infiltration locations.

Contamination testing concluded that the mobilisation of contaminants is considered unlikely, except potentially in 3 trial pits, located in the south and west of the site (TP14, TP09 and DTS05). This will be more fully assessed based on the results of further environmental investigations.

Initial discussions with the London Borough of Richmond, as part of the EIA scoping, have stated that a Greenfield run-off should be achieved. Where this is not possible, justification should be provided and run-off must be no greater than 3 times the Greenfield rate or must achieve a minimum 50% reduction from the existing run-off rate. Sustainable drainage schemes must be used on the site and any storage sized for a 1 in 100 year storm, with an appropriate allowance for climate change. Rainwater harvesting and green roofs should also be provided, and any SuDS schemes could be linked with enhancements to the River Crane.

2.7. Telecoms

BT Openreach have infrastructure along the west boundary of the site, with incoming infrastructure to the south-west. They also have infrastructure along Egerton Road to the east, with incoming infrastructure opposite Court Way and along Craneford Way.

BskyB have infrastructure along the A316 bounding the north side of the site.

3. Utilities Improvements

3.1. Development Proposals

The proposed development includes residential units, a new college, school, and commercial space. The development Masterplan, prepared by HOK Architects, is attached in Appendix C.

3.2. BREEAM

The college and school buildings will aim to achieve Good or Excellent BREEAM ratings. It is likely that the residential development will also seek to achieve a Code for Sustainable Homes rating (or equivalent).

To minimise water consumption, credits in the following areas will be sought;

- Use of low flow fittings to reduce consumption
- Water meters on all incoming supplies, and significant water consuming equipment
- Leak detection systems
- Identification of un-regulated water consumption

In terms of the drainage, the following credits will be sought;

- Surface water run-off mitigation
- Minimising water course pollution

3.3. Water Supply

A water supply point of connection will be required for each building. Now that the Thames Water maps have been received, an application for the new supplies will be submitted in due course and a quotation for the works will be requested.

3.4. Electricity

For the provision of new electricity supply to the site, UK Power Networks have provided a budget estimate of £190,000 (exclusive of VAT) for a 1625 kVA supply at 400 V. This estimate is based on a point of connection to the high voltage network at the junction of Egerton Road and the A316.

It is estimated that 3 No. substations will be required on site. It is thought that the existing substation could be retained for the residential element of the development.

3.5. Gas

Gas consumption estimates for the development have been forwarded to National Grid for identification of infrastructure requirements. These loadings are attached in Appendix E.

1 additional metered gas supply will be required and the anticipated peak gas load for the whole site is 5,500 kW. The peak gas load takes into account heating, domestic hot water and catering, including allowance for gas Bunsen burners in the schools and college. The peak value is based on rules of thumb and predicted usage profiles.

Atkins are awaiting response from National Grid to identify likely point of connection and budget estimate for the works.

3.6. Foul and Surface Sewerage

3.6.1. Foul Water

It is proposed that after redevelopment, the proposed foul water drainage system will follow the existing drainage regime and a TW Pre-Development Application will be submitted at RIBA Stage 2. This will determine if sufficient capacity is available in the existing foul water drainage system to accommodate the development, without upgrades. The outcome will be dependent on the increase in population of the new entire development over the existing population.

The final foul drainage strategy will need to also tie in with the other proposed developments on the site (Haymarket Technical Hub, REEC Schools and Residential Development), to provide a holistic drainage strategy for the entire re-developed site.

3.6.2. Surface Water

It is proposed that the new development will follow the principles set out in the site-wide 'Sustainable Drainage Assessment' undertaken by ESI, predominately using infiltration and green roofs. High groundwater levels will require the use of shallow infiltration devices (such as porous paving). In some areas it may not be possible to use infiltration drainage if permeability results are found to be too low and there are high ground water levels. In these cases alternative methods of disposal will need to be considered. If this involves connecting to the existing TW drainage system, a TW Pre-Development Application will be submitted at RIBA Stage 2

Further assessment of the potential mobilisation of contamination will also need to be considered, particularly in the vicinity of trail pits TP14, TP09 and DTS05. This may preclude the use of infiltration drainage in these vicinities. Careful consideration of the pollution control of hydrocarbons will also need to be considered.

3.7. Telecoms

Atkins have not contacted telecoms providers at this stage. It is not anticipated that telecoms connections would pose constraints on the development.

3.8. Easements

Provision of the above services on site will be subject to minimum easements if they are to be adopted by the various utility undertakers. These easements, the minimum horizontal distances between services and buildings/structures, will be dependent on the size and depth of the services.

Appendices



Appendix A. Site Location



Appendix B. Topographical Survey

[illegible]

Appendix C. Illustrative Masterplan

A vertical scale bar labeled "Millimetres". It has major tick marks at 0, 10, and 100. There are also minor tick marks every 2 units, with labels at 2, 4, 6, 8, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, and 98.



In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

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