

Your connection details

Connection - 23 x Houses

The connection to each premises will be one phase, 230 Volts, alternating current, at 50Hz, terminating in a fused cut out with a maximum capacity of 100 Amps subject to an after diversity maximum demand of 345kVA for the entire development.

How to get your meter

It is extremely important for you to note that your meters cannot be installed by Scottish and Southern Energy Power Distribution. Although Scottish and Southern Energy Power Distribution own the cables coming into the premises **we are not an electricity supply company and we do not install the meters.** You must arrange a supply contract with the Supplier of your choice. Once you have chosen your preferred Supplier you will need to contact them to register the MPAN(s) associated with the new premises. We suggest you do this as soon as possible to avoid any delays in being able to use your electricity supply.

Once you have registered with your chosen supplier, they will arrange for their Meter Operator to fit the meter(s) and energise the supply(ies). Meter(s) cannot be installed until all connection works have been completed by us.

What is an MPAN

- The MPAN(Meter Point Administration Number) is a unique number that identifies each electricity supply point.
- The MPAN is sometimes also called a Supply Number but it should not be confused with your customer reference number.
- **Every MPAN number must be registered with a Supplier before a meter can be connected and final energisation can take place.**

Earthing

The electrical installation must comply with statutory requirements. Protection against earth leakage is at all times the responsibility of the customer. We can assist and will provide a PME (TN-CS) terminal at the meter position. We strongly recommend that you make use of this facility. The bonding of the electrical installation must meet the requirements of the current edition of the IET Wiring Regulations.

Service intake housing – cabinets

The house service cable must be installed in 32mm internal diameter **black** polyethylene ducting (complying with the current edition of the ENATS specification 12-24) from our mains cable to the meter position. You must supply and install this ducting as you carry out your site works. Please lay the ducting with a minimum cover of 450mm on the most direct route from the boundary of the property to its meter position. You must provide a draw wire or rope in the ducting and you will be responsible for clearing the ducting if it is found to be blocked. You must install cable marker tape over all service ducting, directly above the ducting at a depth of 250mm below finished ground level.

Meter location

The service termination and metering equipment for each premises will be at the position shown on your plan. We will need a wall space 600mm high x 450mm wide to accommodate our equipment. The bottom of our meter board will be fixed between 450mm and 1,050mm above the finished floor level. The meter position must not be situated in a kitchen, bathroom, toilet or any other location deemed to be unsafe for installation of the equipment. The length of interconnecting cable (tails) between the meter position and the customer's consumer unit must not exceed 3.0m. If your gas meter will be in the same area as the electricity

service, for safety, the gas meter must be at least 300mm away from the electrical equipment and well ventilated.

We must be able to securely fix our equipment to the wall. The wall space must be of a masonry construction or provided with an 18mm thick fire retardant wooden backboard. This location must be easily accessible with frontal clearance for installation and maintenance of at least 1.0m.

Connection - 35 Flats and 6 Landlord Supplies

The connection to each premises will be one phase, 230 Volts, alternating current, at 50Hz, terminating in a fused cut out with a maximum capacity of 100 Amps subject to an after diversity maximum demand of 585kVA for the entire development.

You will need to provide ducts between the multiway unit and the individual flats. The meter position will be in the flat or in a suitable external cabinet adjacent to the flat. It is intended to install a multiway unit in a convenient position with rising service cables to the individual flats. The service cables will be installed as part of our works and will be owned and maintained by Scottish and Southern Energy Power Distribution.

You will need to provide ducts to facilitate installation and possible replacement of the individual service cables to each flat. These must be installed in such a way that faulted service cables may be replaced without the need to enter the property of a third party. This generally requires a plastic or earthenware duct from the distribution position to the individual flats. These should be installed in public areas, with a maximum of one easy radius bend between draw in points. You should provide a draw-rope for the full length of each duct.

British Standard BS.8313 "Code of Practice for Accommodation of Building Services in Ducts" gives guidance on the specification of such ducts etc., and gives details of fire resisting barriers etc. which may be required.

How to get your meter

It is extremely important for you to note that your meters cannot be installed by Scottish and Southern Energy Power Distribution. Although Scottish and Southern Energy Power Distribution own the cables coming into the premises **we are not an electricity supply company and we do not install the meters.** You must arrange a supply contract with the Supplier of your choice. Once you have chosen your preferred Supplier you will need to contact them to register the MPAN(s) associated with the new premises. We suggest you do this as soon as possible to avoid any delays in being able to use your electricity supply.

Once you have registered with your chosen supplier, they will arrange for their Meter Operator to fit the meter(s) and energise the supply(ies). Meter(s) cannot be installed until all connection works have been completed by us.

What is an MPAN

- The MPAN(Meter Point Administration Number) is a unique number that identifies each electricity supply point.
- The MPAN is sometimes also called a Supply Number but it should not be confused with your customer reference number.
- **Every MPAN number must be registered with a Supplier before a meter can be connected and final energisation can take place.**

Earthing

The electrical installation must comply with statutory requirements. Protection against earth leakage is at all times the responsibility of the customer. We can assist and will provide a SEN (TN-S) terminal at the meter position. We strongly recommend that you make use of this facility. The bonding of the electrical installation must meet the requirements of the current edition of the IET Wiring Regulations.

Meter location

The service termination and metering equipment for each premises will be at the position shown on your plan. We will need a wall space 600mm high x 450mm wide to accommodate our equipment. The bottom of our meter board will be fixed between 450mm and 1,050mm above the finished floor level. The meter

position must not be situated in a kitchen, bathroom, toilet or any other location deemed to be unsafe for installation of the equipment. The length of interconnecting cable (tails) between the meter position and the customer's consumer unit must not exceed 3.0m. If your gas meter will be in the same area as the electricity service, for safety, the gas meter must be at least 300mm away from the electrical equipment and well ventilated.

We must be able to securely fix our equipment to the wall. The wall space must be of a masonry construction or provided with an 18mm thick fire retardant wooden backboard. This location must be easily accessible with frontal clearance for installation and maintenance of at least 1.0m.

Cable entry

You will need to provide a 150mm diameter black Ridgiduct or earthenware duct, as previously specified, through the footings of the building at a nominal depth of 500mm below external finished ground level. The duct(s) should terminate in an easy radius bend at finished floor level against the specified wall space. We will need a wall space measuring 1,800mm high x 800mm wide for our cable termination and multi way distribution board.

We must be able to securely fix our equipment to the wall. The wall space must be of a masonry construction or provided with an 18mm thick fire retardant wooden backboard. This location must be easily accessible with frontal clearance for installation and maintenance of at least 1.0m.

Your site requirements schedule

Including any detailed requirements for our on-site works, what you need to know about cable routes and trenching and any special or unusual load you have requested to be connected such as motors and welders.

Scottish and Southern Energy Power Distribution Reference: **EGB607/4**

Site address: Land Off Conwy Close
Reading
Berkshire
RG30 4BZ

Quotation date: 14 July 2016

This schedule gives details of the site works you will need to complete for us to meet your requirements. Please read this document carefully as any problems with these works may result in additional charges and/or delays. If you need any assistance please contact me.

When we attend to undertake our works you must ensure that any substation site/s, cable routes and any associated overhead line positions are clear of all encumbrances and ready for on site construction.

You are required to ensure that all works on your own electrical installation are carried out by an electrical contractor who is registered. For Government approved organisations that register electricians please refer to the Electrical Safety Council.

Cable routes and ducts

The proposed cable routes are shown on the draft site plan. Before we can lay our cables you will need to set out kerb lines, establish levels where roads or footpaths are not yet being constructed and, provide routes clear of obstructions or building materials. We will charge you for any subsequent alterations to our cables because of changes to the site layout.

You will need to install 150mm diameter road crossing ducts. These must be twin walled black polyethylene ducting such as Ridgiduct, complying with the current edition of the ENATS specification 12-24.

Duct crossings must be laid at a depth of not less than 600mm and not more than 800mm below the finished road surface. The crossings should extend approximately 150mm beyond the kerb line on either side of the road and the ends should be blanked off to prevent ingress of spoil.

Please ensure that ducts provided for our use are spaced at least 1.0m clear of inspection pits and other duct lines to ensure working clearance at the ends of the ducts.

Trenching and inspection of cables

Where you are trenching for our cables, further information is available in our 'Mains Trenching Guide'. Please ask our Team Manager for a copy. This will ensure you meet our requirements and comply with the NJUG recommendations.

We will blind our cables using suitable material - which must be free of sharp stones and rocks etc.. Where the excavated material is not suitable, you will need to provide us, free of charge, an alternative material for this purpose, typically sand. You will be responsible for backfilling and reinstatement of the trenches. Please contact our Team Manager a few days before you start works on site and he will visit and advise you on any additional requirements.

You are required to ensure that all works on your own electrical installation are carried out by an electrical contractor who is registered. For Government approved organisations that register electricians please refer to the Electrical Safety Council.

Removal of Scottish and Southern Energy Power Distribution equipment

Any equipment disconnected from our network is still our property. You may not remove any disconnected plant or cables without our prior agreement.

Harmonic distortion limits

The complete installation must strictly comply with the requirements detailed in the Electricity Association Engineering Recommendation G5/4 "Planning levels for harmonic voltage distortion and the connection of non-linear equipment to transmission systems and distribution networks in the United Kingdom". The connection must comply with the Stage 1, Stage 2 or Stage 3 limits as specified by G5/4.

Substation

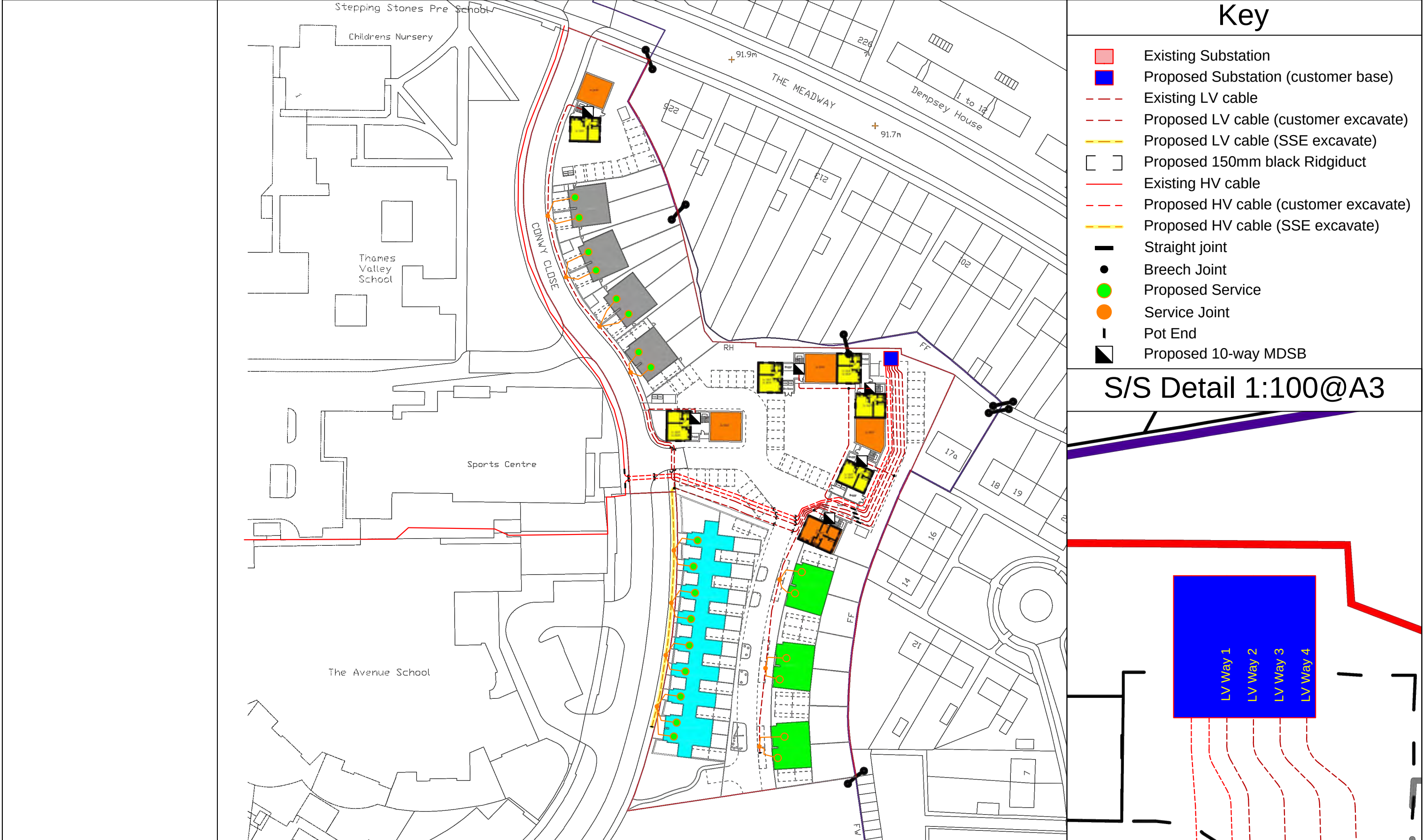
To provide a connection we shall need a new distribution substation(s) at the location shown on the attached plan. We require a site nominally 4.0m wide x 4.0m deep site for the substation and its equipment. The subsoil must be capable of withstanding a load of 8.0 tonnes per square metre to avoid settlement.

It is important to avoid delays with the legal transactions. I will ask our Wayleave Officer to pursue this when I receive your acceptance, any Connection Agreements and payment of the quotation. Please ask your solicitor to write to the Wayleave Officer at this office as soon as possible, enclosing a copy of the Registered Title for the substation site where appropriate. We will be unable to start our substation site works until the legal formalities have been completed.

We need unrestricted access to the substation for operational purposes. Access may also be required, at a later stage, to enable additional connections from the substation to our network. Any future site security, both during and after completion of the development, must reflect this requirement.

Substation enclosure

The substation will be fully enclosed in a glass reinforced plastic GRP housing. You are responsible for providing the foundation for this housing and I enclose drawing TG-PS-584 which details our requirements.



Key

- Existing Substation
- Proposed Substation (customer base)
- Existing LV cable
- Proposed LV cable (customer excavate)
- Proposed LV cable (SSE excavate)
- Proposed 150mm black Ridgiduct
- Existing HV cable
- Proposed HV cable (customer excavate)
- Proposed HV cable (SSE excavate)
- Straight joint
- Breach Joint
- Proposed Service
- Service Joint
- Pot End
- Proposed 10-way MDSB

S/S Detail 1:100@A3

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID

	services	l.v.	h.v.	e.h.v.
FOOTPATH	0.40m	0.45m	0.60m	0.75m
ROAD CROSSING	0.60m	0.60m	0.75m	0.90m
l.v. / services	- up to 1000V.			
h.v.	- over 1000V. to 11,000V			
e.h.v.	- 22,000V. to 132,000V			

WARNING

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depth of cables. HS (G) 47 Booklet from the Health and Safety Executive - Avoiding Danger from Buried Cables - should be consulted before commencing excavation work. (available from HMSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTE GS6 SHOULD BE CONSULTED. (AVAILABLE FROM HMSO)

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Scottish and Southern Energy Pipelines Ltd
Registered in Scotland No 274721
55 Vastern Road
Reading
Berkshire
RG1 8BU

UNCONTROLLED COPY

GRID REFERENCE
SU6772373009



Scottish and Southern
Energy Power Distribution

DESIGNER

G. Triantafyllidis

SCALE

1:1000@A3

JOB REFERENCE NUMBER

EGB607/4

VERSION

1

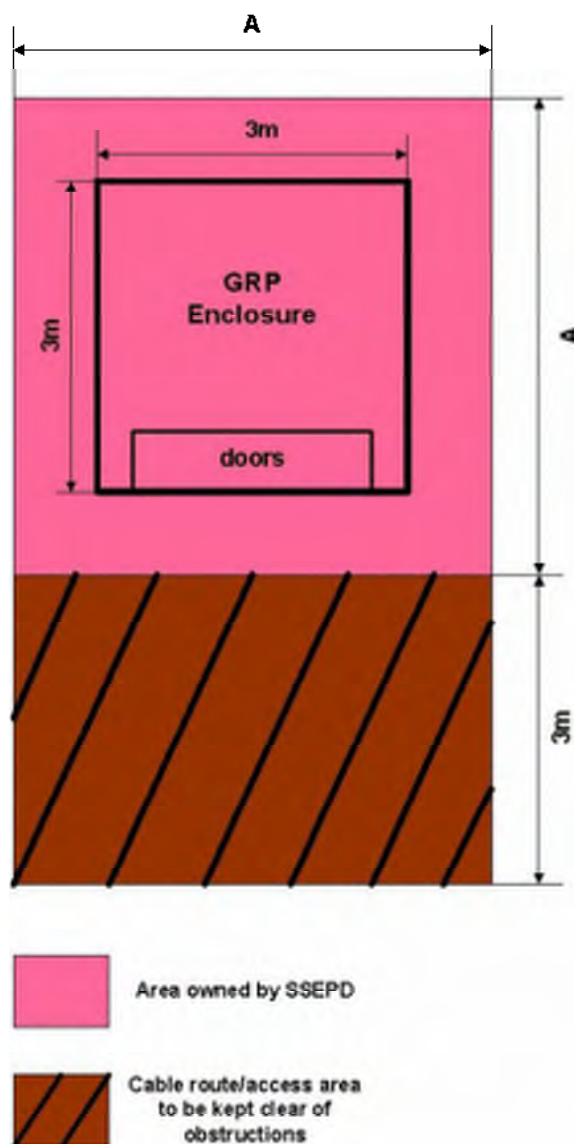
DRAWING TITLE

Proposed Design

DATE

14/07/2016

Applies to: SSEPD Staff and Third Parties	THE DESIGN AND INSTALLATION OF NEW SECONDARY SUBSTATIONS FOR ADOPTION OR USE BY SCOTTISH AND SOUTHERN ENERGY POWER DISTRIBUTION INCLUDING JOINT USER SUBSTATION	TG-PS-883
Classification: Public	Uncontrolled if printed	Rev:1.01



	Dimension A
Scotland	5m
Elsewhere	4m

Figure 1

The Company's Standard Terms and Conditions

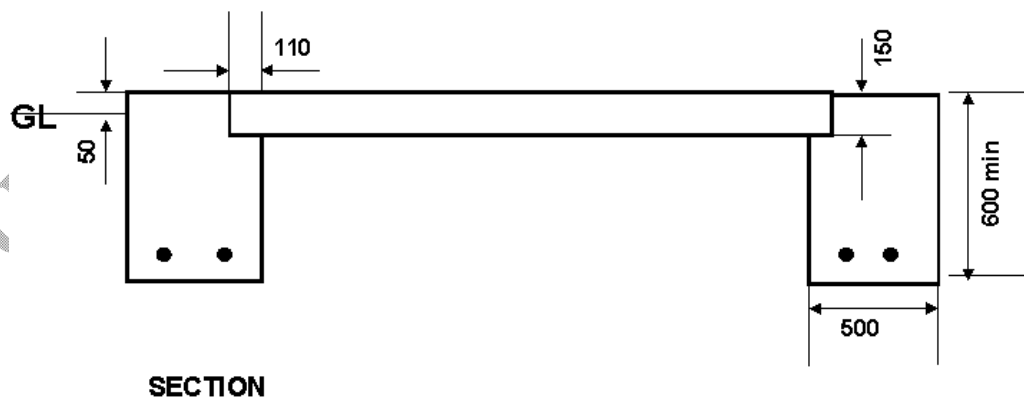
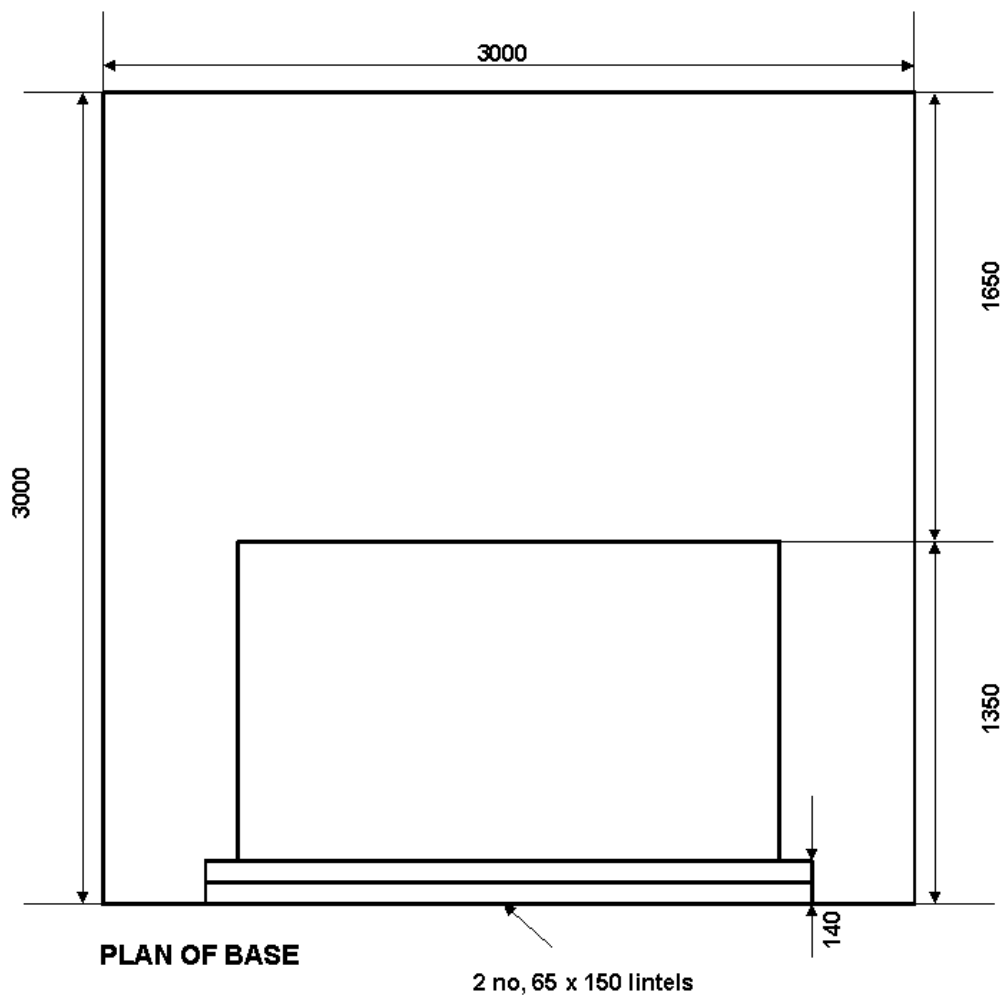
Definitions:

The "Company":	Shall mean either Scottish Hydro Electric Power Distribution plc or Southern Electric Power Distribution plc as the context requires;
The "Adoption Agreement":	The agreement between the Customer and the Company for adoption of any Contestable Connection Works undertaken by the Customer;
The "Agreement":	These conditions of contract and the Quotation;
The "Agreement Date":	The date of acceptance of the Quotation;
The "Agreed Contract Price":	The total price payable to the Company for the Works as shown in the Quotation;
The "Connection Agreement":	The agreement between the Company and the Customer relating to the connection of the Customer's premises;
The "Contestable Connection Works":	The part of the Works that the Customer may elect to undertake;
The "Cost Apportionment Contribution":	A financial contribution made with respect to the costs of connection from the Company in favour of the Customer;
The "Customer" or "Applicant":	The person, firm or company whose name and address is shown in the Quotation;
The "Equipment":	The equipment, plant and/ or apparatus the Company will supply as detailed in the Quotation;
The "Quotation":	The Quotation or Offer letter supplied with these conditions of contract;
The "Site Information & Customer Requirements":	Customer Requirements document supplied with the Quotation; and
The "Works":	The works that the Company will carry out as detailed in the Quotation.

- The Quotation remains open for acceptance in writing for 90 days from the date of issue, unless notified by the Company in writing to the contrary. The Company reserves the right to amend or withdraw the Quotation at any time prior to the Customer accepting it.
- The Customer will provide the Company with all the facilities reasonably necessary to enable it to complete the Works in the most economical manner. In default the Customer shall pay the Company such reasonable additional costs that may result.
- Where any changes to the Works are required other than as a result of the Company's negligence the Company shall submit written details of the additional cost to the Customer who shall be entitled to terminate the contract upon giving the Company written notice within 5 working days of the date of submission of such details. In the event of termination the Customer shall pay the Company's reasonable charges for the work done or committed and materials purchased prior thereto and reimburse any costs or expense incurred or committed by the Company in obtaining any wayleaves and consents.
- A suitable level substation site(s) complying with the Company requirements shall be provided by the Customer and conveyed to the Company at the nominal price of £1. The Customer will meet their legal and other fees and expenses, the legal and other fees and expenses of the Company and the legal and other expenses of any consensor in connection with the conveyancing to follow hereon.
- The Customer will grant any wayleaves or cable easements required over his property, provide and install ducts for on site road crossings and for service cable entry and agree service terminations in a position acceptable to the Company, provide and install service tubes from the back of the footpath to the premises to which the connection is required terminating where possible in an external meter reading cabinet.
- The Customer will, at no cost to the Company and to a satisfactory standard reasonably specified by the Company, be responsible for carrying out all on site cable trenching for services, LV and HV mains cable, other than within substation sites and for backfilling and trench reinstatement once the Company has laid and covered the aforesaid cabling.
- The Customer will be responsible for all building costs associated with the supply intake and any meter cabinets.
- The Customer will provide service termination facilities, in a position acceptable to the Company.
- The Quotation is subject to obtaining all necessary wayleaves and consents for carrying out the Works. If alternative arrangements are necessary they are likely to have a significant impact on costs. The Quotation assumes all plant and equipment will be placed in public highway or land owned or controlled by the Customer who will provide all necessary wayleaves and consents free of charge. The Customer will pay the full cost of obtaining any necessary wayleaves and/or consents from third parties (including wayleave damage claims) in addition to the Agreed Contract Price provided that where these have a significant impact on the overall cost the Customer shall be entitled to terminate the contract upon written notice to the Company. In the event of termination the Customer shall pay the Company's reasonable charges for the work done or committed and materials purchased prior thereto and reimburse any costs or expense incurred or committed by the Company in obtaining any wayleaves and consents.
- It is assumed that the Company will carry out all Works during normal working hours. There will be an additional charge for any overtime working at the Customer's request.
- The Quotation is based on material and labour costs prevailing at the Agreement Date. The Company shall have the right to vary the Agreed Contract Price in accordance with any variations in the material or labour costs subsequent to the Agreement Date (unless otherwise stated in the Quotation) upon submitting written details of the additional cost to the Customer who shall be entitled to terminate the contract upon giving the Company written notice within 5 working days of the date of submission of such details. In the event of termination the Customer shall pay the Company's reasonable charges for the work done or committed and materials purchased prior thereto and reimburse any costs or expense incurred or committed by the Company in obtaining any wayleaves and consents.
- Unless otherwise agreed the Company requires full payment 28 days prior to commencement of the Works. All other arrangements will be subject to status.
- The Company may submit progress invoices to the Customer, in respect of the amount of labour expended and materials delivered to site and the Company's stores up to the date of the progress invoice.
- Adjustments will be made to the rates of VAT to those applicable at the date of invoice or payment, whichever is the earlier.
- The Customer must settle invoices within 28 days of the date of the invoice.
- If any amount remains unpaid after the due date, the Company shall (in addition to any other remedies) be entitled to charge interest on the amount unpaid at the annual rate of 3% over the base rate of the Bank of England in relation to the Company's Works.
- Unless otherwise agreed in writing by the Company time is not of the essence in relation to the Company's Works.
- Subject to condition 17, the Company shall have no liability to the Customer for any loss of profit, revenue, business, savings, (anticipated or otherwise) or any other form of economic loss (whether or not occurring in connection with physical damage) resulting from or arising out of the Company's negligence provided that the above shall not exclude or restrict the liability of the Company for death or personal injury.
- The Customer acknowledges and confirms that it does not enter into the Agreement in reliance on any oral representation, warranty or undertaking not fully reflected in the terms of the Agreement and that no amendment, modification or substitution to the Agreement shall be effective unless executed in writing by both parties.
- The Equipment shall at all times remain the property of the Company. On completion of the Works and, with respect to any Contestable Connection Works undertaken by the Customer, the Customer both satisfactorily completing any Contestable Connection Works and an Adoption Agreement with the Company covering the Contestable Connection Works, the whole of the Works, Equipment and the aforesaid Contestable Connection Works shall become the property of the Company. The Customer shall protect the Equipment from any damage or interference between delivery to the site and completion of the Works and shall indemnify the Company for any loss or damage to the Equipment during such period. The Company shall be responsible for the final connection of the Works to its distribution system.
- The Quotation is net of any Cost Apportionment Contribution due to the Customer and no further contributions or allowances are applicable. The value of the Cost Apportionment Contribution has been calculated on the basis of, inter alia, the Equipment specified in the Quotation, the available capacity agreed for the development, the build rate and the electrical heating the Customer has declared will be installed. The value of Cost Apportionment Contribution made in favour of the Customer by the Company will be indicated in the attached Quotation and its value may be recalculated by the Company to reflect any alteration to the basis of the calculation and the Customer will refund any excess Cost Apportionment Contribution made by the Company upon demand. The Customer shall be liable to pay to the Company the full value of the Cost Apportionment Contribution received from the Company in the event this Agreement is terminated prior to the completion of the Connection. In such event, the Customer shall be liable to pay to the Company a proportion (to be determined by the Company) of the Cost Apportionment Contribution.
- It is a Condition of the Quotation that the Customer shall enter into a Connection Agreement with the Company prior to energisation of the Connection.
- The Customer will carry out the site work specified in the Site Information & Customer Requirements document.
- This Quotation is based on the understanding that the Works will not be undertaken on contaminated land. Where contaminated land is found by or advised to the Company additional charges will be rendered to the Customer in accordance with condition 3.

Applies to: Power Systems Staff	FOUNDATION ARRANGEMENTS FOR ENVICO OR MORGAN MARINE GRP ENCLOSURES (not including 1500kVA transformers)	TG-PS-584
Prepared by: John Baker, Network Services	Uncontrolled if printed	Rev: 1.02

Approved by: Stewart Reid	Issue Date: February 2009	Review Date: December 2013	No of this copy:
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GRP Bases – Construction and Installation Instructions

- 1 Install base to setting out dimensions and top datum level supplied by SSE Power Distribution. Datum will be 50mm above finished ground level.
- 2 Concrete base to 600mm minimum depth, but increase depth to suit site conditions. Concrete grade designation C30D.
- 3 Foundations will be reinforced by 2 no, 20mm diameter mild steel bars to BS 4449, minimum cover 50mm.
- 4 A face shutter may be used around the perimeter of the base but the area in front of the transformer base must have a full depth shutter.
- 5 Form rebate in each side of foundation for the concrete lintel
- 6 Install 2 precast, reinforced concrete lintels, 65mm x 150mm , across front of enclosure. This will be carried out after the electrical works are complete. (note, pre-stressed concrete lintels must not be used due to the camber).
- 7 The area in front of the transformer base shall be filled and covered with 100mm of stone chippings. This will be carried out after the electrical works are complete.
- 8 The GRP Enclosure shall be erected on Compriband (or equivalent) self adhesive, pre-compressed sealant strip, 100mm wide and 20mm thick.

Appendix D

SEWERS



Mr N Coulson
WSP Parsons B
1 Capital Quarter
Tyndell Street
CARDIFF
CF10 4BZ

Developer Services

Your ref
Our ref 50100031 /DS6018340
Name Siva Sivarajan
Phone 0800 009 3921
E-Mail developer.services@thameswater.co.uk

14 June 2016

Re: Land adj to Conwy Close Reading RG30 4BZ

Dear Mr Coulson

I write in relation to the above site and further to your Pre-Development Enquiry application and supporting documentation.

Further to receiving your application we have consulted with our Asset Planners for the area regarding the capacity of the public foul sewer network adjacent to the proposed site to accommodate foul flows from the development as detailed in your application.

I can advise that the foul flow discharges from your proposed development will not have a detrimental effect on our existing foul sewage network, based on the information submitted with your application and supplementary documentation.

Surface water discharges should ideally go to soakaways / infiltration basins / watercourses (if any present in area). If it can be illustrated that none of the above are feasible then surface water discharges should be stored on site and attenuated, to the satisfaction of the local authority stipulation. To this end you have to liaise with the local authority and discuss their criteria regarding surface water discharges in that area. If you adhere to the local authority stipulation then Thameswater can accept surface water flows as per their stipulation.

At no account should the surface water flows be discharged to the TW foul sewer network.

Please note that the views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

We reserve the right to change our position in relation to any such planning applications.

If you have any further queries then please do not hesitate to contact me.

Siva.sivarajan@thameswater.co.uk

Thames Water Utilities Ltd,
Clearwater Court, Vastern
Road, Reading RG1 8BD
T 0118 3 738744
I www.thames-water.com

Registered in England and Wales
No. 2386861. Registered office
Clearwater Court, Vastern Road
Reading, Berks. RG1 8BD



Page 2

Yours sincerely,

A handwritten signature in black ink, appearing to read "Siva Sivarajan", written over a circular blue stamp.

Siva Sivarajan
Senior Adoptions Engineer (TW)

Developer Services-Adoptions Team
Thames Water Utilities Ltd
Clearwater Court



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 467711,173016

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
821E	n/a	n/a
821F	n/a	n/a
921D	n/a	n/a
921C	n/a	n/a
921B	n/a	n/a
921A	n/a	n/a
9203	91.86	89.88
9256	91.87	90.61
921K	n/a	n/a
921H	n/a	n/a
711D	n/a	n/a
8102	92.22	90.46
7201	92.45	90.3
6254	n/a	n/a
7251	92.36	90.64
921E	n/a	n/a
8253	92.15	90.57
8201	92.2	90.2
8252	92.01	91.34
8255	92.14	91.61
721C	n/a	n/a
721D	n/a	n/a
721B	n/a	n/a
9257	92.06	90.44
621C	n/a	n/a
9204	n/a	n/a
8257	92.25	90.95
821D	n/a	n/a
6251	92.42	n/a
821A	n/a	n/a
8254	92.05	90.2
7252	92.49	90.48
8202	91.98	89.74
621G	n/a	n/a
8258	92.03	90.61
7202	92.47	89.97
8204	92.12	90.56
6153	n/a	n/a
6154	n/a	n/a
6151	92.43	91.07
7152	92.12	89.54
7101	91.98	88.94
7102	92.57	90.74
7151	92.52	90.89
711G	n/a	n/a
711C	n/a	n/a
711B	n/a	n/a
7051	91.35	89.2
711A	n/a	n/a
7103	91.63	88.53
811A	n/a	n/a
8155	n/a	n/a
8101	92.11	90.53
8154	92.16	90.72
8001	90.83	88.18
8156	n/a	n/a
8152	92.22	90.86
9902	88.38	85.93
9051	91.43	89.68
4150	93.13	90.11
4102	n/a	n/a
5155	92.72	89.78
5154	92.77	90.35
5101	n/a	n/a
5202	n/a	n/a
5151	93.24	91.39
5051	92.44	92.05
5152	92.98	n/a
5102	92.93	90.08
521C	n/a	n/a
5153	n/a	n/a
5252	93.14	91.87
521A	n/a	n/a
521D	n/a	n/a
521B	n/a	n/a
611B	n/a	n/a
611A	n/a	n/a
621J	n/a	n/a
621A	n/a	n/a
621H	n/a	n/a
6101	92.79	89.65
6152	92.82	n/a
611C	n/a	n/a
621F	n/a	n/a
621D	n/a	n/a
621I	n/a	n/a
6253	92.86	n/a
621B	n/a	n/a
691I	92.46	90.25
8951	90.5	88.78
9950	89.06	86.56

Manhole Reference	Manhole Cover Level	Manhole Invert Level
691D	93.14	91.69
691H	92.86	90.65
601B	92.93	92.07
601A	93.022	91.362
8051	91.18	n/a
5752	89.3	n/a
6853	88.73	86.48
681A	90.61	89.1
681F	n/a	n/a
681E	n/a	n/a
6852	88.67	87.61
6701	88.68	85.8
681B	90.958	89.433
6850	88.31	86.24
681C	90.167	88.717
681G	90.3	88.24
6851	88.2	86.22
691G	n/a	n/a
691A	91.607	90.202
691F	n/a	89.89
691E	n/a	n/a
691B	92.204	90.414
6801	87.5	85.48
691C	92.417	90.612
681H	87.4	86
771H	88.06	86.71
771C	88.01	86.7
771G	87.96	86.6
771D	87.95	86.29
9751	n/a	n/a
8753	n/a	n/a
8701	n/a	n/a
671D	87.75	86.4
8752	n/a	n/a
671B	87.65	86.19
7803	85.61	n/a
681D	89.5	87.21
681I	87.15	85.4
6854	n/a	n/a
7804	86.91	n/a
7801	n/a	85.11
8851	87.86	85.93
8801	88.09	85.41
7802	87.41	85
8850	n/a	n/a
7850	87.64	85.81
8950	89.87	88.23
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Vent Pipe
	Bio-solids (Sludge)
	Proposed Thames Surface Water Sewer
	Proposed Thames Water Foul Sewer
	Gallery
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Sludge Rising Main
	Proposed Thames Water Rising Main
	Vacuum

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Outfall
	Undefined End
	Inlet

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property insight on 0845 070 9148.

Other Symbols

Symbols used on maps which do not fall under other general categories

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit
Areas	Lines denoting areas of underground surveys, etc.
	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer
	Surface Water Sewer
	Combined Sewer
	Gulley
	Culverted Watercourse
	Proposed
	Abandoned Sewer

Appendix E

POTABLE WATER



ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"
Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"
Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY
Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE
Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED
Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Thames Water Utilities Ltd

Developer Services

Asset Development



Second Floor West, Clearwater Court, Vastern Road, Reading RG1 8DB

Potable Water Capacity Flow & Pressure Investigation

**Location: The Avenue School, Reading,
Berkshire, RG30 4BZ.**

DATE	ISSUE	REFERENCE	AUTHOR	APPROVED
21/6/2016	1.0	50100228	K Tuchscherer	M Cieslak

CONTENTS

1. Introduction.....	3
2. Existing Network.....	4
3. Existing Demand Type	4
4. Domestic Demand	4
5. Test Location.....	4
6. Pressure Logger Locations.....	5
7. Induced Flows	5
8. Investigation Results	5
9. Conclusion.....	6
10. Budget Costs For Reinforcement.....	6
Appendix	7

1. INTRODUCTION

As per your request received 1st June 2016, this report is to evaluate the results of the flow and pressure test and to ascertain the availability of capacity within the existing local mains network and its ability to supply the proposed new domestic peak demand profile for 23 domestic dwellings and 35 apartments at The Avenue School, Reading, Berkshire, RG30 4BZ.

The investigation will also determine whether or not any enhancement to the existing network is necessary to supply your requirement, while maintaining existing flows and pressures to our present customers.

Should your development proposal change, this report would become invalid and a further test would be required. If other developments are completed within the Water Pressure Zone before your development and depending on their size and location, this may also necessitate the test to be retaken. The findings of this report are valid for 18 months.

2. EXISTING NETWORK

The local mains network is hydraulically dominated by the Tilehurst Tower Water Pressure Zone.

3. EXISTING DEMAND TYPE

The local demand type is predominately residential and residential amenities, which have an overall peak morning water demand profile from the distribution mains network.

4. DOMESTIC DEMAND

The redevelopment of the site consists of 23 residential domestic dwellings and 35 apartments.

Based on empirical and historical data for this type of use, maximum daily consumption will be 17,850 litres. By applying diversity factors, this equates to a peak demand profile of 1.13 l/s.

[

5. TEST LOCATION

It was essential to select a suitable washout to induce your flow requirements on our existing network. The following three criteria have determined the location of this washout:

- a) must be located on the main proposed to supply your domestic demand;
- b) must be closest to the point of entry of your connection; and
- c) located in such a manner that when the calibrated flow gauge is operated to induce the required flow rates, the discharged water will not cause flooding of existing properties.

The washout selected was on the 100mm diameter main in Conwy Close, Reading, Berkshire, RG30 4BZ. Please refer to appendix for plan of the test location.

6. PRESSURE LOGGER LOCATIONS

Pressure Logger locations have been selected to comprehensively monitor the impact of the morning domestic peak demand profile on the existing mains network. Please refer to appendix for pressure logger location plans.

LOGGER 1. 4" MAIN IN THE MEADWAY, TILEHURST, READING, RG30 4AJ
LOGGER 2. 6" MAIN IN USK ROAD, TILEHURST, READING, RG30 4HG
LOGGER 3. 3" MAIN IN DUNSFOLD ROAD, TILEHURST, READING, RG30 4NP
LOGGER 4. 4" MAIN IN THE MEADWAY, TILEHURST, READING, RG30 4NY

See Appendix for the location of the site, test and pressure loggers.

7. INDUCED FLOWS

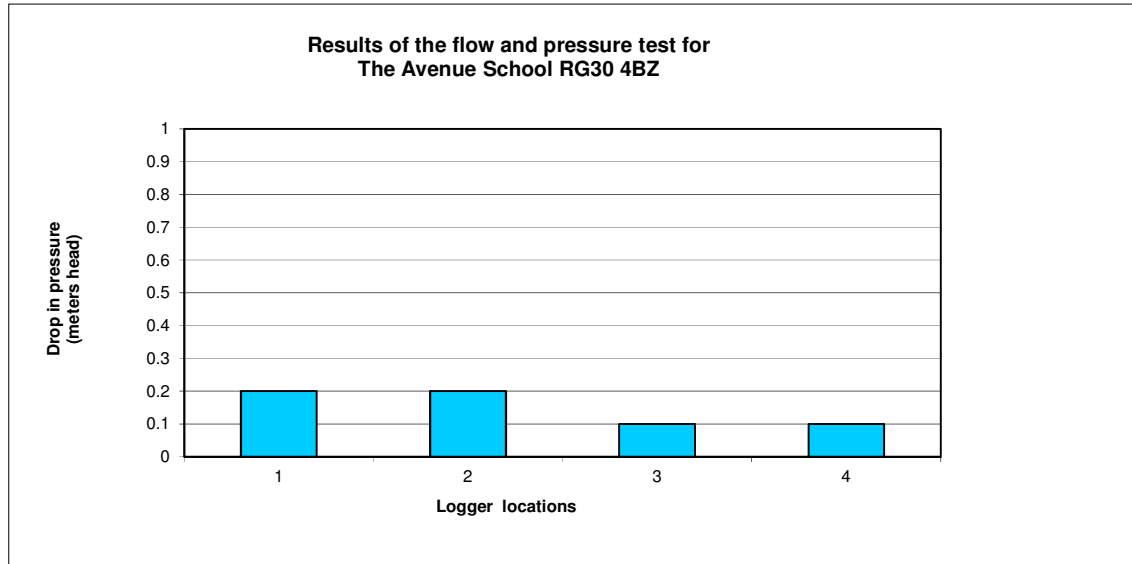
For the domestic demand, flow rates of 1.20 l/s were induced for 3 minute periods.

The flow rate was induced during the weekday peak morning demand period, Monday to Friday 07:00 - 08:30 inclusive. The pressure loggers monitoring the investigation will show a significant drop in pressure, if the network has insufficient spare capacity to supply the new peak demand.

8. INVESTIGATION RESULTS

The investigation was undertaken on 7/6/2016. All four pressure loggers provided the field data for the duration of the investigation. The drops in pressure recorded during the test are represented in the table and graph below.

Flow rates	1.2
Logger location 1	0.2
Logger location 2	0.2
Logger location 3	0.1
Logger location 4	0.1



These are within acceptable levels and show that the mains network is capable of supplying your proposed extension to the hospital facilities and no offsite main reinforcement is required to the network however should your proposal change, this report would become invalid and a further test would be required.

The result of the seven day pressure logger showed the minimum pressure available at the site was 32.50 meters head, (3.2 Bar). This occurs between 8.30 am. It is expected that on completion and occupation of the development, there would be a further reduction in pressure of approximately 0.2 meters head as shown in the flow test.

Please note that irrespective of the pressure which currently exists within the local mains network, Thames Water's minimum level of service is 10 metres head of pressure at the boundary stop valve.

See Appendix for the results graph of the 7 day pressure logger.

9. CONCLUSION

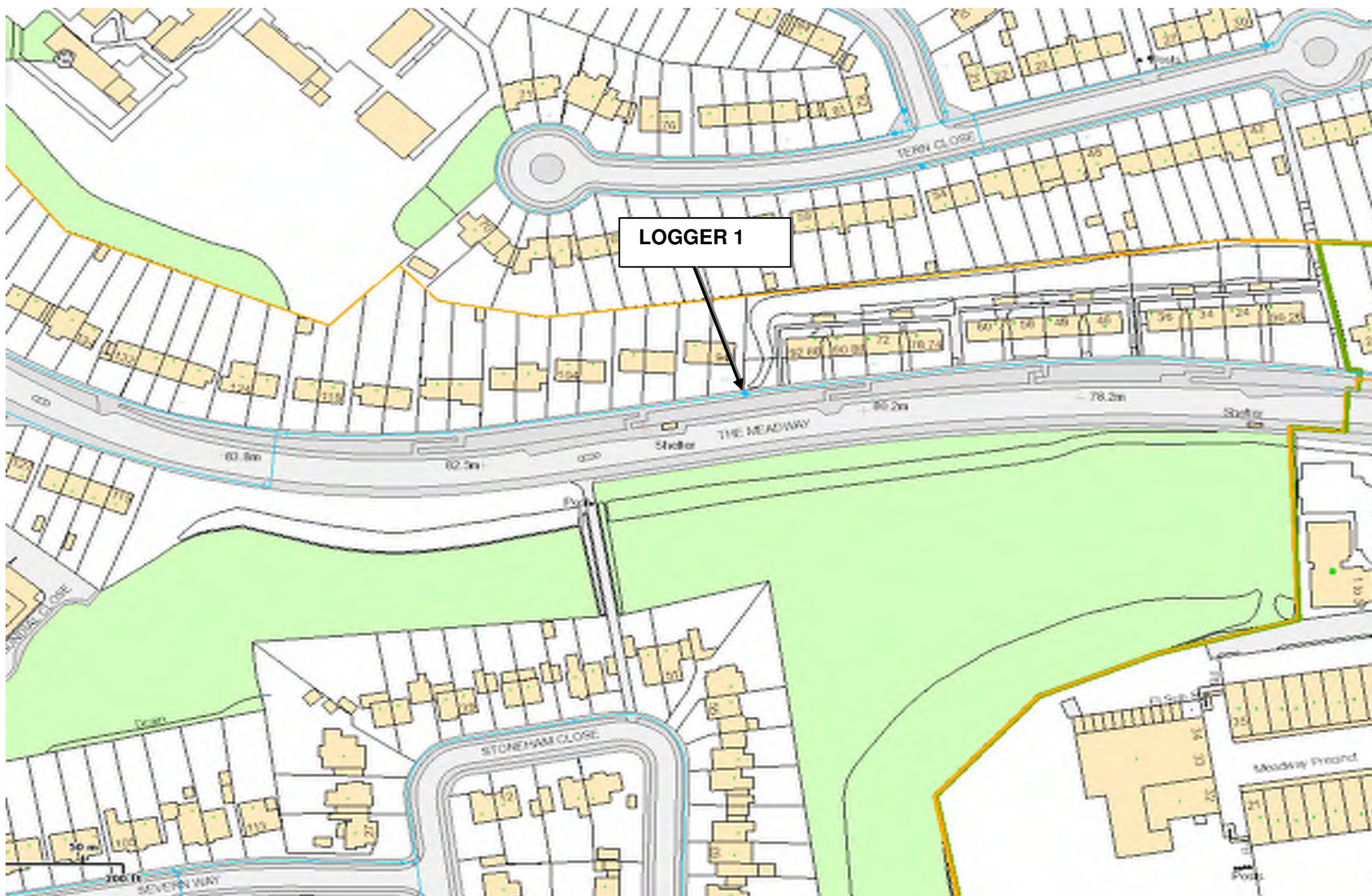
The result of the investigation has established the following: The network has sufficient spare capacity in the distribution main in to supply your domestic peak demand profile for the proposed development of 23 domestic dwellings and 35 residential apartments..

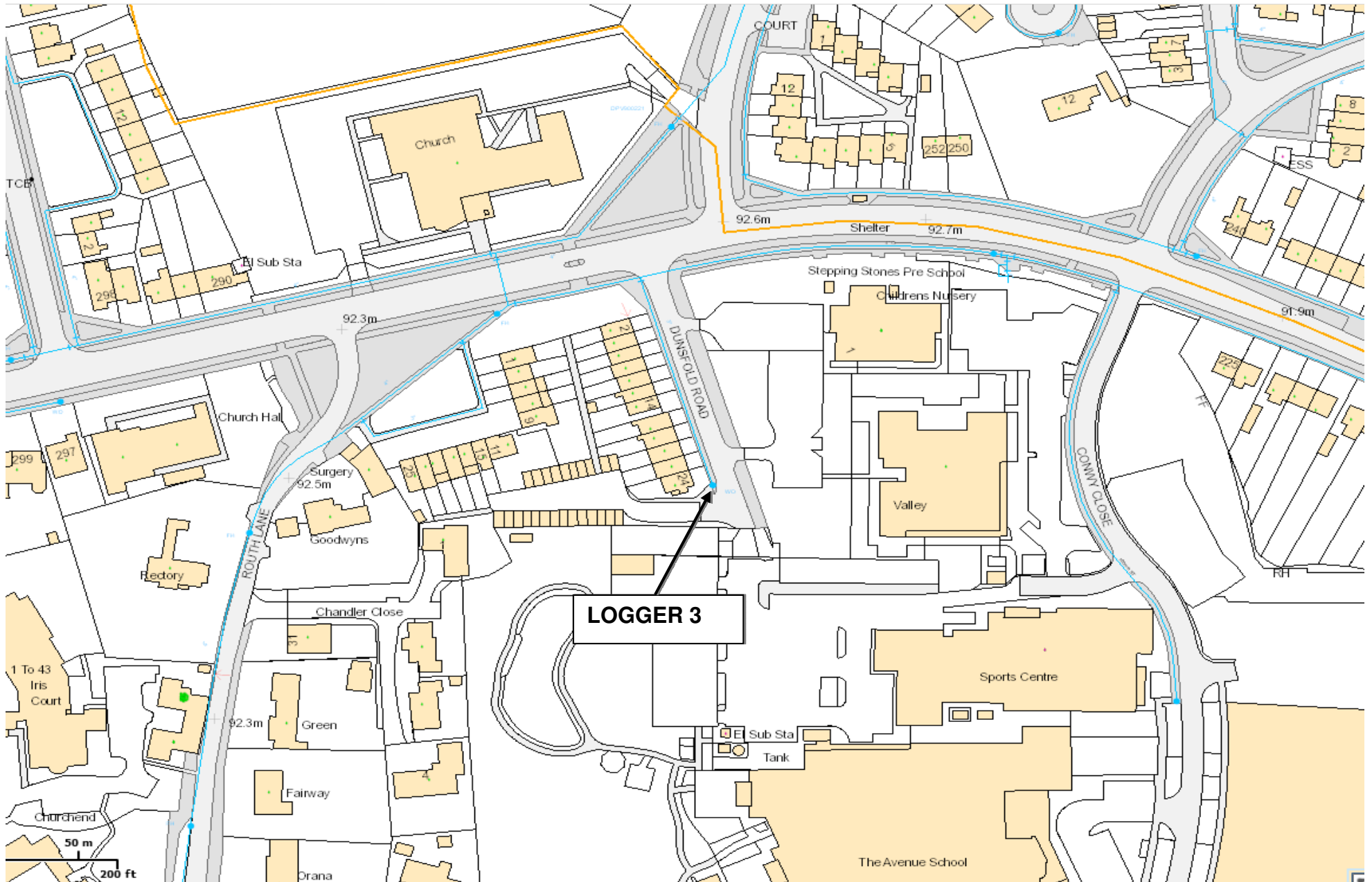
10. BUDGET COSTS FOR REINFORCEMENT

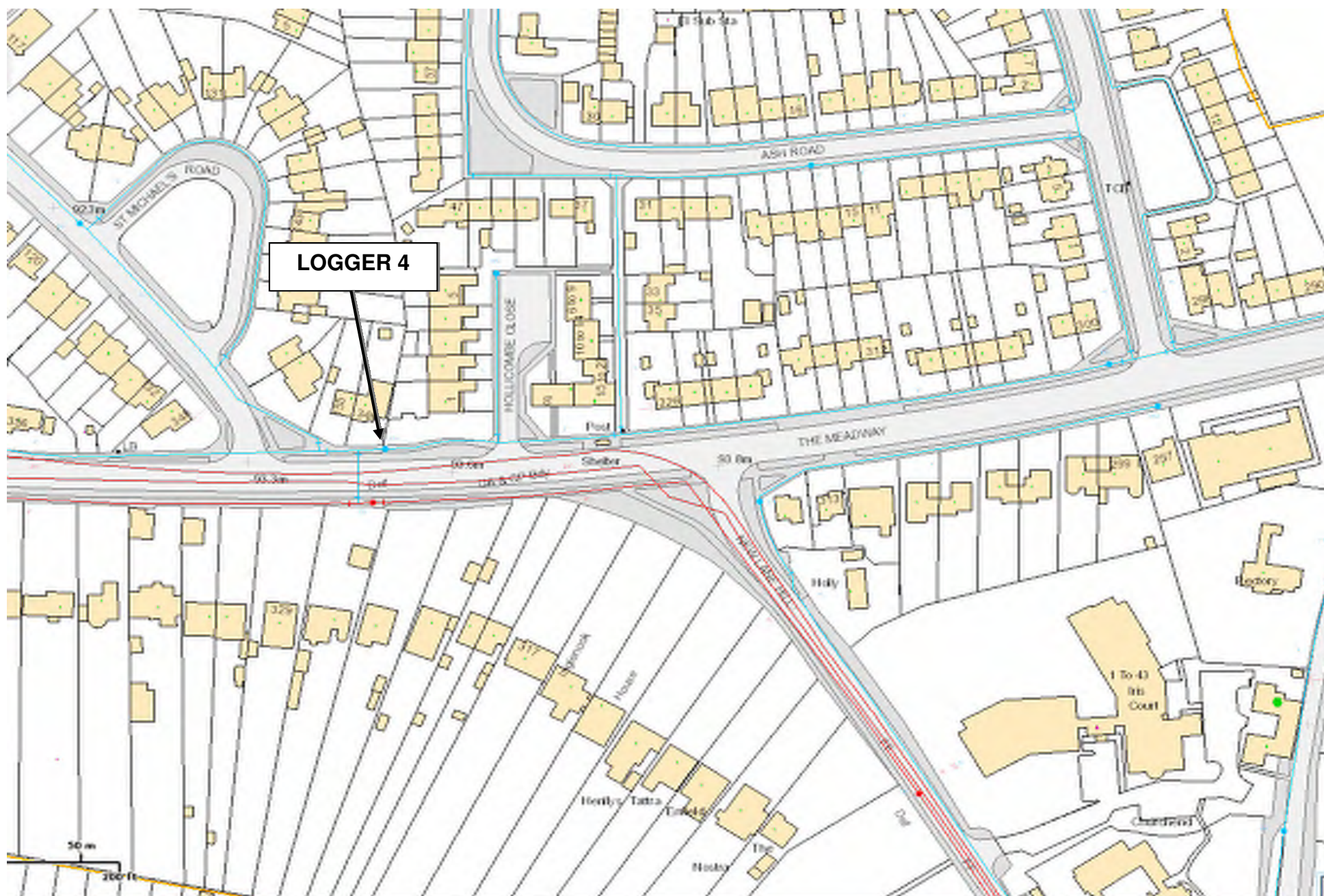
N/A

APPENDIX

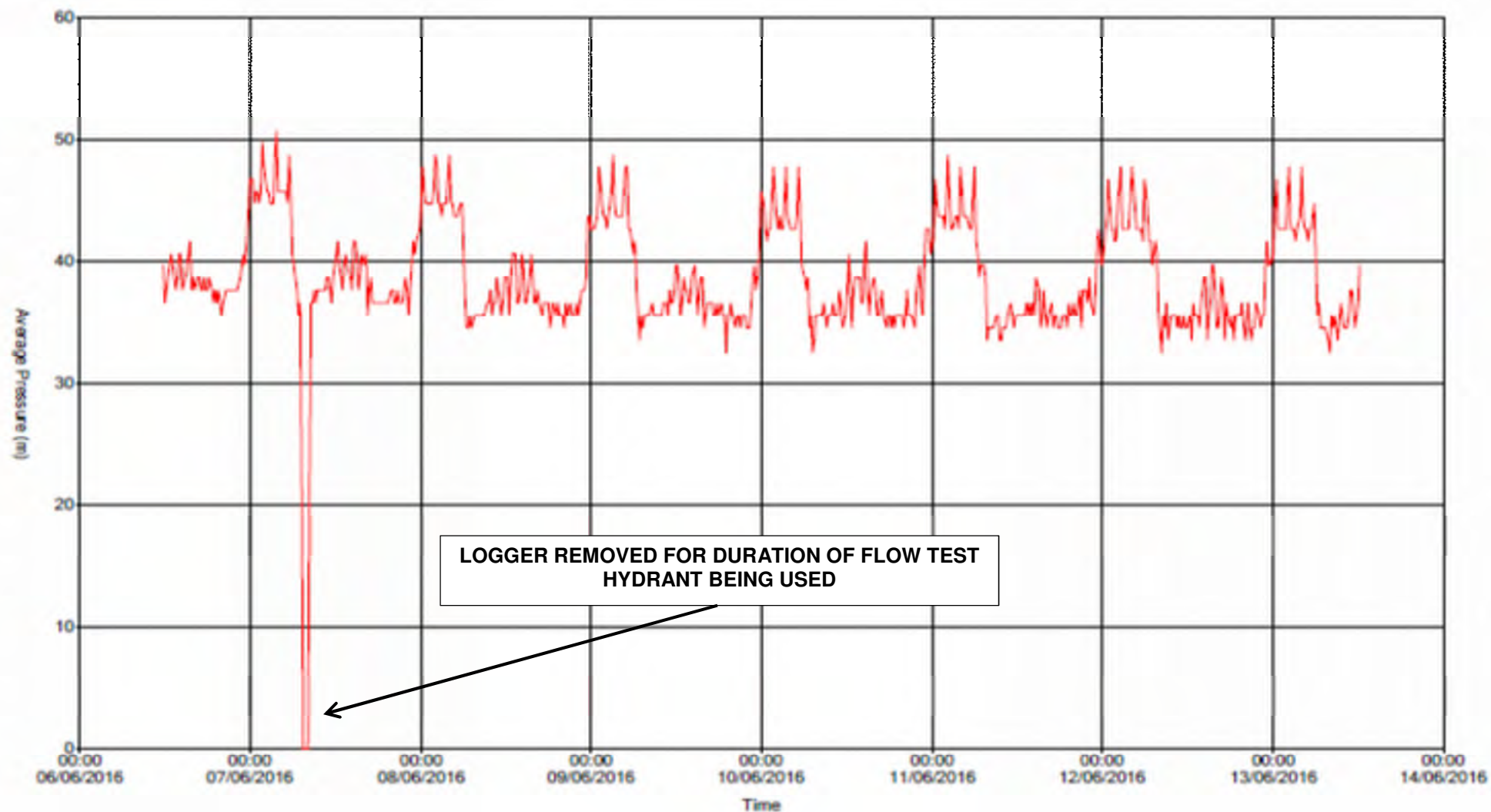








7 DAY PRESSURE TREND AT THE AVENUE SCHOOL READING RG30 4BZ
MINIMUM PRESSURE 32.50 METRES HEAD MAXIMUM PRESSURE 50.20 METRES HEAD



PLEASE NOTE, THAMES WATER'S MINIMUM LEVEL OF SERVICE IS 10M HEAD AT THE PROPERTY BOUNDARY VALVE

Appendix F

BT

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.

It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

ADVANCE NOTICE REQUIRED
(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com

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KEY TO BT SYMBOLS

	UNDERGROUND PLANT		POLE
	OVERHEAD PLANT		CABINET
	JOINT BOX		BURIED JOINT
	DISTRIBUTION POINT		JOINTING POST
	MANHOLE		PROPOSED U/G
	DP BOUNDARY		PROPOSED O/H
	OTHER BT BOUNDARY		PROPOSED BOX

Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

openreach
a BT Group business

BT Ref : MEP032658

Map Reference : (centre) SU6760372963

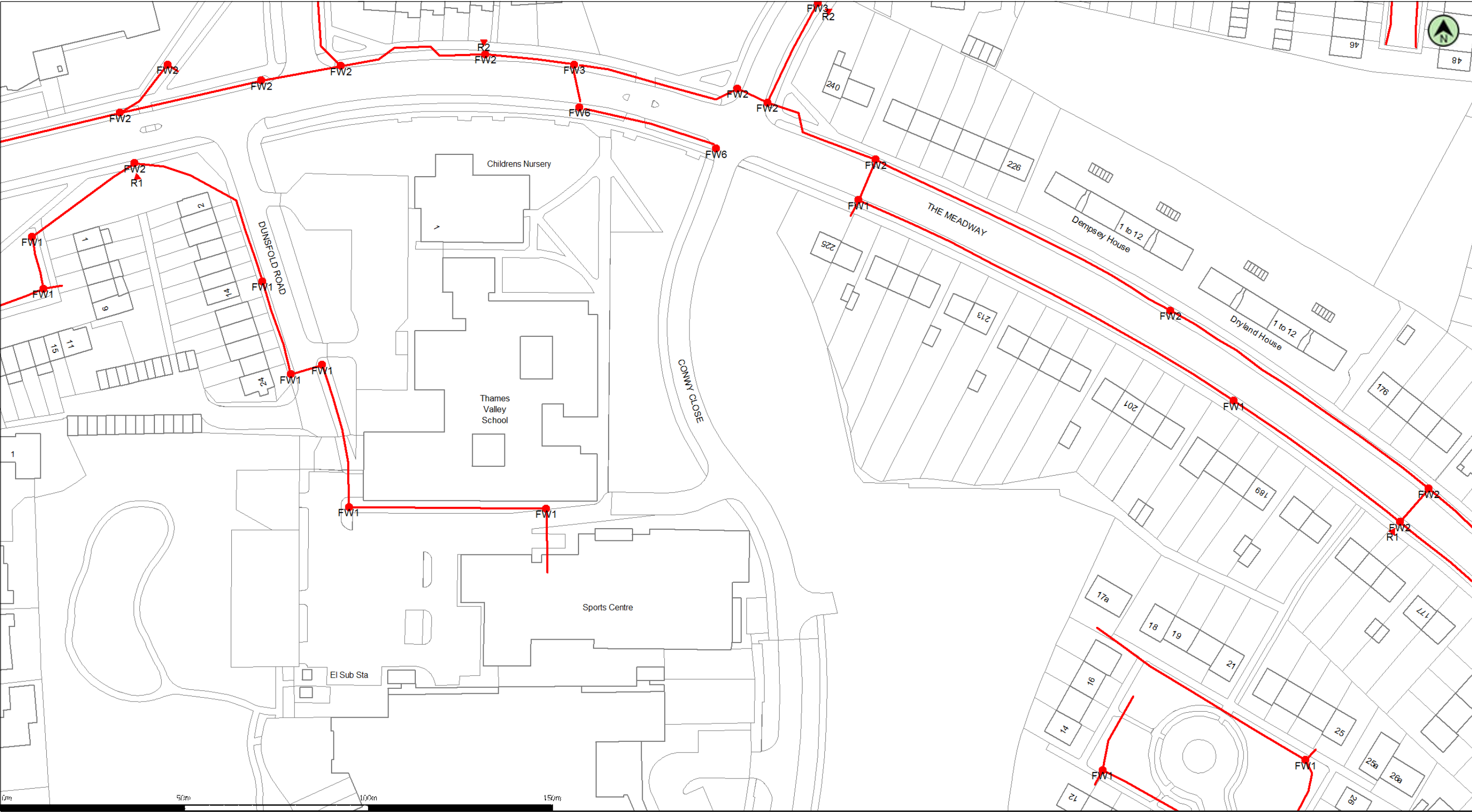
Easting/Northing : (centre) 467603,172963

Issued : 16/05/2016 15:26:29

FOOTNOTE: WARNING IT IS ESSENTIAL THAT YOU CONTACT NATIONAL NETWORK HANDLING CENTRE BY EMAIL nnhc@openreach.co.uk BEFORE PROCEEDING WITH ANY WORK IN THE HATCHED AREA

Appendix G

VIRGIN MEDIA



(c) Crown copyright and database rights 2016 Ordnance Survey 100019209 Date: 16/05/16 Scale: 1:1000 Map Centre: 467668,173065 Data updated: 28/02/16 Our Ref: 185512 - 1 Telecoms Plan A3

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the 'Affected Postcodes.pdf', which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2016 Ordnance Survey 100019209.

Duct, Trench	Chamber	Cabinet

maqsud.thafader@pbworld.com
Conwy Close VM1



Appendix C

CCGI FACTUAL REPORT



CC Ground Investigations Ltd

FACTUAL REPORT

SITE: Conwy Close

CLIENT: Reading Borough Council

ORDER No: PO576635

DATE: 08 June 2017

REPORT No: C5630



CONTENTS**REPORT**

1.	INTRODUCTION	1
2.	SITE DESCRIPTION AND GEOLOGY	3
2.1	Site Description	3
2.2	Geology	3
3.	GROUND INVESTIGATION	4
3.1	Fieldwork	4
3.2	In Situ Testing	6
3.3	Logging	7
3.4	Laboratory Testing	8
3.5	Gas and Groundwater Monitoring	9
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APPENDICES**Appendix A – Site Plan****Appendix B – Exploratory Hole Data****Appendix C – Photography****Appendix D – Laboratory Test Results****Appendix E – Gas and Groundwater Monitoring****Appendix F – SPT Calibration Data**

1. INTRODUCTION

This investigation was carried out by CC Ground Investigations Ltd (CCGI) on the instruction and on behalf of Reading Borough Council (The Client) under the technical direction of WSP UK Ltd (The Engineer).

The purpose of the ground investigation was to provide information to assist in the design of a new housing development.

The scope of the ground investigation was defined in the Engineer's specification, reference: 70012984.

This report describes the work carried out by CC Ground Investigations Ltd and presents the findings.

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. There may however be conditions at or adjacent to the site which have not been taken into account, such as unpredictable soil strata and water conditions between or below exploratory holes. A careful watch should be maintained during any future groundworks and the comments of this report reviewed as necessary.

This report has been prepared for Reading Borough Council and WSP UK Limited. This report shall not be relied upon or transferred to other parties without the written consent of CC Ground Investigations Ltd. Should any information contained within this report be used by any unauthorised third party it is done so

at their own risk and shall not be the responsibility of CC Ground Investigations Ltd.

2. SITE DESCRIPTION AND GEOLOGY

2.1 Site Description

The area of investigation comprises a demolished school used as parking area and disused space at, the Avenue School, Conwy Close, Reading. The site is centred on the approximate National Grid Reference SU 67707 73016.

2.2 Geology

Geological Records (British Geological Survey (BGS), England and Wales sheet 268 1:50,000 scale) indicate the site is underlain by superficial deposits of Winter Hill Gravels (River Terrace Deposits). Underlying solid geology comprising the London Clay Formation, with the Lambeth Group at depth is recorded.

3. GROUND INVESTIGATION

3.1 Fieldwork

Ten exploratory holes were carried out between 26th and 28th April 2017. All exploratory hole locations are shown on the site plan (Appendix A). The exploratory hole locations were set out by CCGI as directed by the Engineer on site.

The fieldwork was carried out in general accordance with BS5930; 2015.

Two boreholes, referenced BH101 and BH102 (Exploratory Hole Data – Appendix B) were formed using a track mounted Comacchio MC305 multi-purpose rig. Following CAT scanning hand tools were used to excavate an inspection pit to a maximum depth of 1.20m to check for buried services. Bulk disturbed and environmental soil samples were taken and retained from the inspection pits. The boreholes were then advanced using percussive sampling techniques to produce continuous disturbed samples ranging between 112mm and 98mm diameter.

On refusal of percussive sampling the boreholes were continued by rotary core drilling techniques utilising a water and environmental polymer flush. A double-tube swivel core barrel with a semi-rigid plastic liner was utilised to recover continuous cores of 91mm diameter.

Undisturbed samples of 100mm nominal diameter were taken in suitable cohesive material using an open drive sampler (UT100). The samples were wax sealed on site to prevent moisture loss.

Boreholes were monitored for groundwater ingress as they were advanced. Upon encountering water, sampling was temporarily stopped to allow the level to stabilise. Water levels were also recorded at the start and finish of each shifts work and on completion of the borehole and are presented on the relevant log.

On completion combined gas and water monitoring standpipes were installed in BH101 and BH102. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of limestone free gravel. The installation was sealed above and below with a bentonite pellet seal and accessed via a valve assembly. The installations were protected at the surface by a lockable stopcock cover set in concrete. Installation details are given on the relevant borehole log.

Following CAT scanning, eight trial pits, referenced TP101 to TP108, (Exploratory Hole Data – Appendix B) were excavated by a JCB 3CX mechanical excavator with a 0.60m wide backactor bucket. Representative bulk disturbed and environmental soil samples were taken and retained in sealed plastic bags and airtight containers to retain moisture content.

Photographs of the trial pit profile, and of the spoil heap were taken and are presented in Appendix C.

On completion, all trial pits were backfilled with arisings. The ground surface was reinstated.

On completion of fieldwork all samples were brought to CCGI's office for storage.

3.2 In Situ Testing

Standard penetration tests (SPT's) were carried out in general accordance with BS EN ISO 22476-3:2005. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained as small disturbed samples. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. SPT results are summarised as uncorrected N values on the borehole logs. SPT hammer calibration data is presented in Appendix F.

Hand shear vane tests were carried out using a direct read Pilcon Simmons Edeco hand vane tester. The results are presented on the relevant exploratory hole log. (Appendix B)

Three infiltration tests were carried out in accordance with BRE 365. The results and calculated infiltration rate are included following the relevant log in Appendix B.

Two In situ California Bearing Ratio (CBR) tests, referenced CBR1 and CBR2 (Appendix B) were carried out in accordance with BS1377-9.

The test force was applied to the CBR plunger via a screw jack, the apparatus being mounted on a Landrover which provided the reaction load. The test force was measured by a calibrated proving ring and the vertical penetration of the plunger

by a calibrated dial gauge readable to 0.01mm. The jack applied the load so as to keep the plunger penetration rate at 1mm/min.

3.3 Logging

Soil samples from the exploratory holes were logged by an Engineering Geologist in general accordance with BS5930; 2015. Bulk, small disturbed, core and environmental soil samples were taken and retained at a range of depths. Water samples were also taken after the fieldwork phase of the investigation. Environmental soil samples were stored on site in temperature controlled conditions. Soil and rock descriptions are presented in the borehole logs together with details of sampling, in situ testing and relevant comments on drilling techniques.

3.4 Laboratory Testing

The following laboratory tests were carried out by Professional Soils Laboratory (UKAS No. 4043) in accordance with BS1377:1990, Parts 1 to 8, unless otherwise stated. The results are presented in Appendix D.

Test Type	No. of Tests	Remarks
Natural Moisture Content	24	The results are shown on the summary of soil classification tests.
Liquid and Plastic Limits	13	The results are shown on the plasticity chart and summary of soil classification tests.
Particle Size Distribution (wet sieving method)	11	The results are presented as grading curves.
Quick undrained triaxial compression test	2	Carried out on full diameter UT100 or core sub samples.
BRE SD1 chemical testing suite for soil and water	20	Testing carried out by Chemical Testing Laboratories in accordance with BRE Special Digest 1.

A range of chemical tests were carried out on soil and water samples by i2 Analytical (UKAS No. 4041). Testing was carried out in accordance with ISO 17025. The results are tabulated and presented in Appendix D.

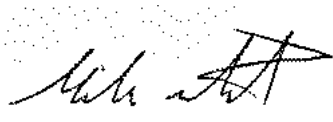
3.5 Gas and Groundwater Monitoring

One return visits has been made by CCGI to monitor and sample groundwater and at all installed boreholes.

The installations were monitored for methane, carbon dioxide, oxygen and hydrogen sulphide using a Gas Analyser GA5000 with internal flow meter. Installations were also monitored for gas flow, reported as gas flow in litres/hour. Subsequent readings are presented in Appendix E. Readings will be taken in general accordance with CIRIA 665.

Gas & Groundwater monitoring data is presented in Appendix E.

CC GROUND INVESTIGATIONS LIMITED



pp
Jonathan Koster BEng (Hons) FGS
Engineering Geologist



Rob Clarke. BSc (Hons) MSc (Eng) FGS
Director

4. REFERENCES

British Geological Society, Solid and Drift Sheet 268, Reading, 1:50,000 scale

BRE Special Digest 1:2003: Concrete in aggressive ground. Part 1.

BRE Digest 365 (2007), Soakaway Design.

BS 5930; 2015, Code of Practice for Site Investigations

BS 1377: Parts 1 to 9 (1990), Methods of Tests of Soils for Civil Engineering Purposes

BS EN ISO 14688: Part 1: (2002), Identification and description of soil.

BS EN ISO 14688: Part 2: (2004), Principles for a classification of soil.

BS EN ISO 14689: Part 1: (2003), Identification and description.

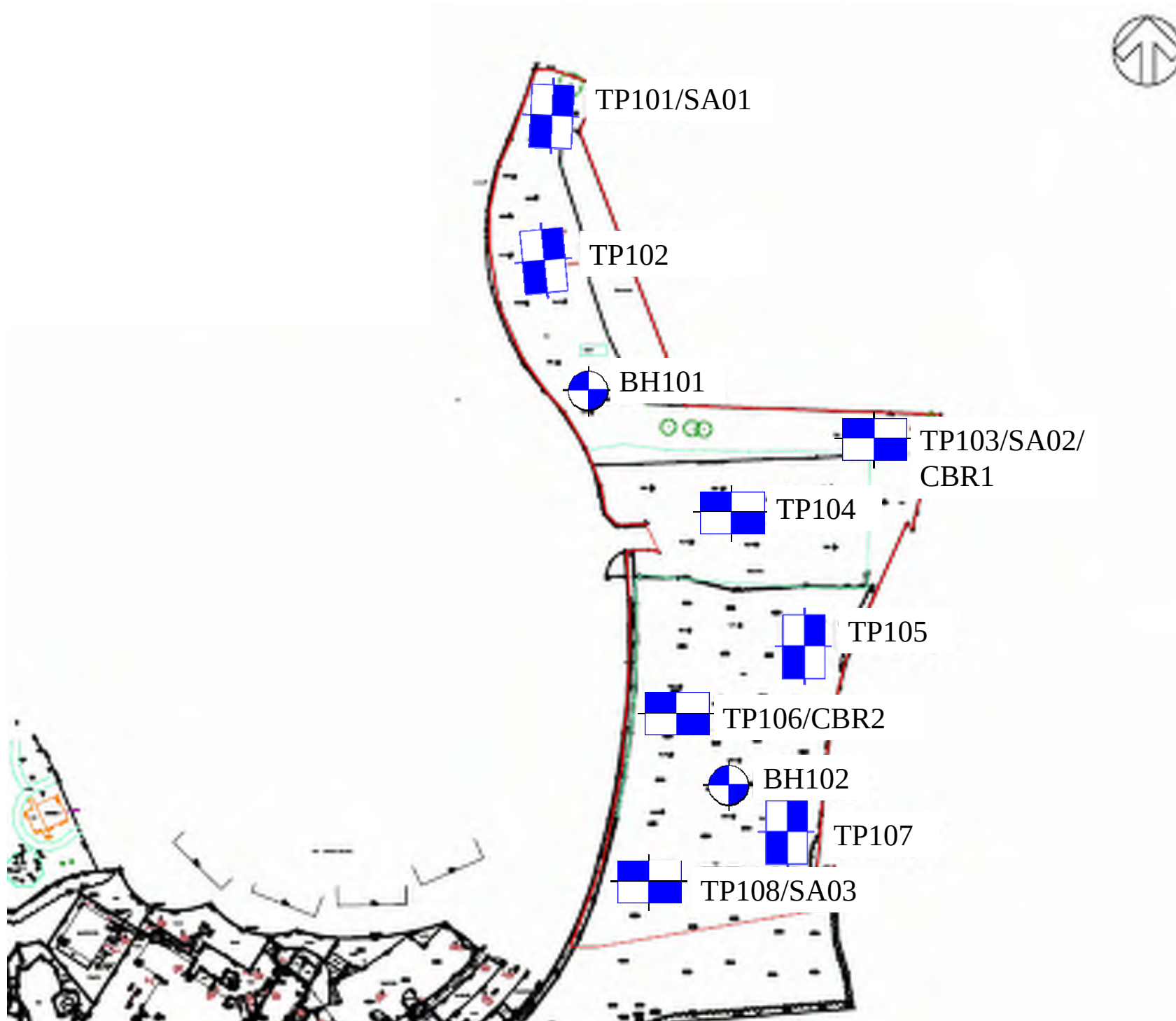
BS EN ISO 22475: Part 1: (2006), Technical principles for execution.

BS EN ISO 22476: Part 3: (2005), Standard penetration test.

CIRIA C665 (2007), Assessing risks posed by hazardous ground gases to buildings.

APPENDIX A

Appendix A – Site Plan



KEY:

-  Borehole
-  Trial Pits

Notes:

Reproduced from base plan provided by Engineer.

Locations indicative only.



Site Layout Plan

Conwy Close

Reading Borough Council

Appendix A

Contract No: C5630

Drawn by

JK

Scale

NTS

APPENDIX B

Appendix B – Exploratory Hole Data

KEY TO EXPLORATORY HOLE LOGS

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015.

Sample type

B	Large disturbed sample
C	Core run
CS	Rotary core sub-sample
D	Small disturbed sample
ES	Environmental sample
SPT	Standard penetration test carried out using split spoon (split spoon sample retained)
SPT C	Standard penetration test carried out using solid cone (no sample retained)
U70 or U100	Undisturbed sample followed by nominal diameter of sample. (Taken using thick-walled open-tube sampler – OS-TK/W)
UT100	Undisturbed sample followed by nominal diameter of sample. (Taken using thin-walled open-tube sampler – OS-T/W)
W	Water sample

Water levels

		3.00m/Dry
Initial Water Strike	Level after monitoring	Standing Level/No groundwater encountered

Insitu Testing

S 30	Denotes SPT undertaken using split spoon followed by N Value (EN ISO 22476-3:2005+A1:2011)
C 30	Denotes SPT undertaken using solid cone followed by N Value (EN ISO 22476-3:2005+A1:2011)
*240	Denotes SPT where full test drive has not been completed and linearly extrapolated N value reported
**	Denotes no effective penetration (Linearly extrapolated N value > 1000)
H 30	Hand shear vane. Direct reading in kPa

Sample range

	Undisturbed sample		Core run		U(T)100 Undisturbed Samples		Rotary core sub-sample
---	--------------------	---	----------	---	-----------------------------	---	------------------------

Installation Details

	Porous Tip		Screened Standpipe		Bentonite seal
	Plain standpipe		Granular response zone		Concrete
	Grout		Backfill with arisings		

Soils	Rocks		
	Sedimentary	Metamorphic	Igneous
 Made ground	 Chalk		
 Boulders and cobbles	 Limestone	 Coarse-grained	 Coarse-grained
 Gravel	 Conglomerate	 Medium-grained	 Medium-grained
 Sand	 Breccia	 Fine-grained	 Fine-grained
 Silt	 Sandstone		
 Clay	 Siltstone		
 Peat	 Mudstone		
	 Shale		
	 Coal		
	Pyroclastic (volcanic ash)		
	Gypsum, Rocks etc.		

BOREHOLE LOG



Borehole No.

BH101

Sheet 1 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close

Project No:

C5630

Co-ords: E N

Hole Type
DS+RC

Location: Reading

Level: mAOD

Scale
1 : 50.00

Client: Reading Borough Council

Dates: Start: 26/04/2017
End: 27/04/2017Logged By
JK

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10				MADE GROUND: TARMACADAM.	0.07		1
		ES					MADE GROUND: Brown sandy silty angular to sub-angular fine to coarse GRAVEL of calcareous sandstone.	0.20		
		B	0.50				MADE GROUND: Dark grey very sandy slightly clayey angular to rounded fine to coarse GRAVEL of siliceous material.	(0.55)		
		B	1.00				Orangish brown sandy slightly clayey angular to rounded fine to coarse GRAVEL of siliceous material.	0.75		
		SPT	1.20 - 1.58	S*67			0.75-0.85m: Sand.	(0.45)		
2		B	1.50 - 2.00				Very dense orangish brown very gravelly silty SAND. Gravel is angular to rounded fine to coarse of siliceous material.	1.20		2
		SPT C	2.00 - 2.33	C*83						
		B	2.50 - 3.00					(2.80)		
3		SPT C	3.00 - 3.40	C*61						3
		B	3.30 - 4.00							
		D	4.00	C 14			Stiff indistinctly thinly laminated very closely fissured grey silty CLAY with occasional lenses of light grey silty sand (<40x10mm).	4.00		4
4		SPT C	4.00 - 4.45				4.00-4.15m: Orangish brown.			
		ES	4.20							
		B	4.50 - 4.80	H 94						
		H	4.50							
		D	4.80	H 96						
5		H	4.90							5
		UT100	5.00 - 5.45							
		D	5.45 - 5.55							
6		H	5.90	H 118						6
		D	6.00							
		SPT	6.50 - 6.95	S 23			6.40m: 1no. fossilised wood fragment (<30x4mm).			
7								(5.60)		7
		D	7.30							
		B	7.50 - 8.00							
8										8

EQUIPMENT: Hand digging tools. Comacchio MC305 track mounted rig.

METHOD: Waterflush coring using 300mm diamond tipped barrel 0.00-0.10m. Hand dug inspection pit: 0.10-1.20m. Dynamic sampling using 113mm sample barrel: 1.20-10.60m. Waterflush rotary coring using T6-116 coring barrel: 10.60-15.00m.

CASING: PW to 9.00m.

GROUNDWATER: None encountered prior to using water flush to advance casing to 2.00m.

INSTALLATION: Borehole backfilled with bentonite pellets 4.00-15.00m. 50mm ID HDPE slotted pipe with geosock surround and washed gravel response zone: 1.00-4.00m. Plain 50mm ID HDPE pipe with bentonite pellet seal: 0.20-1.00m. Flush 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.

REMARKS: Limited recovery on run 12.00-13.50m. Volatile Organic Compounds (VOC): 0.10m = 2.30ppm, 0.50m = 0.00ppm, 1.00m = 0.00m, 1.50m = 1.60ppm, 2.00m = 1.60ppm, 2.50m = 0.70ppm, 3.00m = 0.70ppm, 3.50m = 1.10ppm, 4.00m = 1.10ppm, 4.50m = 0.60ppm.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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BOREHOLE LOG



Borehole No.

BH101

Sheet 2 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close

Project No:

C5630

Co-ords: E N

Hole Type
DS+RC

Location: Reading

Level: mAOD

Scale
1 : 50.00

Client: Reading Borough Council

Dates: Start: 26/04/2017
End: 27/04/2017Logged By
JK

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
9		UT100	8.00 - 8.45				Stiff indistinctly thinly laminated very closely fissured grey silty CLAY with occasional lenses of light grey silty sand (<40x10mm). <i>(continued from previous sheet)</i>			
		D	8.45 - 8.55				8.30m: 1no. sub-angular mudstone/siltstone nodule (<25mm).			
		D	8.60				8.80-9.00m: 3no. of sub-angular pyrite nodules (<52mm).			
		D	9.40							
10		SPT	9.50 - 9.95	S 32			Very stiff grey locally speckled black sandy silty CLAY with occasional off white comminuted shell fragments (<22mm).	9.60		
		H	9.90	H 110			9.85m: Rare sub-rounded to rounded black siliceous gravel (<25mm).			
		D	10.00							
		H	10.30	H 77						
11		C	10.60 - 12.00	C*86			10.42-10.60m: Frequent lenses of light grey mudstone/siltstone (<90mm).			
		SPT C	10.60 - 10.93				10.60-13.70m: Locally tending to a silt.			
		D	11.00							
		D	11.80					(4.10)		
12		C	12.00 - 13.50	S*103			11.90-12.00m: Frequent off white comminuted shell fragments (<20mm).			
		SPT	12.00 - 12.29							
		D	13.40							
		C	13.50 - 15.00	C*111						
14		SPT C	13.50 - 13.73				Very stiff very closely fissured light grey mottled reddish brown CLAY.	13.70		
		D	14.20					(1.30)		
		CS	14.50 - 14.88							
		D	14.90							
15		SPT C	15.00 - 15.31	C*75			Borehole completed at 15.00m	15.00		

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
26/04/2017 17:00	10.60	7.00	4.95
27/04/2017 08:00	10.60	7.00	4.95
27/04/2017 17:00	15.00	9.00	2.30

Hole Progress:

BOREHOLE LOG



Borehole No.

BH102

Sheet 1 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N	Hole Type DS+RC
Location: Reading	Level: mAOD	Scale 1 : 50.00	
Client: Reading Borough Council	Dates: Start: 27/04/2017 End: 28/04/2017	Logged By JK	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.20				MADE GROUND: Light grey sandy angular to sub-angular fine to coarse GRAVEL of red brick, concrete, plastic, felt, metal, timber and siliceous material with low cobble content. Cobbles are sub-angular of red brick and concrete.	(0.40)		
		ES	0.50					0.40		
		B	1.00				MADE GROUND: Dark greyish brown sandy angular to rounded fine to coarse GRAVEL of siliceous material.	(0.50)		
		ES	1.20 - 1.65	S 19				0.90		
2		SPT	1.50 - 1.20				Medium dense orangish brown very sandy sub-angular to rounded fine to coarse GRAVEL of siliceous material.	(1.10)		
		B	2.00 - 3.00	S 23				2.00		
		SPT	2.00 - 2.45				Dense orangish brown slightly gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	(1.30)		
3		SPT	3.00 - 3.45	S 9			Stiff indistinctly thinly laminated closely fissured grey silty CLAY. 3.30-3.75m: Orangish brown.	3.30		
		H	3.40	H 58						
		D	3.50				4.30m: 2no. sub-angular to sub-rounded pyrite nodules (<18mm).			
4		D	3.90	H 67			5.30-13.50m: Occasional lenses of light grey fine to medium grained sand (<25mm).			
		H	4.00 - 4.45							
		UT100	4.30				6.45m: 1no. fossilised wood fragment (<20mm). 6.50m: Close to medium spaced fissures.			
		D	4.45 - 4.55							
5		H	4.60	H 77			7.70m: 2no. sub-angular to sub-rounded pyrite nodules (<42mm).			
		D	4.70							
		SPT	5.00 - 5.45	S 12						
6		H	6.30	H 107						
		D	6.40							
		UT100	6.50 - 6.95							
7		D	6.95 - 7.05							
		D	7.10							
8		D	7.70							

EQUIPMENT: Hand digging tools. Comacchio MC305 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Dynamic sampling using 120mm and 113mm sample barrel: 1.20-9.00m. Waterflush rotary coring using T6-116 coring barrel: 9.00-15.00m.
 CASING: PW to 8.00m.
 GROUNDWATER: Encountered at 2.00m. Rising and settled at 1.90m after a 10 minute monitoring period.
 INSTALLATION: Borehole backfilled with bentonite pellets 3.50-15.00m. 50mm ID HDPE slotted pipe with geosock surround and washed gravel response zone: 1.50-3.50m. Plain 50mm ID HDPE pipe with bentonite pellet seal: 0.20-1.50m. Flush 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.
 REMARKS: Volatile Organic Compounds (VOC): 0.20m = 0.30ppm, 0.50m = 6.10ppm, 1.00m = 0.70ppm, 1.50m = 0.00ppm, 2.00m = 0.00ppm, 2.50m = 0.00ppm, 3.00m = 0.00ppm, 3.50m = 0.00ppm, 4.00m = 0.00ppm.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
27/04/17	2.00		1.90

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
27/04/2017 17:00	6.50	4.00	2.60
28/04/2017 08:00	6.50	4.00	2.60

BOREHOLE LOG



Borehole No.

BH102

Sheet 2 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close

Project No:

C5630

Co-ords: E N

Hole Type
DS+RC

Location: Reading

Level: mAOD

Scale
1 : 50.00

Client: Reading Borough Council

Dates: Start: 27/04/2017
End: 28/04/2017Logged By
JK

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
		SPT	8.00 - 8.45	S 28			Stiff indistinctly thinly laminated closely fissured grey silty CLAY. (continued from previous sheet)			
9		D	8.80							
		C	9.00 - 10.50							
		UT100	9.00 - 9.45							
		D	9.45 - 9.55							
10		D	10.00							
		CS	10.20 - 10.50				10.30-10.50m: Locally dark greenish grey and sandy.			
		C	10.50 - 12.00	S 45			Very stiff indistinctly thinly laminated closely fissured grey silty CLAY.	10.50		
		SPT	10.50 - 10.95							
11										
		CS	11.55 - 11.85							
12		C	12.00 - 13.50	S*120			11.80-12.00m: Frequent off white comminuted shell fragments (<45mm).	(3.00)		
		SPT	12.00 - 12.28							
13		D	13.00							
		C	13.50 - 15.00	S*103			13.20-13.40m: Frequent off white comminuted shell fragments (38mm).			
		SPT	13.50 - 13.80				Very stiff very closely fissured light grey mottled reddish brown CLAY.	13.50		
14		D	14.20				13.50-13.80m: Occasional sub-angular cobble sized mudstone lithorelicts.			
		CS	14.60 - 14.90				13.80-14.00m: 2no. intersecting sub-horizontal to sub-vertical planar smooth fissures.	(2.05)		
15		D	14.90							
		UT100	15.00 - 15.45							
		D	15.45 - 15.55	S*79						
		SPT	15.55 - 15.84				Borehole completed at 15.55m	15.55		
16										
17										

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
28/04/2017 17:00	15.00	8.00	4.00

STANDARD PENETRATION TEST

Telephone: 01452 739165, Fax: 01452 739220, Email: info@ccground.co.uk



CLIENT
SITE

Reading Borough Council
Conwy Close

BH	Top Depth (m)	Type	Seating Blows	Blows Main Test	Total Penetration (mm)	Spt 'N' Value	Spt Reported Result	Casing Depth (m)	Water Depth (m)	Hammer Serial Number	Hammer Energy Ratio (%)	Self-Weight Penetration	Blows 1	Blows 2	Blows 3	Blows 4	Blows 5	Blows 6	Pen 1 (mm)	Pen 2 (mm)	Pen 1 (mm)	Pen 2 (mm)	Pen 1 (mm)	Pen 2 (mm)	Remarks
BH01	1.20	S	14	50	380	50	S*67			CC06	65		4	10	10	12	28		75	75	75	75	75		
BH01	2.00	C	21	50	330	83	C*83	2	1.1	CC06	65		7	14	22	15	13		75	75	75	75	30		
BH01	3.00	C	15	50	400	61	C*61	3	1	CC06	65		5	10	11	12	18	9	75	75	75	75	75	20	
BH01	4.00	C	6	14	450	14	C 14	4	1	CC06	65		3	3	3	4	4	3	75	75	75	75	75	75	
BH01	6.50	S	8	23	450	23	S 23	5	4.1	CC06	65		4	4	5	5	6	7	75	75	75	75	75	75	
BH01	9.50	S	10	32	450	32	S 32	7	4.7	CC06	65		4	6	6	9	8	9	75	75	75	75	75	75	
BH01	10.60	C	18	50	330	86	C*86	7	4.95	CC06	65		7	11	11	19	20		75	75	75	75	25		
BH01	12.00	S	23	50	290	103	S*103	9	2.1	CC06	65		11	12	21	29			75	75	75	70			
BH01	13.50	C	25	50	230	111	C*111	9	2.3	CC06	65		20	5	23	27			75	75	75	60			
BH01	15.00	C	25	50	310	75	C*75	9	2.3	CC06	65		16	9	18	19	15		75	75	75	75	50		
BH02	1.20	S	4	19	450	19	S 19			CC06	65		1	3	4	5	5	5	75	75	75	75	75	75	
BH02	2.00	S	7	23	450	23	S 23			CC06	65		3	4	6	6	6	5	75	75	75	75	75	75	
BH02	3.00	S	7	9	450	9	S 9		1.9	CC06	65		4	3	3	3	2	1	75	75	75	75	75	75	
BH02	5.00	S	4	12	450	12	S 12	4	2	CC06	65		2	2	3	3	3	3	75	75	75	75	75	75	
BH02	8.00	S	8	28	450	28	S 28	6.5	2.45	CC06	65		3	5	6	6	9	7	75	75	75	75	75	75	
BH02	10.50	S	12	45	450	45	S 45	8	3.05	CC06	65		5	7	8	11	11	15	75	75	75	75	75	75	
BH02	12.00	S	22	50	280	120	S*120	8	3.1	CC06	65		4	18	29	21			75	75	75	50			
BH02	13.50	S	23	50	300	103	S*103	8	3.1	CC06	65		7	16	27	23			75	75	75	70			
BH02	15.55	S	24	50	340	79	S*79	8	4	CC06	65		11	13	18	19	13		75	75	75	75	40		

Notes:

- 1 Test carried out in general accordance with BS EN ISO 22476: Part 3: (2005)
- 2 N values have not been subjected to any correction.
- 3 Test carried out using split spoon S, solid cone C.

4 Where full test drive not completed, linearly extrapolated N value reported.

5 <1 Denotes hammer self weight penetration (sank under own weight).

6 ** Denotes no effective penetration.

CONTRACT
C5630

CHECKED
CS

TRIAL PIT LOG



Pit No
TP101
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 1.80m Depth 2.60m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.20 - 0.40 0.20		MADE GROUND: Greyish brown sandy angular to rounded fine to coarse GRAVEL of red brick, tile, clay pipe fragments and glass.	(0.90)		
		B ES	0.50 - 0.70 0.50			0.90		
		B ES	1.00 - 1.20 1.00		Orangish brown mottled grey slightly gravelly SAND with low cobble content. Gravel is angular to rounded fine to coarse of siliceous material. Cobbles are sub-angular of siliceous material.	(0.40)		
		B	1.40 - 1.60		Orangish brown mottled grey slightly gravelly slightly clayey SAND. Gravel is angular to rounded fine to coarse of siliceous material.	(0.30)		
2					Dark brown mottled orangish brown gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	1.60		
		B	2.00 - 2.00			(1.00)		
3								
4								
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 2.50m. No rise recorded.

STABILITY: Trial pit sides generally stable and vertical.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.10m = 6.30ppm, 0.60m = 11.80ppm, 1.10m = 9.80ppm, 1.50m = 4.20ppm, 1.80m = 0.20ppm, 2.30m = 0.00ppm, 2.90m = 0.00ppm, 3.60m = 0.00ppm, 4.30m = 0.00ppm. Soakaway Test referenced SA01 undertaken. See separate sheet.

TRIAL PIT LOG



Pit No
TP102
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 3.60m Depth 4.60m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.10		MADE GROUND: Brown gravelly silty SAND. Gravel is angular to rounded fine to coarse of red brick, glass, tile and siliceous material.			1
		B ES	0.60			(1.30)		
		B ES	1.10			1.30		
2		B ES	1.50		MADE GROUND: Grey and brown sandy angular to sub-angular fine to coarse GRAVEL of red brick, concrete and tile with low cobble content. Cobbles are sub-angular of red brick, concrete and tile.	(0.40)		2
		B ES	1.80			1.70		
		B	2.30 - 2.50			(1.30)		
3	2.80m: Slight seepage	B	2.90 - 3.10		Orangish brown sandy angular to rounded fine to coarse GRAVEL of siliceous material.			3
						3.00		
						(0.50)		
4		B	3.60 - 3.70		Orangish brown very gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	3.50		4
						(1.10)		
		B	4.30 - 4.50			4.60		
5					Trial pit completed at 4.60m			5

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 2.80m. No rise recorded.

STABILITY: Trial pit sides generally unstable and collapsing 3.50-4.60m.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.20-0.40m = 0.00ppm, 0.50-0.70m = 0.00ppm, 1.00-1.20m = 3.20ppm, 1.40-1.60m = 5.40ppm, 1.60-1.80m = 0.00ppm, 2.00-2.20m = 1.60ppm.

TRIAL PIT LOG



Pit No
TP103
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 1.90m Depth 2.70m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20		Brown gravelly SAND with frequent roots and rootlets (<3mm). Gravel is angular to rounded of siliceous material.	(0.60)		
		ES	0.40			0.60		
		B	0.50		Orangish brown gravelly SAND with rare roots and rootlets (<1mm). Gravel is angular to rounded fine to coarse of siliceous material.	(0.30)		
		ES				0.90		
2		B	1.00 - 1.20		Orangish brown mottled yellowish brown and grey gravelly clayey SAND with occasional lenses of clay (<400mm). Gravel is angular to rounded fine to coarse of siliceous material.	(0.70)		
						1.60		
		B	1.70 - 1.90		Orangish brown mottled light grey gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	(1.10)		
						2.70		
3	2.70m: Slight seepage.	B	2.50 - 2.70		Trial pit completed at 2.70m			
4								
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 2.70m. No rise recorded.

STABILITY: Trial pit generally unstable and collapsing from 2.50-2.70m.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.20m = 0.00ppm, 0.70m = 0.00ppm, 1.00-1.20m = 0.00ppm, 1.70-1.90m = 0.00ppm, 2.50-2.70m = 0.00ppm.

Soakaway Test referenced SA02 undertaken. See separate sheet.

TRIAL PIT LOG

Pit No
TP104

Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close

Project No:

C5630

Co-ords: E N

Level: mAOD

Date
27/04/2017

Location: Reading

Dimensions: 2.00m

Depth
3.65m

0.70m

Scale
1 : 31.25

Client: Reading Borough Council

Logged By
MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.00 - 0.10		MADE GROUND: TARMACADAM.	0.10		
					MADE GROUND: Light reddish grey slightly clayey slightly sandy sub-angular GRAVEL of mudstone	0.25		
					MADE GROUND: Red brick MASONRY.	0.40		
		B ES	0.40 - 0.60 0.40		Grey sandy sub-angular to sub-rounded fine to coarse GRAVEL of siliceous material.	(0.30)		
		B ES	0.80 - 0.90 0.80		Dark brownish green mottled grey slightly gravelly clayey SAND. Gravel is angular to rounded fine to coarse of siliceous material.	0.70 (0.50)		
					Dark brownish green mottled grey and greenish grey clayey SAND. Gravel is angular to rounded fine to coarse of siliceous material.	1.20 (0.30)		
2		B	1.60 - 1.80		Orangish brown mottled grey gravelly SAND with occasional lenses of gravelly clayey sand (<400mm). Gravel is angular to rounded fine to coarse of siliceous material.	1.50 (0.50)		
					Orangish brown gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	2.00		
3		B	2.40 - 2.50					
		B	2.90 - 3.00			(1.65)		
4	3.50m: Slight seepage.	B	3.50 - 3.60					
					Trial pit completed at 3.65m	3.65		
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 3.50m. No rise recorded.

STABILITY: Trial pit sides generally unstable and collapsing from 2.10-3.50m.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.40m = 0.00ppm, 0.80-0.90m = 0.00ppm, 1.60-1.80m = 0.00ppm, 2.40-2.50m = 0.00ppm, 2.90-3.00m = 0.00ppm, 3.50-3.60m = 0.00ppm.

TRIAL PIT LOG



Pit No
TP105
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 2.40m Depth 4.00m 0.80m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20 - 0.40		MADE GROUND: Greyish brown very gravelly SAND with low cobble content and occasional roots and rootlets (<2mm). Gravel is angular to sub-angular fine to coarse of red brick, concrete, tile, clay pipe fragments and siliceous material.	(0.40)		
		B	0.50 - 0.70		0.40m: Geotextile membrane.	0.40		
		ES	0.50		MADE GROUND: Dark brown gravelly SAND. Gravel is angular to sub-rounded fine to coarse of red brick, concrete, tile and siliceous material.	(0.30)		
		B	1.00 - 1.20		Light brownish grey sandy locally very sandy angular to rounded fine to coarse GRAVEL of siliceous material.	0.70		
2		ES	1.00		Orangish brown mottled brown sandy angular to rounded fine to coarse GRAVEL of siliceous material with occasional lenses of clayey sandy gravel (<400mm).	0.90		
		B	1.70 - 1.90		Orangish brown mottled grey very gravelly SAND with low cobble content. Gravel is angular to rounded fine to coarse of siliceous material. Cobbles are sub-angular of siliceous material.	1.65		
		B	2.50 - 2.70			(1.35)		
		B	3.20 - 3.40		Orangish brown slightly gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	3.00		
3	3.00m: Slight seepage	B	3.20 - 3.40			(0.80)		
		B	3.70 - 3.80			3.80		
		H	3.80		Stiff brown mottled orange and reddish brown slightly sandy CLAY.	3.80		
					Trial pit completed at 4.00m	4.00		
4								
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 3.00m. No rise recorded.

STABILITY: Trial pit sides generally stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.20m = 0.00ppm, 0.50m = 0.10ppm, 1.00m = 0.00ppm, 1.70m = 0.00ppm, 2.50m = 0.00ppm, 3.20m = 0.00ppm, 3.90m = 0.00ppm.

TRIAL PIT LOG



Pit No
TP106
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 2.40m Depth 3.80m 0.80m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		MADE GROUND: Dark grey slightly sandy angular to sub-angular fine to coarse GRAVEL of tarmacadam.	0.03		
		ES				0.15		
		B	0.30		MADE GROUND: Greyish brown sandy angular to sub-rounded fine to coarse GRAVEL of red brick, concrete, tarmacadam and siliceous material.	(0.30)		
		ES			0.15m: Geotextile membrane.	0.45		
		B	0.60		Dark brown very gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	(0.25)		
2		ES			Brown very gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	0.70		
					Orangish brown sandy angular to rounded fine to coarse GRAVEL of siliceous material with occasional lenses of sandy gravelly clay (<400mm).	(0.50)		
		B	1.20 - 1.40		Orangish brown mottled grey gravelly SAND with low cobble content. Gravel is angular to rounded fine to coarse of siliceous material. Cobbles are sub-angular to rounded fine to coarse of siliceous material.	1.20		
						(0.80)		
						2.00		
3		B	2.10 - 2.30		Orangish brown slightly gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.			
						(1.50)		
		B	2.60 - 2.80					
4	3.20m: Slight seepage	B	3.20 - 3.40					
						3.50		
		H	3.60		Stiff brown mottled orangish brown and reddish brown slightly sandy CLAY.	(0.30)		
		H	3.70					
		H	3.80		Trial pit completed at 3.80m	3.80		
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 3.20m. No rise recorded.

STABILITY: Trial pit sides generally unstable and collapsing from 1.70-3.50m.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.10m = 0.00ppm, 0.30m = 0.00ppm, 0.60m = 0.00ppm, 1.20-1.40m = 0.00ppm, 2.10-2.30m = 0.00ppm, 3.20m = 0.00ppm, 3.70m = 0.00ppm.

TRIAL PIT LOG



Pit No
TP107
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 2.40m Depth 3.20m 0.80m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.20 - 0.40 0.20		MADE GROUND: Greyish brown very gravelly SAND with low cobble content. Gravel is angular to sub-angular fine to coarse of red brick, concrete, tile, mudstone and siliceous material. Cobbles are sub-angular of red brick and concrete. 0.27-0.50m: Dark brown.	(0.50)		
		B ES	0.60 - 0.80 0.60		0.50m: Geotextile membrane. MADE GROUND: Dark brown gravelly SAND. Gravel is angular to rounded fine to coarse of red brick, concrete, tile and siliceous material.	0.50 (0.45)		
		B ES	1.00 - 1.20		0.90m: 1no. redundant clay pipe. Orangish brown mottled yellowish brown gravelly SAND with low cobble content. Gravel is angular to rounded fine to coarse of siliceous material. Cobbles are sub-rounded to rounded of siliceous material.	0.95		
2					1.70-2.00m: 1no. lense of orangish brown mottled yellow gravelly clayey sand (<300mm).	(1.75)		
					2.50m: Slight seepage.			
3					Orangish brown gravelly SAND. Gravel is angular to sub-rounded fine to coarse of siliceous material.	2.70 (0.50)		
					Trial pit completed at 3.20m	3.20		
4								
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: Some seepage at 2.50m. No rise recorded.

STABILITY: Trial pit sides generally stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.20m = 0.00ppm, 0.60m = 0.00ppm, 1.00-1.20m = 0.00ppm, 1.50m = 0.00ppm, 2.00m = 0.00ppm, 2.50m = 0.00ppm, 3.00m = 0.00ppm.

TRIAL PIT LOG



Pit No
TP108
Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: Info@CCGround.co.uk

Project Name: Conwy Close	Project No: C5630	Co-ords: E N Level: mAOD	Date 27/04/2017
Location: Reading	Dimensions: 2.00m Depth 2.00m 0.80m		Scale 1 : 31.25
Client: Reading Borough Council			Logged By MT

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry	ES	0.10		MADE GROUND: Dark grey slightly sandy angular to sub-angular fine to coarse GRAVEL of tarmacadam. 0.15m: Geotextile membrane. Dark brown gravelly locally very gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	0.15		
		B ES	0.50 0.60			(0.75)		
		B ES	0.95 - 1.15 1.00		Light brownish yellow sandy locally very sandy angular to rounded fine to coarse GRAVEL of siliceous material.	0.90 (0.30)		
		B	1.60 - 1.80		Orangish brown very gravelly SAND. Gravel is angular to rounded fine to coarse of siliceous material.	1.20 (0.80)		
2					Trial pit completed at 2.00m	2.00		
3								
4								
5								

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m bucket.

GROUNDWATER: None encountered.

STABILITY: Trial pit sides generally stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings and compacted with excavator bucket.

REMARKS: Volatile Organic Compounds (VOC): 0.0.10m = 0.00ppm, 0.60m = 0.00ppm, 1.00m = 0.00ppm, 1.60m = 0.00ppm. Soakaway Test referenced SA03 undertaken. See separate sheet.



STRUCTURAL SOILS LTD

INSITU TESTING REPORT



1774

Report No. 747322R.01(00)

Date 02-May-2017 Contract Conwy Close, Reading

Client CC Ground Investigations Ltd
Address Unit A2
Innsworth Technology Park
Innsworth Lane
Gloucester
GL3 1DL

For the Attention of Richard Tucker

Order received 04-April-2017
Testing Started 27-April-2017
Testing Completed 27-April-2017

Client Reference None
Client Order No. CC9440
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

2no. Insitu CBR tests carried out at locations specified by client.

Not UKAS Accredited Tests

The results represent the ground conditions at the specified locations and depths at the time of testing.

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd 1a Princess Street Bedminster Bristol BS3 4AG Tel.0117 9471000. e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **02/05/2017 13:46:35**.

Testing reported after this date is not covered by this Verification Certificate.

S. Philp

Approved Signatory
Steven Philp (Laboratory/ Site Technician)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
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Hemel Laboratory
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Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Conwy Close, Reading

Job No:

747322



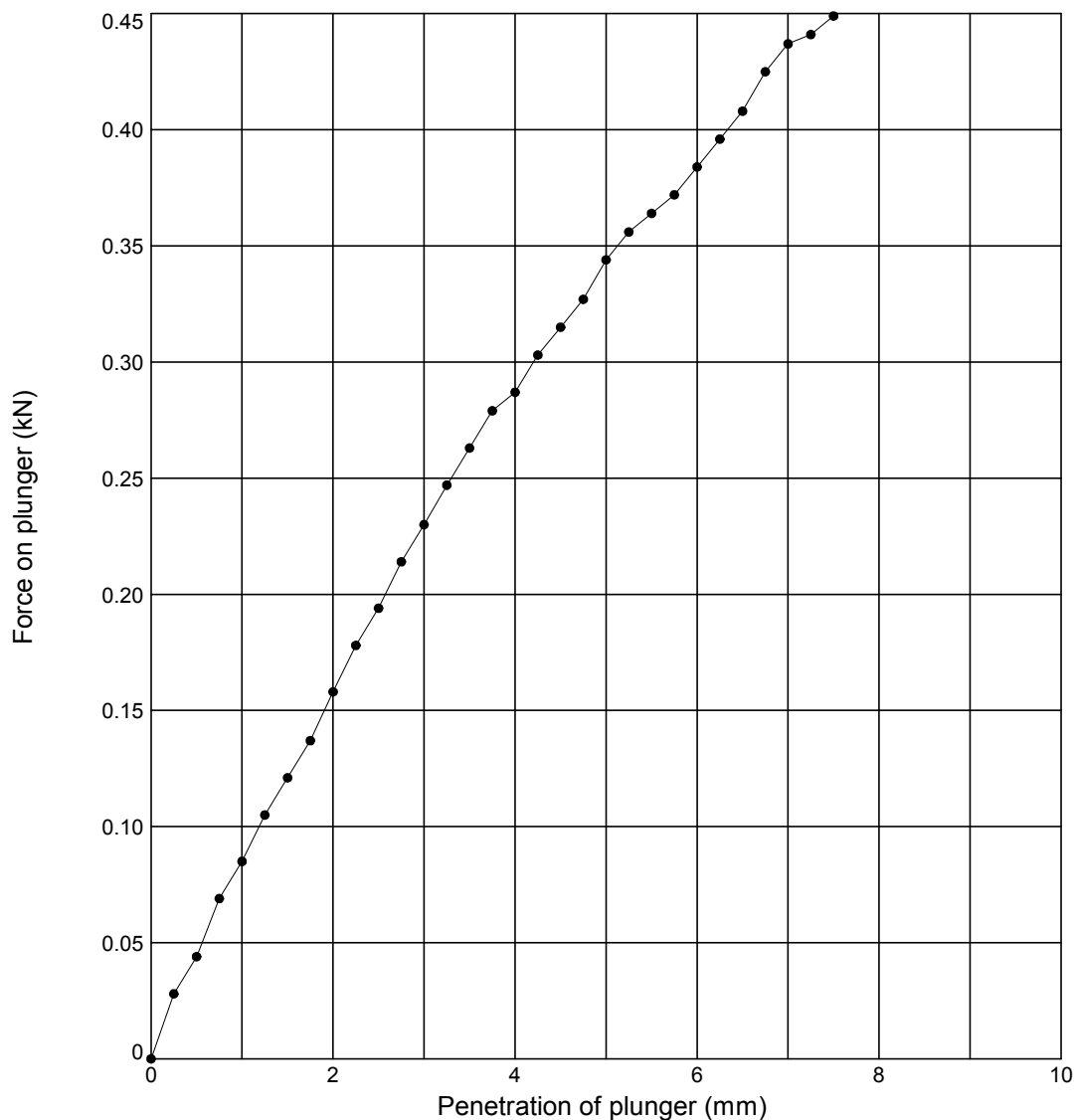
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

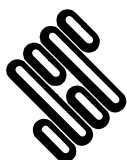
Position Ref: **CBR1**

Depth (m): **0.75**

Date: **27/04/17**



Test Details	Test Conditions	Test Results
Kentledge : Landrover Surcharge (kg) : 4.5 Surcharge Pressure (kPa) : 1	Weather : Sunny Temperature (°C) : 13	CBR Value (%) : 1.7 Moisture Content (%) : 14
Sample Description	Test Notes	
Light brown clayey SAND	Estimated particles >20 mm (%) : 10 Size and position of particles >20mm in relation to the plunger : Unknown	



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

Date

MD Strowger

MICHAEL STROWGER

02/05/17

Contract

Conwy Close, Reading

Contract Ref:

747322



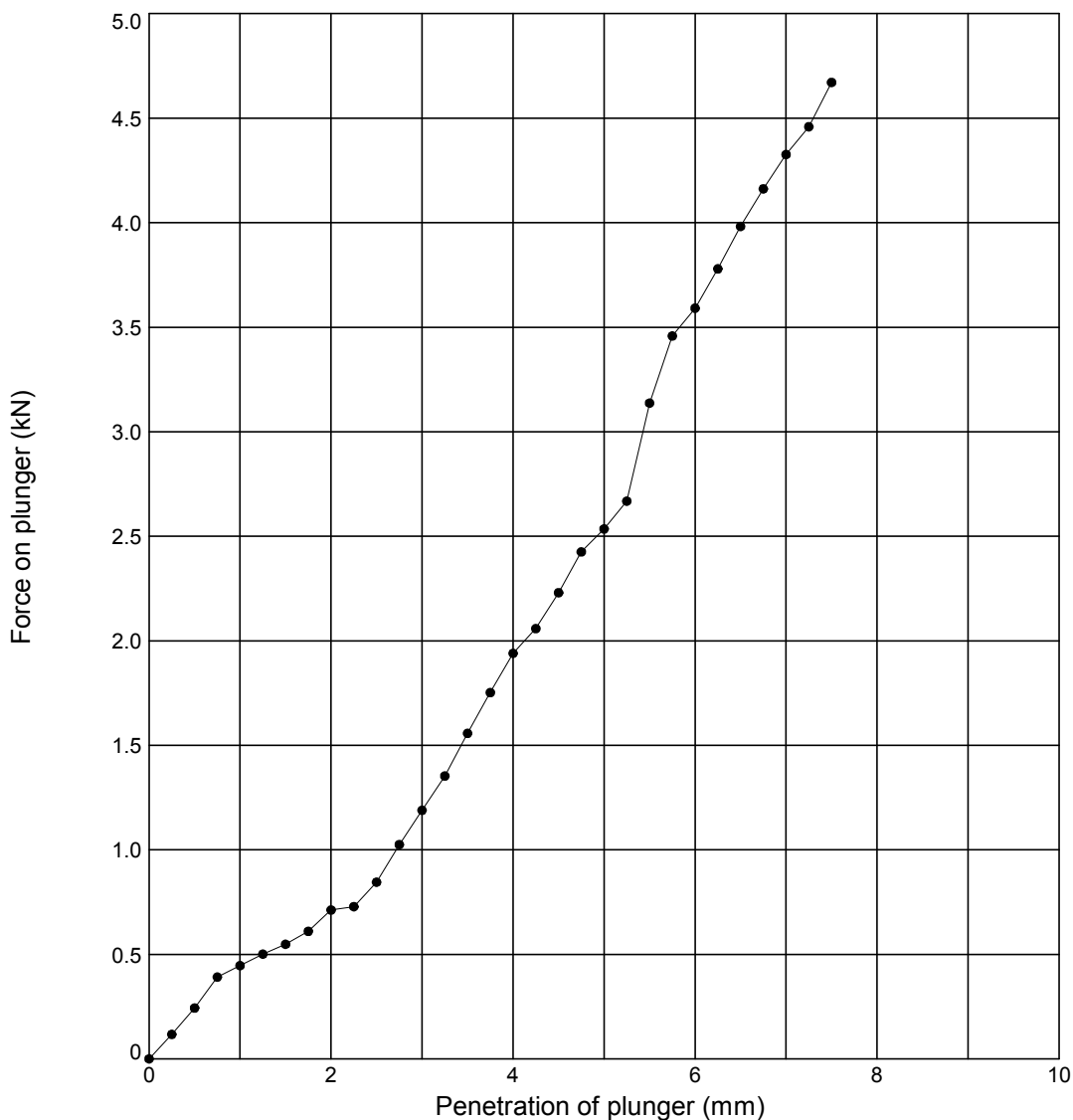
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

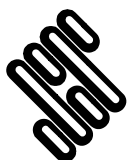
Position Ref: **CBR2**

Depth (m): **0.55**

Date: **27/04/17**



Test Details	Test Conditions	Test Results
Kentledge : Landrover Surcharge (kg) : 4.5 Surcharge Pressure (kPa) : 1	Weather : Sunny Temperature (°C) : 13	CBR Value (%) : 13 Moisture Content (%) : 6.3
Sample Description	Test Notes	
Brown slightly silty slightly gravelly SAND	Estimated particles >20 mm (%) : 20 Size and position of particles >20mm in relation to the plunger : Unknown	



STRUCTURAL SOILS
1a Princess Street
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MD Strowger

MICHAEL STROWGER

Date

02/05/17

Contract

Conwy Close, Reading

Contract Ref:

747322



APPENDIX C

Appendix C – Photography

Core Photograph



CC Ground Investigations Ltd

Contract ID:

C5630

Borehole ID:

BH101

Contract Name:

Conwy Close

Box No:

Client:

WSP

Depth:

0.00-1.20m

Core Photograph



CC Ground Investigations Ltd

Contract ID:

C5630

Contract Name:

Conwy Close

Client:

WSP

Borehole ID:

BH101

Box No:

Depth:

0.00-1.20m

Core Photograph



CC Ground Investigations Ltd

Contract ID:

C5630

Contract Name:

Conwy Close

Client:

WSP

Borehole ID:

BH101

Box No:

Depth:

0.00-1.20m