Geo-Environmental Site Investigation Report

At:

114-130 Lower Hythe Street
Dartford
DA1 1BN

For:

Keith Mullner

Private and Confidential

Ref: 5477 23 09 01 Rpt 01 Rev B AK KM

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Quality Assurance Control Sheet

This report has been produced in accordance with the Sevenoaks Environmental Consultancy Quality Assurance System

Report Ref:	**5477 23 09 01 Rpt 01 Rev B AK KM**		
	Consultant's Name	**Consultant's Signature**	**Date**
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Report reviewed by:	**Brendan Davis** *Technical Director*		09/10/2023

Contents

1.0 Introduction

The work covered in this report was undertaken on behalf of Keith Mullner in accordance with Sevenoaks Environmental Consultancy Ltd.'s (SEC) proposal dated 18th July 2023 (Ref: 5477 23 07 18 Ltr 02 FPA 02 Rev B KW KM). The site is known as 114-130 Lower Hythe Street (see Appendix A Figure 1 – Site Location Plan).

The site currently comprises 2no. single-storey former precision engineering workshops laid to hardstanding throughout (see Appendix A Figure 2 – Existing Site Layout Plan). We understand that the proposed development involves the change of use from commercial/light industrial to residential and that the existing buildings will be demolished and cleared to make way for the construction of 7no. residential properties with associated parking areas and soft landscaping to the south. (see Appendix A Figure 3 – Proposed Site Layout Plan). This report has been produced for due diligence purposes ahead of the potential sale of the site and to help address the contaminate land planning condition associated with the proposed development.

This report includes a review of the findings from the previous Geo-Environmental Desk Study carried out by others, describes the fieldwork and laboratory testing undertaken as part of this current ground investigation, reviews the test results in the light of current guidance and provides an updated Conceptual Site Model based on a source-pathway-receptor linkage qualitative risk assessment in relation to Contaminated Land.

A previous Phase I Geo-Environmental Desk Study Report for the site was produced by R. Carr Geotechnical Services (Ref: 3771/20) dated May 2020. A review of previous report pertaining to the site is provided in Section 3 of this current report.

It is understood that this previous report has been approved by the Regulators in relation to planning.

This report should be read in conjunction with the previous report associated with the site.

2.0 Site Description

2.1 Site Location

The site was located to the west of Hythe Street and to the north of Dartford town centre. The site is centred approximately on Ordnance Survey (OS) National Grid Reference 554209, 174566 (see Appendix A Figure 1 - Site Location Plan).

2.2 Site Setting and Topography

The site is situated within a semi-residential semi-industrial setting with new residential apartment blocks to the east. A former gas works and gas holder was previously situated immediately adjacent the west, the Hufflers Arms public house was located immediately adjacent to the south and Howarth Timber and Building Supplies was present immediately adjacent to the north, beyond which was a metals recycling centre. The ground level across the site was generally flat.

2.3 Site Description

The site formed a rectangular plot comprising 2no. single-storey former precision engineering workshops within external areas laid to hardstanding consisting of asphalt along the eastern boundary and concrete between the 2no. buildings. The 2no. buildings were cladded in potential asbestos cement sheeting and appeared to be generally consistent with the site layout and condition observed at the time of the previous Desk Study Report in May 2020 See Appendix B for site Photos.

2.4 Current Site Activity

At the time of writing the site was inactive.

2.5 Proposed Site Activity

For the purposes of this report, we understand the proposed development involves the change of use from commercial (Use Class B2) to residential (Use Class B3) with associated gardens and parking.

3.0 Review of Previous Reports

3.1 Phase I Geo Environmental Desk Study and Preliminary Risk Assessment conducted by R CARR Geotechnical Services (Ref: 3771/20) Dated May 2020:

A Phase I Desk Study Report was produced by R CARR Geotechnical Services in May 2020 to help inform prospective developers of the site.

The Desk Study Report was written based upon a proposed change of land use from industrial to residential with limited communal landscaping. It is noted that Desk Study Report considered a different proposed development layout than this current report. It is noted that the site layout and condition noted in the previous Desk Study Report is generally consistent with that identified on site currently.

Historically the Desk Study identified that the site had comprised a row of terraced houses with rear gardens between 1871-1890, which were demolished between 1929-1952 and replaced with 2no. structures which appear to be indicative of the existing structures. The Desk Study noted that the site was purchased in 1985 by the Client and has since been used for precision engineering and toolmaking. Off-site a public house was noted adjacent to the south end of the site, Gas works with three gas holders were noted 25m west of the site 1871-1890, additional; gas works and gas holder were noted 100m east of the site 1897-1902, works were noted 50m east of the site 1966-1967.

The published geological map for the area locally to the site indicated that the site was located on an area of Alluvium, underlain by Taplow Gravel, underlain by Seaford Chalk member. The Alluvium was identified as a Non-Aquifer, Taplow Gravel was identified as a Secondary Aquifer with the Seaford member was identified as a Principal Aquifer.

The Desk Study included a review of publicly available environmental data. It is noted that previously on site potentially contaminative land uses including oil, petroleum and gas refining was stored between 1898-1983 which appeared likely to relate to the adjacent Gas Works. Off site ~9m was a factory or works, a metal casting factory foundries ~126m from the site. Tanks were identified 4m from the site in 1975. No landfills were identified by the Desk Study. A scrap yard was identified 49m from the site. The Desk Study also noted that the environmental data identified a risk of surface water flooding on site, it is noted that the Desk Study does not provide details for any groundwater abstractions or whether the site is located within an SPZ. SEC note the site is not located within an SPZ but is located relatively close.

The potential on site sources of contamination identified by the Desk Study included the following;

- Residual inorganic and organic contamination from the site's industrial use e.g. toxic metals, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC).

- Made Ground present beneath existing site surface possibly containing metals, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH) and asbestos.

- Localised TPH contamination due to leakages of lubricants from parked vehicles.

- Asbestos-containing materials present within the fabric of the existing buildings.

The potential off-site sources of contamination identified by the Desk Study included the following;

- A large number of contemporary and historic industrial activities and installations identified within 250m of the site, the most significant being the gas works adjacent to the west of the site.

In light of the Desk Study findings, an intrusive site investigation was recommended, to include laboratory analysis of soil samples for potential contaminants of concern including metals, hydrocarbons, speciated polyaromatic hydrocarbons (PAH), volatile and semi-volatile organic compounds (VOC and SVOC), phenols and asbestos. The investigation should include exploratory holes located within areas of proposed landscaping the investigation should include gas monitoring in order to characterise the site.

The Desk Study also recommended appropriate removal and disposal of any asbestos-containing material within the existing building fabric.

4.0 Description of Field Works

4.1 General

SEC attended the site to conduct the Site Investigation fieldwork on 18th August 2023 (See Appendix B - Site Photos). The scope of work conducted comprised the following:

- Provision of Statutory Service Plans to manage Health and Safety on site (See Appendix C – Preliminary UXO Risk Assessment and Service Plans);
- Production of RAMS and initial safety searches including the conduct of a Preliminary UXO Risk Assessment prior to fieldwork (See Appendix C – Preliminary UXO Risk Assessment and Service Plans);
- Site attendance by a Geo-Environmental Engineer to record ground conditions to BS5930 / Eurocode & CIRIA 574, collect samples, document the investigation and help manage safety;
- Mobilisation and site attendance by a concrete coring crew;
- Conduct of hand dug safety starter pits up to 1.20m bgl, including the use of Cable Avoidance Tool (CAT) to help reduce potential risks associated with buried services;
- Attendance to site by a Continuous Dynamic Sampler drill rig and crew to conduct of 5no. mini boreholes (WS01-WS05) up to 4m bgl;
- Installation of monitoring pipework within exploratory holes;
- Conduct of groundwater and ground gas monitoring visits;
- Chemical laboratory analysis of recovered samples for potential contaminants of concern including metals, speciated PAHs, phenols, TPH, asbestos presence / absence, ammonia and pH;
- Production of a Geo-Environmental Site Investigation Report to present findings. It is noted that the ground gas risk results will be discussed in a Gas Risk Assessment Letter Report following the completion of the ground gas monitoring.

The exploratory hole locations conducted were agreed between SEC and the Client, based upon the findings. of the previous Phase I Desk Study and to provide good general site coverage (see Appendix A Figure 4 – Exploratory Hole Location Plan).

4.2 Chemical Laboratory Analysis

Soil samples were collected from the exploratory holes and were sent for analysis at an independent UKAS and MCERTS accredited laboratory.

Soil samples recovered from the Made Ground and underlying natural material were analysed for a range of determinands taking into consideration visual and olfactory observations made on site during the fieldwork and previous and recent site usage identified by the previous Desk Study Report. Analysis included metals,

speciated PAHs, phenols, TPH, asbestos presence / absence, pH and VOCs. Groundwater samples were also recovered from some of the boreholes for laboratory analysis of a similar suite of potential contaminants.

5.0 Ground Conditions

5.1 Lithology

Detailed information relating to the strata encountered was recorded on Exploratory Hole Records, which are presented in Appendix D. A summary of the ground conditions encountered is however presented below.

5.2 Hardstanding

Hardstanding comprising of concrete was encountered at WS01, WS04 and WS05 up to 0.20m bgl. Ashphalt was encountered at WS02 and WS03 up to 0.10m bgl.

5.3 Made Ground

Made Ground was encountered within all exploratory hole locations up to 1.50m bgl (WS03 and WS05) and was variable and comprised dark brown gravelly sandy Clay with varying inclusions of flint and brick fragments. Within WS01, WS04 and WS05 where as within WS02 and WS03 to the southern area of the site the Made Ground consisted of gravelly Sand / sandy Gravel.

5.4 Natural

Natural deposits encountered beneath the Made Ground comprised light brown/brown sandy/very sandy Gravel in all exploratory hole locations proven up to 4.00m bgl.

5.5 Groundwater

Groundwater was encountered in all of the exploratory positions during drilling between 2.00m and 2.20m bgl.

Groundwater levels were also recorded during the subsequent monitoring visits, the data from which have been recorded and discussed within the Ground Gas Risk Assessment Addendum Letter Report (Ref: 5277 23 09 26 Ltr Rpt 01 Rev A AK KM).

5.6 Environmental Observations

Headspace tests were carried out on all samples recovered from the exploratory holes conducted to help screen for potential contamination from Volatile Organic Compounds (VOC's). The headspace tests were conducted using a photo ionisation detector (PID) to detect any vapour release. Concentrations of VOC's were identified in all of the samples collected up to between 0.7ppm (WS02 at 0.70m bgl) and 13.3ppm (WS03 at 3.50m bgl).

5.7 Gas Monitoring

As part of this assessment a Ground Gas Risk Assessment has been undertaken and is ongoing at the time of writing. The Ground Gas Risk Assessment will be presented following the completion of the Ground Gas monitoring, within a Ground Gas Addendum Letter Report.

6.0 Chemical Laboratory Results

6.1 General

The results of the soil analyses have been compared against the available published guidance for residential end use with homegrown produce based upon the proposed residential development with home grown produce. These guidance values have been adopted from the LQM/CIEH (Land Quality Management / Chartered Institution of Environmental Health) Suitable Use Levels (S4ULs) for Human Health Risk Assessment 2015. Where concentrations for contaminants are not provided within the LQM/CIEH S4ULs the Category 4 Screening levels (CL:AIRE) have been used for screening purposes.

It should be noted that the various available S4UL values that have been used in the current absence of any recognized SGV's must be used with some caution, as they have not been formally reviewed or endorsed by Government or the Environment or Health Protection Agencies.

The results of the groundwater analyses have been compared against the available published Drinking Water Standards 2018.

Results for the soil and groundwater analysis detailed in Section 6.2 are presented in Appendix E of this report.

A total of 8no. samples of Made Ground, 1no. sample of natural material and 2no. groundwater samples were scheduled for laboratory analysis for a range of determinands associated with the contaminants of concern identified by the previous Desk Study and included metals, speciated PAHs, TPH, pH, asbestos presence / absence, VOC, phenols and ammonia.

6.2 Soil Analysis Discussion

Made Ground

Asbestos

All of the samples of Made Ground analysed for asbestos presence / absence recorded an absence of asbestos.

Metals

Toxic metals are those considered to be potentially harmful / toxic to human health at elevated concentrations. Concentrations of toxic metals identified to be elevated within the Made Ground samples analysed include elevated concentrations of lead up to 1,470mg/kg (WS05 at 0.70m bgl) which exceeded the adopted guidance value of 190mg/kg. Arsenic recorded elevated concentrations up to 77mg/kg

(WS05 at 0.70m bgl) which exceeded the adopted guidance value of 37mg/kg. Total mercury recorded potentially elevated concentration up to 4.5mg/kg (WS05 at 0.70m bgl) which exceeded the adopted guidance value of 1.2mg/kg (although it is noted that the 1.2mg/kg guidance value for mercury relates to elemental mercury).

Phytotoxic metals are those considered to be harmful to the growth of plant life (including copper, nickel, zinc and water-soluble boron) but are not considered to be harmful to human health in concentrations more commonly encountered. Based upon the available data concentrations of phytotoxic metals were identified to be elevated including zinc up to 1,210mg/kg (WS04 at 0.30m bgl) and copper up to 449mg/kg (WS01 at 0.30m bgl).

Total Petroleum Hydrocarbons (TPH)

Concentrations of TPH within the Made Ground samples analysed were recorded to be generally low, with concentrations up to between 37mg/kg (WS02 at 0.70m bgl) and 227 mg/kg (WS02 at 0.05m bgl). Basic speciation of these hydrocarbons indicated that the majority of the 227mg/kg concentration related to carbon fraction >C21 – C40 (225mg/kg), although this concentration did not exceed the guidance threshold for this carbon fraction for both aromatic and aliphatic hydrocarbons and was therefore not considered unacceptably elevated.

Polycyclic Aromatic Hydrocarbons (PAH's)

Similarly, to concentrations of TPH identified, Total PAHs were only recorded to be slightly elevated within the Made Ground samples analysed up to between <1.6mg/kg (WS03 at 0.50m bgl) and 22.2mg/kg (WS05 at 0.70m bgl). Speciated PAH analysis identified no individual PAH constituents that were in exceedance of adopted threshold values for Human Health with respect to residential end use with homegrown produce.

Organic Matter

5no. samples of Made Ground were analysed for soil organic matter.

These results have been split into groups depending on the Made Ground encountered within each hole, dark brown gravelly sandy Clay (WS01, WS04 and WS05) and gravelly Sand/sandy Gravel (WS02 and WS03).

The values recorded ranged from 6.3% (WS04 at 0.30m bgl and 26.5% (WS05 at 0.70m bgl with an average of 17.06% within the gravelly sandy Clay made ground and from 0.8% (WS03 at 0.50m bgl) up to 2% (WS02 at 0.70m bgl) with an average of 1.4% within the more granular material.

Other Determinands

The Made Ground samples were also analysed for other determinands including: phenols, sulphide, thiocyanate, total cyanide and free cyanide. All concentrations of these contaminants were not identified to be elevated except for cyanide. Total cyanide was identified up to 9mg/kg (WS04 at 0.30m bgl) made ground and free cyanide in this sample was <1mg/kg however there is no published guidance value for cyanide.

Natural Ground

Natural material across the site was identified to be homogenous across the site and a single sample of the natural material was analysed from WS03 at 3.50m bgl (given the slightly elevated headspace test results within this sample).

Asbestos

Asbestos was identified to be absence from the sample of natural material analysed.

Metals

Concentrations of toxic and phytotoxic metals were not recorded to be elevated within the natural material analysed.

Total Petroleum Hydrocarbons (TPH)

Concentrations of TPH within the natural sample analysed were recorded to be below laboratory detection limits <6mg/kg (WS03 at 3.50m bgl) and were therefore not elevated.

Polycyclic Aromatic Hydrocarbons (PAH's)

Concentrations of total and speciated PAH's were recorded to be below laboratory detection limit within the sample of natural material analysed.

Volatile Organic Compounds (VOC's)

Concentrations of VOC's were note recorded to be elevated above the laboratory detection limit.

Organic matter

The sample of Natural material analysed recorded a soil organic matter content of 0.2%.

Other Determinands

The natural sample was also analysed for other determinands including: phenols, sulphide, thiocyanate, total cyanide and free cyanide. The sample did not record elevated concentrations of these contaminants.

Groundwater

Groundwater samples were recovered from WS01 and WS05 during the environmental monitoring visits undertaken as part of this assessment and were analysed for potential contaminants of concern. A summary of the results is provided below;

Metals

Concentrations of metals were identified to be slightly elevated including Total cyanide up to 141ug/l (WS01) with free cyanide up to 9ug/l (WS01) which exceeded the UK Drinking Water Standard of 50ug/l. Whilst slightly elevated concentrations of mercury were identified up to 0.15ug/l (WS01) this did not exceed the UK Drinking Water Standard of 1ug/l.

Ammonia (NH4)

Concentrations of Ammonia were recorded within both groundwater samples recovered from WS01 and WS05 up to 1,540 ug/l (WS01). Which exceed the adopted UK Drinking Water Standards 2018 guidance value of 500 ug/l.

Speciated Poly Aromatic Hydrocarbons (PAH)

Concentrations of total PAHs recorded within the samples of groundwater analysed from WS01 and WS05 were not recorded to be elevated and were below the laboratory's detection limit of <0.16µg/l. However, individual determinands were recorded as being slightly elevated. Napthalene up to 0.51 ug/l (WS01), Phenanthrene up to 0.24 ug/l (WS01), Fluoranthene up to between 0.02 ug/l (WS05) and 1.23 ug/l (WS01), Pyrene up to between 0.03 ug/l (WS05) and 1.30 ug/l (WS01), Benzo(a)anthracene up to 0.43 ug/l (WS01), Chrysene up to 0.45 ug/l (WS01), Benzo(b)fluoranthene up to 0.46 ug/l (WS01) and Benzo(k)fluoranthene up to 0.25 ug/l (WS01) although the Drinking Water guidance value is based upon 0.1ug/l for Total PAH which was not exceeded.

Total Petroleum Hydrocarbons (TPH)

Concentrations of total TPH recorded within the samples of groundwater recovered from WS01 and WS05 were recorded to be slightly elevated up to between 109 ug/l (WS05) and 165 ug/l (WS01), which were in exceedance of the UK Drinking Water Guidance Value of 10 ug/l for TPH. Basic speciation of the hydrocarbons recorded indicated that the hydrocarbons related to carbon fraction >C21-C40.

7.0 Updated Conceptual Site Model and Qualitative Risk Assessment

7.1 Conceptual Model

In accordance with BS 10175 an updated conceptual site model has been developed for the site, based on the potential sources, pathways and receptors associated with the proposed development for the site and taking into account both the previous Desk Study and current Site Investigation findings (see Appendix A Figure 5 - Updated Conceptual Site Model).

7.2 Sources of Potential Contamination / Hazards

Based on the currently available information from the site investigation the following potential on-site sources of contamination have been identified.

- Made Ground across the site up to 1.50m bgl comprising either, dark brown gravelly sandy Clay with varying inclusions of flint and brick fragments or gravelly Sand/sandy Gravel and identified to contain elevated concentrations of Lead (1,470mk/kg WS05 at 0.70m bgl), Arsenic (77mg/kg WS05 at 0.70m bgl), mercury (4.5mg/kg at WS05 at 0.70m bgl), Zinc (1,210mg/kg WS04 at 0.30m bgl) and Copper (449mg/kg WS01 at 0.30m bgl);

- Groundwater identified beneath the site at between 1.8m bgl and 2.13m bgl and impacted with elevated concentrations of Ammonia up to 1,540 ug/l (WS01), Total cyanide up to 141ug/l (WS01) and TPH up to 165 ug/l;

- The site's former industrial use, as a precision-engineering workshop the storage of oil drums; and

- Ground gases including methane, carbon dioxide and VOC;s.

Potential off-site sources of contamination have been identified and include:

- Gas works immediately adjacent to the west of the site 1871-1890, former Factory / Works 9m west of the site, a metal casting factory / foundry 126m from the site, Tanks 4m and a scrap yard 49m from the site.

7.3 Potential Receptors for Contamination / Hazards

The following potential receptors have been identified as requiring appraisal in the context of potential pollutant linkages:

- Proposed building (building fabric and garden areas);

- Future site users;
- Ground workers;
- Neighbouring sites;
- Controlled waters (Unproductive Aquifer, over Secondary Aquifer, over Principal Aquifer);
- Ecological receptors.

7.4 Potential Pathways

The following potential pathways have been considered in relation to the sources and receptors identified above:

- Inhalation;
- Ingestion;
- Direct contact;
- Dust migration;
- Permeable strata
- Percolation, infiltration and leaching;
- Groundwater and surface water migration; and
- Explosive Event.

7.5 Updated Qualitative Risk Assessment

An updated Qualitative Risk Assessment has been completed based on the findings of the SEC investigation and has been produced using all of the currently available information. It is based upon a source-pathway-receptor linkage model and is presented as Table 1 below. The terms adopted for severity of impact are – serious, moderate and negligible; for risk to the receptor; – high, medium and low. Full definitions are presented in Appendix F.

Should any further investigations be carried out then the additional information obtained should be used to refine the conceptual site model.

Table 1: Qualitative Risk Assessment

Sources of Potential Contamination	Receptor	Pathway	Severity of Impact	Probability of Exposure	Risk	Recommended Action (to clarify level of risk and/or assess suitable mitigation measures or to mitigate the risk)
On-site sources: Made Ground across the site up to 1.50m bgl comprising either, dark brown gravelly sandy Clay with varying inclusions of flint and brick fragments or gravelly Sand/sandy Gravel identified to contain elevated concentrations of Lead (1,470mk/kg WS05 at 0.70m bgl), Arsenic (77mg/kg WS05 at 0.70m bgl), mercury (4.5mg/kg at WS05 at 0.70m bgl), Zinc (1,210mg/kg WS04 at 0.30m bgl) and Copper (449mg/kg WS01 at 0.30m bgl)	Future site users Groundworkers Maintenance workers Neighbouring sites Controlled waters (Secondary Aquifer associated with the Taplow Gravel over Principal Aquifer associated with the Chalk) Proposed development (building fabric and garden areas) Ecological receptors	Inhalation Ingestion Direct contact Dust migration Permeable strata Percolation, infiltration and leaching Groundwater and surface water migration	Medium	Likely	Moderate	Made Ground was identified across the site up to 1.50m bgl. The Made Ground observed within the exploratory holes was noted to vary between sandy Clay and sandy Gravel/gravelly Sand. The gravelly Sand/sandy Gravel Made Ground within WS02 and WS03 to the southern area of the site did not appear to be impacted by contaminants of concern however, the sandy Clay Made Ground within WS01, WS04 and WS05 was identified to contain elevated concentrations of heavy metals including Lead, Arsenic, Mercury and phytotoxic metals including Zinc and Copper. Whilst the conduct of some further investigation would be prudent (following the clearance of the buildings to slab level to improve access across the site) to help delineate the extent of the impacted Clay Made Ground, it will be necessary to conduct remedial work to mitigate potential risks. Potential risks primarily relate to the proposed future residents associated with garden areas and in order to mitigate the risks a certified “clean” cover system is recommended in garden areas. The “clean” cover system should be provided to a minimum thickness of 600mm and be laid over a hi-visibility marker layer. Prior to importation of any topsoil / material to site, the supplier’s chemical batch data should be provided to an Environmental Consultant for approval in relation to human health. The cover system should be certified by an Environmental Consultant including representative validation sample analysis and confirmation

						of cover system thickness. Further groundwater level monitoring is also recommended to inform the need for a capillary break layer beneath the cover system, given the potential for shallower groundwater levels over the winter months than those recorded to date. Subject to existing and proposed site levels, it may be necessary to remove existing site soils in garden areas to accommodate the required cover system thickness. All waste disposal associated with the redevelopment of the site should be managed in accordance with the Environment Agency's current WM3 guidance. WAC analysis will be required if it is proposed to disposal to dispose of arisings to landfill. Where impacted Made Ground is located outside of the proposed garden areas it will be covered by hardstanding associated with the new buildings (the design of which is noted to include parking to the ground floor with habitable rooms at 1st floor level). The hardstanding would help cap the impacted Made Ground and therefore mitigate potential risks. Potential risks to groundworkers / site operatives should be mitigated by avoiding contact with soil and groundwater, not smoke, adopt high standards of personal hygiene and operate with due care whilst wearing appropriate PPE. Potential risks to groundwater are discussed below however, concentrations of cyanide were identified to be elevated in relation to the UK Drinking Water Standards and may have migrated down to the groundwater from the Made Ground although the highest concentration of total cyanide identified within the groundwater was 141ug/l (WS01) and the Drinking Water Standard is 50ug/l and given the absence of any proposals to abstract the groundwater on site for

						potable supply potential risks posed by the Made Ground are likely to be low. The proposed development will also cap the majority of the site in hardstanding and the cover system in garden areas will be likely to result in the removal of the highest chemical concentrations within the Made Ground in exposed areas which will help reduce risks to the groundwater further. Prior to the conduct of any remedial work a Remedial Method Statement written by an Environmental Consultant should be approved by the LPA. Additionally any remedial work undertaken should be documented within a Verification Report, also written by an Environmental Consultant. In relation to water supply pipework it is recommended for due diligence purposes at this early stage of the site assessment that it be assumed that chemically resistant barrier water supply pipe be provided to the new development. All waste arisings should be classified for disposal purposes in accordance with current Environment Agency WM3 guidance and waste arisings should be disposed of to a suitably licensed waste management facility. To help facilitate appropriate disposal it is recommended that waste arisings be segregated according to material type and waste classification and as such a watching brief during any groundwork by an Environmental Consultant would help to facilitate appropriate disposal.
On site sources: Groundwater identified beneath the site at between 1.8m bgl and 2.13m bgl and impacted with elevated	Proposed development fabric and garden areas) Future site users	Ingestion Direct contact Permeable Strata	Moderate	Unlikely	Low	The Groundwater was identified between 1.8m bgl and 2.13m bgl beneath the site and samples recovered from WS01 and WS05 were identified to contain slightly elevated concentrations of ammonia up to 1,540 ug/l and TPH up to 165 ug/l and total cyanide up to 141ug/l.

concentrations of Ammonia up to 1,540 ug/l (WS01), Total cyanide up to 141ug/l (WS01) and TPH up to 165 ug/l	Ground workers Maintenance workers Neighbouring sites Ecological Receptors Controlled Waters (Secondary Aquifer associated with the Taplow Gravel over Principal Aquifer associated with the Chalk)	Percolation, infiltration and leaching Groundwater and surface water migration				These contaminant concentrations may relate to the site and former activity on site but may also be indicative of the general groundwater chemical quality locally to the site given the historical nature of the local land use including a former Gas Works immediately adjacent to the west. The source of the ammonia could potentially relate to leaking foul drainage on site but may also relate to the adjacent former gas works. Similarly the concentrations of TPH identified may be symptomatic of leaks / spills on site but may also relate to the adjacent former gas works as may the cyanide identified in the groundwater. The concentrations recorded are noted to be elevated with respect to the UK Drinking Water Standards (2018) but it is not currently proposed to abstract the groundwater for potable supply on site and as such the fisk to future site users are likely to be low (vapour risks are to be discussed within the Ground Gas Risk Assessment Addendum). Risks to the Secondary Aquifer beneath the site is also considered to be low given the close proximity of the former gas works and that the groundwater quality beneath the site is likely to be indicative of the general groundwater quality locally to the site. Based upon the currently available data it would appear unlikely that groundwater remediation will be required as part of the redevelopment of the site residential purposes however the conduct of further groundwater monitoring would be prudent to confirm these initially favourable findings. At this early stage, the foundation design for the proposed development is unknown and therefore it is not known whether dewatering will be required. Given the depth of the groundwater recorded beneath the site to date, de-watering is perhaps unlikely however, if it is required, consideration of discharge consent to release water to the foul sewer or removal of groundwater to a licensed disposal facility via

						lorry tankers would be necessary. It is recommended that the existing groundwater monitoring boreholes be retained and protected until LPA approval for a remedial strategy has been confirmed, which does not require any further groundwater characterisation or remediation. To help mitigate potential risks to groundworkers / maintenance workers it is recommended that they avoid contact with soil and groundwater, not smoke, adopt high standards of personal hygiene and operate with due care whilst wearing appropriate PPE. Residual risks should be mitigated by the implementation of a Discovery Strategy during the development of the site which should include for the immediate reporting of any potential indicators of ground or water contamination e.g. asbestos fragments, ash or hydrocarbon odours for additional separate assessment by an Environmental Consultant.
On site sources: The site's former industrial use, as a precision-engineering workshop the storage of oil drums	Future site users Groundworkers Maintenance workers Neighbouring sites Controlled waters (Unproductive Aquifer) Proposed development (building fabric and garden areas)	Inhalation Ingestion Direct contact Dust migration Permeable strata Percolation, infiltration and leaching Groundwater and surface water migration	Medium	Likely	Moderate	Based upon the findings of the site investigation to date the site's former use does not appear to have caused major impact to the site. Some near surface impact, primarily relating to elevated soil concentrations of metals have been identified as discussed above but based upon the available data this would suggest remedial work would be limited to garden areas in relation to the provision of a 'clean' cover system. However, the potential exists for as yet unidentified contamination to exist between exploratory hole locations and as such some further site investigation may be prudent when the existing buildings have been removed to slab level.

	Ecological receptors					
On site sources: Ground gases including methane, carbon dioxide and VOC;s	Future site users Groundworkers Maintenance workers Neighbouring sites Controlled waters (Unproductive Aquifer) Proposed development (building fabric and garden areas) Ecological receptors	Inhalation Ingestion Direct contact Dust migration Permeable strata Percolation, infiltration and leaching Groundwater and surface water migration				It is recommended that the preliminary Ground Gas Risk Assessment be completed. However, for due diligence purposes it should be assumed that the design of the proposed development include ground gas protection measures consistent with Characteristic Situation 2 (CS2) of CIRIA C665 guidance given the close proximity to the site of the former gas works and given consideration of the site's former uses with the potential for organic contaminants (hydrocarbons and solvents) which could cause vapours and ground gases. Based on the BS:8485 guidance, the proposed development can be classed as a Type B building which corresponds with a private or commercial property with multiple occupancy small to medium sized rooms with passive ventilation and other internal spaces throughout ground floor and basement areas. It is recommended within BS 8485, that for a Type B building with CS2, 3.5 gas protection points are required as a minimum. For example, passive sub floor ventilation (e.g. clear void of formed using gravel) at a very good performance would be worth 2.5 points, and proprietary gas resistant hydrocarbon resistant membrane would be worth 1.0 point, generating the acceptable gas protection score of 3.5 points (however please refer to Tables 5, 6 and & of the BS 8485:2015 guidance for further details). Please note that all joints and penetrations should be appropriately sealed and that protective measures should be fitted appropriately in accordance with the manufacturer's specification and current guidance including BRE414 and BS8485. At an early design stage prior to construction a Verification Plan written by a ground gas specialist which details the gas protection materials' specifications, methodology of installation, installation design and the installers

						qualifications and experience should be submitted to the Regulators for their approval prior to installation of the protection measures to avoid proceeding at risk. An independent specialist should also validate the membrane installation and provide a guarantee / warranty for the installation. It is noted that part of the ground floor of each house provides under croft parking which helps to reduce gas risk to the properties but the internal spaces (entry hallway and store) to the ground floor should be afforded protection.
Off-site sources: Gas works immediately adjacent to the west of the site 1871-1890, former Factory / Works 9m west of the site, a metal casting factory / foundry 126m from the site, Tanks 4m and a scrap yard 49m from the site.	Future site users Ground workers Maintenance workers Proposed building (fabric and garden areas) Ecological receptors	Inhalation Ingestion Direct contact Dust migration Permeable strata Percolation, infiltration and leaching Groundwater and surface water migration	Medium	Low	Low / Moderate	Based upon the findings of this current Site Investigation there may have been some impact to the site associated with the off-site sources identified, notably the former gas works to the west although based upon the available data it would be difficult to determine with complete certainty that the source of the impact identified does not relate to the former site use. Nevertheless potential risks should be mitigated by the provision of ground gas protection measures within the proposed developments, the provision of a 'clean' cover system across all garden areas and the inclusion of chemically resistant barrier water supply pipework as discussed above. Residual risks should be mitigated by the implementation of a Discovery Strategy during the redevelopment of the site that groundworkers should work in well ventilated areas, avoid confined spaces, avoid contact with soil and groundwater, not smoke, adopt high standards of personal hygiene and operate with due care whilst wearing appropriate PPE / RPE during all excavation works.

8.0 Conclusions and Recommendations

A review of the Site Investigation data has been undertaken in the context of the previously established environmental sensitivity and a qualitative risk assessment has been conducted based on our understanding from the Client that the site's proposed development involves conversion of the site to residential properties with garden areas.

Should the existing or proposed usage change or additional information be obtained then a re-assessment of the potential risks associated with the site will be required.

The following recommendations have been made based on the findings of this assessment and given consideration of the proposed residential end use:

- That some further investigation be conducted following the clearance of the buildings to slab level to improve access across the site in order to help delineate the extent of the metals impacted Clay Made Ground and confirm the absence of unidentified contamination between exploratory holes locations. However, based upon the available data it will be necessary to conduct remedial work in the proposed garden areas to mitigate potential risks associated with the impacted Made Ground identified. Accordingly, a certified "clean" cover system is recommended in the proposed garden areas which should comprise imported "clean" topsoil provided to a minimum thickness of 600mm laid over a hi-visibility marker layer. Prior to importation of any topsoil to site, the supplier's chemical batch data should be provided to an Environmental Consultant for approval in relation to human health. The cover system should also be certified by an Environmental Consultant including representative validation sample analysis and confirmation of cover system thickness;
- That subject to existing and proposed site levels, it may be necessary to remove existing site soils in garden areas to accommodate the required cover system thickness. All waste disposal associated with the redevelopment of the site should be managed in accordance with the Environment Agency's current WM3 guidance. WAC analysis will be required if it is proposed to disposal to dispose of arisings to landfill;
- That remedial excavation to remove impacted Made Ground in areas that are to be capped by hardstanding associated with the proposed development are not considered to require remediation based on the current data given that the hardstanding will effectively break potential exposure pathways;
- That further groundwater level monitoring be conducted to inform the need for a capillary break layer beneath the cover system given the potential for shallower groundwater levels over the winter months than those recorded to date. Additionally further confirmatory groundwater monitoring should be conducted to confirm the initially favourable findings which suggest that groundwater remediation is unlikely to be required;
- That the preliminary Ground Gas Risk Assessment be completed and reported within a Ground Gas Addendum but for due diligence purposes it is recommended that it should be assumed that the design of the proposed development include ground gas protection measures consistent with Characteristic Situation 2 (CS2) of CIRIA C665 guidance given the close proximity to the site of the

former gas works and given consideration of the site's former uses with the potential for organic contaminants (hydrocarbons and solvents) which could cause vapours and ground gases. Based on the BS:8485 guidance, the proposed development can be classed as a Type B building which corresponds with a private or commercial property with multiple occupancy small to medium sized rooms with passive ventilation and other internal spaces throughout ground floor and basement areas. It is recommended within BS 8485, that for a Type B building with CS2, 3.5 gas protection points are required as a minimum. For example, passive sub floor ventilation (e.g. clear void of formed using gravel) at a very good performance would be worth 2.5 points, and proprietary gas resistant hydrocarbon resistant membrane would be worth 1.0 point, generating the acceptable gas protection score of 3.5 points (however please refer to Tables 5, 6 and & of the BS 8485:2015 guidance for further details). Please note that all joints and penetrations should be appropriately sealed and that protective measures should be fitted appropriately in accordance with the manufacturer's specification and current guidance including BRE414 and BS8485. At an early design stage prior to construction a Verification Plan written by a ground gas specialist which details the gas protection materials' specifications, methodology of installation, installation design and the installers qualifications and experience should be submitted to the Regulators for their approval prior to installation of the protection measures to avoid proceeding at risk. An independent specialist should also validate the membrane installation and provide a guarantee / warranty for the installation.

- That it would appear unlikely that dewatering of excavations will be required on site given the apparent depth of the groundwater (~1.8m bgl) however if it is required, consideration of discharge consent to release water to the foul sewer or removal of groundwater to a licensed disposal facility via lorry tankers would be necessary;
- That the existing groundwater and ground gas monitoring boreholes be protected and retained until the LPA have approved a Remedial Method Statement under planning;
- That a Discovery Strategy be implemented on site during the development of the site which should include for the immediate reporting of any potential indicators of ground or water contamination e.g. asbestos fragments, ash or hydrocarbon odours for additional separate assessment by an Environmental Consultant;
- That groundworkers / site operatives avoid contact with soil and groundwater, not smoke, adopt high standards of personal hygiene and operate with due care whilst wearing appropriate PPE;
- That the design of the proposed houses include for water supply pipework that is chemically resistant barrier water supply pipe;
- That prior to the conduct of any remedial work a Remedial Method Statement written by an Environmental Consultant should be approved by the LPA. Additionally, any remedial work undertaken should be documented within a Verification Report, also written by an Environmental Consultant.

<u>General Recommendations</u>

In addition to the above recommendations, any discharges from the site should be appropriately consented by the Environment Agency.

The findings of this assessment are based upon SEC's current understanding of the site. Should circumstances change then the Risk Assessment should be revisited by an Environmental Consultant. The recommendations made above are subject to regulatory approval.

An ecological survey, an asbestos survey, a topographical survey, and a flood risk assessment of the site were beyond the scope of this report.

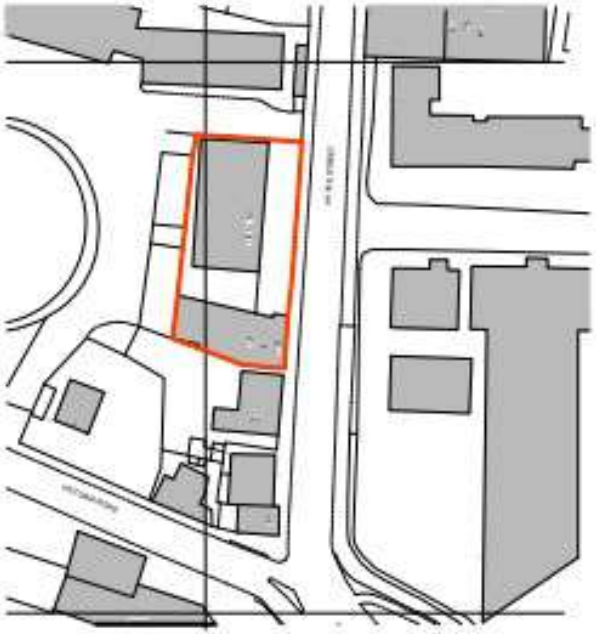
9.0 General Limitations and Exceptions

1. The advice given in this report with respect to contaminated land / pollution is based on the guidelines available at the time of writing.
2. The Client is advised that the conditions observed on site by SEC at the time of the investigation or assessment are subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance or investigation and they may subsequently have become observable.
3. Comments made relating to land gas or groundwater conditions are based on observations made at the time of an investigation unless otherwise stated. However, land gas or groundwater conditions may vary as a result of seasonal or other effects.
4. Ground contamination often exists as small discrete areas of contamination and there can be no certainty that any or all such areas have been located, sampled and / or identified.
5. Whilst commonly regarded as one of the most reliable drilling techniques, cable percussive drilling may result in a certain amount of soil mixing.
6. This assessment may be subject to amendment in light of additional information becoming available.
7. The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from 1) previous site investigations and 2) chemical testing laboratories, and which SEC has assumed are correct. Nevertheless, SEC cannot and does not guarantee the authenticity or reliability of the information it has relied upon. SEC can accept no responsibility for inaccuracies within the data supplied by other parties.
8. This report is written in the context of an agreed scope of work between SEC and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the assessment or report in whole or part may be necessary after its original submission.
9. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.
10. SEC believes that providing information about limitations is essential to help the Client identify and thereby manage risks.
11. The copyright of written materials supplied shall remain the property of SEC but with a royalty free perpetual licence, granted to the Client on payment in full of any outstanding monies.
12. SEC does not provide legal advice and the advice of the Clients legal advisors may also be required.
13. The use of data generated by this site investigation for the design of foundations or geo-technical assessment was outside the scope of this report.
14. An ecological, topographical or asbestos survey was outside of the scope of this report.
15. SEC notes that all recommendations made within our report are subject to regulatory approval and should be agreed with them prior to the conduct of any further site investigation, remediation or development works.
16. This report represents a stage in an iterative process of investigation and assessment and as such it is possible that further work may be recommended.
17. The report is issued on the condition that SEC will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the boreholes or trial pits which have not been shown by the borehole, trial pits or other tests carried out during the investigation.

18. In addition, SEC will not be liable for any loss whatsoever arising directly or indirectly from any opinion given on the possible configuration of strata both between the borehole and/or trial pit positions and/or below the maximum depth of the investigation. Such opinions, where given, are for guidance only.
19. No allowance has been made in this report for testing which may be required for waste categorisation prior to the removal of any material from site for disposal.
20. No person other than the client to whom this report is addressed, shall rely on it in any respect and no duty of care shall be owed to any such third party.
21. That this investigation has relied on information from a discrete number of exploratory hole locations and allowances should be made for the variation in ground conditions between these locations and within the site boundary.
22. The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between or beyond borehole positions, these are only for guidance only and no liability can be accepted for their accuracy.
23. It should be noted that the Made Ground depth recorded above is that encountered within the exploratory holes undertaken during the phase of work to which this report pertains. Owing to the variable nature and unknown deposition criteria of Made Ground it is possible that deeper or more extensive areas of Made Ground may exist at this site which has not been revealed by the current work. SEC can only comment on the findings within the exploratory holes conducted and cannot be held liable for variation of ground conditions between exploratory hole.

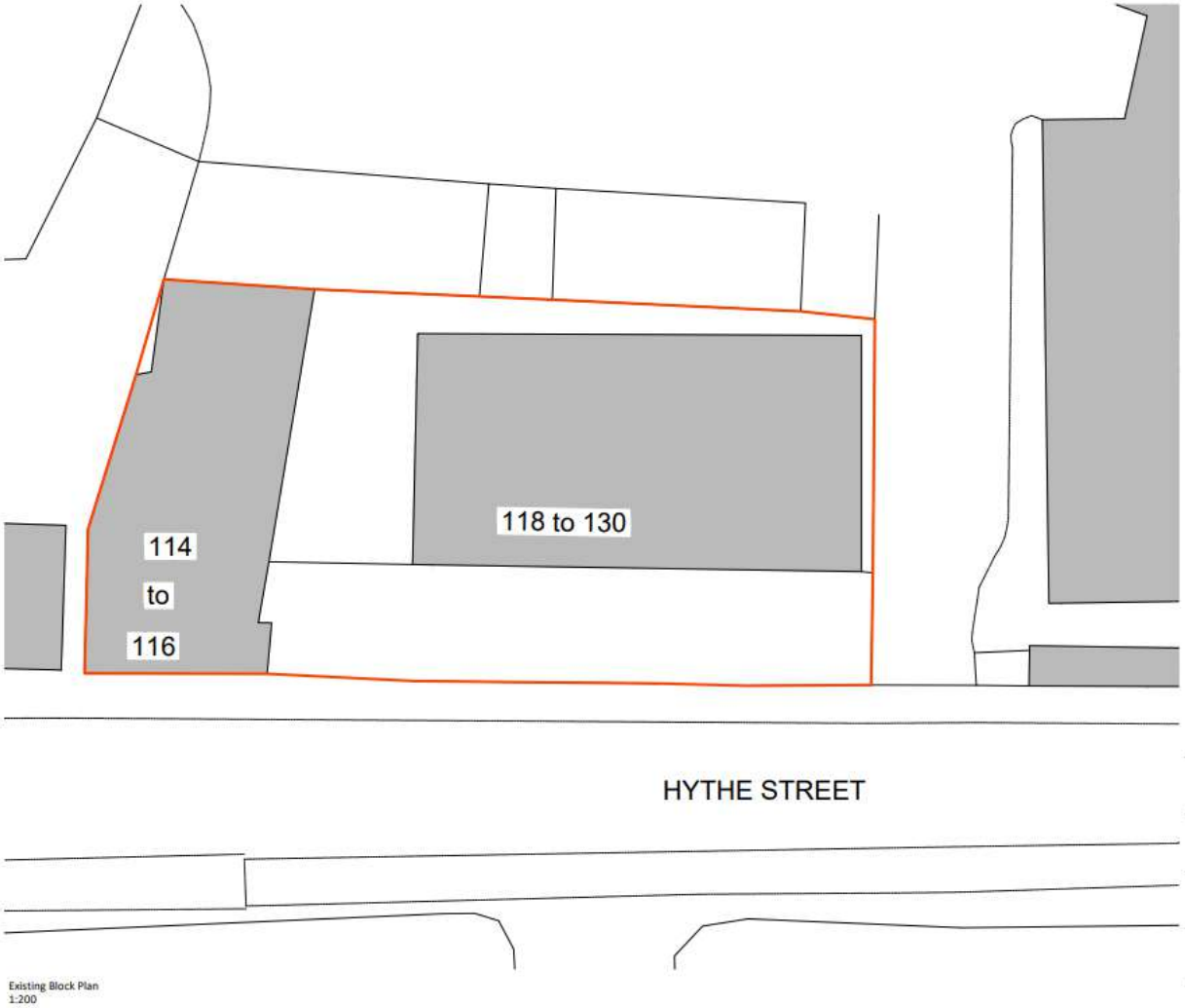
Appendix A

Figures



Site Location Plan
1:1250

SITE: 114-130 Lower Hythe Street, Dartford, DA1 1BN	SCALE: NTS	JOB NO: 5477	SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Site Location Plan	REV: 01	FIGURE NO: 1	



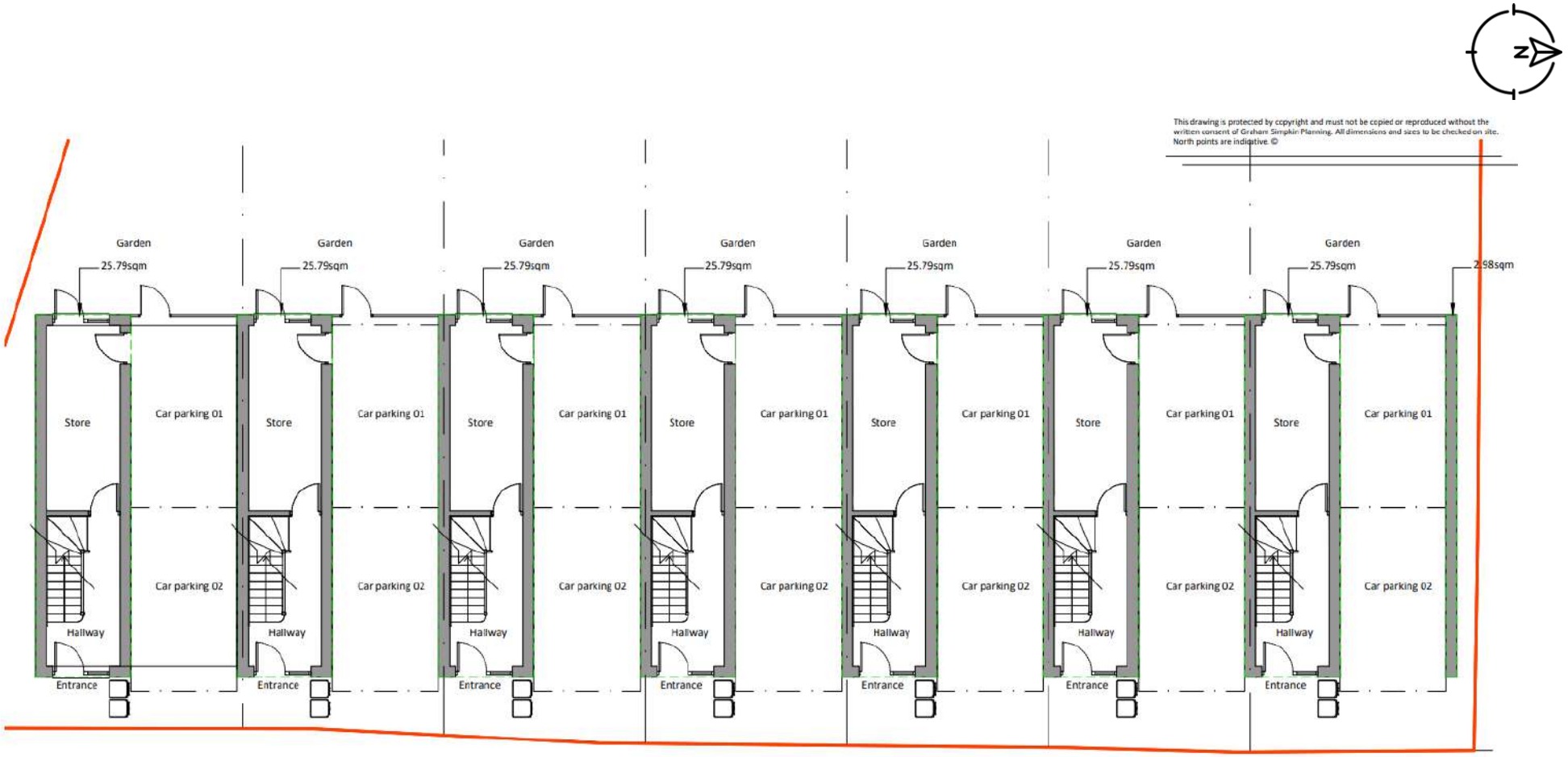
Existing Block Plan
1:200

Graham Simpkin Planning
2 The Parade, Ash Road, Hartley
Longfield, Kent DA3 8BG
Tel: 01474 703705
www.grahamsimpkinplanning.co.uk
Email: webmail@grahamsimpkinplanning.co.uk

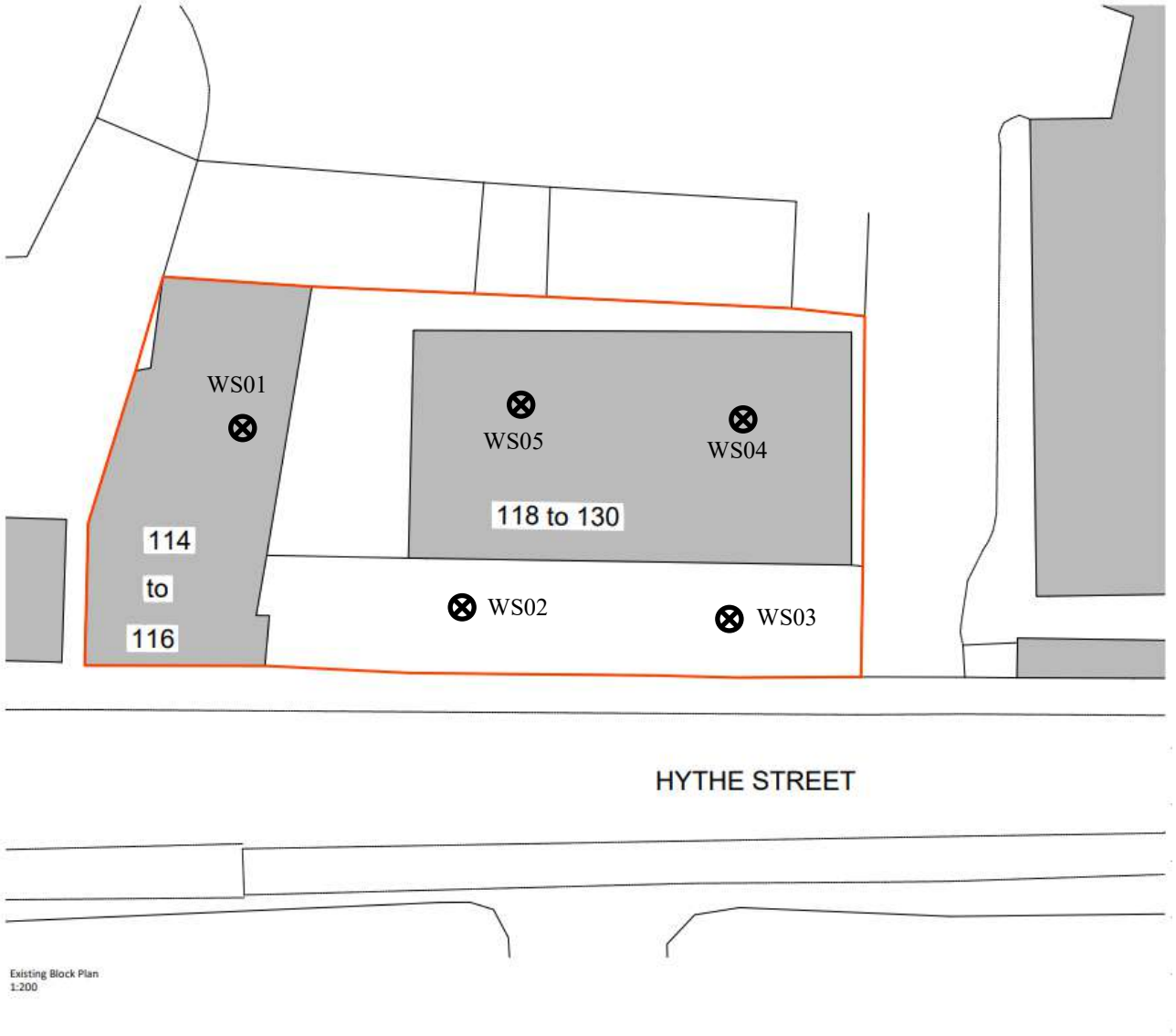
Project Title: 114-130 Lower Hythe Street, Dartford, DA1 1BN			Job No: 3816
Drawing Title: Existing Block Plan	Drawing No: 02		Revision: -
Date: 15.03.2023	Drawn by: MS		Checked by: PN
Scale: 1:200 @ A3	Note		

0 2 4 6 8 10 12
1:200 metres

SITE: 114-130 Lower Hythe Street, Dartford, DA1 1BN	SCALE: NTS	JOB NO: 5477	SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Existing Site Layout Plan	REV: 01	FIGURE NO: 2	



SITE: 114-130 Lower Hythe Street, Dartford, DA1 1BN	SCALE: NTS	JOB NO: 5477	SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Proposed Site Layout Plan	REV: 01	FIGURE NO: 3	



SITE: 114-130 Lower Hythe Street, Dartford, DA1 1BN	SCALE: NTS	JOB NO: 5477	SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Exploratory Hole Location Plan	REV: 01	FIGURE NO: 4	

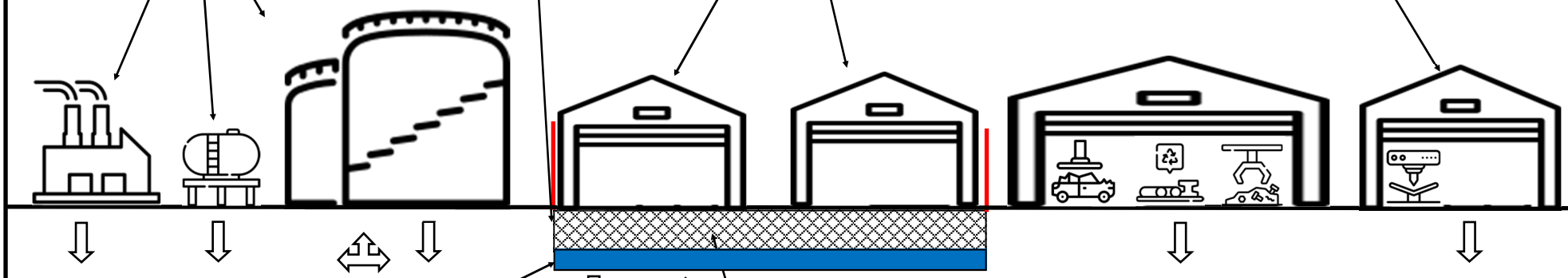
W **Site boundary in RED** E

Offsite: Gas works immediately adjacent to the west of the site 1871-1890, Tanks 4m, former Factory / Works 9m west of the site

On site: Potential for elevated ground gas concentrations

On site: The site's former industrial use, as a precision-engineering workshop the storage of oil drums

Offsite: a metal casting factory / foundry 126m from the site and a scrap yard 49m from the site



On site: Groundwater identified beneath the site at between 1.8m bgl and 2.13m bgl and impacted with elevated concentrations of Ammonia up to 1,540 ug/l (WS01), Total cyanide up to 141ug/l (WS01) and TPH up to 165 ug/

Inferred local groundwater gradient is noted to be to the south

Key

- Ground Level
- Potential migration of contaminants
- Made Ground
- Inferred groundwater gradient
- Potential ground gas migration

On site: Made Ground across the site up to 1.50m bgl comprising either, dark brown gravelly sandy Clay with varying inclusions of flint and brick fragments or gravelly Sand/sandy Gravel and identified to contain elevated concentrations of Lead (1,470mk/kg WS05 at 0.70m bgl), Arsenic (77mg/kg WS05 at 0.70m bgl), mercury (4.5mg/kg at WS05 at 0.70m bgl), Zinc (1,210mg/kg WS04 at 0.30m bgl) and Copper (449mg/kg WS01 at 0.30m bgl)

Geology: Solid bedrock geology comprising Lewes Nodular Chalk Formation and Seaford Chalk Formation (Chalk) with no overlying superficial deposits comprising Alluvium superficial deposits.

SITE: 114-130 Lower Hythe Street, Dartford, DA1 1BN	SCALE: NTS	JOB NO: 5477	SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Updated Conceptual Site Model	REV: 01	FIGURE NO: 5	

Appendix B

Site Photos

Photo 1 – Showing the front of the site (118-130 Hythe Street)

Photo 2 – Showing the other building located on site (114-116 Hythe Street)

Photo 3 – Showing the concrete track between the 2 buildings

Photo 4 – Showing inside the building (118-130 Hythe Street)

Photo 5 – Showing inside the building (114-116 Hythe Street)

Photo 6 – Showing the rig set up at WS01

Photo 7 – Showing the UXO Detection Engineer clearing the borehole

Photos 8 – Showing the soil arisings from the hand dug safety starter pit

Photo 9 – Showing core samples taken from 1-3m bgl

Photos 10 – Showing soil samples taken from WS01

Photo 11 – Showing the borehole installed with monitoring wells and borehole cover

Appendix C

Preliminary UXO
Risk Assessment
and Service Plans

Pre-Desk Study Assessment

Site:	114-130 Lower Hythe Street, Dartford, Kent
Client:	Sevenoaks Environmental Consultancy
Contact:	Tobias Ing
Date:	31st July 2023
Pre-WWI Military Activity on or Affecting the Site	None identified.
WWI Military Activity on or Affecting the Site	None identified.
WWI Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing, and chemical and engineering works. ■ Royal Flying Corps (RFC) Joyce Green. ■ Anti-Aircraft (AA) defences.
WWI Bombing	None identified on the Site.
Interwar Military Activity on or Affecting the Site	None identified.
WWII Military Activity on or Affecting the Site	None identified.
WWII Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing, and chemical and engineering works. ■ Military barracks, camps, depots, and training areas. ■ AA and anti-invasion defences.
WWII Bombing Decoys (within 5km of Site)	None.
WWII Bombing	During WWII the Site was located in the Municipal Borough (MB) of Dartford, which officially recorded 566No. High Explosive (HE) bombs with a bombing density of 133.7 bombs per 405 hectares (ha). Readily available records have been found to indicate that several HE bombs fell in close proximity to the Site.
Post-WWII Military Activity on or Affecting the Site	None identified.
Recommendation	It is recommended that a detailed desk study is commissioned to assess, and potentially zone, the Unexploded Ordnance (UXO) hazard level on the Site.
Further information	For information about Zetica's detailed UXO desk studies and other UXO services, please visit our website: www.zeticauxo.com. Details and downloadable resources covering the most common sources of UXO hazard affecting sites in the UK can be found **here**. If you have any further queries, please don't hesitate to get in contact with us at uxo@zetica.com or 01993 886 682.

This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary.

It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.

From: Plantenquiries - CA Telecom <plantenquiries@catelecomuk.com>
Sent: 01 August 2023 17:28
To: Utility Solutions GDC Requests
Subject: RE: Plant Enquiry - 208638 - Site off Hythe Street, Dartford - Please respond by 10/08/2023

Please Note: Our search criteria has changed. We previously searched for Colt Network which was within 200 metres, this has now changed to 50 metres. The negative response will be for all enquiries that the network is 50 metres or more away from the place of enquiry.

Dear Sir/Madam,

Thank you for your enquiry for the above reference.

We can confirm that Colt Technology Services do not have apparatus near the above location as presented on your submitted plan, if any development or scheme amendments fall outside the 50 metre perimeter new plans must be submitted for review.

Search is based on Overseeing Organisation Agent data supplied; we do not accept responsibility for O.O. Agent inaccurate data.

If we can be of any further assistance please do not hesitate to contact us.

Kind regards,

Plant Enquiry Team

Please consider the environment before printing this email.

From: Utility Solutions Orders <requests.utilitysolutions@atkinsglobal.com>
Sent: 01 August 2023 07:13

You recently requested information pertaining to the above location and in relation to CityFibre Holdings Ltd plant.

Reference be897ddb-3d0b-42fd-8d21-64f1950f5caf

User: User

Title: 208638

Comment: 20230802021918643

Please find attached a plan of the area of your interest that may contain plant which may be affected by your proposed works.

The validity of this response is 6 weeks, after such time a new enquiry would need to be made.

Please see the points of contact below if they are required:

Plant Enquiries

Rutherford House

Birchwood Park

Warrington

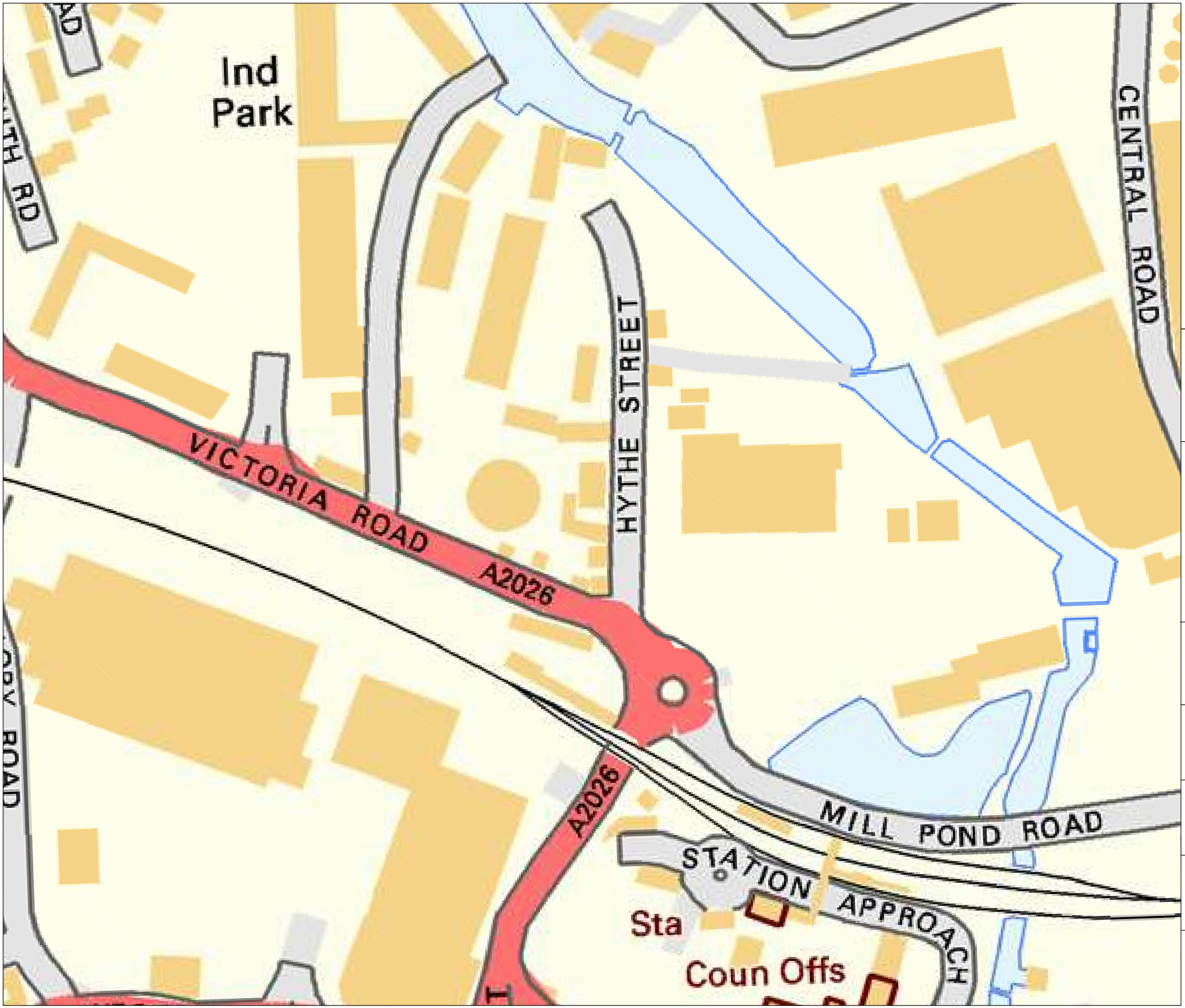
WA3 6ZH

asset.team@cityfibre.com

Please quote the Reference ID in the subject line in any correspondence.

_____

[CityFibre]<https://urldefense.com/v3/__https://cityfibre.com/__;!!OepYZ6Q!8GwIMhtvLKm2BILDxqkuPCZW5h4tSNwn43Ma13d4kZE8dv_f4ZOduRpJQNmxKzvX4UWQEKhvnGTozAgWqzE2S-mSBg2vTOd2lC4ev0lZ_ltISXvd7A$ >



bitmap_layout select_raster

LEGEND

EXISTING PLANT

EXISTING PLANT

bitmap_layout select_raster

Head Office
CityFibre Holdings Ltd
15 Bedford Street,
London,
WC2E 9HE

Tel: 0845 293 0774
Web: www.cityfibre.com

Asset Office
CityFibre Holdings Ltd,
Rutherford House,
Birchwood,
Warrington,
WA3 6ZH

Email: asset.team@cityfibre.com

Project

Plant Enquiry

Drawing

Existing Plant

Drawn by:

smallworld

Date: 02/08/2023

Drawing No.

CFH_EP_000001

Revision

001

Scale: 1:2500

A4

0m 20m 40m 60m 80m 100m

N

From: Networks Enquiries <assetenquiries@eclipsepower.co.uk>
Sent: 01 August 2023 13:25
To: Utility Solutions GDC Requests
Subject: RE: Plant Enquiry - 208638 - Site off Hythe Street, Dartford - Please respond by 10/08/2023

Dear Sir/ Madam,

Thank you for your email. I can confirm that we have no present projects in the illustrated area as demonstrated in your email.

This response is valid for 3 months, after this time has commenced, we request you submit another email demonstrating the location of your plans.

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

Kindest regards,
Harry Constantine
Eclipse Power
Office: +44 (0) 1234 486487
www.eclipsepower.co.uk
https://www.linkedin.com/company/eclipse-power-networks

From: Utility Solutions Orders <requests.utilitysolutions@atkinsglobal.com>
Sent: Tuesday, August 1, 2023 7:13 AM
To: Networks Enquiries <assetenquiries@eclipsepower.co.uk>
Subject: Plant Enquiry - 208638 - Site off Hythe Street, Dartford - Please respond by 10/08/2023

From: esp@safedigs.co.uk
Sent: 01 August 2023 11:17
To: Utility Solutions Searches
Subject: ESP Utilities Group Plant Affected Notice LSBUD Ref. 30352943
Attachments: ESPE1101_1 AsLaid.PDF; Guidelines when working in vicinity of electricity cables July 2016.pdf

01/08/2023

LinesearchbeforeUdig Ref: 30352943
Your Ref: LM 208638/KaY

Dear Sir/Madam,

Further to your enquiry received on 01/08/2023 05:44:12 AM please find attached the ESP Utilities Group (ESP) response to your enquiry.

If your proposed work site was found to be in the vicinity of ESP plant, project drawing as laid extracts for these sites are enclosed (not to scale) for your information which show the approximate location of the ESP gas/electric network close to the area of interest.

As your plans for the proposed work develop you are required to keep ESP regularly updated about the extent and nature of your proposed works in order for us to fully establish whether any additional precautionary or diversionary works are necessary to protect our gas network.

Arrangements can be set in place so that one of our representatives can meet on site (date to be agreed) and we will be happy to discuss the impact of your proposals on the gas network once we have received the details.

ESP are continually constructing new gas and electricity networks and this notification is valid for 90 days from the date of this letter. If your proposed works start after this period of time, please re-submit your linesearchbeforeUdig enquiry.

The attached files are in PDF format, to view them you will need Adobe Acrobat Reader(R). You can download it free of charge from
https://urldefense.com/v3/__http://get.adobe.com/reader__;!!OepYZ6Q!6ojN9UtCopv2FcLp248KRI6VnUOsChlF1m_7_EGwlLwOr_nhjzDcyscHMna31zhfKYHhArDkr9mwSCOZHB2YaGX3KV8K8D0$

Yours sincerely,

ESP Utilities Group Ltd

ESP Utilities Group Ltd can be contacted at:

Office Address: Bluebird House, Mole Business Park, Leatherhead, Surrey, KT22 7BA

Office Tel: 01372 587500; email: PlantResponses@espug.com

1:100

UK Power Networks / Esp Electricity requires 24/7 unrestricted access to substation. Unimpeded access to be provided from adopted high way to substation position

Hardstanding area around the substation

Hardstanding area in front of the substation

1300

1000

6 xRemovable Bollard for UKPN/ESPE access

BLOCK E

SPACE 1

STAIRS

INCOMING SERVICES

2 x 185mm² Al Waveform 4c

A A

B B

SL11

Transition Joint 1

Transition Joint 2

TBS2 @240KVA, 3ph
400A Heavy Duty Cut Out

MBJ1

1x 185mm² Al Waveform 3c, 8m

2 x 185mm² Al Waveform 4c

11000

8000

1000

2x Potends

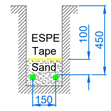
128

129

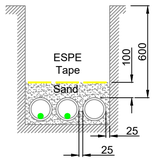
127

Site Layout and Cable Routes

1:20 A-A Foot Way



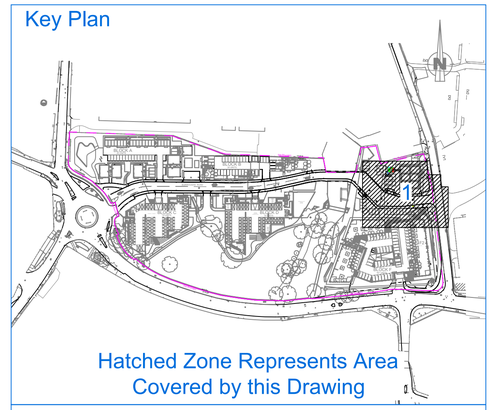
B-B Road Crossing



Excavation, installation of ducting/warning tape and reinstatement will be carried out in accordance with the ESP G81 and NRSWA requirements.
Service cable sections apply to all relevant service cable areas

Trench Cross Sections

Key Plan



Hatched Zone Represents Area Covered by this Drawing

Site Address: Mill Pond Road, Dartford, Kent, DA1 5FY

Cable Installation Data

Cable Type	Max Pulling Tension	Minimum Bending Radius (On Route)	Minimum Duct Size
185mm² Al Waveform 3c	7000N	800mm	125mm
185mm² Al Waveform 4c	7000N	800mm	125mm

Cable Data

Legend

	LV Breech Joint
	New LV Cable
	Straight Joint
	Site Boundary
	Earthing Rod

REV	AMENDMENT	DATE	BY
3	185/95MBJ outside Block D	20/12/18	GMN
2	Block F2 - Gym connected	10/07/18	CH
1	Joints outside Blocks C1 & C2	27/04/18	CH

UKPS
UK POWER SOLUTIONS
The Utility Connection Company
River View House
Bonds Mill Estate
Stonehouse
Gloucestershire
GL10 3RF

Client: Weston Homes PLC

Project: Mill Pond Road

Title: As Laid Plan - LV

Planning Engineer: Jesus Garcia	Contact No.: 0845 257 7105
Project Manager: TBC	Contact No: TBC

Drawn By: GJ	Checked By: AF	Date: 16/08/16
Scale: As Shown	Sheet No.: 1/2	Original Size: A1

Drawing No.: UKP4028 - DWG901 | Rev: 3

Drawing Status: As Laid

1:100

Block A3
10 Way MSDB
7 x Apartments/Flats @2kVA
1 x Landlord Supply @5kVA
Total: 19kVA

Block A1 (4)
10 Way MSDB
8 x Apartments/Flats @2kVA
Total: 16kVA

SL4

BURROUGHS ROAD

UNDERGROUND DUCTING

185mm² Waveform 4C

2000

3500

185mm² Waveform Low Smoke

1000

500

SL1

VISITOR CYCLE PARKING (6)

BIN STORE
(9 EB's & 3 Glass)

LIFT

STAIR CORE

SERVICES

Block C2
24 Way 2J MSDB & 15 Way 1J MSDB
35 x Apartments/Flats @2kVA
1 x Landlord Supply @10kVA
Total: 80kVA

BLOCK C
79 UNITS

CARPARK - 51 SPACES

BIN STORE
(12 EB's & 3 Glass)

STAIR CORE

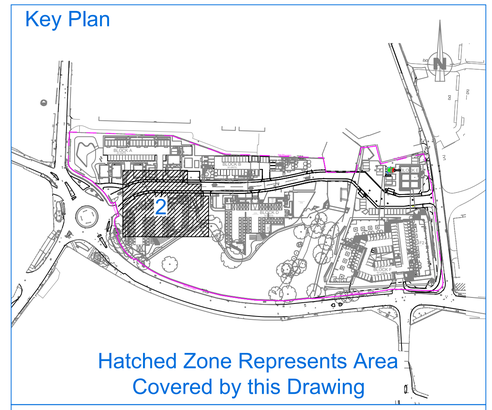
LIFT

SERVICES

Block C1
24 Way 2J MSDB & 24 Way 1J MSDB
44 x Apartments/Flats @2kVA
Total: 88kVA

Site Layout and Cable Routes

Key Plan



Hatched Zone Represents Area Covered by this Drawing

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Cable Installation Data

Cable Type	Max Pulling Tension	Minimum Bending Radius (On Route)	Minimum Duct Size
185mm² Al Waveform 3c	7000N	800mm	125mm
185mm² Al Waveform 4c	7000N	800mm	125mm

Cable Data

Legend

	LV Breech Joint
	New LV Cable
	Straight Joint
	Site Boundary
	Earthing Rod

REV	AMENDMENT	DATE	BY
3	185/95MBJ outside Block D	20/12/18	GMN
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Planning Engineer: Jesus Garcia	Contact No.: 0845 257 7105
Project Manager: TBC	Contact No: TBC

Drawn By: GJ	Checked By: AF	Date: 16/08/16
Scale: As Shown	Sheet No.: 2/2	Original Size: A1

Drawing No.: UKP4028 - DWG901 | Rev: 3

Drawing Status: As Laid

PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK IN THE VICINITY OF ELECTRICITY CABLES

ADVICE TO SITE PERSONNEL

MANAGEMENT NOTE

Please ensure that a copy of this note is read by your site management and to your site operatives.

Early consultation with ESP Utilities Group prior to excavation is recommended to obtain the location of plant and precautions to be taken when working nearby.

This Guidance Note should be read in conjunction with the Health and Safety Executive guidance HSG47 "Avoiding danger from underground services".

1.0 Introduction

This procedure should be read in conjunction with the ESP Electricity Distribution Safety Rules and other relevant procedures.
The object of this procedure is:

a) To lay down the rules for the location of cable before work is started.

b) To specify the safe working procedure to be adopted by persons who have to work on or in the vicinity of cables.

2.0 Reference

ESP Electricity G81 – Design and Planning
ESP Electricity G81 – Installation and Records
National Joint Utilities Group (NJUG) Guidance Notes
Avoiding danger from underground services HSG47 HSE Advice Booklet.

3.0 Work

3.1 All cables and apparatus to which the cables are connected shall be treated as being live, until they have been proved dead and all points of isolation have been establish and controlled.

3.2 All work carried out under this procedure shall also be carried out in strict accordance with the ESP Electricity Distribution Safety Rules and other relevant procedures.

3.3 For the purpose of this procedure:

a) Work on a cable includes the intentional cutting or removal of its Sheath or Armour, cutting of its core(s) or conductor(s) and the removal of a spiking gun.

b) Work in the vicinity of a cable includes digging or any activity carried out at any work location where cables are or may be present, whether or not for the specific purpose of preparation for work on a cable.

4.0 Cable Locating Devices

4.1 An approved cable locating device is to be used on every occasion before any surface is removed or any digging is started. It must also be used during the course of any digging work.

4.2 Cable location devices provide information on the position of cables. They must not be used as the only means of cable location.

4.3 Cable locating devices must be regularly checked for correct operation.

All persons using cable locating devices must be adequately trained in their use and must be Competent Persons.

5.0 Location of Cables

5.1 The depth of underground cables varies greatly. It is essential that a site specific risk assessment is undertaken for the proposed work you are planning this must include obtaining an up-to-date map of the electricity cables in the area and to make use of it. The electricity cable records must be checked before any work is started. Changes in surface level or reference points, and work carried out by other people may affect the reliability of these records. Anybody excavating must be told of these possibilities.

5.2 Before the start of any excavation work, a cable locating device shall be used to establish the run of live cables. Reasonable steps should be taken to establish the runs of cables both along and across the length of the intended area of digging. The cable avoidance tool shall be used together with mains records and where provided, service records.

5.3 All cable runs either confirmed by use of the cable locating device or indicated on the mains records must be marked out on the surface using a waterproof marker. Marked cable runs must be extended 300mm beyond either end or side of the intended digging area, and must stay visible while the digging is going on. The trial hole dig method can be used to identify the run of cables using hand dig tools only.

6.0 Precautions to be Taken while Working in Vicinity of Cables

6.1 Work in the vicinity of cables must be carried out as if the cables are live and all excavation work must be personally supervised by a Competent Person. All persons shall wear a minimum of safety footwear, Safety Glasses, hard hat, Task Specific Gloves flame retardant overalls.

6.2 Approved hand tools should always be used in preference to power tools in the vicinity of cables, unless site conditions make this impracticable. Spades should always be used in preference to forks. Extreme care must always be taken when using a fork or pick. Forks must be of approved type with shortened chisel ended tines. Spades must have sharp corners of the blade rounded. The selection of a fork or pick will be assessed on a Task Specific Risk Assessment.

6.3 A proprietary air digging tool, which removes oil with a high-velocity jet of air, can be used to expose buried services without damage to the service. However, it will not penetrate asphalt, concrete or frozen ground. Also precautions need to be taken that will prevent injury to the operator and members of the public from ejected soil and other materials.

6.4 When site conditions require the use of hand held power tools they must be fitted with a short bit. The following method of work must be used:

a) Using all the information provided, together with an approved cable locating device, the line of all know cables must be marked out at least 300mm past the hole that will be dug using waterproof marker.

b) Encroachment lines must be drawn 300mm parallel to and away from the outer and innermost cable marker lines. And as in (a) above these must be drawn to extend at least 300mm beyond the edge of the hole that will be dug.

c) Hand held power tools must not be used below ground level in between the encroachment lines. Hand tools must be used for progressive and careful undermining from outside the encroachment lines towards the cable(s). Hand power tools must only be used to break up any hard surface, keeping pace with, but not going past the undermining. Extreme care must, in particular, be exercised when using power tools above cables already exposed by undermining. The use of power tools must stop if at any time the cutting rate quickens, indicating softer ground. At all times, attention must be paid to the cable run marker lines outside the edges of the holes.

d) The safe digging procedure in (c) above must be followed until all cable(s) required for work or for identification have been located.

e) If all recorded or detected cables inside the digging area have been located then hand held power tools may be used below ground level to break up concrete or similar structures, but even then only when site conditions render the use of hand tools impractical.

6.5 During excavation, full use must be made of cable locating devices which must be used to assist in establishing the exact location of live cables.

6.6 Where exposed cables are likely to be damaged in any way they shall be adequately protected and/or supported. Where in the opinion of the person in charge on site it is appropriate, warning notices must be attached to cables e.g. 'live cable exposed above ground level' or 'live coiled cables'.

6.7 Irrespective of the color of the electricity cable it shall be considered as being in a 'live' status unless it has been confirmed and proven that the cable has been physically isolated or turned off.

If damage is caused or suspected the following action should be taken at once:

- Remove all personnel from the immediate vicinity
- Contact ESP Electricity 01372 587500 or out of hours Emergency contact Number 0800 731 6945
- Prevent any approach by the public.
- Assist electricity personnel, Police or Fire Service as requested.

REMEMBER – IF IN DOUBT; SEEK ADVICE FROM ESP Utilities Group.

ESP Utilities Group can be contacted at:

Office Address: Bluebird House, Mole Business Park, Leatherhead, Surrey, KT22 7BA

Office Tel: 01372 587 500**; Fax:** 01372 377996

From: plantenquiryservice@gtc-uk.co.uk
Sent: 01 August 2023 11:10
To: Utility Solutions GDC Requests
Subject: GTC Plant Enquiry - Ref- 3584700
Attachments: 3584700.png; GU-DPR-IG-0022 Safe working in the vicinity of utility networks.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Warning: GTC Apparatus Exists in This Area

Our Plant Enquiry Service Ref: 3584700
Your Enquiry Ref: LM 208638/KaY

Dear Chrissy,

Thank you for your enquiry concerning apparatus in the vicinity of your proposed work. For your records, the search area is shown in the attached map.

Please click on the links below to download copies of the relevant utility asset drawings locating our assets in the area which you identified. These drawings are grouped by our relevant network reference, should you need to contact us regarding any of our networks please quote this reference. Links to files will remain live for 10 days. If you do not download these files within this period you will need to submit a new enquiry – this will ensure you have an up-to-date copy of our asset records.

PLEASE NOTE: Where drawings are large, these have been provided in smaller segments. A drawing index is provided as the first file listed for each network reference (example of a network reference: N1234567) shown below. This is intended to help you find the drawing relevant to you more quickly. Please take care to ensure that you use the relevant drawings for every network listed below as we may have multiple networks and multiple utilities in this area.

N9006837

Gas

- N9006837-1_1_of_1_appendix_3_of_3.png
- N9006837-1_1_of_1.png
- N9006837-1_1_of_1_appendix_2_of_3.png
- N9006837-1_1_of_1_appendix_1_of_3.png

This information is for guidance only and the precise position of the plant must be established, prior to your works, using hand-digging methods only. The contractor will be held responsible for any damage caused to our asset. Please note our assets now include those owned and operated by:

- GTC Pipelines Limited
- Independent Pipelines Limited
- Quadrant Pipelines Limited

- Electricity Network Company Limited
- Independent Power Networks Limited
- Independent Water Networks Limited
- Open Fibre Networks Limited
- Independent Community Heating Limited

If you have any queries or require any further information please do not hesitate to contact us.

All works in the vicinity of our networks should be undertaken in accordance with the attached document "GU-DPR-IG-0022: Safe working in the vicinity of utility networks". Reference should also be made to HSG47 Avoiding Danger from Underground Services.

Important: The area of your proposed works may contain gas mains operating at Medium and Intermediate Pressure tiers or electric cables operating at High Voltage – please refer to the network drawings included with this email. If your proposed works are likely to involve excavation within 10 metres of any of these assets, including but not limited to gas governors and electric substations you MUST inform GTC Plant Enquiries by calling 01359 240363 and quoting your Plant Enquiries Service Reference number.
Important: Drawings provided by this service may include utility assets not owned or managed by GTC. Conversely our drawings will NOT display assets from all third parties. It is your responsibility to ensure you have requested information from all utility asset owners.

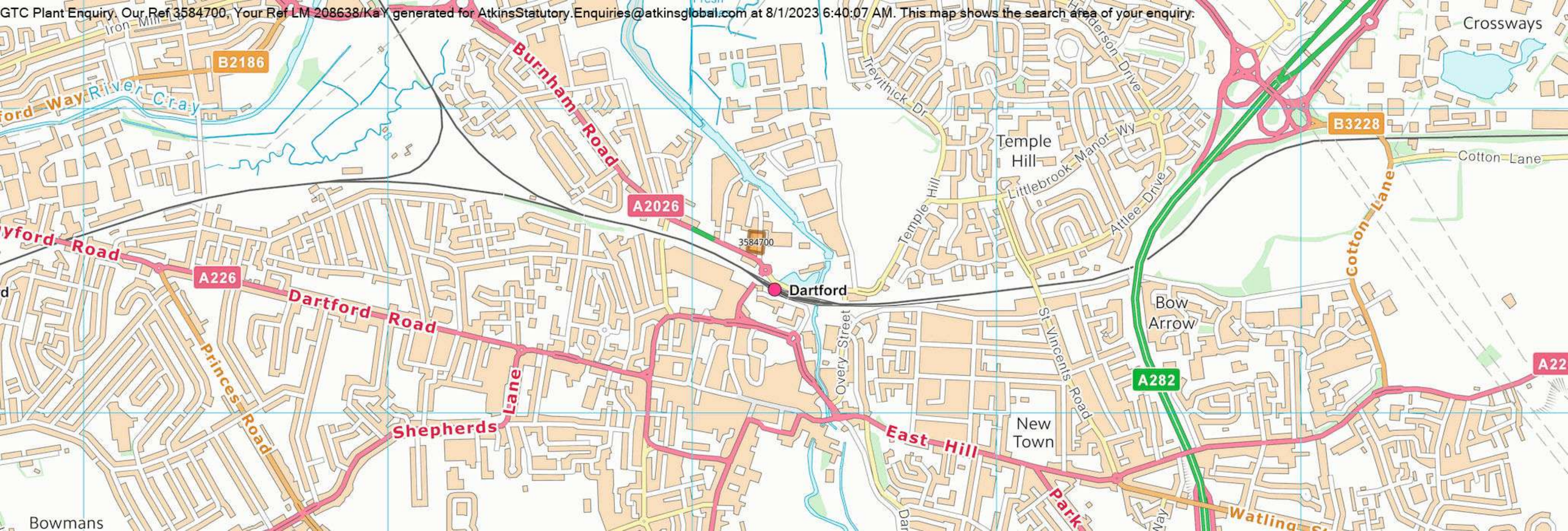
Gas Escape or Damage MUST be reported on 0800 111 999. National Grid / DNGT will attend to make safe and repair.
Electricity Network Damage MUST be reported to ENC on 0800 032 6990.
Water Network Damage MUST be reported to IWNL on 02920 028 711
Fibre Network Damage MUST be reported to IFNL on 0845 051 1669

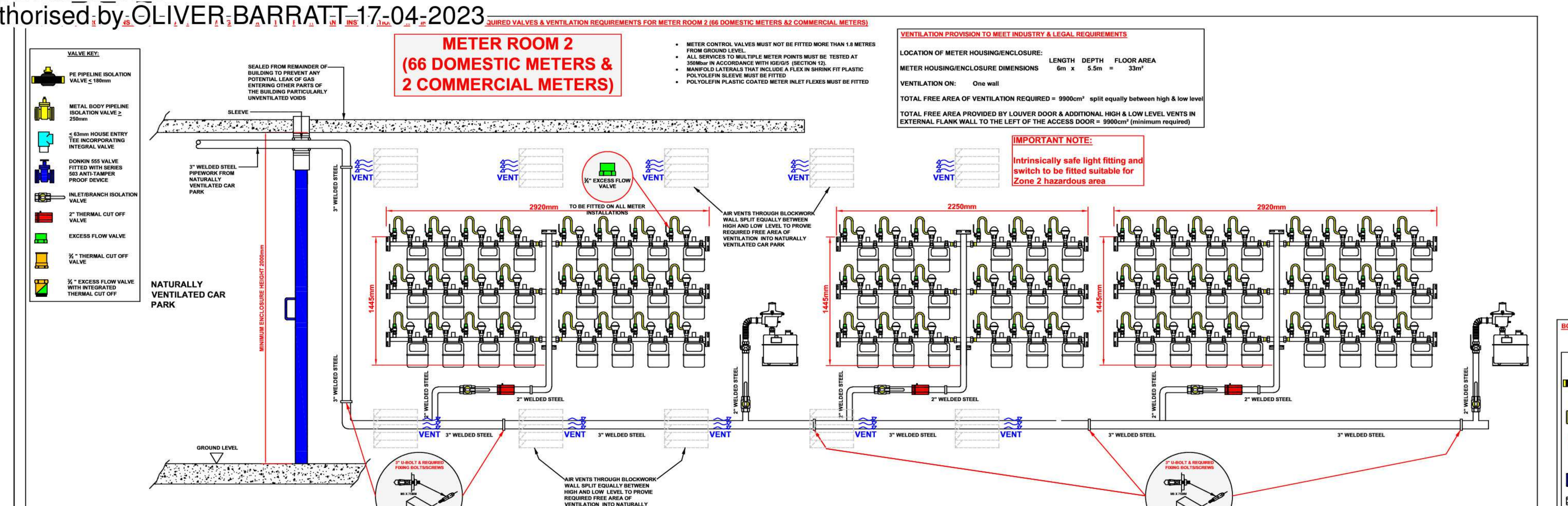
Thank you for using the GTC Plant Enquiries Service.

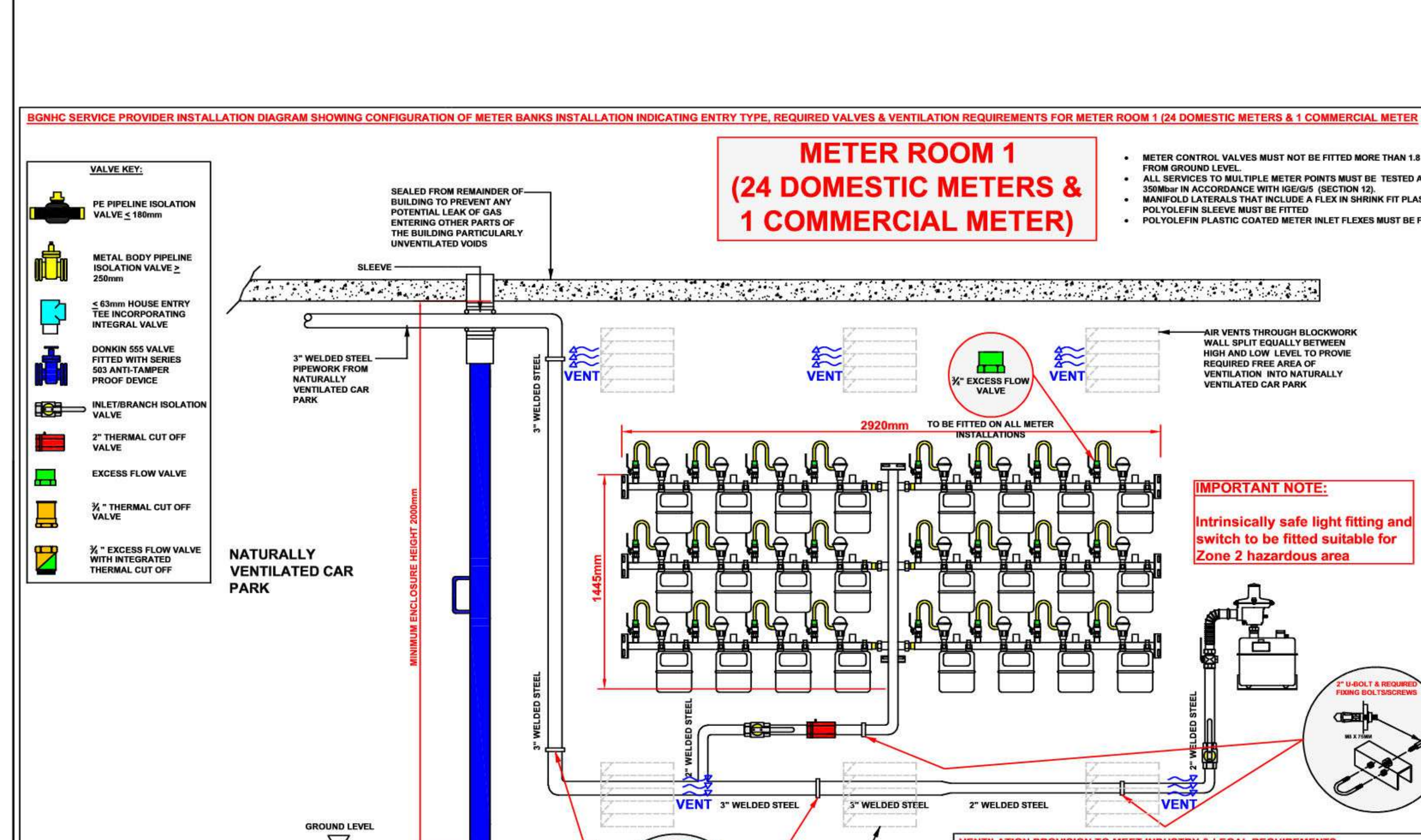
Your sincerely,

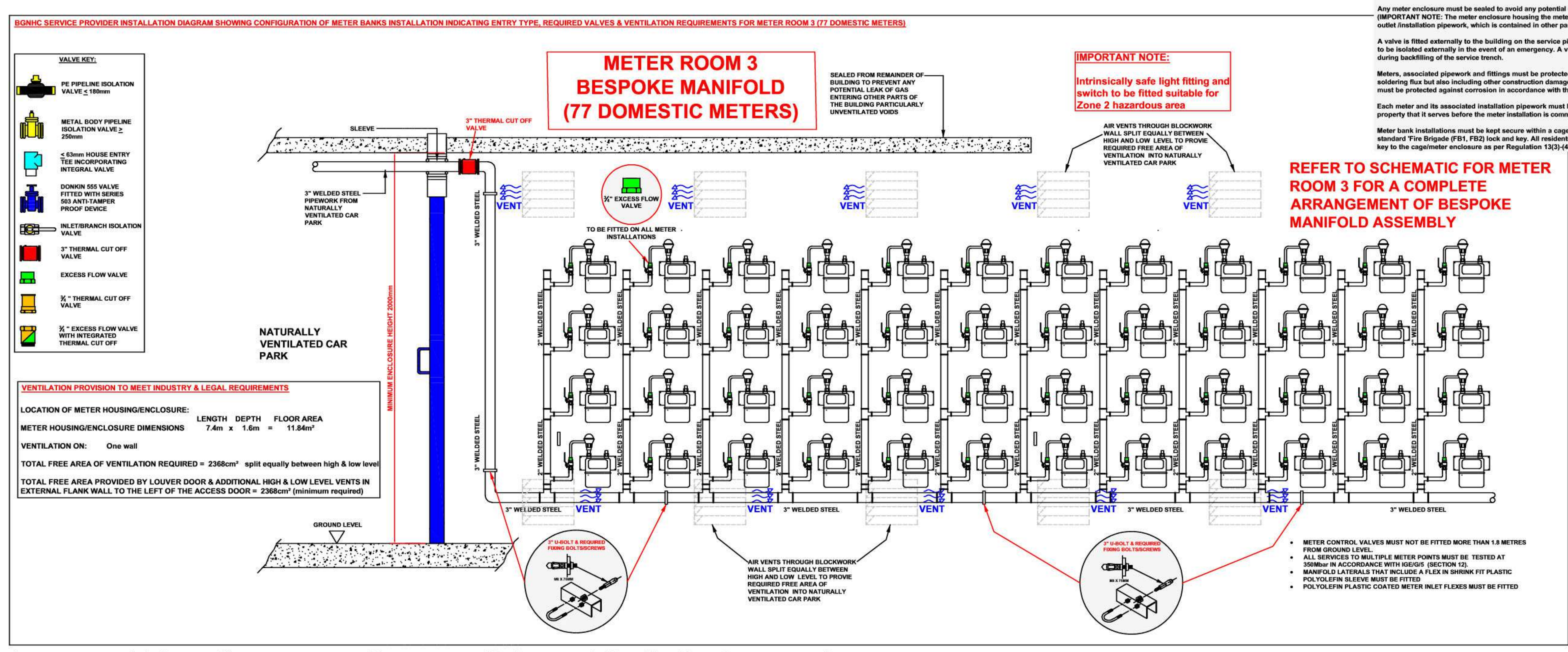
GTC Plant Enquiry Service

GTC
Synergy House
Woolpit Business Park
Woolpit
Bury St Edmunds
Suffolk, IP30 9UP
Tel: 01359 240363
plant.enquiries@gtc-uk.co.uk





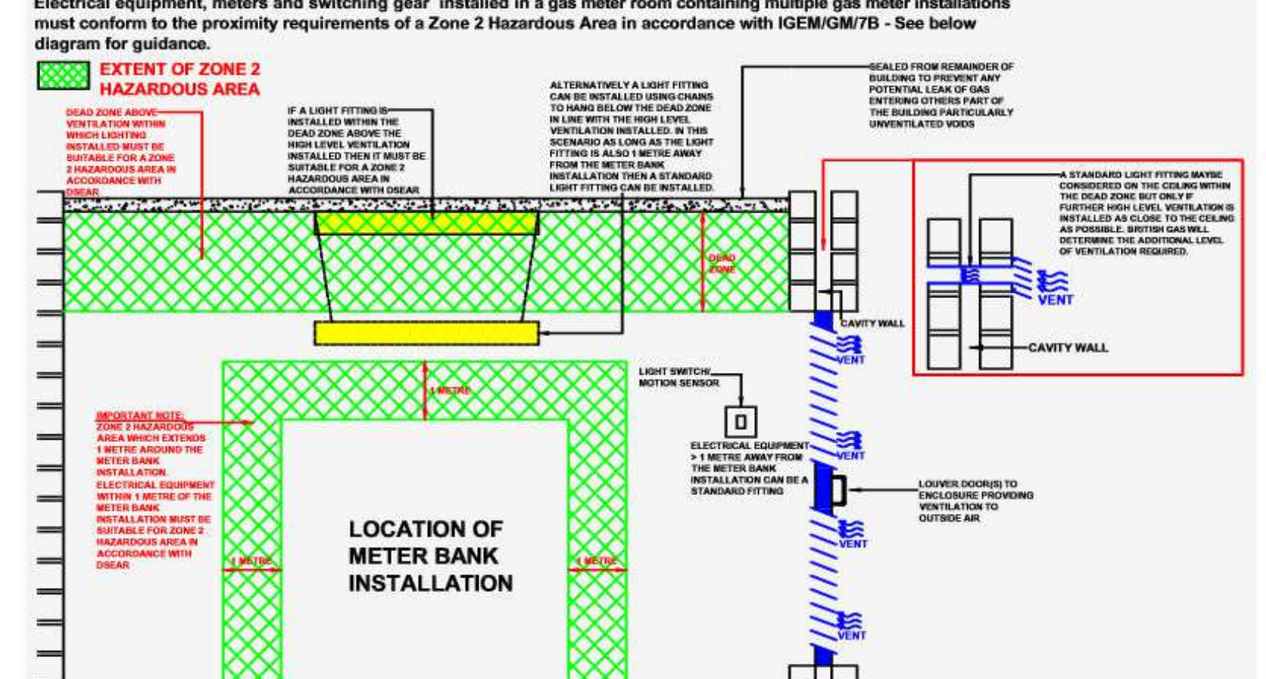




IMPORTANT DEVELOPER REQUIREMENTS FOR METER BANK INSTALLATIONS:

Meters installed on a common alternative means of escape shall be enclosed in a room, box or other compartment that is at least 30 minute fire resistant to BS 476 and have a self closing door. In addition, the pipe immediately upstream of the meter, or regulator shall be provided with a thermal cut-off device (TCO) on inlet pipework and an Excess Flow Valve on each meter.

Electrical equipment, meters and switching gear installed in a gas meter room containing multiple gas meter installations must conform to the proximity requirements of a Zone 2 Hazardous Area in accordance with IGEM/GM/7B - See below diagram for guidance.



Any meter enclosure must be sealed to avoid any potential escape of gas entering other parts of the building. (IMPORTANT NOTE: The meter enclosure housing the meter bank installation must not be used as a means of ventilating outlet /installation pipework, which is contained in other parts of the building).

A valve is fitted externally to the building on the service pipe feeding the meter bank installation to allow the installation to be isolated externally in the event of an emergency. A valve cover and sleeve must be installed by your ground workers during backfilling of the service trench.

Meters, associated pipework and fittings must be protected during construction from corrosive substances especially soldering flux but also including other construction damage from plaster, concrete and paint. Above ground steel work must be protected against corrosion in accordance with the requirements of IGE/G/5 (Section 6.4.1.6).

Each meter and its associated installation pipework must be clearly and permanently labelled to identify the particular property that it serves before the meter installation is commissioned.

Meter bank installations must be kept secure within a cage or purpose built meter enclosure preferably fitted with a standard 'Fire Brigade (FB1, FB2) lock and key. All residents must have access to their meter and should be issued with a key to the cage/meter enclosure as per Regulation 13(3)-(4) of the Gas Safety (Installation & Use) Regulations.

NOTES

CDM STATEMENT

Any information given on this construction drawing must be used only in conjunction with the Construction Health and Safety Plan prepared by the Principal Designer and Principal Contractor. The Principal Contractor must be consulted before any construction work commences. Any changes in design, or conditions arising or information becoming known at a later date that may adversely impact upon the health and safety of any person, must be notified to the Principal Designer and Principal Contractor as soon as possible.

Reference shall be made to the BGNHC Safe System of Work document sent with this construction drawing.

IMPORTANT NOTE RELATING TO CONTAMINATED GROUND

SHOULD THIS SITE HAVE A HISTORY OF SOIL CONTAMINATION PLEASE LIAISE WITH THE SITE MANAGER TO IDENTIFY POTENTIAL HAZARDS BEFORE STARTING WORK.

The developer must ensure the bedding, backfill and surround to all gas mains and services is clean imported material such that installation of new pipework and future pipework maintenance is in clean, inert soil. The developer must be able to support evidence of backfill being clean and inert by the provision of a contamination validation certificate.

The developer must ensure appropriate precautions have been taken to protect construction workers. Good standards of hygiene and appropriate PPE and health and safety procedures must be followed.

IMPORTANT INFORMATION RELATING TO GAS METER POSITIONS AND CHOICE OF METER BOXES

Gas meter positions shown are indicative only.

Semi concealed/Universal meter boxes shall not:
- Obstruct footpaths
- Passageways
- Drives
- Be a trip hazard

For these types of box attention must be paid to ensuring the box is fitted correctly in relation to finished ground levels.

Built-in/Cavity and Surface Mounted meter boxes must be installed in accessible locations.

For all meter box types any position where damage could occur, especially from vehicles, shall be avoided.

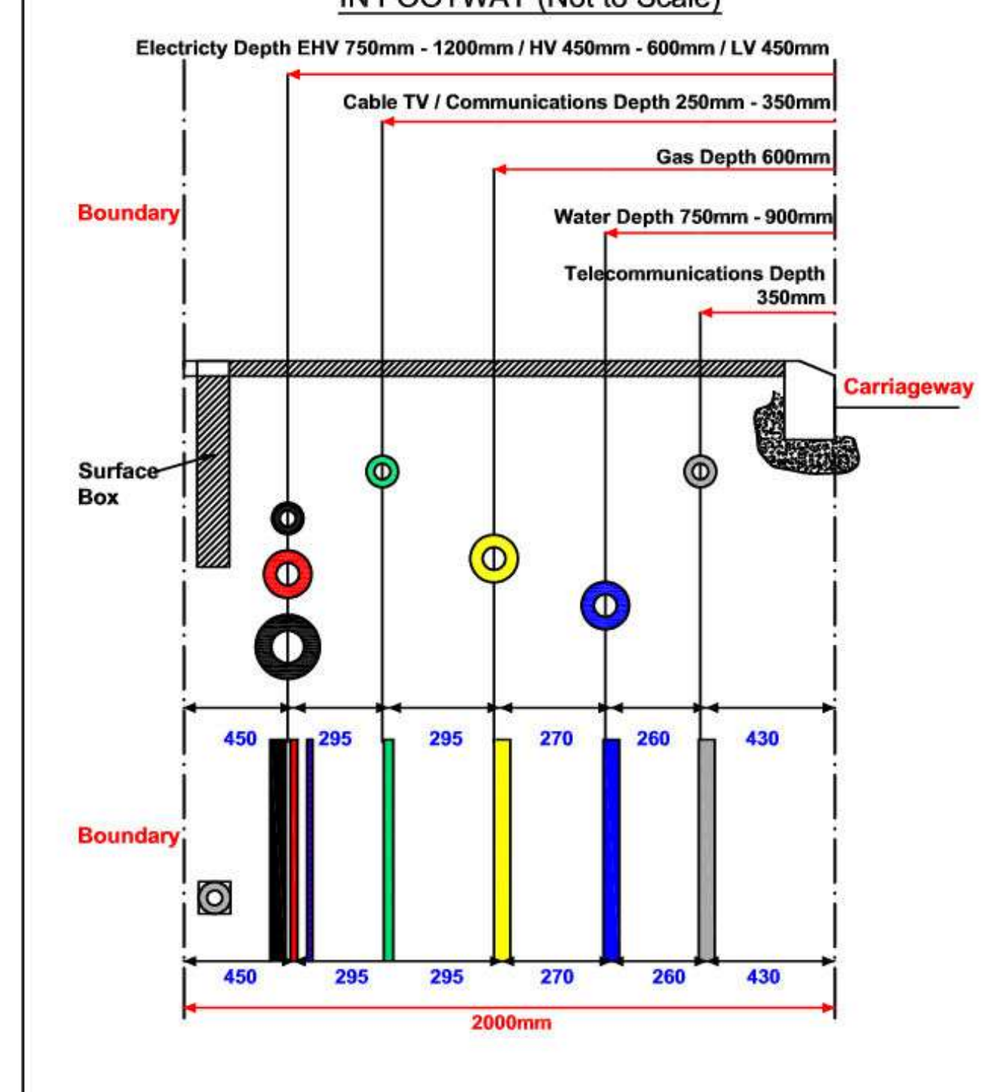
Premises with 2 or more floors above the ground floor should not have meters sited on or under the stairway, or in any other part of the premises where the stairway forms the sole means of escape in case of fire.

IMPORTANT INFORMATION RELATING TO DIVERSIONS/ALTERATIONS TO EXISTING PLANT

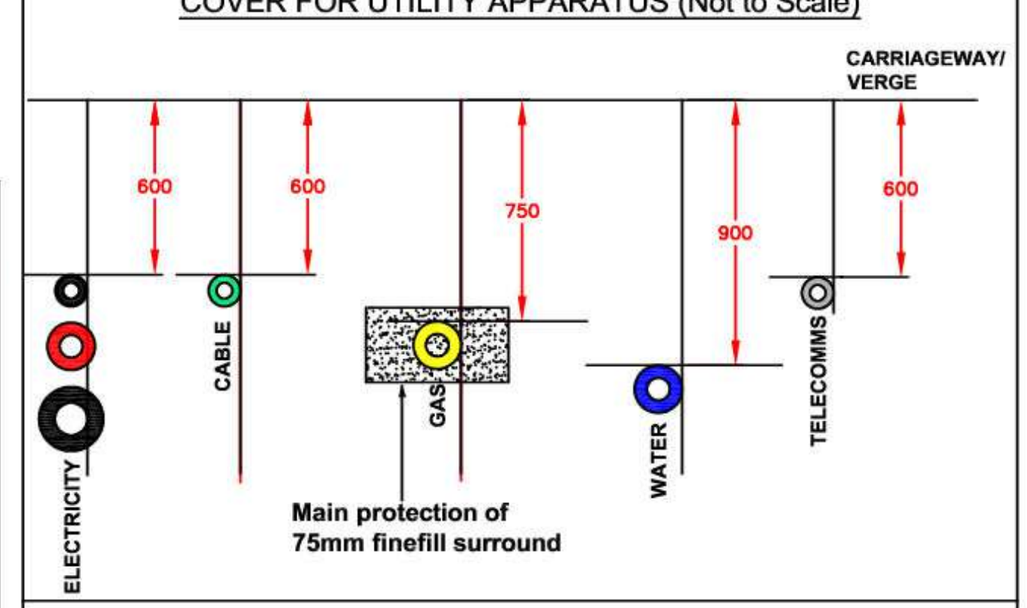
Works specifically excludes any works by British Gas for the diversion, alteration or making dead of any National Grid or other iDN/IGT owned gas distribution infrastructure on the site.

IF YOUR ARE IN ANY DOUBT CONCERNING THE INFORMATION PROVIDED ABOVE THEN PLEASE SEEK ADVICE.

RECOMMENDED POSITIONING OF UTLITY APPARATUS IN FOOTWAY (Not to Scale)



TYPICAL ROAD/VERGE SECTION INDICATING DEPTH OF COVER FOR UTILITY APPARATUS (Not to Scale)



KEY FOR MAINS AND SERVICE PIPEWORK

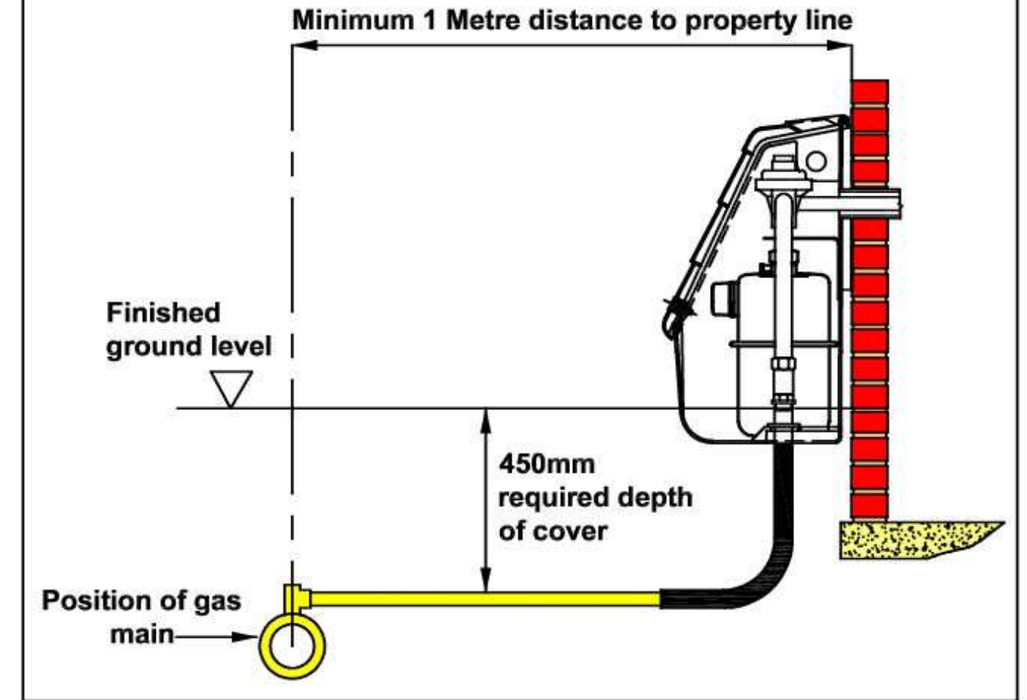
- Proposed L.P Main < 75 mbar
- Existing L.P Main < 75 mbar
- Proposed M.P Main 75 mbar – 2 bar
- Existing M.P Main 75 mbar – 2 bar
- Proposed I.P Main > 2 bar – 7 bar
- Existing I.P Main > 2 bar – 7 bar
- Existing H.P Main > 7 bar – 24 bar
- Existing H.Pressure Main > 24 bar–38 bar
- Existing H.Pressure Main > 38 bar–70 bar
- Change of size
- Pressure Regulator

Guidance for Mains/Services Duct Sizes

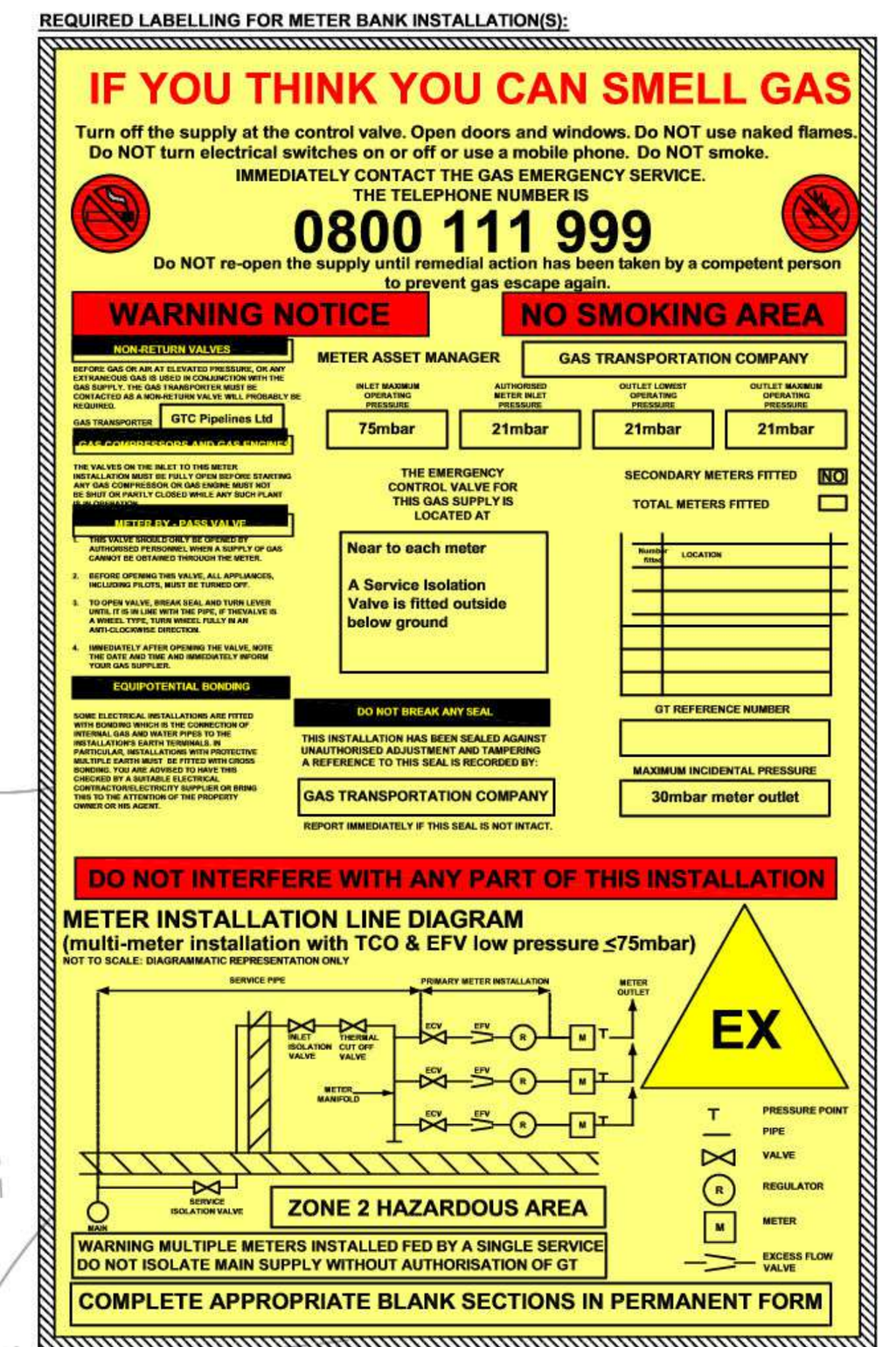
Pipe Size for PE Pipe	Minimum Internal Duct Size for Insertion
≤ 32mm	60mm (yellow perforated)
63mm	100mm
90mm	150mm
125mm	200mm
180mm	250mm

ALL MAINS MDPE:	
90mm and above:	SDR 17.6
63mm	SDR 11

TYPICAL CROSS SECTION OF GAS SERVICE



REQUIRED LABELLING FOR METER BANK INSTALLATION(S):



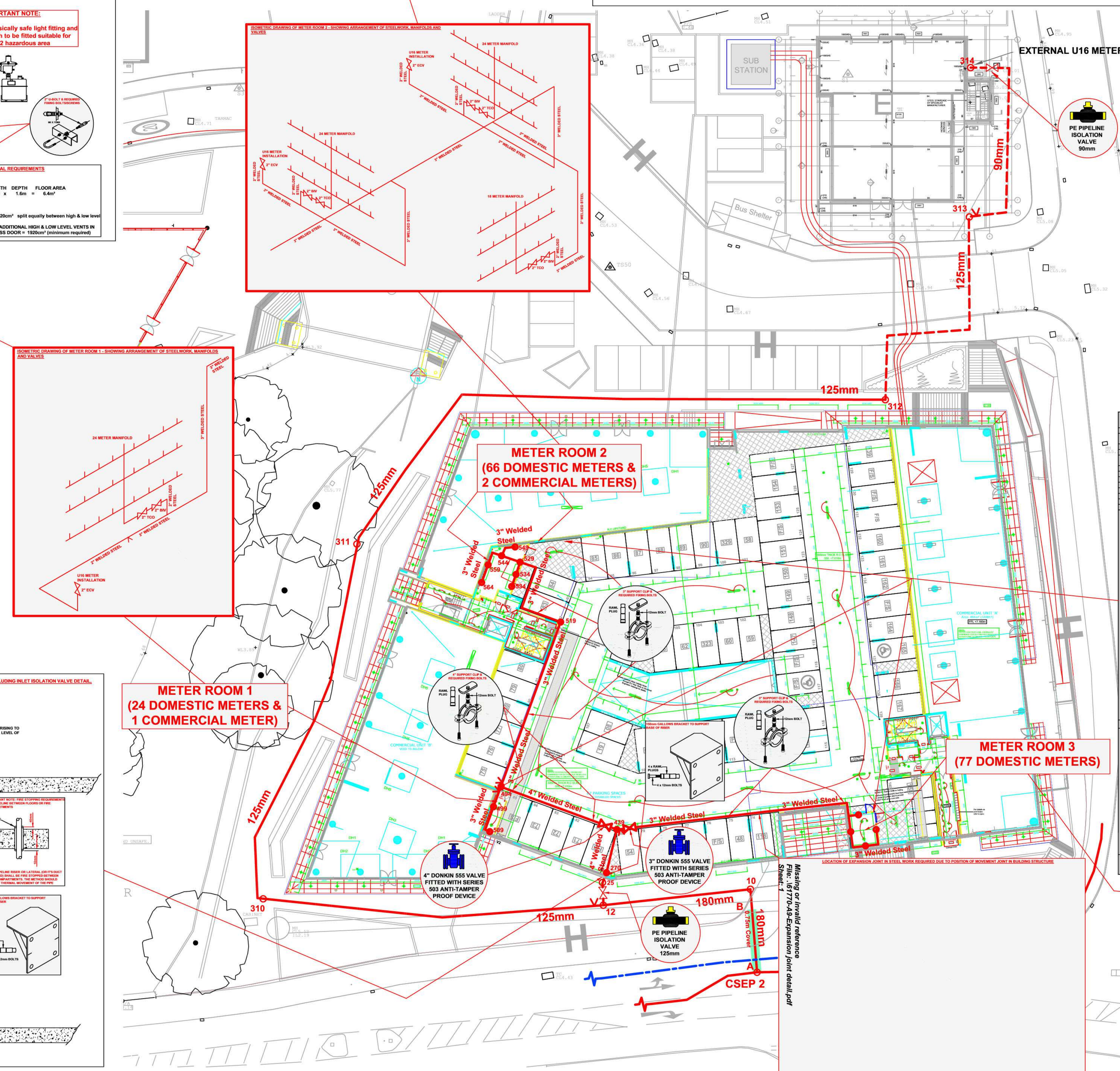
REQUIRED LABELLING FOR METER BANK INSTALLATION(S):

IMPORTANT HEALTH & SAFETY NOTICE:

Reference: The Gas Safety (Installation and Use) Regulations 1998 - Regulation 13 'Meter Housings'

This meter room/enclosure should not be used for storing combustible household waste such as paper and cardboard.

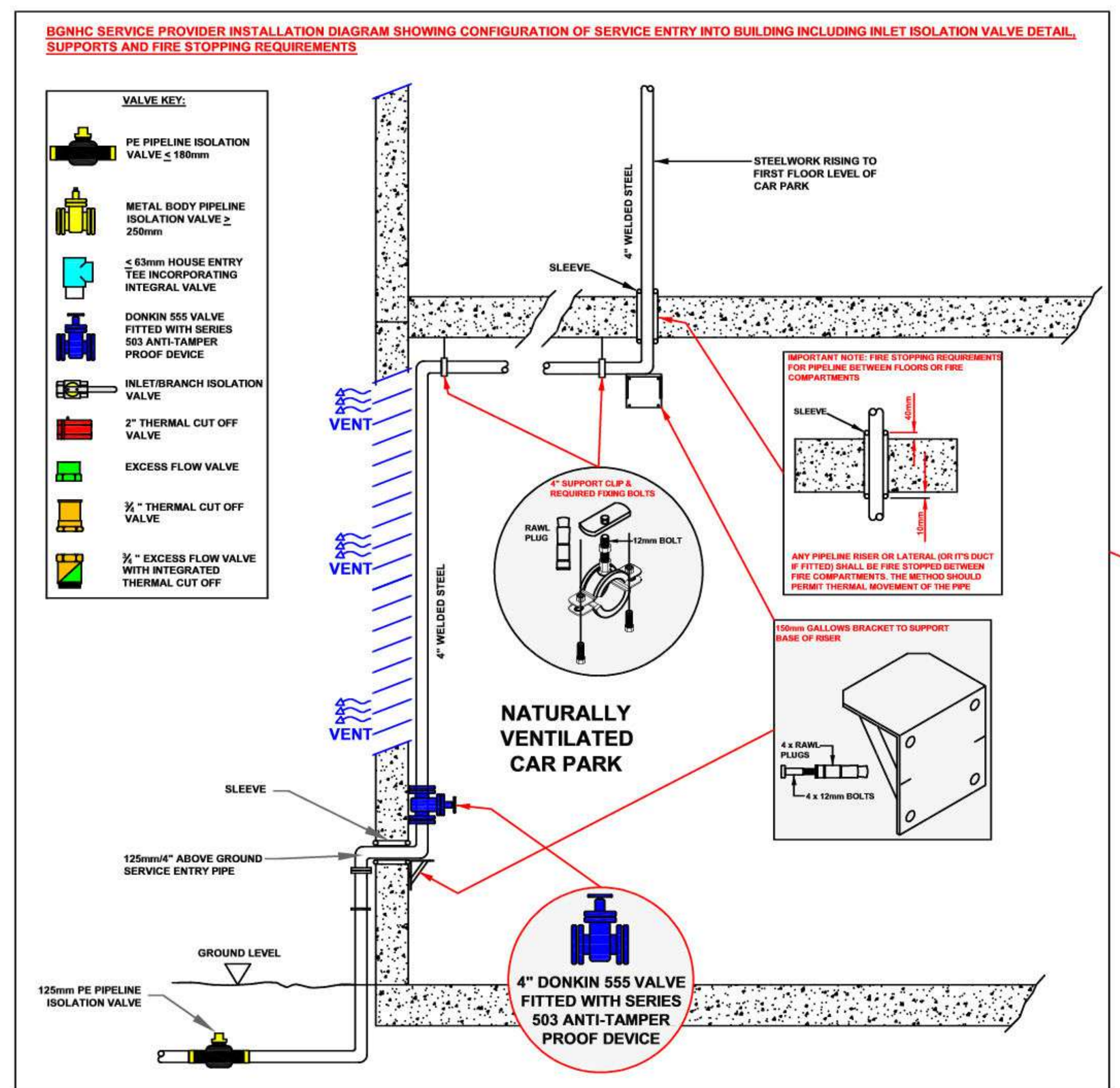
All building occupants whose gas meter resides in this room/enclosure should have been provided with a suitably labelled access key supplied by the building owner.



DETAILED MATERIAL SPECIFICATION FOR METER BANK INSTALLATION(S)

ITEM DESCRIPTION	SPECIFICATION	SIZE	QUANTITY	LOCATION
Pipeline Isolation Valves	GIS/V7-2:2006 GIS/V4:2007	125mm	1	PE Service to Entry Fitting
Above Ground Factory Entry Tee	BS21 & ISO7/1DN Flanges to BS4504.	125mm	1	Inlet to meter bank installation
Tamper Proof Inlet Isolation Valves (Above 2" use Donkin Series 555 Gate Valves fitted with Donkin Series 503 anti-tamper proof device)	Institution of Gas Engineers & Managers PRS1/E and GIS/V7-2:2006 as appropriate	4"	1	Inlet to meter bank installation
Heavy Grade Pipework (Welded) **Welding Procedures (including inspection, testing and approval):** GTC ENG012 (procedure is available from Gas Transportation Company, Woolpit Business Park, Bury St Edmonds, Suffolk IP30 9UQ) **Welding Requirements - General to conform to:** BS EN 12732:2000 Gas Supply Systems - Welding Steel Pipework - Functional Requirements. **Welding Qualification & Approvals to conform to:** BS EN 287-1:2004 Qualification test of welders. Fusion welding. Steels. BS EN 288-9:1999 Specification and approval of welding procedures for metallic materials. BS 4872-1 Specification for approval testing of welders. Fusion welding of steel. BS EN ISO 15614-1:2004 Specification and qualification of welding procedures for metallic materials - Welding procedure test, Part 1 arc and gas welding of steels.	Welded pipework to conform to: BS EN 10216 Part 1 or BS EN 10217 Part 1 wall thickness to BS1387 (Heavy Grade). Certificates must be obtained from the supplier showing evidence of compliance with BS EN 10216 & 10217. Welded fittings to conform to: BS1640 Part 3 (metric units) Butt welding pipe fittings. BS1560-3.2:1989 Circular flanges for pipes, valves & fittings. BS 3799:1974 Specification for steel pipe fittings, screwed and socket welding for the petroleum industry. BS EN 10920-2:2002 Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Steel flanges (Notes: this supercedes BS 4504 which has now been withdrawn.	4" 3" 2"	23 metres 91 metres 8 metres	Inlet to meter bank installation
Gallows Bracket to support steel riser to high level	BS EN 13480 Part 3: 2012 - Metal Industrial Piping, Design and Calculation (Pipe Supports)	150mm	2	Inlet to meter bank installation
Bolts required for Gallows Brackets to support base of steel riser	BS EN ISO 3506-1:2009 - Mechanical properties of corrosion resistant stainless steel fasteners. Bolts, screws and studs.	12mm	8	Inlet to meter bank installation
Support clips to be used to fix welded steel pipework	BS EN 13480 Part 3: 2012 - Metal Industrial Piping, Design and Calculation (Pipe Supports)	4" 3"	3 6	Inlet to meter bank installation
Bolts required to fix Support Clips for welded steel pipework	BS EN ISO 3506-1:2009 - Mechanical properties of corrosion resistant stainless steel fasteners. Bolts, screws and studs.	12mm	18	Inlet to meter bank installation
U-bolts to be used to fix welded steel pipework in meter rooms	BS EN 13480 Part 3: 2012 - Metal Industrial Piping, Design and Calculation (Pipe Supports)	3" 2"	14 9	Inlet to meter bank installation
Bolts required to fix U-bolts for welded steel pipework	BS EN ISO 3506-1:2009 - Mechanical properties of corrosion resistant stainless steel fasteners. Bolts, screws and studs.	12mm 10mm	14 9	Inlet to meter bank installation
Spacing of bracketing and supports for steel pipework and fittings	For spacing of bracketing and supports the maximum unsupported length for welded steel horizontal pipework shall be as shown to comply with the requirements of Section 6.4.1.2 of IGEM/G/5	4" 3"	6m 5.5m (Maximum unsupported horizontal length)	Inlet to meter bank installation
Tamper Proof Branch Inlet Isolation Valves	Institution of Gas Engineers & Managers PRS1/E and GIS/V7-2:2006 as appropriate	4" 3" 2"	2 1 8	Inlet to meter bank installation
Thermal Cut Off Valves	DIN 3586	2"	8	Inlet to meter bank installation
Emergency Control Valves (≤ 2" in Ø) Labelling ECVs ECV outlet connectors	GIS/V7-3:2006 BS6400 or IGE/UP2, as appropriate Union boss to BS746 Comply with BS EN 331	3/4"	167	Meter Inlet
Excess Flow Valves	DIN VP 305-1	3/4"	167	After ECV
Meter Installations **Domestic meter installations:** To be installed in accordance with the requirements of 'BS 6400 Part 1 - Specification for installation, exchange, relocation and removal of gas meters with a capacity not exceeding 6m³/h.	BS EN 1359 or BS 4161-3,5 - Diaphragm meters. BS EN 12480 or BS 4161-6 - Rotary Displacement meters. Institution of Gas Engineers PRS3/E - Meter regulators for gas flows not exceeding 6m³/h inlet pressures less than 75 mbar, 2004. Institution of Gas Engineers PRS6/E Semi-rigid and flexible meter connectors, 2004.	U6	167	Meter

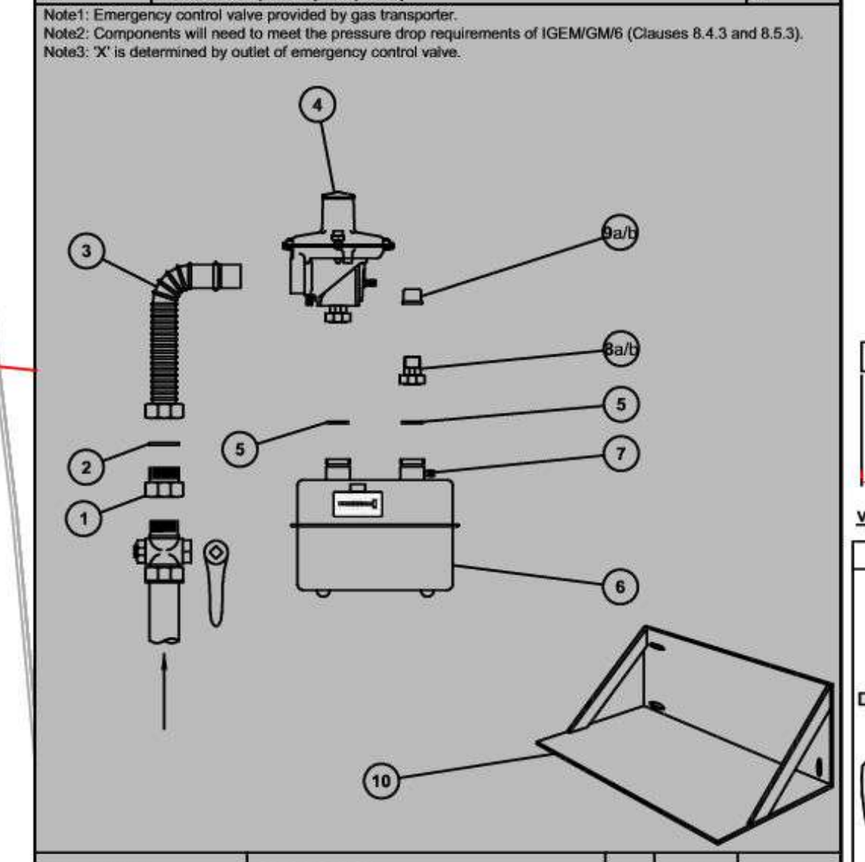
NOMINAL BORE (mm)	MAXIMUM UNSUPPORTED LENGTH (m)			
	Screwed steel horizontal	Screwed steel vertical	Welded steel horizontal	Welded steel vertical
15	2.0	2.5	2.5	3.1
20	2.5	3.1	2.5	3.1
25	2.5	3.1	3.0	3.7
32	2.7	3.3	3.0	3.7
40	3.0	3.7	3.5	4.3
50	3.0	3.7	4.0	5.0
65			4.5	5.6
80			5.5	6.8
100			6.0	7.5
150			7.0	8.7
200			8.5	10.6
250			9.0	11.2



MATERIAL SPECIFICATION FOR U16 DIAPHRAGM METER INSTALLATION

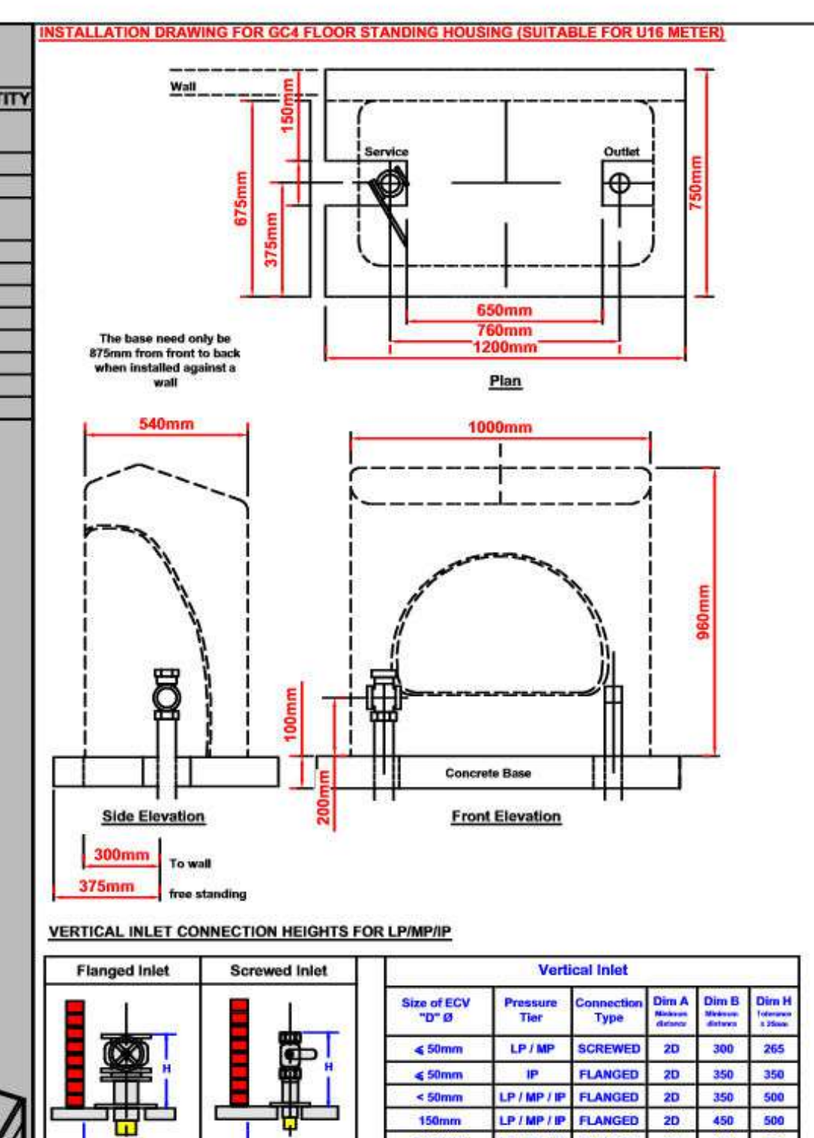
ITEM REF	ITEM DESCRIPTION	QUANTITY
1	1¼" BS 746 male x 'X' adaptor complete with BS 746 washer (if required)	1
2	1¼" BS 746 washer	1
3	1¼" BS 21 male x 1¼" BS 746 500mm long flexible metallic connection	1
4	1¼" BS 21 female x 1¼" BS 746 outlet angled pattern regulator to PRS33/E complete with pressure test points on inlet and outlet	1
5	1¼" BS 746 washer	2
6	U16 Diaphragm meter	1
7	Pressure test point	1
8a	1" BS 21 male x 1¼" BS 746 nut and liner	1
8b	¾ BS 21 male x 1¼" BS 746 nut and liner (Alternative)	1
9a	1" BS 21 cap	1
9b	1¼" BS 21 cap (Alternative)	1
10	Meter/shelf plinth (if required)	1

Note1: Emergency control valve provided by gas transporter.
Note2: Components will need to meet the pressure drop requirements of IGEM/GM/6 (Clauses 8.4.3 and 8.5.3).
Note3: 'X' is determined by outlet of emergency control valve.



DESCRIPTION	SPECIFICATION	SIZE	QUANTITY	LOCATION
Heavy Grade Pipework (Welded) **Welding Requirements - General to conform to:** BS EN 12732:2000 Gas Supply Systems - Welding Steel Pipework - Functional Requirements. **Welding Qualification & Approvals to conform to:** BS EN 287-1:2004 Qualification test of welders. Fusion welding. Steels. BS EN 288-9:1999 Specification and approval of welding procedures for metallic materials. BS 4872-1 Specification for approval testing of welders. Fusion welding of steel. BS EN ISO 15614-1:2004 Specification and qualification of welding procedures for metallic materials - Welding procedure test, Part 1 arc and gas welding of steels.	Welded pipework to conform to: BS EN 10216 Part 1 or BS EN 10217 Part 1 wall thickness to BS1387 (Heavy Grade). Certificates must be obtained from the supplier showing evidence of compliance with BS EN 10216 & 10217. Welded fittings to conform to: BS1640 Part 3 (metric units) Butt welding pipe fittings. BS1560-3.2:1989 Circular flanges for pipes, valves & fittings. BS 3799:1974 Specification for steel pipe fittings, screwed and socket welding for the petroleum industry. BS EN 10920-2:2002 Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Steel flanges (Notes: this supercedes BS 4504 which has now been withdrawn.	2"	9	Inlet to meter installation
Emergency Control Valves (≤ 2" in Ø) Labelling ECVs ECV outlet connectors	GIS/V7-3:2006 BS6400 or IGE/UP2, as appropriate Union boss to BS746 Comply with BS EN 331	1¼"	3	Meter Inlet

INSTALLATION DRAWING FOR GC4 FLOOR STANDING HOUSING (SUITABLE FOR U16 METER)

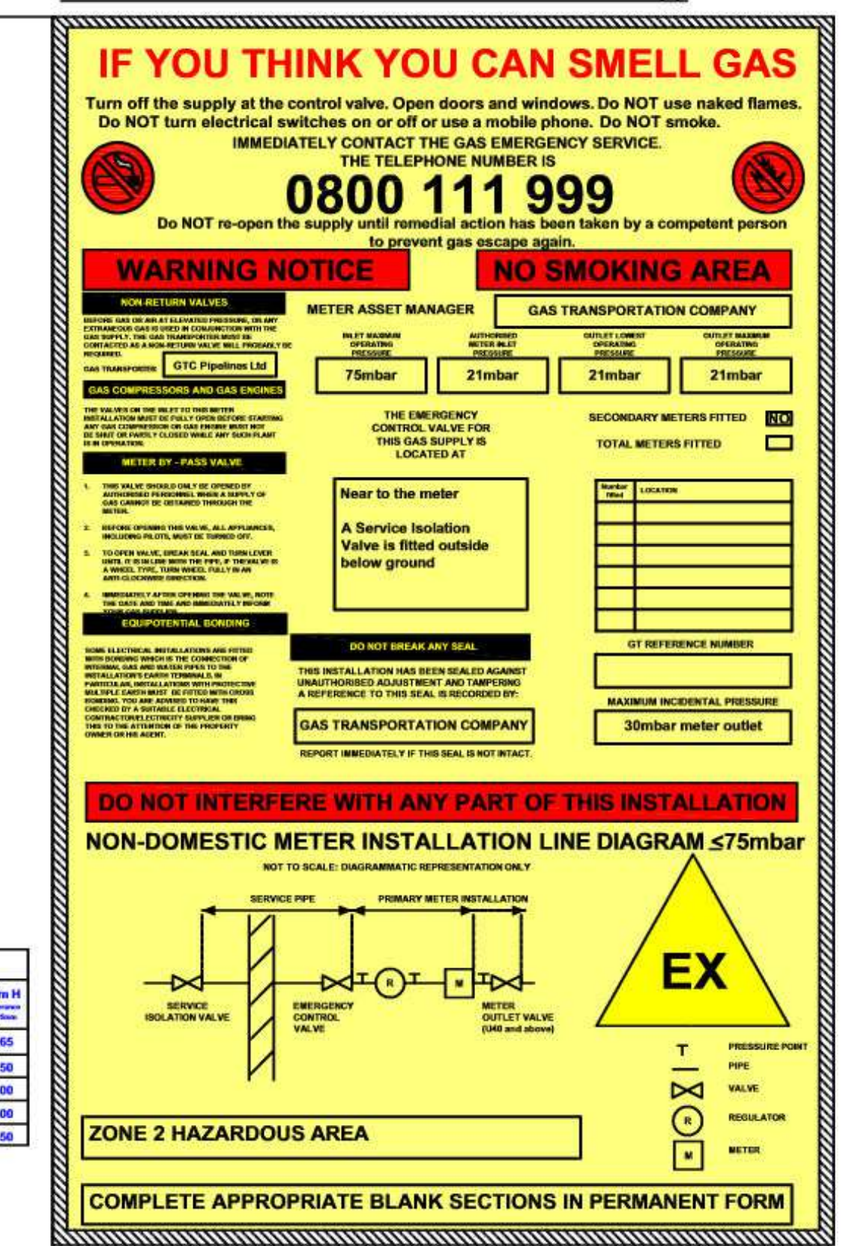


VERTICAL INLET CONNECTION HEIGHTS FOR LP/MP/IP

Size of ECV "D" Ø	Pressure Tier	Connection Type	Dim A	Dim B	Dim H
≤ 50mm	LP / MP	SCREWED	2D	300	265
≤ 50mm	IP	FLANGED	2D	350	350
< 50mm	LP / MP / IP	FLANGED	2D	350	500
150mm	LP / MP / IP	FLANGED	2D	450	500
> 150mm	LP / MP / IP	FLANGED	2D	750	550

Example of Dim A
80mm PN16 ECV - Dim A = 2 x 80mm = 160mm
Pressure Tier
LP = Low Pressure not exceeding 75 mbar
MP = Medium Pressure not exceeding 2bar
IP = Intermediate Pressure not exceeding 7bar

REQUIRED LABELLING FOR NON DOMESTIC METER INSTALLATION(S):



MATERIAL SPECIFICATION FOR LOW PRESSURE & MEDIUM PRESSURE PE MAINS

PIPE & FITTINGS

PE 80 (MDPE) pipes and fittings to Gas Industry Standard (formally National Grid Specifications):

GIS/PL2:2006 Specification for polyethylene pipes and fittings for natural gas and suitable manufactured gas
Part 2: Pipes for use at pressures up to 5.5 bar
Part 4: Fusion fittings with integral heating element(s)
Part 6: Spigot end fittings for electrofusion and/or butt fusion purposes

GIS/PL3:2006 Specification for self-anchoring mechanical fittings for natural gas and suitable manufactured gas

GIS/F2:2006 Specification for main sealing plugs and service connection fittings for use at pressures not greater than 2 bar

GIS/V4:2007 Specification for service isolation valves up to 50mm diameter for use up to 7 bar maximum operating pressures

GIS/V7:2006 Specification for distribution valves
Part 1: Metal-bodied line valves for use at pressures up to 16 bar and construction valves for use at pressures up to 7 bar
Part 2: Plastics bodied valves of sizes up to and including 180mm suitable for operation at pressures not exceeding 5.5 bar

DUCTING PROVISION FOR GAS MAIN/SERVICE ROAD CROSSINGS

Important: Ducting can only be used for perpendicular carriageway crossings.

Only one pipe is allowed per duct. For Service Pipe the duct must be yellow and perforated along it's entire length.

Note: BS4692 is a suitable standard for plastic ducting.

The table below provides information on duct sizes

PE PIPE SIZE	MINIMUM DUCT SIZE
≤ 32mm	60mm (yellow perforated)
63mm	100mm
90mm	150mm
125mm	200mm
180mm	250mm

MATERIAL SPECIFICATION FOR METERS / METER FITTINGS

BS EN 1359 or BS 4161-3,5 - Diaphragm meters

BS EN 12480 or BS 4161-6 - Rotary Displacement meters

BS EN ISO 10380 - Corrugated metal hoses and hose assemblies.

Institution of Gas Engineers PRS3/E - Meter regulators for gas flows not exceeding 6m³/h inlet pressures less tha n 75 mbar, 2004.

Institution of Gas Engineers PRS6/E Semi-rigid and flexible meter connectors, 2004.

BS EN 88, BS EN 334 or PRS33/E - Regulators for non domestic installations shall conform to these standards.

Domestic meter installations: To be installed in accordance with the requirements of 'BS 6400 Part 1 - Specification for installation, exchange, relocation and removal of gas meters with a capacity not exceeding 6m³/h.

Non Domestic meter installations:
To be installed in accordance with the requirements of 'IGEM/GM/6 Non-domestic meter installations. Standard designs'. In particular reference shall be made to Section 9: Component Specification and Appendix 5 for detailed material specifications.

Network or part thereof to be owned and operated by the GTC Pipelines Limited on commissioning Network: N9006837-1

Design and constructed by:
British Gas
30 The Causeway
Staines
Middlesex
TW18 3BY
Tel No: 0800 072 5320
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REVISION NOTES

Date	Rev No	Details of Revision	Revised by	Approved by
16/03/2016	A4	Revised meter location to Blocks A & B all external additional mains added. Commercial unit added Block E additional mains added. Commercial meters added to Block F 3no. U16meters.	M.Borges	P.Mason
06/06/2016	A5	Detailed design for meter bank installations for Blocks C & D now added drawing.		
11/11/2016	A6	Steelwork and meter bank configurations amended for Block F as agreed during site meetings on the 30/09/2016 and 08/11/2016. Dimensions included for the agreed change in layout for meter room 2 taking account of the foul water pipe to be installed. Further 2" isolation valves added to the design for the 3 commercial meters.	P.Mason P.Mason	P.Mason P.Mason
10/02/2017	A7	Commercial meter moved from meter room 3 to meter room 2 in Block F at Developer request, schematics, installation diagrams and ventilation provision updated accordingly.	P.Mason	P.Mason
27/03/2017	A8	Blocks A & B removed from this project at Weston Homes request, details of bespoke manifold for meter room 3 Block F added, along with specification of expansion joint required also within Block F.	P.Mason	P.Mason
18/10/2017	A9	Due to the height of Block C meter room 2 a bespoke welded manifold will now be required. Also configuration of manifolds in Block D meter room 2 amended.	P.Mason	P.Mason
19/04/2018	A10	Spur of 125mm PE gas main from node 215 to be cut back to the footway as blocks A & B now excluded from this project.	John Raphael	P.Mason
04/06/2018	A11	125mm main from node 214 to 409 removed, 90mm service to Block D Meter Room 1 now to be laid from node 210 to avoid scaffolding.	M. Cacciatore	P.Mason

MAJOR VARIATIONS

Date	Description of Variation	INDICATOR Approved by	Variation recorded on drawing (delete as appropriate)
00/00/2016	Variation Details	Name	YES NO

MINOR VARIATIONS

Date	Description of Variation	INDICATOR Approved by	Variation recorded on drawing (delete as appropriate)
00/00/2016	Variation Details	Name	YES NO

CONFIDENTIALITY
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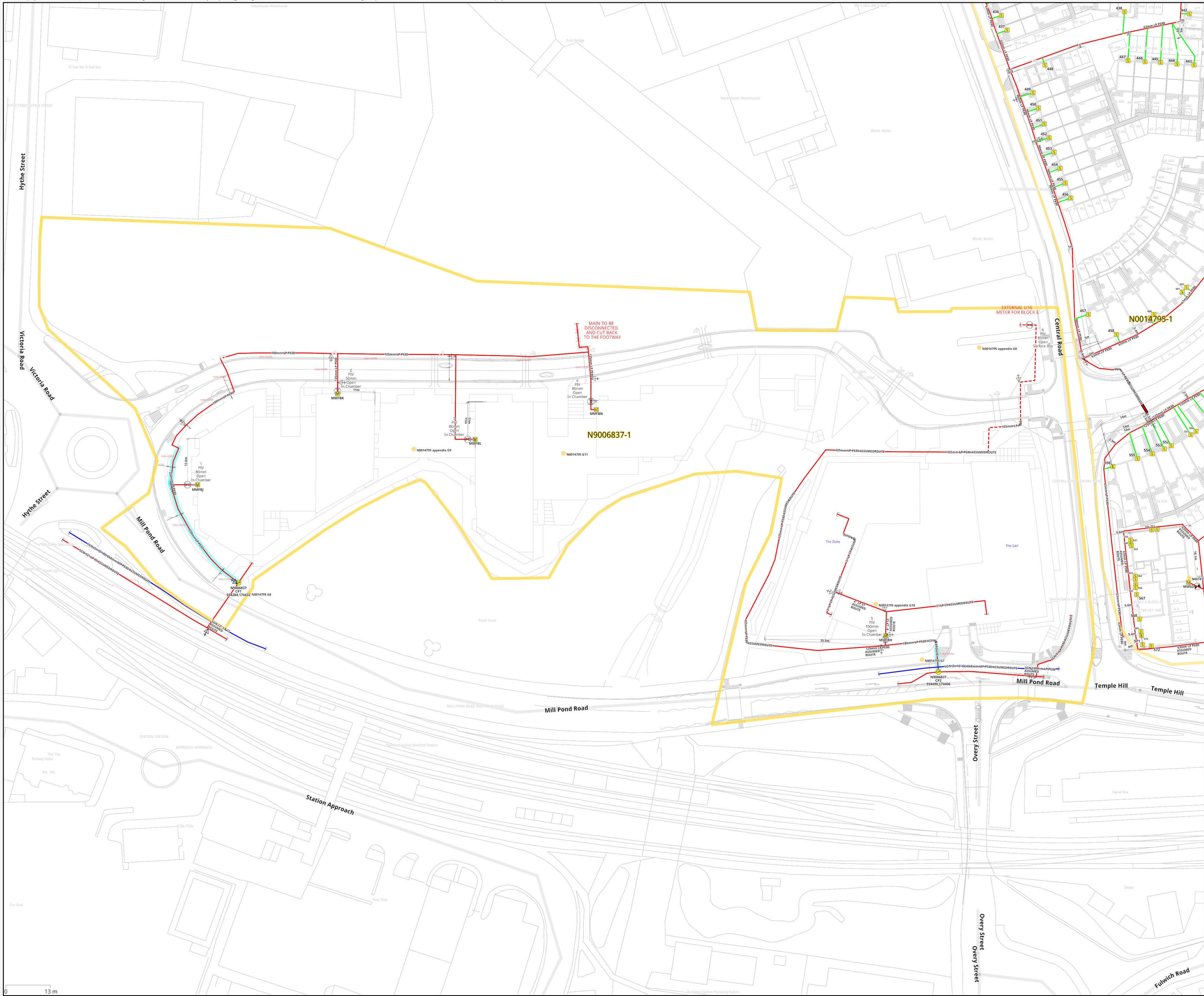
EXISTING PLANT AND EQUIPMENT
The information shown upon this plan is given without obligation or warranty, the accuracy thereof cannot be guaranteed. Where service pipes are not shown their presence should be anticipated. No liability of any kind whatsoever is accepted by British Gas or its agents or servants for any error or omission. The actual position of mains and services must be verified and established before any mechanical plant is used or excavation undertaken.

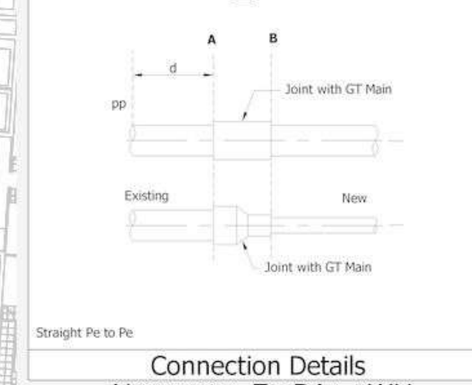
DO NOT SCALE OFF THIS DRAWING

CLIENT	Weston Homes
PROJECT	Blocks E & F Mill Pond, Dartford, Kent DA1 5LR
TITLE	GAS LAYOUT - SHEET 3 OF 3
DATE: 15/09/2015	SCALE: 1:250
DESIGNED BY: Mark Borges	DRAWN BY: Mark Borges
APPROVED BY: Paul Mason	
DRAWING NO: PPS61770-A11-001	SHEET SIZE: A0

GTC Plant Enquiry. Our Ref 3584700, Your Ref LM 208638/KaY generated for AtkinsStatutory.Enquiries@atkinsglobal.com at 8/1/2023 6:40:08 AM. This drawing is reproduced from our records archive at the time of enquiry.



N0014795_E6 DA1 5WU



Connection Details

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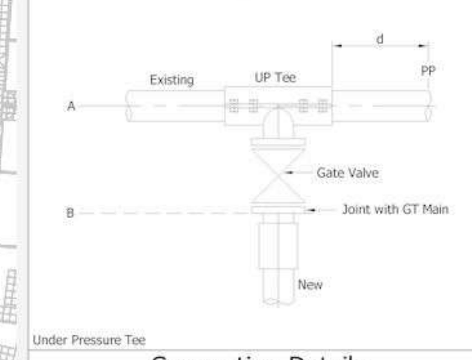

Connection Details

N0014795_E11 DA1 5XQ

CAUTION SITE CONTAMINATION

Please note that this site is contaminated with concentrations that might affect construction workers health. Site operatives must wear approriate PPE and discuss contamination levels with site manager & GTC project manager prior to working on this site.

18-04-2023

This design is across multiple drawings for details please refer to all drawings.

Gas Notes

All gas mains and ducts that shall contain a gas main must be overlaid with gas identifiable maker tape 250mm above the apparatus. All gas services and ducts that shall contain a gas service must be overlaid with gas identifiable maker tape 75mm above the apparatus. All gas pipes and ducts that shall contain a gas pipe should have a minimum of 250mm clearance from other utilities.

Maximum Proximity to Properties

Diameter of main (mm)	Minimum Building Proximity (m)			
	<0.075 bar	>0.075 bar ≤ 2 bar	> 2 bar ≤ 5.5 bar	> 5.5 bar ≤ 7 bar
Up to 125	0.25	2	4	6
126 to 355	1	2	4	6
356 to 500	1	2	4	8
501 to 1000	1	5	13	15

Ducting Specification

- Ducting for mains must be yellow and non-perforated and only used perpendicular carriageway crossings.
- Ducting for services must be yellow and perforated along it's entire length.
- Only one pipe is allowed per duct.

Gas Pipe External Diameter	Duct Inside Diameter
25mm & 32mm	50mm
63mm	100mm
90mm	150mm
125mm	200mm
180mm & 250mm	300mm
315mm	400mm

Meter Positions

For all meter box types any position where damage could occour, especially from vehicles, shall be avoided.
Semi concealed Universal meter boxes shall not:

- Obstruct footpaths
- Passageways
- Drives
- Be a trip hazard

Material Specification

For material specifications please refer to GG-PSC-ES-0002 Gas Materials Purchase - Standards & Specifications

Excavation Carried Out by BUUK

The trenches highlighted in blue will be excavated and reinstated by BUUK contractors, the excavation and reinstatement of the other trenches will be the responsibility of the customer.

	Proposed	Laid
HP Piepe > 7bar		
IP Pipe 2bar - 7bar		
MP Pipe 0.75 - 2bar		
LP Pipe < 0.75mbar		
Service Pipe		
Ducted Pipe		Semi Concealed S
Excavate by buuk Contractors		Cavity C
Asset Boundary Connection Point		Internal I
Pressure Reduction Station		Kiosk K
Reducer		Manifold M
Open / Closed Valve		
Network Boundary Point		
Other IGT Boundary		
Abandoned		
To Disconnect		

Plan Notes

This plan shows apparatus owned by the BUUK Group. Any third party apparatus indicated on these drawings is shown for indicative purposes only. The information shown on this plan is given without warranty, the accuracy cannot be guarenteed. No liability of any kind whatsoever is accepted by the company. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of apparatus. This plan is reproduced by the permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2007, All rights reserved Ordnance Survey Licence number 0100021063.

Developers Responsibility

When apparatus have been laid it becomes the responsibility of the developer to ensure it is suitably protected, therefire backfilling should be carried out as soon as possible. Replacement and repair of damaged apparatus, including administrative costs will be fully recharged to the developer. It will be the developer's responsibilityto recover the costs from the third parties.

Revision Notes

For a revision history of this network design please see seperate revision history document.

gtc

GTC, Woolpit Business Park,
Suffolk,
IP30 9UP

Tel: 01359 240363
www.gtc-uk.co.uk

Last Edit By:

Last Approved By OLIVER BARRATT 17-04-2023

Approved

OS Ref: 554391,174456

Location: Mill Pond, Central road, Flats 1-400, DARTFORD, Kent, DA1 5LR

Developer/Client: Weston Homes Ltd

Drawing Number/Title: N9006837-1_1_of_1_appendix

Network Number:	Project Number:
N9006837	N9006837-1

Scale:	Sheet Size:	Revision:
1:500	A1	1-5