Manchester Cancer Research Centre And Multi Storey Car Park Flood Risk Assessment



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Flood Risk Assessment

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Table of Contents

1 Introduction 2
1.1 Layout of Report 2
1.2 Flood Risk 2
1.3 Planning Policy Statement 25 3

2 Existing Site 7
2.1 Site Description 7

3 Consultation 9
3.1 Environment Agency 9
3.2 Manchester City Council 9
3.3 United Utilities 10
3.4 EnviroCheck 10
3.5 Bertram Done 11

4 Proposed Development 13
4.1 Development Proposals 13

5 Drainage Assessment 15
5.1 Foul Drainage 15
5.2 Surface Water Drainage 16

6 Flood Risk Assessment 24
6.1 Tidal Flooding 24
6.2 Fluvial Flooding 24
6.3 Flooding from Land (Pluvial Flooding) 24
6.4 Groundwater Flooding 24
6.5 Flooding from Public Sewers and Water Mains 24
6.6 Flooding from Artificial Sources 24
6.7 Flood Risk from Proposed Sewers 25
6.8 Mitigation 25
6.9 Flood Risk Vulnerability and Flood Zone Compatibility of Proposed Development 25
6.10 Sequential and Exception Tests 25

7 Summary and Recommendations 27
7.1 Summary 27
7.2 Recommendations 27

Appendices
Appendix 1: Existing Site Information 29
Appendix 2: Correspondence 30
Appendix 3: Proposed Development Information and Calculations 31

List of Tables
Table 1: Forms of Flooding (Extract from PPS25, Annex C) 3
Table 2: Flood Zones (Adapted from PPS25, Table D.1) 4
Table 3: Flood Risk Vulnerability Classification (Adapted from PPS25, Table D.2) 4
Table 4: Flood Risk Vulnerability and Flood Zone Compatibility (Extract from PPS25, Table D.3) 5
Table 5: Climate Change Allowances (Extract from PPS25, Table B.2) 5
Table 6: Proposed Outfall Arrangements 15
Table 7: Minimum Gradients for Foul Drains 16
Table 8: Existing Areas 16
Table 9: Existing Flow Rates 17
Table 10: Proposed Contributing Impermeable Areas 18
Table 11: Capability of different SuDS techniques (Extract from CIRIA C697, Table 1.7) 20
Table 12: MCRC Storage Volumes 21
Table 13: MSCP Storage Volumes 21

1 Introduction









1 Introduction

AECOM has been commissioned by the Christie NHS Foundation Trust to produce a Flood Risk Assessment (FRA) for the proposed Manchester Cancer Research Centre (MCRC) and Multi Storey Car Park (MSCP) which is to be located off Kinnaird Road and Cotton Lane in Withington, Manchester.

This section of the report provides an introduction to the FRA, flood risk and the latest planning guidance on development and flood risk in England.

1.1 Layout of Report

Section 1 provides an introduction to the FRA, explains the layout of this FRA and provides an introduction to flood risk and the latest guidance on development and flood risk in England.

Section 2 provides an introduction to the site. The site description is based on a site visit undertaken and publically available information on flood risk.

In order to obtain further information on flood risk consultation was undertaken with the Environment Agency, Manchester City Council and United Utilities. Section 3 of this report details the information gathered through the consultation.

Section 4 of this report details the development proposals for the site, and considers the development proposals in relation to the current planning policy on development and flood risk in England (and what type of development is considered appropriate in different flood risk zones). Planning Policy Statement 25 (PPS25): Development and Flood Risk (Communities and Local Government, 2010) is the current planning policy on flood risk in England, and an introduction to PPS25 is provided below.

Section 5 considers the drainage arrangements for the proposed development. The drainage assessment is based on PPS25, and outlines an indicative foul and surface water drainage strategy.

Section 6 of this report considers the flood risk to site, and the potential for the development proposals to impact on flood risk. The assessment of flood risk is based on PPS25, and uses all the information gathered as part of the FRA. An Introduction to flood risk is provided below.

Based on all the work undertaken as part of the FRA, Section 7 of this report provides a summary and recommendations for further work. A list of references is provided in Section 8.

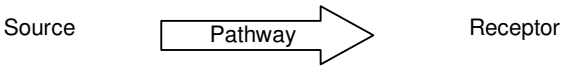
1.2 Flood Risk

Flood risk takes account of both the probability and the consequences of flooding.

Flood risk = probability of flooding x consequence of flooding

Probability is usually interpreted in terms of the return period, e.g. 1 in 100 and 1 in 200 year event, etc. In terms of probability, there is a 1 in 100 (1%) chance of one or more 1 in 100 year floods occurring in a given year. The consequence of flooding depends on how vulnerable a receptor is to flooding.

The components of flood risk can be considered using the source-pathway-receptor model.



Sources constitute flood hazards, which are anything with the potential to cause harm through flooding (e.g. rainfall, extreme sea levels, river flows and canals). Pathways represent the mechanism by which the flood hazard would cause harm to a receptor (e.g. overtopping and failure of embankments and flood defences, inadequate drainage and

inundation of floodplains). Receptors comprise of the people, property, infrastructure and ecosystems that could potentially be affected should a flood occur.

1.3 Planning Policy Statement 25

PPS25 is supplemented by 'Development and Flood Risk: A Practice Guide' (Communities and Local Government, 2009) and together these documents provide guidance on how to evaluate sites with respect to flood risk.

A summary of the requirements of PPS25 is provided below.

1.3.1 Sources of Flooding

PPS25 requires an assessment of flood risk to consider all forms of flooding, and lists six forms of flooding that should be considered as part of a flood risk assessment. These forms of flooding are listed in Table 1, along with an explanation of each form of flooding.

Table 1: Forms of Flooding (Extract from PPS25, Annex C)

Flooding From Rivers (Fluvial Flooding)
Watercourses flood when the amount of water in them exceeds the flow capacity of the river channel. Flooding can either develop gradually or rapidly, depending on the characteristics of the catchment. Land use, topography and the development can have a strong influence on flooding from rivers.
Flooding From the Sea (Tidal Flooding)
Flooding to low-lying land from the sea and tidal estuaries is caused by storm surges and high tides. Where tidal defences exist, they can be overtopped or breached during a severe storm, which may be more likely with climate change.
Flooding from Land (Pluvial Flooding)
Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage where foul sewers surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro-level can influence or exacerbate this. Overland flow paths should be taken into account in spatial planning for urban developments. Flooding can be exacerbated if development increases the percentage of impervious area.
Flooding from Groundwater
Groundwater flooding occurs when groundwater levels rise above ground levels (i.e. groundwater issues). Groundwater flooding is most is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). Chalk is the most extensive source of groundwater flooding.
Flooding from Sewers
In urban areas, rainwater is frequently drained into sewers. Flooding can occur when sewers are overwhelmed by heavy rainfall, and become blocked. Sewer flooding continues until the water drains away.
Flooding from Other Artificial Sources (i.e. reservoirs, canals, lakes and ponds)
Non-natural or artificial sources of flooding can include reservoirs, canals and lakes. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

1.3.2 Flood Zones

For river and sea flooding, PPS25 uses four Flood Zones to characterise flood risk. These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences, and are detailed in Table 2.

Table 2: Flood Zones (Adapted from PPS25, Table D.1)

Flood Zone	Definition
1	Low probability (less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%))
2	Medium probability (between 1 in 100 and 1 in 1,000 annual probability of river flooding (1%-0.1%)or between 1 in 200 and 1 in 1,000 annual probability of sea flooding(0.5%-0.1%) in any year).
3a	High probability (1 in 100 or greater annual probability of river flooding (>1%)in any year or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any given year).
3b	This zone comprises land where water has to flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 20 (5%), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

1.3.3 Vulnerability

PPS25 classifies the vulnerability of developments to flooding into five categories. These categories are detailed in Table 3.

Table 3: Flood Risk Vulnerability Classification (Adapted from PPS25, Table D.2)

Flood Risk Vulnerability Classification	Examples of Development Types
Essential Infrastructure	- Transport Infrastructure - Utility Infrastructure (e.g. water treatment works and wind turbines)
Water Compatible	- Flood Control Infrastructure - Water and Sewerage Infrastructure - Navigation Facilities
Highly Vulnerable	- Emergency Services - Basement Dwellings - Mobile home parks
More Vulnerable	- Hospitals and other health services - Residential Establishments - Educational Establishments
Less Vulnerable	- Commercial Establishments (e.g. shops, restaurants and offices)

Based on the vulnerability of a development, PPS25 states what Flood Zone(s) the development is appropriate within. The flood risk vulnerability and Flood Zone ‘compatibility’ of developments is summarised in Table 4.

Table 4: Flood Risk Vulnerability and Flood Zone Compatibility (Extract from PPS25, Table D.3)

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	1	✓	✓	✓	✓	✓
	2	✓	✓	Exception Test	✓	✓
	3a	Exception Test	✓	×	Exception Test	✓
	3b	Exception Test	✓	×	×	×

1.3.4 The Sequential Test, Exception Test and Sequential Approach

The Sequential Test is a risk-based test that should be applied at all stages of development and aims to steer new development to areas with the lowest probability of flooding (Zone 1). This is applied by the Local Planning Authority by means of a Strategic Flood Risk Assessment (SFRA).

The SFRA and PPS25 may require the Exception Test to be applied to certain forms of new development. The test considers the vulnerability of the new development to flood risk and, to be passed, must demonstrate that:

- There are sustainability benefits that outweigh the flood risk;
- It is on previously developed land or there are no other suitable previously developed sites in lower flood risk zones; and
- The new development is safe and does not increase flood risk elsewhere.

The Sequential Approach is also a risk based approach to development. In a development site located in several Flood Zones or with other flood risks, the sequential approach directs the most vulnerable types of development towards the areas of least risk within the site.

1.3.5 Climate Change

PPS25 makes it a planning requirement to account for climate change in the proposed design. The recommended allowances are summarised in Table 5 below.

Table 5: Climate Change Allowances (Extract from PPS25, Table B.2)

Parameter / Horizon	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height	+5%		+10%	

1.3.6 Sustainable Drainage

The key planning objectives in PPS25 are to appraise, manage and where possible, reduce flood risk. Sustainable Drainage Systems (SuDS) provide an effective way of achieving some of these objective, and PPS25 and Part H of the Building Regulations (DTLR, 2002) directs developers towards the use of SuDS wherever possible.

2 Existing Site









2 Existing Site

This section of the report provides a description of the site based on the site visit undertaken and the information available on flood risk.

2.1 Site Description

2.1.1 General

A site location plan and site plan is provided in Appendix 1. It is located off Kinnaird Road and Cotton Lane in Withington, Manchester.

The overall site is approximately 3.03ha in area. The site consists of a number of specialist treatment buildings for hospital patients and nurses and doctor's residential buildings, as well as formal parking areas, informal hardstandings and landscaping. The site is accessed off Kinnaird Road to the south and Cotton Lane to the north and is bounded by the B5093 Wilmslow Road to the west and properties off Cotton Hill to the east. In the wider area the site is surrounded by residential development to the north, east and south and the Christie NHS Foundation Trust and the Paterson Institute for Cancer Research to the west.

2.1.2 Topography

Based on Ordnance Survey mapping contained in Appendix 1 the site and surrounding area is generally sloping from north east to south west. The levels in the vicinity of the site range from 38m Above Ordnance Datum (AOD) to 34mAOD.

Within the site itself a detailed topographic survey has been undertaken, and this is provided in Appendix 1. It shows that within the site generally vary between approximately 37.4mOD and 34.4mOD. Although some of the variations in site levels are irregular there appears to be a general fall across the site from east to west and north to south, the lowest point of the site right by the entrance on Kinnaird Road. The ground is retained in certain areas, with access provided by steps.

2.1.3 Services

Based on the services survey drawing in Appendix 1 the site is heavily serviced by buried gas, electric, water, telecoms and sewers, and overhead wires.

In the wider vicinity the United Utilities sewer record contained in Appendix 1 show public sewers in Cotton Lane and Kinnaird Road and in the B5093 Wilmslow Road.

There are four proven and one unproven outfalls from the combined and separate foul and surface water private on-site sewers to the United Utilities sewers, as shown on the services survey drawing (Appendix 1). However, the detail of these sewers is limited and there will be a need to undertake further investigations to confirm the sewer condition and gradient if these are to be re-used and the capacity determined. The capacity of the existing sewers will be discussed in Section 4.

2.1.4 Site Visit

A site visit was undertaken in February 2011 and photographs showing the site are contained in Appendix 1.

During the site visit rainwater pipes and gullies were observed, proving a positive drainage of impermeable and roofed areas. An assessment was made on the impermeable contributing areas that were formally and informally drained and this information will be used in determining the existing surface water runoff regime.

There was no evidence of watercourses flowing through the site.

3 Consultations









3 Consultation

During the course of producing this FRA, AECOM consulted the Environment Agency, Manchester City Council and United Utilities, as well as commissioning an EnviroCheck report. This section of the report details the information gathered through the consultation, as well as information obtained from the EnviroCheck searches.

3.1 Environment Agency

The Environment Agency responses to AECOM's inquiries are contained in Appendix 2, and in summary:

- The site is in Flood Zone 1
- An FRA is required
- A critical drainage assessment will be required

3.2 Manchester City Council

Manchester City Council's response to AECOM's inquiries is contained in Appendix 2, and in summary:

- The site is in Flood Zone 1
- The Strategic Flood Risk Assessment is available to review
- A critical drainage assessment will be required
- There is a hidden watercourse nearby

The response also advised AECOM to look into policies WB2 and DC21.1.

3.2.1 Strategic Flood Risk Assessment

Information from the Strategic Flood Risk Assessment (SFRA) which is relevant to the site is summarised below.

3.2.1.1 SuDS

The SFRA explains that

> *"Surface water flooding is a major source of flood risk and as demonstrated by the summer 2007 floods can lead to serious flooding of property and possessions. These impacts can typically be mitigated through the implementation of established best practice drainage techniques including Sustainable Drainage Systems (SUDS) at the planning application stage."*

3.2.1.2 Fluvial Flood Risk

According to the Greater Manchester sub-regional SFRA, a significant source of flood risk across the region is from fluvial flooding. Fluvial flooding is flooding caused by high flows in rivers or streams exceeding the capacity of the river channel and spilling onto the floodplain, usually after a period of heavy rainfall.

The Level 2 SFRA surface water flood map and flood risk assessment indicates that the site is not at highest risk of surface water flooding:

3.2.1.3 Records of Flooding

According to Greater Manchester sub-regional SFRA there are no known reports of groundwater flooding recoded by the Manchester, Trafford and Salford authorities

3.2.2 WB2 (from Employment and Economic Development)

The policy WB2 states:

> *"In considering proposals for the expansion and/or redevelopment of major employment sites in the area, particularly the Christie Hospital on Wilmslow Road, the Council will have regard to the need to minimise any impact upon the environmental quality and character of the area, residential amenity, and traffic movements."*
>
> *Reason: The major employer in the Withington and Burnage area is the Christie Hospital on Wilmslow Road, Withington, which provides an important regional and national medical facility. It already generates a considerable amount of traffic and the lack of adequate off-street car parking facilities to cater for this traffic is becoming a problem locally."*

In relation to flood risk therefore the environmental quality issues need to be addressed.

3.2.3 DC21.1 (from Flood Risk Areas)

The policy DC21.1 states

> *"development, including the raising of land, will not normally be permitted", it is therefore the proposed development retains the existing levels as a minimum so the area does no lose any flood plain storage."*

3.3 United Utilities

AECOM contacted United Utilities to obtain public sewer and water main asset plans for the local area and these are contained in Appendix 1 and in summary:

- The sewer plan shows a 300mm combined sewer running from east to west along Kinnaird road which connects into a 1275mm combined sewer flowing from north to south in Wilmslow Road. The plan also shows a 375mm combined sewer running from east to west along Cotton Lane which connects into a 450mm combined sewer flowing from South to North.
- The water main asset plan shows a complex network of public water main's around the site ranging from 90-225mm in diameter.
- No public water mains cross the site.

AECOM also enquired as to the potential to maintain existing connections to the sewer (which are described in Section 4) and a copy of the correspondence is contained in Appendix 2 and summarised below:

- Domestic sewage and storm water can be connected at unrestricted rates
- Clarification required on waste water to be discharged as it might require a consent
- No information on flooding from public sewers is available

3.4 EnviroCheck

AECOM procured an EnviroCheck report which is contained in Appendix 2. In summary:

- The site is in Flood Zone 1
- The site is at negligible pluvial flood risk from the 1 in 75 and 1 in 100 year return periods
- The site is at pluvial flood risk from the 1 in 1000 year return period
- The site does not have a river within it
- The site is at negligible risk from groundwater flooding

3.5 Bertram Done

Betram Done are responsible for the civil, structural, highway and drainage design of the Multi Storey Car Park and the new access road into the site. The Bertram Done engineers have forwarded the drainage calculations that are discussed in Section 5 of this report.

AECOM and Betram Done have co-ordinated the drainage approach to the MCRC and MSCP development and considered flood risk accordingly.

4 Proposed Development









4 Proposed Development

During the course of the assessment the development proposals were considered in relation to the current flood risk planning guidance (PPS25). This section details the site proposals in relation to PPS25.

4.1 Development Proposals

The development proposals consist of three elements, two of which are considered in this Flood Risk Assessment report and as shown in the Proposed Boundaries and Existing Outfalls' drawing in Appendix 3:

- The MCRC Site – This site contains the MCRC building and surrounding paths and landscaping features.
    - AECOM are responsible for the drainage design of this site.
- Multi Story Car Park (MSCP) Site - This site includes the MSCP, the access road between the MSCP and the MCRC site and the surrounding landscaping features.
    - Bertram Done are responsible for the drainage design of this site.
- Potential Future Development – These areas are to be retained in their existing state and use, but have been highlighted for possible future development.
    - At this stage the proposals are unknown and undefined
    - Flood risk from these areas therefore can not be considered
    - A separate or updated FRA should accompany any future planning applications that cover these areas
    - This FRA does not cover these areas

The MCRC works will consist of the demolition of the existing buildings within the development areas and the construction of a new building and associated infrastructure and services to house the new Cancer Research Centre facility, a service yard, paths, landscaping features and street frontage.

The MSCP works will consist of a new Multi-Story Car park, access road and car parking at ground level from the new site access and all associated landscaping, infrastructure and services.

5 Drainage Assessment









5 Drainage Assessment

In accordance with PPS25 and the recommendations of the Environment Agency and Manchester City Council this drainage assessment is seeks to demonstrate that it is possible to discharge foul and surface water from proposed development safely, without increasing flood risk. The exact details of the proposed drainage system will be defined at the detailed design stage. This section should be read in conjunction with the 'Proposed Boundaries and Existing Outfalls' drawing found in appendix.

5.1 Foul Drainage

5.1.1 Existing Drainage Arrangements

As described in Section 3 and as shown on the existing services drawing in Appendix 1, the entire site is served by its own private combined and separate foul and surface water sewer system. Please note however, that sewers indicated as "foul" or "surface water" are subject to confirmation, as it would appear that the majority of the system is combined. Flows are discharged to one of four known outfalls into the United Utilities public sewer system around the site, as follows:

- Outfall 1 is to the north west of the site
- Outfall 2 is to the south west of the site
- Outfall 3 is to the north east of the site
- Outfall 4 is to the south of the site

There are other sewers shown on the existing site survey, although it is not known where these ultimately outfall too and therefore have been ignored for the purposes of this report.

The buildings to be demolished as part of the proposed works have formal foul drainage systems which discharge to Outfalls 1 and 2.

Exiting flows from the buildings to be demolished are not expected to be high, less than 10l/s.

5.1.2 Proposed Drainage Arrangements

For the proposed development the new MCRC building site will be served by a new separate foul water sewer system. At this stage no foul flow is expected from the MSCP part of the site.

The existing outfalls into the public sewer will be retained. The proposed outfall arrangements for the site can be summarised in Table 6 below:

Table 6: Proposed Outfall Arrangements

Outfall	Proposals
1	To serve the MCRC and MSCP proposed surface water flows
2	To serve the MCRC proposed foul water flows
3	To be retained for existing and future development
4	To be retained for existing and future development

The proposed foul water sewers will be designed to meet the standards of the Building Regulations Part H with particular reference to Table 7 below.

The proposed building foul flow will not be significant, and likely to be less than 10l/s.

Table 7: Minimum Gradients for Foul Drains

Peak Flow (litres per second)	**Pipe Diameter** (mm)	**Minimum Gradient** (1 in …)	**Notes**
< 1	100	40	None
> 1	100	80	Minimum 1 WC
> 1	150	150	Minimum 5 WCs

5.2 Surface Water Drainage

5.2.1 Existing Drainage Arrangements

As described in Section 5.1 above and Section 3, the site is served by its own private combined and separate foul and surface water sewer network which discharges flows to United Utilities sewers via four known outfalls.

5.2.2 Existing Contributing Areas

Based on the site visit, aerial photography and the below ground services drawing, impermeable contributing areas for the existing site were assessed and attributed and apportioned to one of the four outfalls, as shown in the drawing in Appendix 1. In summary refer to Table 8 below.

Table 8: Existing Areas

Discharge Reference	**Location**	**Impermeable Area (Ha)**
Outfall 1	North west corner	0.275
Outfall 2	South west corner	0.205
1& 2 Sub-total	-	0.480
Outfall 3	North east corner	0.217
Outfall 4	South	1.041
Informally Drained	-	0.172
Permeable	-	1.141

5.2.3 Existing Surface Water Runoff Rates

The existing discharge rates can be calculated using a variety of methods. It is usual to use the lesser of the flow based on the contributing impermeable area or the discharge capacity of the outfall pipe.

Contributing Area Method

The existing rate of surface runoff from the impermeable areas can be estimated using BS EN 752 Part 4: 1998 ’11.3.2 Methods of Calculating Runoff from Small Development Schemes’. The BS EN 752 Part 4 method is applicable for sites up to 200 ha in area, and is explained below:

$Q = \Psi iA$ where: Q = Peak Runoff Rate (l/s)

Ψ = Permeability factor (1 being wholly impermeable)

i = Rainfall Intensity (l/s.ha) = 140l/s.ha for 1 in 30 year storm

A = Area (ha)

Discharge Capacity Method

The existing flow rate from the site can be calculated using the Colebrook White formula for pipe flow, assuming pipe free discharge. The Colebrook White formula is as follows:

Flow velocity, $V = -2(2gDS)^{0.5} \log\left[\frac{ks}{3.7D} + \frac{2.51v}{D(2gDS)^{0.5}}\right]$

Where,
g = gravitational acceleration = 9.81 m/s^2
D = Pipe diameter (m)
Ks = Pipe roughness = 0.6mm (surface water)
v = kinematic viscosity = 1.14×10^{-6} m^2/s
S = Hydraulic gradient (m/m)

Flow, Q = V x A (cross sectional area of pipe)

All outfall pipes are 150mm diameter, although the gradient for Outfalls 1, 3 and 4 are unknown and assumed to be 1/150. Outfall 2 has a gradient of 1/10.

The existing theoretical discharge rates based on the two methods are above are shown in Table 9 below.

Table 9: Existing Flow Rates

Discharge Location	**Impermeable Area** (ha)	**Flow Rate (Contributing Area Method)** (l/s)	**Flow Rate (Discharge Capacity Method)** (l/s)
To Outfall 1	0.275	38.5	14
To Outfall 2	0.205	28.7	57
To Outfall 3	0.217	30.4	14
To Outfall 4	1.041	145.7	14

Note:
Both methods are based on pipe free discharge and not a surcharged pipe. Should the level of water rise in the upstream manhole the outfall pipe would become surcharged and the head of water (which could rise to ground level) would drive more flow down the outfall pipe therefore the above calculations are conservative. This is what occurs now.

For simplicity and to be conservative at this stage a flow rate of **14l/s** will be assumed from each outfall, although this will be clarified at the detailed design stage.

5.2.4 Proposed Surface Water Management Methods.

PPS25 and the Building Regulations Part H state a hierarchy of where surface water should discharge. This hierarchy should be followed were practicable, and is listed below:

1) Infiltration

2) Watercourses

3) Public sewers

The superficial geology for the area, as determined in the AECOM Geo-Environmental desk study (which can be made available upon request) is boulder clay overlying shallow sandstone. Clay has little infiltration capacity.

Soils and rock of this nature have varying permeability and in the case of sandstone it depends on the weathering of the rock and the presence of fissures. Infiltration tests may show high infiltration potential or low infiltration, and it is down to

luck as to whether fissures are exposed for the water to drain through during the tests. The results therefore may not be reflective of the wider areas' ground conditions. The requirements of PPS25 and the drainage design standards mean that the 1 in 100 year return periods must be analysed, with the impact of climate change increases to rainfall considered. Because of this, runoff rates are large and whereas once, soakaway devices were required to deal with the 1 in 10 year return periods (as described in BRE Digest 365) the soakaway devices are required to manage and discharge significantly higher flow rates and therefore are required to be much larger. For this reason, a soakaway test covering a relatively small area is not representative of the final system. Excavating a larger area for the tests is not practicable in this case as the site is in use and predominantly formally surfaced, and the location of proposed soakaways could be in areas that are currently developed.

Of further risk is that exposing fissures or discovering high infiltration rates during the site tests may not be replicated at the construction stage, and if the permanent works do not drain the site as required then the flood risk is increased which is unacceptable. Leaving the design to 'luck' is also not acceptable.

Further potential issues that would affect the possibility to infiltrate surface water is the risk of contamination, as there is considerable made ground over the site, and the risk of high groundwater which is known to exist in this area. Finally, to rely on infiltration to dispose of all surface water from the site in such a densely populated urban area like this carries significant risk. For all of these reasons infiltration as a means of surface water disposal has been discounted.

The second preferred method is to discharge to a watercourse, but there are no suitable watercourses on site or in the vicinity of the site, therefore disposal of surface water to a watercourse is discounted.

Because of the above it is proposed that the existing discharge rights and outfall connections to United Utilities sewers are retained and maintained. This is acceptable based on the United Utilities response to AECOM's enquiries.

5.2.5 Proposed Contributing Areas

Based on the 'proposed impermeable area take off' drawing contained in Appendix 3, the impermeable contributing areas were assessed and apportioned to the outfalls. In summary refer to Table 10 below.

Table 10: Proposed Contributing Impermeable Areas

Discharge Location	Impermeable Area (Ha)
To Outfall 1	0.726
To Outfall 2	0.362
1 & 2 Sub-Total	**1.088**

5.2.6 Climate Change

PPS25 requires climate change to be taken into account. According to PPS25 (Table 2), rainfall intensity is estimated to increase by 20% until 2085 to allow for climate change. Beyond this it is expected there will be up to 30% increase in rainfall intensity.

In accordance with EA policy and the expected lifetime of the proposed development (60 years), the site must be designed to account for 20% increase in rainfall intensity over its lifetime.

5.2.7 Sustainable Drainage Systems (SuDS)

As outlined in Section 1, PPS25 and Part H of the Building Regulations direct developers towards the use of SuDS wherever possible. The Environment Agency and Manchester City Council also encourage the use of SuDS.

Table 11 on the following page outlines the type of SuDS that could be used on site.

In regards to the current proposals on the MCRC and MSCP site, due to the layout and site constraints, the following SuDS will be possible:

- Rainwater harvesting
- Oil/petrol interceptors
- Silt traps
- Flow control devices
- Attenuation storage
- Trapped gullies and channel drains

There is insufficient space within the site and health and safety issues associated with using filter strips, swales and open basins; permeable pavement will not be used because of the potential for future development, its appearance and drainage and its ability to withstand high traffic loadings; and green roofs have been discounted due to increased loading of the structural elements and foundation loads.

Table 11: Capability of different SuDS techniques (Extract from CIRIA C697, Table 1.7)

Technique	Description	Management Train Suitability						Water Quantity				Water Quality								Environmental Benefits		
		Prevention	Conveyance	Pre-treatment	Source control	Site Control	Regional Control	Conveyance	Detention	Infiltration	Water Harvesting	Sedimentation	Filtration	Adsorption	Biodegradation	Volatilisation	Precipitation	Uptake by plants	Nitrification	Aesthetics	Amenity	Ecology
Water butts, site layout and management	Good housekeeping and design practices.	■	▲		■			▲	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Pervious pavement	Allow infiltration of rainwater into underlying construction/soil.	■			■	▲			■	■	▲	■	■	■	■	■				▲	▲	▲
Filter drain	Linear drains/ trenches filled with a permeable, often with a perforated pipe at the base of the trench.		■		■	▲		■	■				■	■	■	■						
Filter strips	Vegetated strips of gently sloping ground designed to drain water from impermeable areas and filter out silt and other particulates.			■	■			▲	▲	▲		■	■	■	■					▲	▲	▲
Swales	Shallow vegetated channels that conduct and/or retain water (and can permit infiltration when underlined). The vegetation filters particulates.		■		■	■		■	■	▲		■	■	■	■			▲		▲	▲	▲
Ponds	Depressions used for storing and treating water. They have a permanent pool and bankside emergent and aquatic vegetation.					■	■		■	▲	■	■	■	■	■	■	■	■	■	■	■	■
Wetlands	As ponds, but the runoff flows slowly but continuously through aquatic vegetation that attenuates and filters the flow. Shallower than ponds.		▲			■	■	▲	■	▲	■	■	■	■	■	■	■	■	■	■	■	■
Detention Basin	Dry depressions designed to store water for a specified retention time.					■	■		■			■	▲	▲	■			■		▲	▲	▲
Soakaways	Sub-surface structures that store and dispose of water via infiltration.				■					■			■	■	■							
Infiltration Trenches	As filter drains, but allowing infiltration through trench base and sides.		▲		■	■		▲	■	■			■	■	■	■						
Infiltration basins	Depressions that store and dispose of water via infiltration.					■	■		■	■			■	■	■	■				▲	▲	▲
Green roofs	Vegetated roofs that reduce runoff volume and rate.	■		■	■				■				■	■	■	■	■	■	■	■	■	■
Bioretention areas	Vegetated areas for collecting and treating water before discharge downstream, or to the ground via infiltration.				■	■			■	■		■	■	■	■	■	■	■	■	■	■	■
Sand filters	Treatment devices using sand beds as filter media.			■		■	▲		■	▲			■	■	■	■	■					
Silt removal devices	Manhole and/or proprietary devices to remove silt.			■								■										
Pipes, subsurface storage	Conduits and their accessories as conveyance measures and/or storage. Water quality can be targeted using sedimentation and filter media.		■			■		■	■			▲	▲	▲								

Key	
■	Recommended
▲	Some opportunities, subject to design

5.2.8 Surface Water Design Parameters

Based on recommendations by the Environment Agency and guidance within Building Regulations Part H and the CIRIA Report C697 'The SuDS Manual' the surface water sewer network for the proposed development has been designed using the following parameters:

- No increase in surface water discharge compared to the existing rates so as not to increase flood risk downstream
- No flooding from the drainage network for the 30 year return period.
- No flooding of buildings or off site parties for the 100 year return period with a 20% allowance for climate change.
- Above ground flooding is tolerated in controlled areas during the 100 year return period with a 20% allowance for climate change, subject to depth and the risks of doing so.

5.2.9 Proposed Management of Increase in Surface Water Runoff

It is proposed that surface water runoff is limited to the agreed rate to ensure that the development does not increase the risk to the site or off site parties and land from surface water flooding.

For the purposes of this report flows to each outfall in excess of 14l/s will need to be controlled to 14l/s. In reality the exact flow to each outfall will be confirmed at the detailed design stage. To balance excess flows because of the impact of climate change and the 30 year and 100 year flows, attenuation storage will be provided in the form of oversized pipes and a storage tank.

5.2.10 Surface Water Hydraulic Modelling and Storage Requirements

5.2.10.1 MCRC Site

Using MicroDrainage's WinDes software based on the indicative MCRC proposed surface water drainage drawing in Appendix 3, Table 12 shows the indicative storage volumes are necessary:

Table 12: MCRC Storage Volumes

Outfall and Return Period	**Storage Volume** (m^3)
Outfall 2: 1 in 30 + CC*	110
Outfall 2: 1 in 100 + CC	158

*To provide a conservative estimate climate change has been included at this stage for the 30 year event.

5.2.10.2 MCSP Site

As described previously the surface water design for the MSCP site and the access road between the MCRC and MSCP site has been undertaken by Bertram Done. The hydraulic modelling results can be found in Appendix 3 and the storage requirements can be summarised in Table 13 below. The table should be read in conjunction with the 'Proposed Multi Storey Car Park' drawing (Appendix 3).

Table 13: MSCP Storage Volumes

Storage Structure	**Approximate Length of Pipe** (m^3)	**Storage Volume** (m^3)
900mm pipe	155	99
750mm pipe	52	23
-	**Total**	**122**

5.2.11 Surface Water Conclusion

Based on the assumptions and indicative calculations above surface water from both site's will be discharged to the United Utilities sewers as currently occurs at an agreed rate. For the purposes of this report this is 14l/s per outfall, but is subject to further and ongoing investigations and detailed design.

In order to balance excess flows attenuation storage will be provided to ensure flooding does not occur up to the 1 in 30 year return period. Flows in excess of this, up to the 1 in 100 year return period (plus an allowance for rainfall intensity increases due to climate change of 20%) will be tolerated above ground if it is safe to do so or additional below ground storage will be proved.

At the detailed design stage the surface water drainage design will be confirmed, based on the principles described above, but a safe and sustainable drainage system can be constructed.

6 Flood Risk Assessment









6 Flood Risk Assessment

In accordance with PPS25 flood risk must be assessed for all sources of flooding. The development of any site must also be carried out in such a way as to mitigate any potential flood risk, both on and off site. This section identifies the foreseeable sources of flooding and assesses the flood risk associated with each one.

6.1 Tidal Flooding

The site is located approximately 55km to the east of the Irish Sea. None of the watercourses located within the vicinity of the site are tidally influenced.

The risk to the site from tidal flooding is considered to be low and acceptable.

6.2 Fluvial Flooding

The Environment Agency Flood Map shows the site is located in Flood Zone 1. The annual probability of fluvial flooding occurring in Flood Zone 1 is less than 0.1%, and is considered low.

The risk to the site from fluvial (river) flooding is considered to be low and acceptable.

6.3 Flooding from Land (Pluvial Flooding)

As shown on the 'RMS 75 Year Return Flood Data' and 'RMS 100 Year Return Flood Data' maps in Appendix 2, the site is not at risk from pluvial flooding during the 1 in 75 and 1 in 100 year return period.

The 'RMS 1000 Year Return Flood Data' map in Appendix 2 shows the site is at risk from the 1 in 1000 year return period, as is the majority of the surrounding area and no doubt Manchester.

The risk to the site from pluvial flooding is considered to be low and acceptable.

6.4 Groundwater Flooding

As shown on the 'BGS Groundwater Flooding Susceptibility' map in Appendix 2, the site and surrounding area can be considered to have a 'negligible susceptibility' to groundwater flooding. No works is proposed to create a basement and existing ground levels will be retained where possible and where it is not possible the works will be limited. During the construction of the building foundations and sewerage systems, measures may have to be taken by the contractor to protect the works from groundwater ingress depending on the level of the groundwater at the time of the works. This is a usual and acceptable risk in civil engineering.

The risk from groundwater flooding is therefore considered to be low and acceptable.

6.5 Flooding from Public Sewers and Water Mains

Public sewer and water main asset plans have been obtained from United Utilities and no sewers cross the site. Public sewers within the vicinity of the site are over 3.5m deep and on site sewers are small. Water mains are also small. There are no known records of the site being affected by sewer or water main flooding.

The risk of flooding from public sewers and water mains is therefore considered to be low on site.

6.6 Flooding from Artificial Sources

There are no artificial water bodies located within the proximity of the site.

The flood risk to site from artificial sources is therefore considered to be low and acceptable.

6.7 Flood Risk from Proposed Sewers

6.7.1 Foul Water Sewers

The peak foul flows from the site are not expected to be significant, less than 10l/s. The existing foul sewers associated with the buildings that are being demolished will be replaced with new foul sewers serving the new building and the proposed foul flows are not expected to be significant, again less than 10l/s.

The new sewer system will be designed to meet the requirements of the Building Regulations Part H and the United Utilities sewers in the vicinity are large diameter.

On this basis the flood risk associated with the construction of new foul water sewers is considered to be low and acceptable.

6.7.2 Surface Water Sewers

Based on the information in Section 5 the contributing impermeable area for the MCRC and MSCP parts of the site will increase compared to the existing contributing impermeable area for those parts of the site and the impact of climate change will also increase surface water runoff rates: Flow rates could increase compared to the existing situation. Constructing new sewers that discharge to the United Utilities public sewer in the vicinity at an unlimited rate will likely increase flood risk downstream.

The flood risk associated with the construction of new surface water sewers is therefore considered to be medium and unacceptable and therefore mitigation is required as described in Section 6.8 below.

6.8 Mitigation

As described in Section 5 and from Section 6.7 above, surface water flows from the site will increase compared to the existing scenario due to increases to the impermeable area and the increase in rainfall intensity due to the impact of climate change. This will likely lead to an increase in flood risk, which is unacceptable.

In order to mitigate the risk the surface water flows will be controlled to existing rates, which will be proven by additional survey where information is lacking, and agreed. Excess flows will be balanced using storage systems which for the MSCP site will consist of oversized pipes and for the MCRC site will consist of oversized pipes or tanks. Flows up to the 1 in 30 year return period will be stored below ground. Flows up to the 1 in 100 year (plus an allowance for rainfall intensity increase due to climate change of 20%) return period will be stored either below ground or above ground in areas that are able to support flooding without undue risk to health and safety, off site third parties, on site users and the safe operation of the site.

The flow rates to the outfalls will be agreed with United Utilities. The flow rates and volumes of storage included in Section 5 are indicative at this stage and subject to agreement and detailed design, but seek to demonstrate that a suitable below ground surface water drainage system is achievable. Further advisable mitigation to protect against incapacity of the sewer system or overland flows is to construct the finished floor level of the building 150mm above the surrounding ground.

On this basis the flood risk associated with the construction of new surface water sewers, flow control devices and attenuation storage (SuDS) is considered to be low and acceptable.

6.9 Flood Risk Vulnerability and Flood Zone Compatibility of Proposed Development

The entire site falls in Flood Zone 1, therefore all types of building or development are appropriate.

6.10 Sequential and Exception Tests

The site is located in Flood Zone 1 and therefore the sequential test and exception test is not required.

7 Summary and Recommendations









7 Summary and Recommendations

7.1 Summary

AECOM has prepared this FRA to assess the flood risk to the proposed development of the Manchester Cancer Research Centre and the Multi Story Car Park on Kinnaird Road, Withington in Manchester.

All the appropriate agencies have been consulted in producing this FRA, including the Environment Agency, Manchester City Council and United Utilities. In summary of the recommendations, a FRA was required to accompany any planning application and due to flood risk associated with drainage in the area, a drainage assessment was required and local planning policies need to be taken into account.

This FRA demonstrates the flood risk to the site is low and as it is located in Flood Zone 1 which means that all forms of development are appropriate

From the drainage assessment in Section 5 there are four existing outfalls to United Utilities sewers and infiltration or a watercourse connection is not possible, therefore the existing sewer connections will be maintained. To mitigate the increase in flood risk due to surface water flow rates increasing because of an increase in contributing impermeable area and the impact of climate change, flow control devices and attenuation storage will be necessary. Section 5 and the supporting indicative calculations demonstrate that surface water can be adequately managed and that flood risk is low and acceptable. An indicative foul and surface water drainage layout is contained in the Appendices.

In relation to Policy WB2 the environmental issues are addressed by the use of SuDS to improve the water quality and flows are being discharged in separate sewers which is an improvement compared to the existing scenario.

This FRA has considered the other potential sources of flooding to the site, including sea, rivers, groundwater, land, existing sewers and other artificial sources and shows that the flood risk is low and considered to be acceptable.

On this basis therefore planning permission should not be withheld and appropriate conditions in relation to surface water drainage can be applied to the grant of planning permission.

7.2 Recommendations

The following recommendations are made based on the findings of the report:

- Agree surface water discharge flow rates with United Utilities
- Provide detailed calculations to determine how surface water will be managed
- Provide details of the finished ground levels and drainage arrangements
    - Bertram Done to provide for MSCP and access road and car paking
    - AECOM to provide for MCRC building
- Finished floor levels could be 150mm above surrounding ground
- Undertake an update to this FRA report or produce a separate FRA report for the potential future development

Appendices









Appendix 1: Existing Site Information

SITE LOCATION PLANS

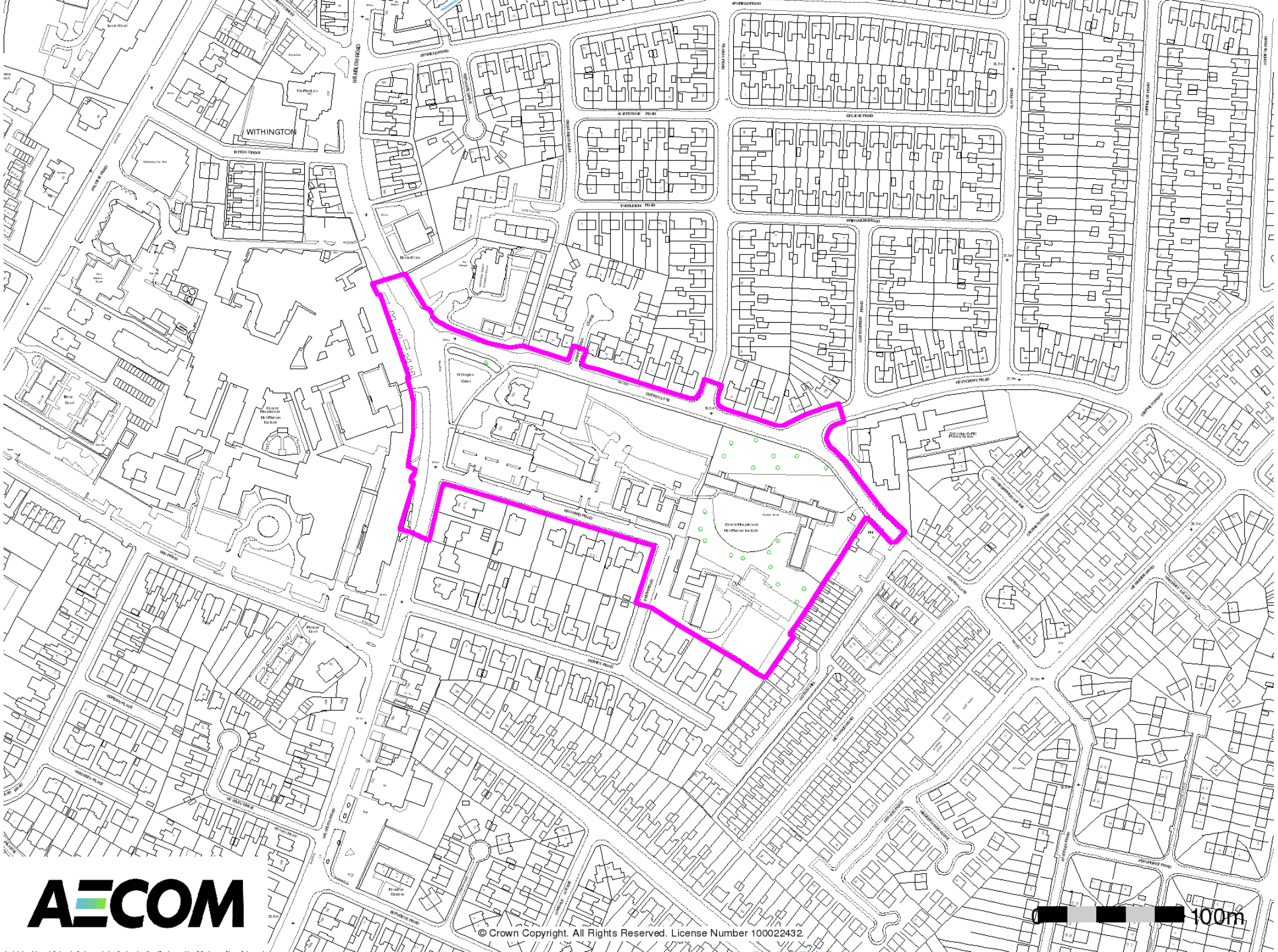
SERVICES SURVEY

SITE PHOTOGRAPHS

EXISTING AREA TAKE OFF

SEWER RECORDS

EXISTING OUTFALL ANALYSIS



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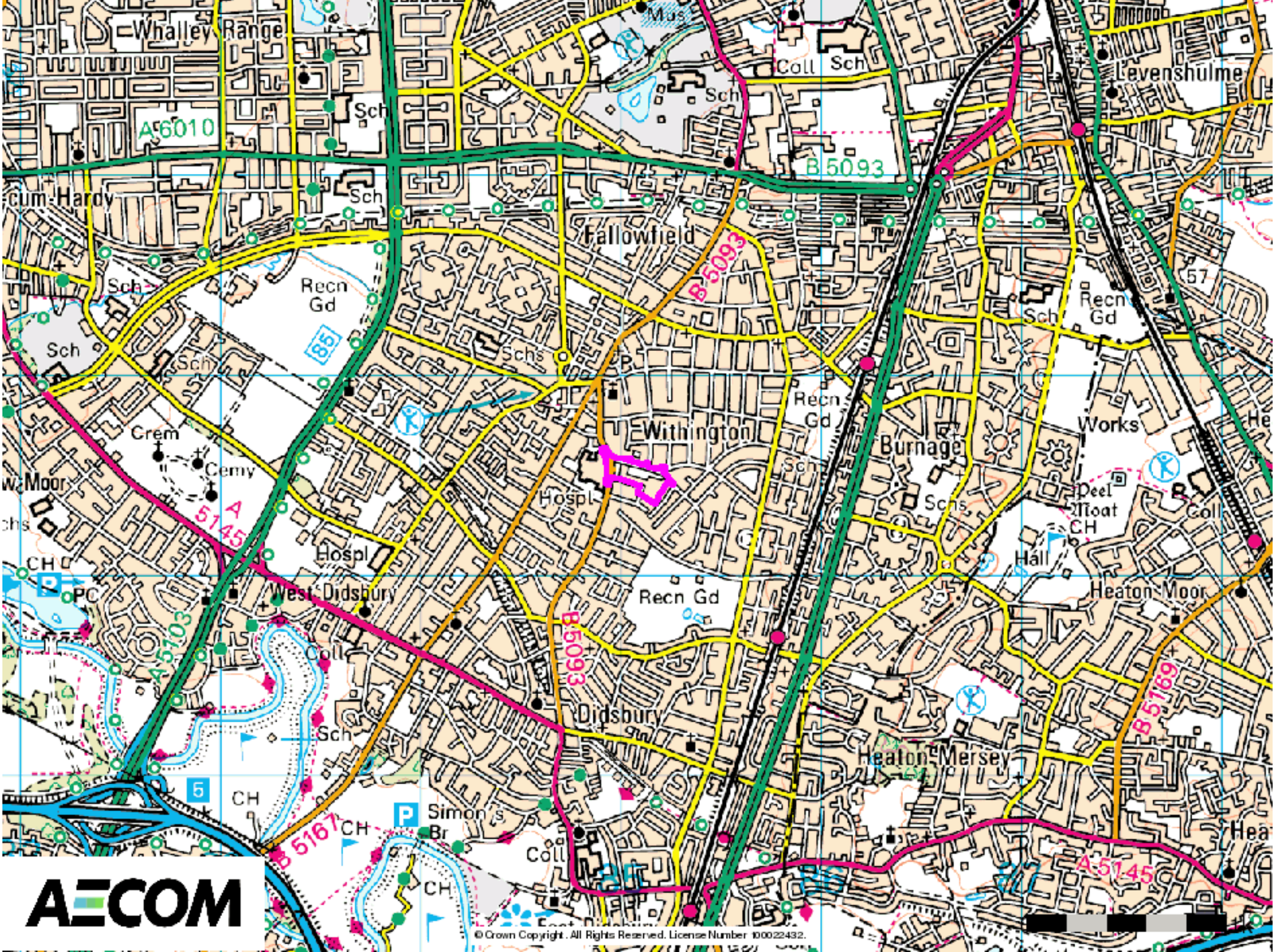
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Withington
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West Didsbury
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Heaton Moor
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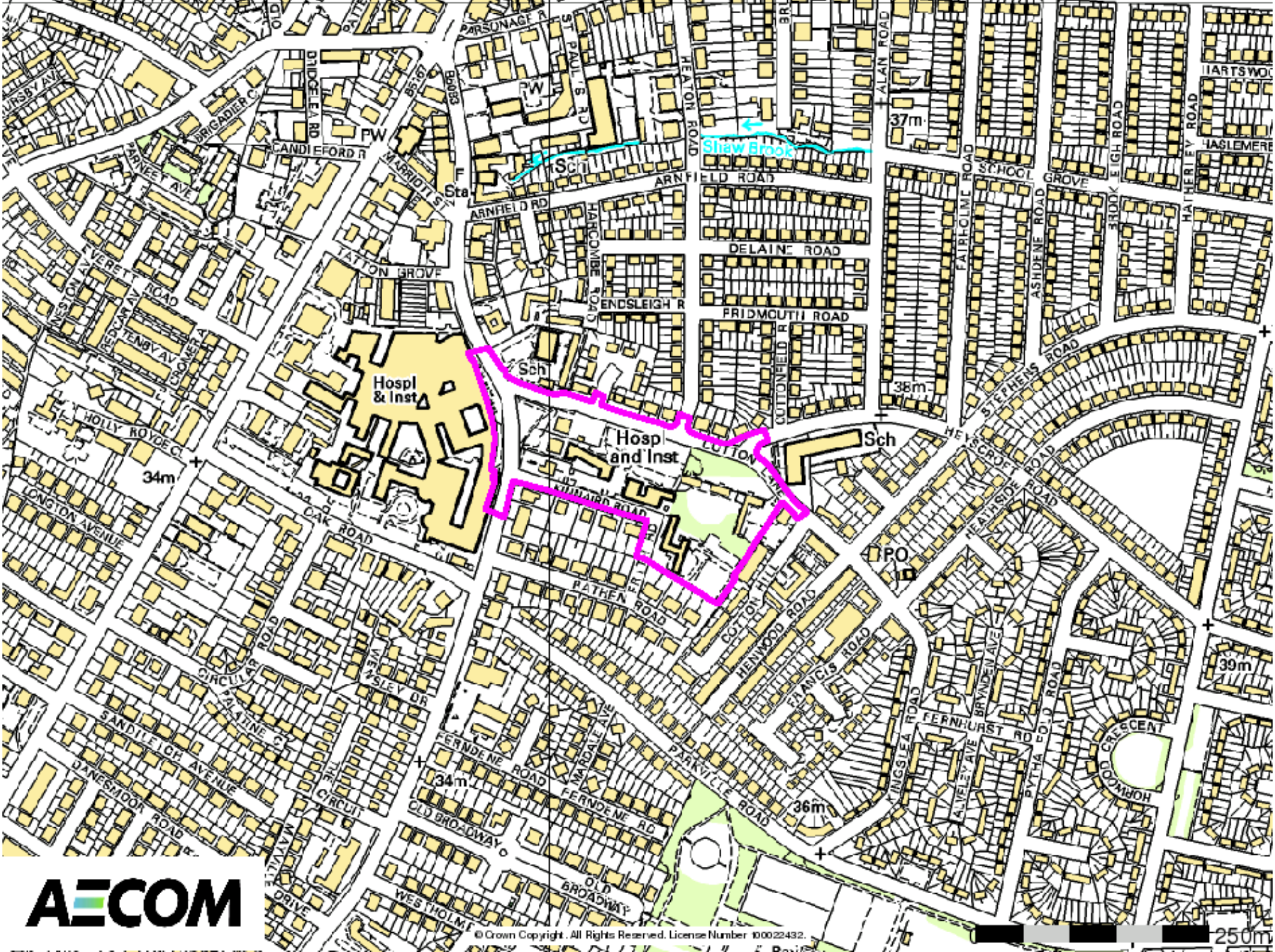
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ARNFIELD ROAD
DELAINE ROAD
FRIDMOUTH ROAD
HARCOMBE ROAD
ENDSLEIGH R
COTTONFIELD R
FAIRHOLME ROAD
ASHDENE ROAD
SCHOOL GROVE
STEPHENS ROAD
HEYSCROFT ROAD
HEATHSIDE ROAD
HARTSWOOD
HASLEMERE
BRIDGE
BRIDGELEA RD
BRIGADIER CL
CANDLEFORD R
MARRIOTT ST
PARNELL AVE
EVERETT ROAD
TATTON GROVE
TENBY AV
HOLLY ROYCE CL
LONGTON AVENUE
OAK ROAD
CIRCUIT ROAD
CIRCUIT
SANDLEIGH AVENUE
DANESMOOR ROAD
WESTHOLME DRIVE
FERNDENE ROAD
MARDALE AVE
OLD BROADWAY
PARKVILLE ROAD
RATHEN ROAD
COTTON HILL
HENWOOD ROAD
FRANCIS ROAD
KINGSLEA ROAD
FERNHURST RD
BRYNDEN AVE
ALVELEY AVE
PYTHALEY ROAD
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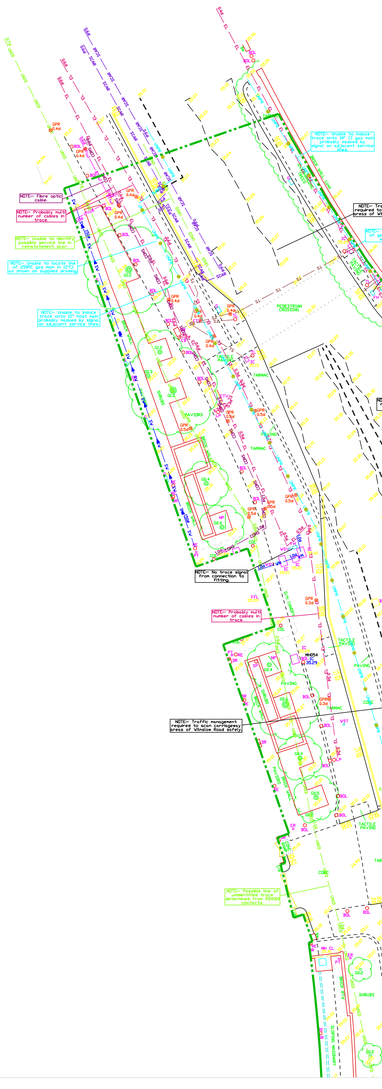
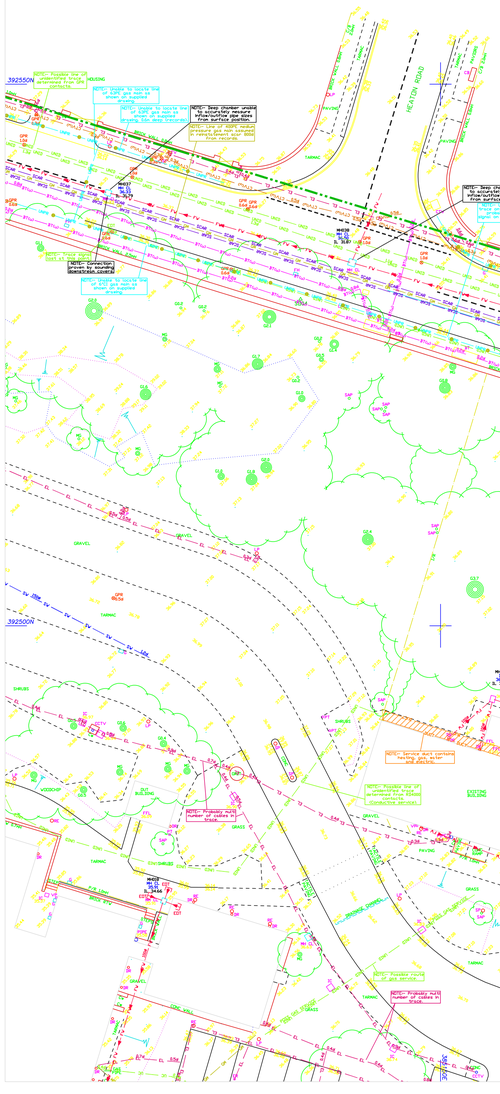

NOTE:- Probably multi number of cables in track.
NOTE:- Unable to identify invisible service due to recently tarmac'd area.
NOTE:- Unable to locate the ref point of Planter service.
NOTE:- Unable to produce trace owing to fact that there is no visible sign on adjacent service area.
NOTE:- Fibre optic cable.
NOTE:- traffic management required to close part/whole area of Whalley Road Ashley.
NOTE:- No trace signs from connection to fitting.
NOTE:- Unable to locate the ref point of Planter service.
NOTE:- Probably multi number of cables in track.
NOTE:- Provided line of connections route determined from Drawing contracts.
NOTE:- Line of HDPE marked on ground not shown on record plan.
NOTE:- Unable to locate the ref point of Planter service.
NOTE:- Probably multi number of cables in track.
NOTE:- Line of BT pit not connected to any other pits.
NOTE:- Unable to locate the ref point of Planter service.
NOTE:- Probably multi number of cables in track.
NOTE:- Provided line of connections route determined from Drawing contracts.
NOTE:- Line of BT pit not connected to any other pits.
NOTE:- Probably multi number of cables in track.
NOTE:- Unable to locate the ref point of Planter service.
NOTE:- Probably multi number of cables in track.
NOTE:- Provided line of connections route determined from Drawing contracts.
NOTE:- Probably multi number of cables in track.
NOTE:- Probably multi number of cables in track.
NOTE:- Probably multi number of cables in track


392600N
392550N
392500N
392450N
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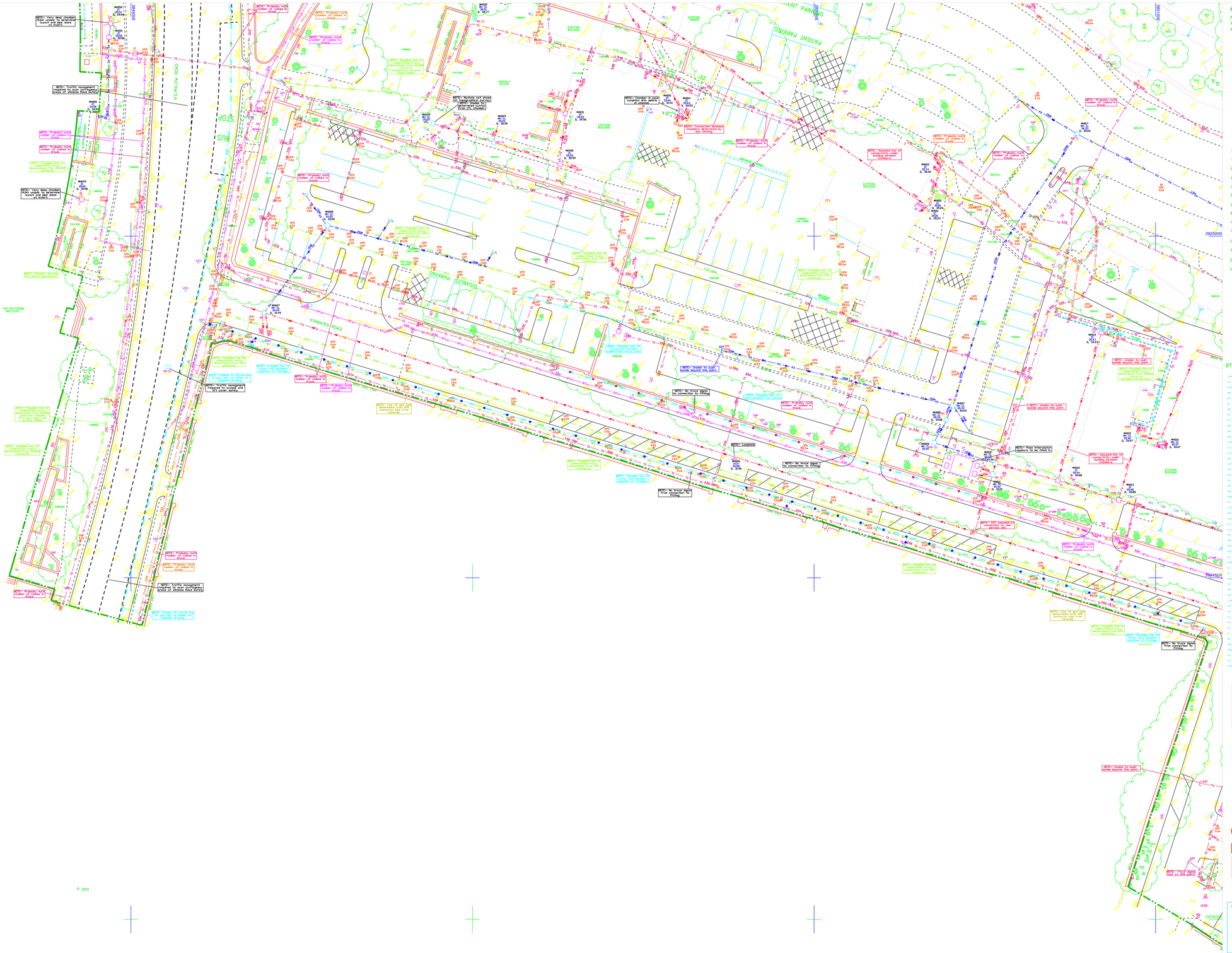
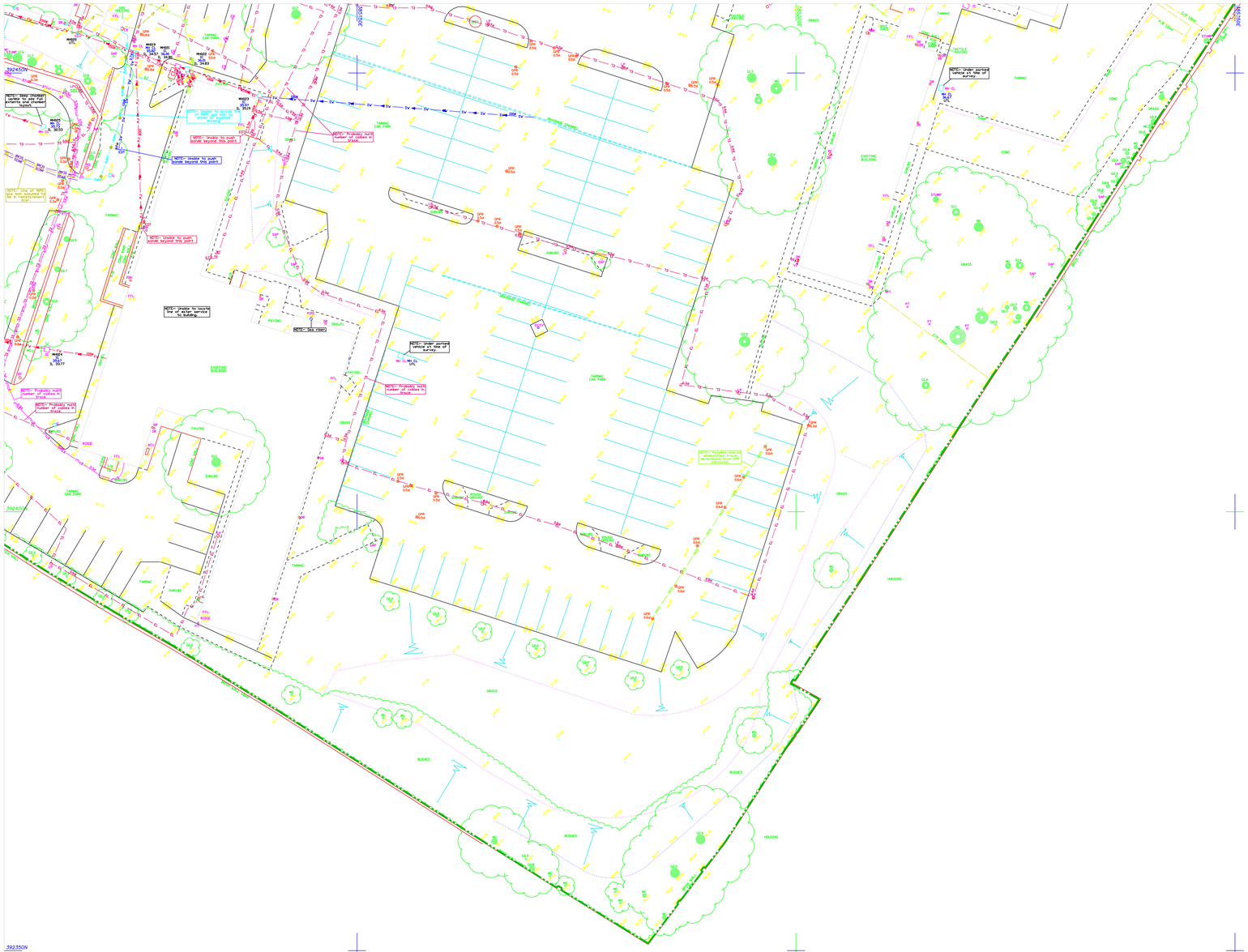
392600E
HOUSING
TARMAC
GRAVEL
GRASS
SHRUBS
CONC
EXISTING BUILDING
EXISTING PAVING
EXISTING TARMAC
EXISTING GRASS
EXISTING GRAVEL
EXISTING SHRUBS
EXISTING CONC
EXISTING HOUSING
KEYSCROFT ROAD
SCHOOL KEEP CLEAR
EDITION LANE
NOTE:- Probably multi number of cables in trench
NOTE:- Trace to turn off LOPS gas main to isolate for survey. DO NOT EXCAVATE
NOTE:- Trace to turn off LOPS gas main to isolate for survey. DO NOT EXCAVATE
NOTE:- Service duct contains 'live' gas and/or electricity cables
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Line of duct under pressure gas main assumed from surface position
NOTE:- Line of duct under pressure gas main assumed from surface position
NOTE:- Drop chamber unable to accurately measure from surface position due to heavy traffic
NOTE:- Channel surcharged by 0.300m (chamber 1.300 deep)
NOTE:- Probably multi number of cables in trench
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Line of duct under pressure gas main assumed from surface position
NOTE:- Trace to turn off LOPS gas main to isolate for survey. DO NOT EXCAVATE
NOTE:- Line of duct under pressure gas main assumed from surface position
NOTE:- Probably multi number of cables in trench
NOTE:- Line of duct deformed from CPE contractor
NOTE:- Probably multi number of cables in trench
NOTE:- No trace signal from connection to fitting
NOTE:- Lamp post
NOTE:- No trace signal from connection to fitting
NOTE:- Probably multi number of cables in trench
NOTE:- Probably multi number of cables in trench
NOTE:- Probably multi number of cables in trench
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Probably multi number of cables in trench
NOTE:- Trace to turn off LOPS gas main to isolate for survey. DO NOT EXCAVATE
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Service duct contains 'live' gas and/or electricity cables
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Provision line of connection to house obtained from plans
NOTE:- Provision line of connection to house obtained from plans


WILMSLOW ROAD
KINGWAY
DISABLED PARKING
PATIENT PARKING
BUS STOP
KINGWAY ROAD
THE PATTERSON INSTITUTE
392500N
392450N
392400N
NOTE:- Traffic management required to access and lift cover safely.
NOTE:- Probably multi number of cables in trench.
NOTE:- Possible line of connection from CPU determined from GPR survey. Confirm by excavation.
NOTE:- Possible line of connection from CPU determined from GPR survey. End from chamber.
NOTE:- Manhole not shown on survey. Position determined from GPR survey.
NOTE:- Chamber in poor condition with debris in channel.
NOTE:- Connection between chambers not found by GPR survey.
NOTE:- Assumed line of connection to under footway chambers.
NOTE:- Possible line of connection from CPU determined from GPR survey. End from chamber.
NOTE:- Possible line of connection from CPU determined from GPR survey. End at footway



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N

Notes:

The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

Utility survey added to topographical survey job No. 10LO10.

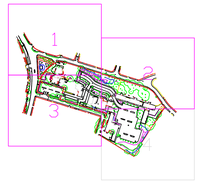
Drainage information must be verified with local authority records before use

SURVEY STATIONS

Name	Easting	Northing	Height
5001	384657.08	392458.82	34.70
5002	385052.81	392363.49	35.84
5003	385059.20	392258.39	36.04
5004	385137.08	392533.15	36.52
5005	385216.56	392526.52	37.05
5006	385280.30	392448.68	37.45
5007	385322.52	392415.69	37.53
5008	385139.36	392189.72	35.39
5009	384900.64	392335.76	34.71
5010	384802.04	392376.49	34.58
5011	384842.28	392424.49	34.68
5012	385085.59	392350.77	35.02
5013	385116.75	392448.06	35.53
5014	385023.51	392476.75	34.88

STANDARD REFERENCE & ABBREVIATIONS

AM)..... Assumed Mark
AV..... Air Valve
B/M..... Bolted Mire
BB..... Belisha Beacon
BH..... Borehole
B.L..... Bed Level
BO..... Box Step
BT Box..... British Telecom Box
BT..... British Telecom IC
BW..... Brick Wall
Bar..... Barrier
Bol..... Bollard
C/B..... Close Boarded
C/I..... Corrugated Iron
C/P..... Chestnut Paling
CB..... Control Box
CCTV..... Closed Circuit TV
CD..... Cable Duct
Chn..... Chain Link
CL..... Cover Level
CM..... Cable Marker
Col..... Column
CONC..... Concrete
CP..... Catch Pit
CTV..... Cable Television
CW..... Concrete Block Wall
Dry..... Driveway
Cul..... Culvert
D.C..... Drainage Channel
DP..... Down Pipe
Drn..... Drain
ECP..... Electricity Cable Pit
ESC..... Electricity Inspection Cover
Ex..... Expansion Joint
EJB..... Electricity Junction Box
EL SUB STN..... Electricity Sub Station
Ev..... Eaves Level
ELB..... Electricity Box
EP..... Electricity Pole
FB..... Earth Rod
FTL..... Electricity Transmission Line
F.B..... Flower Bed
FFL..... Finished Floor Level
FH..... Fire Hydrant
FL..... Floor Level
FP..... Flagpole
g.t.*..... Girth of tree
G..... Gulley
GP..... Guide Post
HBV..... Hose Bibb Valve
HRE..... Housing
HV..... High Voltage
Ht..... Height
I.R..... Iron Railing
IC..... Inspection Cover
IL..... Invert Level
KO..... Kerb Outlet
LB..... Letter Box
LP..... Lamp Post
MBL..... Multi Girth
Mh..... Manhole
MMB..... Marker
MP,MS..... Mile Post or Stone
NP..... Street Name Plate
O/H..... Overhead
O/P..... Open Paling
OSBM..... Ordnance Survey Bench Mark
P/C..... Post & Chain
P/R..... Post & Rail
P/W..... Post & Wire
PAV..... Paving
PB..... Pillar Box
PC..... Pedestrian Crossing
PP..... Petrol Pump
PT..... Post or Pillar
RE..... Reading Eye
Rd..... Road Sign
RTN..... Retaining Wall
RWP..... Rain Water Pipe
SAP..... Sapling
SL..... Sump Level
SP..... Sign Post
SV..... Stop Valve (unspecified)
SVP..... Soil Vent Pipe
SW..... Stone Wall
Sws..... Settle Level
TB..... Traffic Bollard
TBM..... Temporary Bench Mark
TCB..... Telephone Cell Box
TPB..... Timber Pile Bollards
TST..... Anchor Point (Masts/Poles)
TL..... Traffic Light
TLB..... Traffic Light Control Box
TW..... Tinted Window
TWL..... Tarmac
TP..... Telecommunications Pole
TPPT..... Tribal Pit
U/C..... Under Construction
U/G..... Underground
UTL..... Unable to Lift (BT,IC etc)
VDP..... Vehicle Detector Pad
Vt..... Vent Pipe
W/M..... Wire Mesh
WL..... Water Level
WM..... Water Meter
WO..... Wash Out
WST..... Water Stop Tap (masonry)
WSV..... Water Stop Valve (mains)



SV SV STORM WATER SEWERS
FV FV FOUL WATER SEWERS
CS CS COMBINED WATER SEWERS
WM WM WATER MAIN
CW CW CLAIMSTED WATER
GM GM GAS MAINS
HV HV HV ELECTRIC CABLES
EL EL ELECTRIC CABLES
DUCT CABLE DUCTING
HT HT CCTV MONITORING
PA PA PUBLIC ADDRESS SYSTEMS
FL FL FUEL LINE
BT(u) BT (UNDERGROUND) TELEMETRY SYSTEMS
TH TH COMMUNICATIONS CABLES
ETV(U) CABLE TV
TS TS TRAFFIC CONTROL SIGNAL
CCTV CLOSED CIRCUIT TV
UNID UNIDENTIFIED FEATURE
UP UP UNIDENTIFIED PIPE
UC UC UNIDENTIFIED CABLE
IMPR IMPROVEN FEATURE
SOAK SOAKAWAY DRAIN
AS ABANDONED SERVICE / UTILITY
SV SV END OF TRACE
FV FV
EXTENT OF SURVEY IN RURAL OPERATIONS ONLY
GPR BURIED FEATURE FOUND USING RADAR

UNIDENTIFIED - A buried feature or utility that has been located, but we are unable to state what it is.

UNPROVEN - The assumed location of a reported feature or utility, usually taken from records, but not found during the utility trace (due to various conditions).

CAUTION - Electric pot ended cables, even when they are live, are unable to be detected or traced.

UNDERGROUND UTILITIES SERVICES DISCLAIMER

We have endeavoured to locate existing services using records provided by Statutory Authorities as a guide. Some apparatus were unaccessible and details have therefore been taken from Utility Record Drawings, which may be of poor quality. Consequently we cannot guarantee accuracy of information

Where indicated, no allowance has been made for sub-surface entry into manholes, other chambers or confined spaces below ground level. Therefore any details relating to depths, sizes etc, are taken from the surface and as such will be approximate.

We have endeavoured to supply you with the most accurate data possible by using methods and equipment that are at the forefront of our industry. We have taken great care in the detection of pipework and buried features, but as with all methods of detecting underground or buried utilities the information provided is based on results obtained from electromagnetic techniques, and as such may be liable to distortion or errors beyond the reasonable control of the operator or his instruments.

It is the responsibility of the user under Health & Safety (HSG47) Guidelines to satisfy himself of the suspected location of any services prior to excavation of the services shown.

NOTE 1

This utility survey has been undertaken using
A: Radiodetection RD4000 + RD4000 TX2
B: Mala Geoscience Ground Probing Radar

NOTE 2

Power carrying features shown on this drawing are shown as an individual service line. This does not necessarily represent the number of cables actually present and it is possible that there could be multi numbers of cables including HV, LV and communications transmission cables following the same trace line. These could be at different depths, the trace signal from the deeper cables being masked by signal emitted from the shallower service above. Cable runs could also be present running parallel to the single line shown.

SurveY OPERATIONS
Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client
Wilson Mason and Partners
Upland House, Spring Lane
Samlesbury
PR5 0UX

Drawing Title
Utility Survey of Land at:
Manchester University
MCRC Building
Sheet 4 of 4

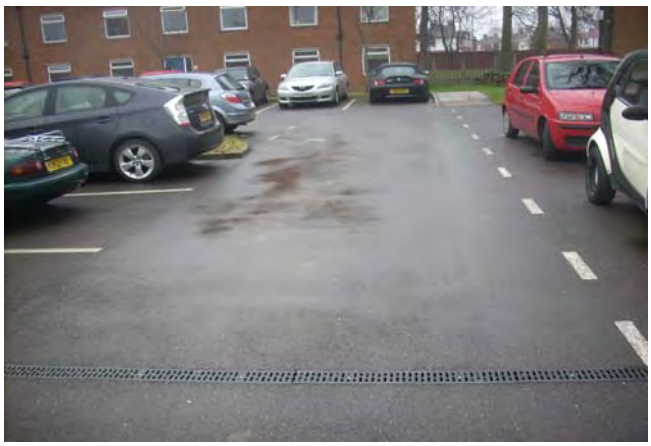
Scale(s) 1:200	Surveyor PG
Date JAN 11	Drawn IT
Job Number 11A152	Checked PG/SG

Sheet Size & Drg Number & Revision
A0 11A152/004












K556 AXC
























LAND ROVER
MA05 WNS













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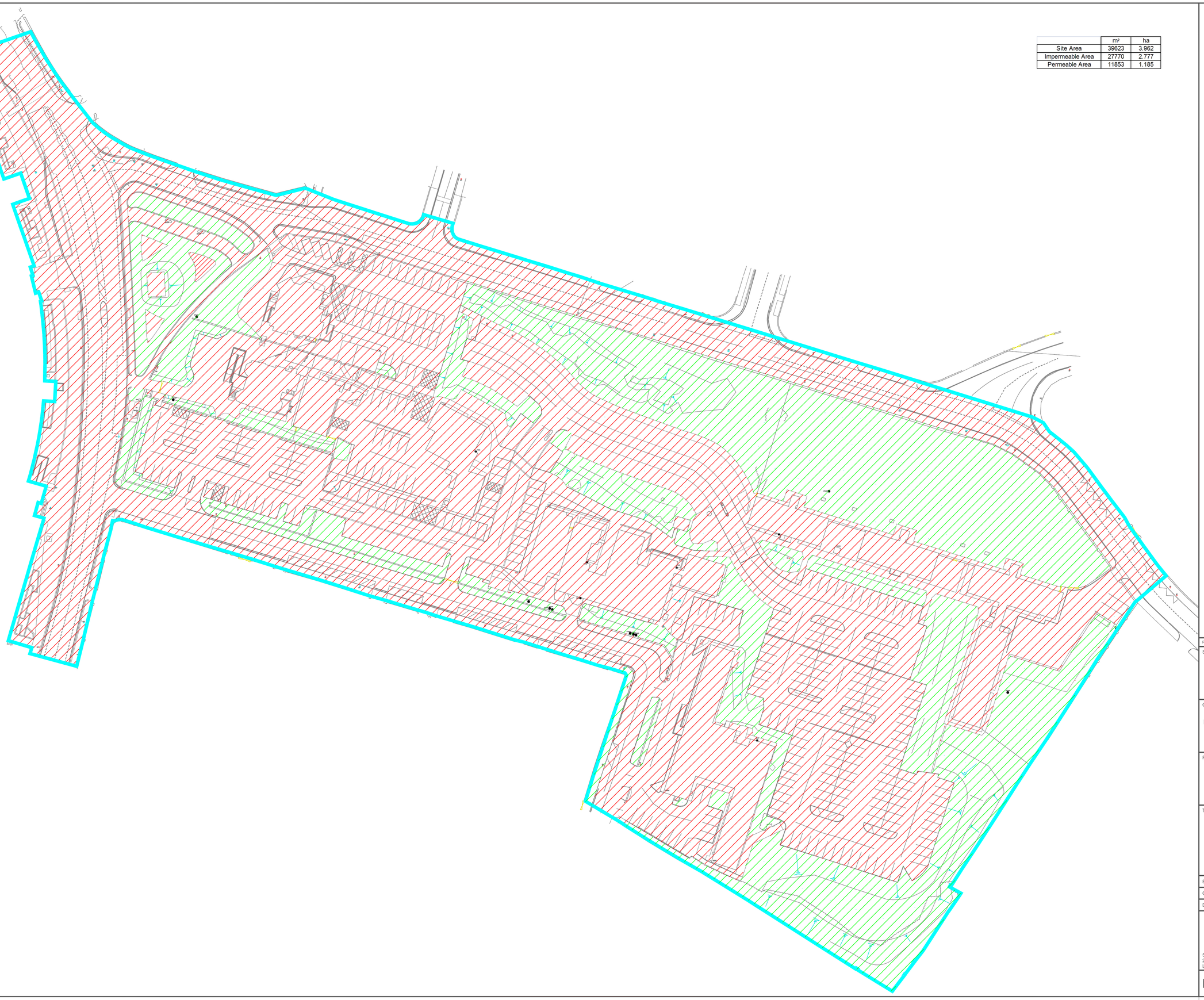


	m²	ha
Site Area	39623	3.962
Impermeable Area	27770	2.777
Permeable Area	11853	1.185

NOTES:
1. DO NOT SCALE FROM THE DRAWING

SITE BOUNDARY

IMPERMEABLE AREA

PERMEABLE AREA

Rev	Date	Detail	Made	Chk'd	App'd

Status :

INFORMATION

Client :

UNIVERSITY OF MANCHESTER

Project :

MCRC

Title :

EXISTING AREA TAKE OFF

Eng : MF	CAD : MF
Chk'd : JCR	App'd : JAG
Date : 23.02.11	Scale : 1:500 @A1

AECOM

5th Floor
2 City Walk,
LEEDS, LS11 9AR

Tel: +44 (0) 113 391 6800
Fax: +44 (0) 113 391 6899
www.aecom.com

No. 60189982-MCRC-C-L-(52)-001

Rev: -

A1

United Utilities North West
Property Searches
Stephen's Way
Goose Green
Wigan WN3 6PJ

DX 719690 Wigan 8

Telephone 0870 7510101
www.unitedutilities.com

CENTREMAPS @ MALCOLM HUGHES LTD

65 CROSS STREET
MANCHESTER
SALE
M33 7HF

Facsimile: 0870 7510102
Email: property.searches@uuplc.co.uk
Your Ref:
Our Ref: 08/ 771023
Date: 09/11/2010
MsContact: Hazel Kay

FAO:

Dear Sirs

Location: KINNAIRD ROAD

I acknowledge with thanks your request dated 05/11/10 for information on the location of our services.

Please find enclosed plans showing the approximate position of our apparatus known to be in the vicinity of this site.
I attach General Condition Information sheets, which details contact numbers for additional services (i.e. new supplies, connections, diversions) which we are unable to deal with at this office. In addition you should ensure they are made available to anyone carrying out any works which may affect our apparatus.

I trust the above meets with you requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please telephone us on 0870 7510101.

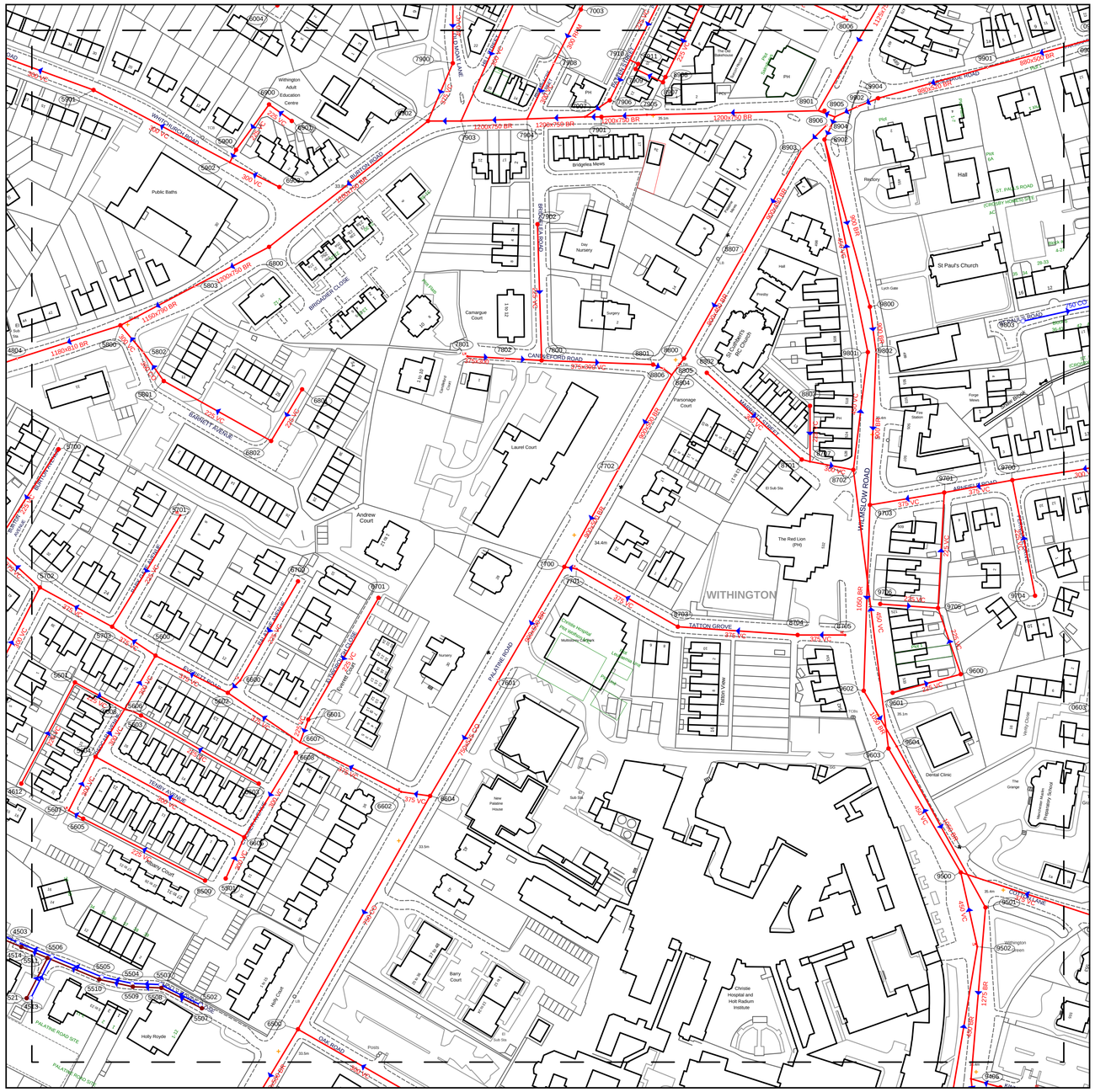
Yours Faithfully,

S McManus.

Sue McManus
Operations Manager
Property Searches

INVESTOR IN PEOPLE

United Utilities Water PLC
Registered in England & Wales No. 2366678
Registered office: Haweswater House, Lingley Mere
Business Park, Lingley Green Avenue, Great Sankey,
Warrington WA5 3LP



OS Sheet No: SJ8492NE

Scale 1:1250 Date: 9-Nov-2010

Printed by: H Kay

Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
5500	33.18	C	M	32.08	225		C	VC	52	66.19
5501	33.19	C	M	30.85	300		C	VC	731	21.93
5502		S	M				C			21.66
5503		S	M				C			13.73
5504		S	M				C			15.14
5505		S	M				C			26.03
5506		S	M				C			17.83
5507		F	M				C			21.94
5508		F	M				C			13.83
5509		F	M				C			16.71
5510		F	M				C			27.12
5511		F	M				C			13.76
5600	32.95	C	M	29.72	375		C	VC	252	25.24
5601	32.59	C	M	30.4	225		C	VC		27.29
5602	33.11	C	M	29.89	375		C	VC	281	39.36
5603	32.93	C	M	30.2	225		C	VC	75	4.47
5604	33	C	M	30.21	300		C	VC	192	26.93
5605	32.99	C	M	30.73	225		C	VC	58	8.06
5606		C	Q	30.14	375			VC	59	4.12
5607		C	L	30.58	300		C	VC	88	29.07
5608		C	J	30.07	300		C	VC	167	30.02
5700	32.76	C	M	30.48	225		C	VC	48	56.3
5701		C	R	30.5	225		C	VC	74	63.29
5702	32.68	C	M	29.42	375		C	VC	186	29.73
5703	32.83	C	M	29.6	375		C	VC	249	39.82
5800	33.13	C	M	28.8	1180	810	E	BR	309	52.5
5801	33.18	C	M	30.05	300		C	CO	-28	17.2
5802		C	Q	30.67	300		C	VC	-27	17.03
5803		C	Q	28.98	1150	790	E	BR	291	40.71
5900	33.88	C	M	31.86	225		C	VC	13	6.71
5901	33.45	C	M	30.98	300		C	VC		55.36
5902		C	J	31.36	300		C	VC	208	74.71
6500	33.61	C	M	30.94	900	500	U	BR	154	52.48
6600		C	L		225		C	VC		8.49
6601	33.23	C	M	31.25	225		C	VC	9	11.7
6602		C	L		375		C	VC		54.56
6603	33.16	C	M	30.63	225		C	VC	165	65.86
6604	34.01	C	M	30.81	750		C	CO	-928	129.87
6604	34.01	C	M	32.6	375		C	VC		14.14
6605	33.25	C	M	30.8	300		C	VC	144	81.88
6607		C	J	29.98	375		C	VC	849	42.44
6608	33.35	C	M	31.15	300		C	VC	146	48.02
6700	32.99	C	M	30.33	225		C	VC		55.57
6701	33.25	C	M	31.85	225		C	VC	126	68.1
6800	33.92	C	M	29.13	1200	750	E	BR	271	40.71
6801	33.55	C	M	31.5	225		C	VC	104	29.15
6802	33.14	C	M	31.21	225		C	VC	56	59.54
6900	34.42	C	M	32.33	225		C	VC	63	27.2
6901	33.58	C	M	31.54	225		C	VC	-17	13.6
6902	34.38	C	M	29.4	1200	750	E	BR	378	98.23
6903	33.74	C	M	31.49	300		C	VC	206	26.83
7601		C	Q	30.86	750	525	C	CO	1300	65
7700	34.41	C	M	30.91	900	500	U	BR	1273	63.63
7701		C	L		375		C	VC		6.08
7702		C	Q	31.06	900	500	F	BR	384	53.71
7800	34.79	C	M	32.09	375	300	E	VC	126	54.04
7801		C	L		375	300	C			18.03
7802		C	Q		375	300	E	VC		18.03
7900	34.46	C	M		375		C	VC		30.46
7901	35.08	C	M	29.72	1200	750	E	BR		8
7902	34.87	C	M	32.5	225		C	VC	174	66.03
7903		C	J		1200	750	E	BR		16
7904		C	J	29.59	1200	750	E	BR		32.02
7905		C	J	29.8	1200	750	E	BR	315	22.02
7906	35.21	C	M		225			VC		14.42
7907		C	J		1200	750	E	BR		28.02
7908		C	Q	30.81	300		C	VC	25	29.97
7909		C	M		225			VC		2.72
7910		F	J		225		C	VC		21.88
7911		C	M		225			VC		4.44
8701	34.84	C	M	31.27	300		C	VC	37	4.12
8702	35.15	C	M	30.55	450		C	VC	522	57.43
8703	34.25	C	M	31.88	375		C	VC		56.44
8704	34.73	C	M	32.39	375		C	VC	116	58.14
8705		C	R	32.81	375		C	VC	56	23
8707		C	J	31.16	300		C	VC	38	21.38
8800	34.8	C	M	31.23	900	450	E	BR	500	5
8801	34.74	C	M	31.65	375	300	E	VC	25	5.39
8802	34.77	C	M	32.12	300		C	VC	74	62.29
8803	35.13	C	M	33.02	225		C	VC	15	27
8804		C	J	31.21	900	500	U	BR	352	52.84
8805		C	Q	31.22	900	500	T	BR	500	5
8806		C	Q	31.43	375	300	H	VC	23	5
8807		C	Q	31.62	900	450	F	BR	154	58.67
8901	35.45	C	M	30.07	1200	750	E	BR	307	83.02
8902	35.54	C	M	29.17	900		C	BR	646	83.93
8903		C	G		900	450	E	BR		57.31
8904		C	Q	30.54	375		C	CO	5	6.71
8905		C	J	31.84	375		C	VC	4	5.39
8905		C	J	32.11	1200	620	R	BR	854	8.54
8906		C	G							16.97
8907		C	M		225			VC		14.72
8908		C	M		225		C	VC		2.8
9500	35.34	C	M	30.95	450		C	VC	631	69.46
9501	35.18	C	M	28.52	1275		C	BR		83.29
9502		C	L	31.11	450		C	VC	230	36.88
9600	35.75	C	M	32.92	225		C	VC	94	33.84
9601	35.19	C	M	33.95	225		C	VC	92	34.21
9602	35.07	C	M	28.69	1050		C	BR	1569	31.38
9603	35.18	C	M	30.82	450		C	VC	504	136.07
9604		C	J	28.67	1050		C	BR	1272	89.07
9700	35	C	M	31.45	375		C	VC	124	33.54
9701	34.99	C	M	31.17	375		C	VC	107	36.5
9703	35.04	C	M	28.88	1050		C	BR	500	90.05
9704	35.91	C	M	33.79	225		C	VC	61	57.07
9705	35.38	C	M	32.52	225		C	VC	127	56.08
9706	35.35	C	M	33.63	225		C	VC	78	28.07
9800	35.5	C	M	29.03	900		C	BR		22.2
9801	35.51	C	M	30.51	450		C	VC	3504	105.12
9802		C	G		900		C	BR		74.06
9803	36.06	S	M	33.53	750		C	CO	250	45.06
9901		C	Q	32.28	980	520	F	BR	787	55.08
9902		C	Q	32.03	825	500	C	BR	64	12.08
9904	35.62	C	M	32.21	950	520	F	BR	60	10.77

WASTE WATER SYMBOLOGY

MANHOLE
FOUL SURFACE COMBINED DUAL
SIDE ENTRY MANHOLE
PRIVATE SEWER
ABANDONED SEWER
SITE TERMINATION
T-JUNCTION (SADDLE)
AIRVALVE
LAMP HOLE
CASCADE
OIL INTERCEPTOR
CONTROL KIOSK
PENSTOCK
CONTROL VALVE
RODDING EYE
GULLEY
SOAKAWAY
HATCHBOX
TUMBLING BAY
HEADWALL
UNSPECIFIED
HYDROBRAKE
VALVE
INLET
WASHOUT
GHOST NODE (inc. GN - Rising Main & GN - Dual Function)
EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)
CATCHPIT
SIDE ENTRY CATCHPIT
CHAMBER
SIDE ENTRY CHAMBER
DROPSHAFT
SIDE ENTRY DROPSHAFT
SHEET EDGE
VENT COLUMN
SEWER OVERFLOW
DISCHARGE POINT (OUTFALL)
TANK
WASTE WATER TREATMENT WORKS
PUMPING STATION
EJECTOR STATION
SLUDGE PUMPING STATION

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F Foul
S Surface
C Combined
T Transition
O Overflow
U Unspecified

MANHOLE / NODE TYPE

M Manhole
J Junction
L Lamphole
H Hatchbox
R Rodding Eye
F Outfall
V Combined Sewer Overflow
P Pumping Station
S Soakaway
D Dual Function Manhole
W Treatment Works
Z Ghost in Rising Main
C Cascade
Y Gulley
E Ejector
O Oil Injector
I Inlet
B Hydrobrake
T Vent Column
X Valve
U Unspecified
Q Expediency Node
G Ghost (to allow pipe bends)

SEWER SHAPE

C Circular
E Egg
O Oval
F Flat Top
R Rectangular
S Square
T Trapezoidal
A Arch
B Barrel
H Horseshoe
U Unspecified

SEWER MATERIAL

AC Asbestos Cement
BR Brick
CI Cast Iron
SI Spun (Grey) Iron
CO Concrete
CS Concrete Segments (Bolted)
CS Concrete Segments (Unbolted)
CC Concrete Box Culvert
DI Ductile Iron
GR Glass Reinforced Concrete
GR Glass Reinforced Plastic
PS Plastic / Steel Composite
PV Polyvinyl Chloride
PE Polythene
RP Reinforced Plastic Matrix
ST Steel
VC Vitrified Clay (All Clayware)
PP Polypropylene
PF Pitch Fibre
MA Masonry - In Regular Courses
MA Masonry - Randomly Coursed
U Unspecified

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OS Sheet No: SJ8492NE
Scale 1:1250 Date: 9-Nov-2010
114 Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS



OS Sheet No: SJ8592NW

Scale 1:1250 Date: 9-Nov-2010

Printed by: H Kay

Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
0500	35.52	C	M	31.42	375		C	VC	143	67.36
0501		C	M		225		C	VC		17.83
0502		C	M		225		C	VC		6.4
0503		S	M		225			VC		18.78
0504		S	M		225			VC		3.25
0600		C	M		225		C	VC		27.81
0601		S	M		225			VC		25.83
0603	36.5	C	M	35.01	150		C	VC	69	33.06
0606	36.46	C	M	33.29	300		C	VC	119	62.01
0607	36.58	C	M	34.72	225		C	VC	68	45.01
0700	36.16	C	M	32.76	300		C	VC	108	56.14
0701	36.55	C	M	33.51	225		C	VC	72	46
0702	35.24	C	M	32.12	300		C	VC	109	70.86
0800	35.79	C	M	32.74	225		C	VC	97	55.11
0801	35.41	C	M	32.89	375		C	VC	85	22.08
0802		C	G		375		C	VC		10
0803	35.68	C	M	32.63	375		C	VC	207	22.81
0804	35.66	C	M	33.21	150		C	VC	16	9.41
0805	35.67	S	M	33.35	150		C	VC	36	5.03
0806	35.71	C	M	32.53	375		C	VC	1181	23.63
0900	36.22	C	M	32.34	880	500	F	BR	897	53.85
0901		C	G		450		C	VC		6.08
0902	35.76	C	M	32.51	375		C	VC		34.08
0903		C	Q	34.39	375		C	VC		5.39
0904		C	Q		450		C	VC		33.54
1006		C	Q	34.47	525		C	VC	11	24.33
1500	36.68	C	M	33.36	300		C	VC	126	41.48
1501	36.46	C	M	31.89	375		C	VC	-770	23.09
1502	36.31	C	M	31.81	375		C	VC		72.6
1600	36.75	C	M	35.33	225		C	VC	71	43.05
1601	36.84	C	M	34.15	300		C	VC	129	93.01
1700	36.92	C	M	35.27	225		C	VC	52	45.01
1701	37.06	C	M	33.96	300		C	VC	160	77.01
1701	37.06	C	M	35	225		C	VC	85	71
1800	36.19	C	M	34.21	225		C	VC	94	39.62
1801	36.43	C	M	33.46	375		C	VC	169	49.01
1802	35.91	C	M	33.13	450		C	VC	236	75.54
1900	36.61	C	M		375		C	VC		25.32
1901	36.6	C	M	32.76	450		C	VC		37.22
2500	37.29	C	M	34.68	225		C	VC	145	52.04
2501	37.38	C	M	34.27	225		C	VC	84	18.44
2502	37.3	C	M	32.21	375		C	VC	3625	36.25
2503	36.95	C	M	32.2	375		C	VC	224	60.44
2504		C	L	32.23	375		C	VC	1118	22.36
2505	37.57	C	M	32.99	375		C	VC	134	57.72
2600	37.22	C	M	35.38	225		C	VC	83	53.04
2601	37.01	C	M	34.59	300		C	VC	141	62.03
2602	37.27	C	M	35	300		C	VC	171	58.01
2700	37.13	C	M	34.6	300		C	VC	204	61.07
2701	37.13	C	M	34.29	300		C	VC	214	62
2800	36.52	C	M	33.91	300		C	VC	159	62.03
2801	36.65	C	M	34.3	300		C	VC	158	60.13
2802	36.11	C	M	33.59	375		C	VC	303	91.01
2803		C	G		375		C	VC		8
2900	37.21	C	M	33.3	375		C	VC		67
3500	37.96	C	M	33.26	375		C	VC	213	55.32
3600	37.42	C	M	35.58	225		C	VC	107	59.03
3601	37.27	C	M	34.29	300		C	VC	206	70.03
3602	37.61	C	M	33.93	300		C	VC	213	70.26
3700	37.13	C	M	35.18	225		C	VC	107	60.03
3701	36.99	C	M	34.63	300		C	VC	219	70.03
3800	36.78	C	M	34.89	225		C	VC	105	58.55
3801	36.65	C	M	35.24	300		C	VC	118	71.03
3802	36.71	C	M		300			VC		78.03
3900		C	L	36	300		C	VC	32	83.05
4500	38.31	C	M	35.12	300		C	VC	52	93.21
4501	38.25	C	M	35.54	300		C	VC	-70	27.29
4502	38.07	C	M	36.1	225		C	VC	93	79.2
4600	38.27	C	M	35.74	300		C	VC	149	70.06
4601	38.02	C	M	36.38	225		C	VC	117	71.18
4601	38.02	C	M	36.39	225		C	VC	95	69.12
4700	37.63	C	M	35.65	300		C	VC	109	72.11
4800	37.39	C	M	34.91	300		C	VC	134	59.03
4801	37.28	C	M	34.43	300		C	VC	158	63.13
4802		C	G		300		C	VC		45.54
4802		C	G		300		C	VC		51.48
4900	37.31	C	M	34	300		C	VC	3553	71.06
8500		F	J		375		C	VC		37.84

WASTE WATER SYMBOLOGY

MANHOLE
FOUL SURFACE COMBINED DUAL
SIDE ENTRY MANHOLE
PRIVATE SEWER
ABANDONED SEWER
SITE TERMINATION
T-JUNCTION (SADDLE)
AIRVALVE
LAMP HOLE
CASCADE
OIL INTERCEPTOR
CONTROL KIOSK
PENSTOCK
CONTROL VALVE
RODDING EYE
GULLEY
SOAKAWAY
HATCHBOX
TUMBLING BAY
HEADWALL
UNSPECIFIED
HYDROBRAKE
VALVE
INLET
WASHOUT
GHOST NODE (inc. GN - Rising Main & GN - Dual Function)
EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)
CATCHPIT
SIDE ENTRY CATCHPIT
CHAMBER
SIDE ENTRY CHAMBER
DROPSHAFT
SIDE ENTRY DROPSHAFT
SHEET EDGE
VENT COLUMN
SEWER OVERFLOW
DISCHARGE POINT (OUTFALL)
TANK
WASTE WATER TREATMENT WORKS
PUMPING STATION
EJECTOR STATION
SLUDGE PUMPING STATION

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F	Foul	T	Transition
S	Surface	O	Overflow
C	Combined	U	Unspecified

MANHOLE / NODE TYPE

M	Manhole	Z	Ghost in Rising Main
J	Junction	C	Cascade
L	Lamphole	Y	Gulley
H	Hatchbox	E	Ejector
R	Rodding Eye	O	Oil Injector
F	Outfall	I	Inlet
V	Combined Sewer Overflow	B	Hydrobrake
		T	Vent Column
P	Pumping Station	X	Valve
S	Soakaway	U	Unspecified
D	Dual Function Manhole	Q	Expediency Node
		G	Ghost (to allow pipe bends)
W	Treatment Works		

SEWER SHAPE

C	Circular	T	Trapezoidal
E	Egg	A	Arch
O	Oval	B	Barrel
F	Flat Top	H	Horseshoe
R	Rectangular	U	Unspecified
S	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
CI	Cast Iron
SI	Spun (Grey) Iron
CO	Concrete
CS	Concrete Segments (Bolted)
CS	Concrete Segments (Unbolted)
CC	Concrete Box Culvert
DI	Ductile Iron
GR	Glass Reinforced Concrete
GR	Glass Reinforced Plastic
PS	Plastic / Steel Composite
PV	Polyvinyl Chloride
PE	Polythene
RP	Reinforced Plastic Matrix
ST	Steel
VC	Vitrified Clay (All Clayware)
PP	Polypropylene
PF	Pitch Fibre
MA	Masonry - In Regular Courses
MA	Masonry - Randomly Coursed
U	Unspecified

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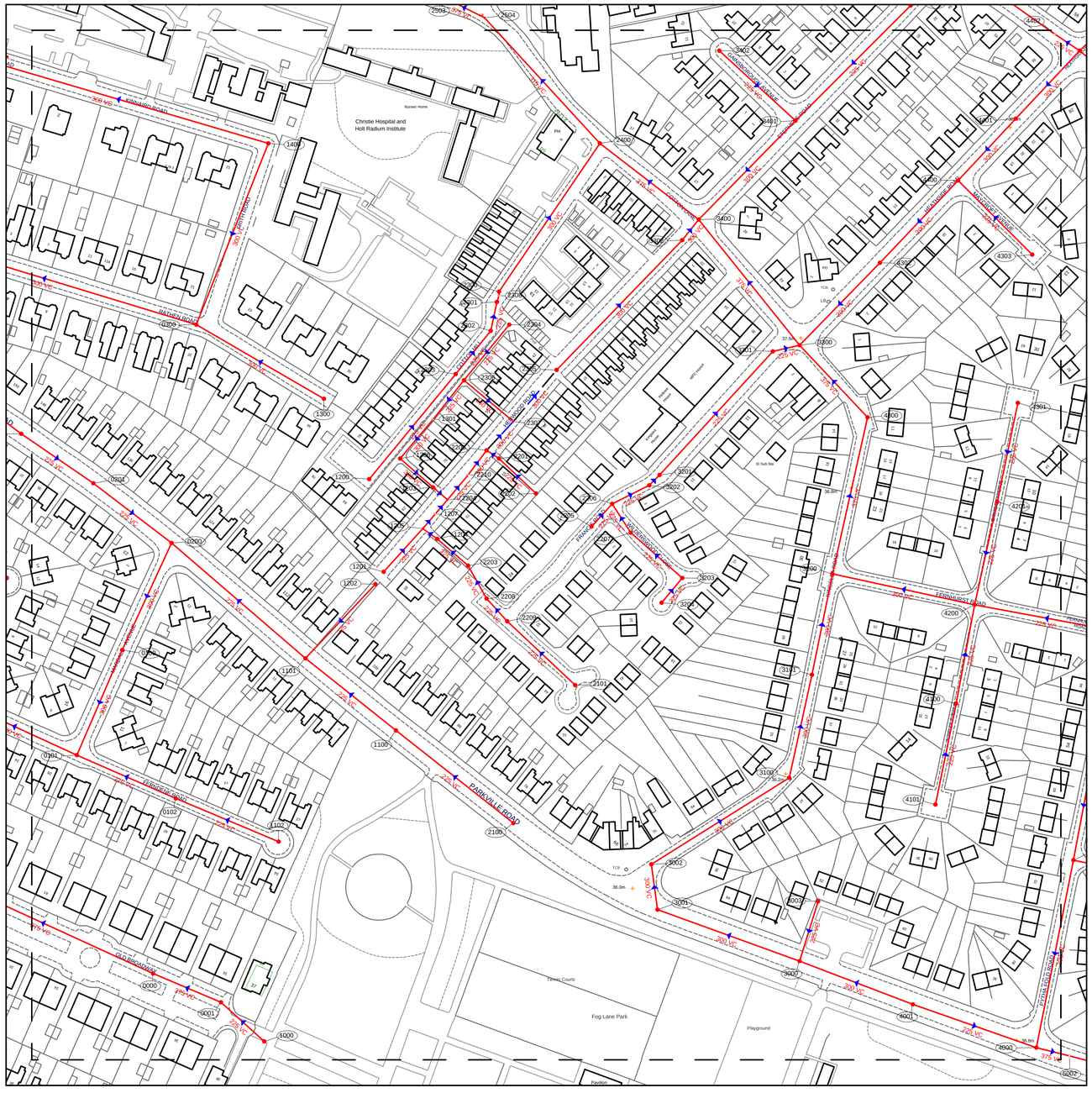
OS Sheet No: SJ8592NW
Scale 1:1250 Date: 9-Nov-2010
78 Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS



OS Sheet No: SJ8592SW

Scale 1:1250 Date: 9-Nov-2010

Printed by: H Kay

Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
0000	34.57	C	M	31.49	375		C	VC	214	117.69
0001	34.61	C	M	31.78	375		C	VC	138	35.85
0100	34.94	C	M	31.52	300		C	VC	99	55.54
0101	34.86	C	M	30.96	300		C	VC	87	67.12
0102	35.03	C	M	33.09	225		C	VC	25	52.39
0200	35.08	C	M	31.81	300		C	VC	212	57.27
0201	34.9	C	M	32.42	225		C	VC	90	47.8
0300	34.98	C	M	32.08	300		C	VC	286	154.69
1000	34.89	C	M	32.72	225		C	VC	34	28.32
1100	35.55	C	M	33.44	225		C	VC	91	56.22
1101	35.37	C	M	32.82	225		C	VC	91	85.8
1102	35.36	C	M	33.71	225		C	VC	90	54.23
1200	35.58	C	M	34.07	225		C	VC	89	66.07
1201	35.51	C	M	34.33	225		C	VC		28.32
1202	35.46	C	M	33.56	225		C	VC	75	49.52
1203	35.17	C	M		300			VC		9.22
1204	35.15	C	M	33.68	225		C	VC		8.6
1205		C	J		225		C	VC		9.22
1206	35.01	C	M	34.11	300		C	VC		21.26
1207		C	Q	34.82	300		C	VC	12	9.22
1300	35.52	C	M	32.7	300		C	VC	119	71.69
1301		C	Q	34.49	300		C	VC	75	24.84
1400	35.76	C	M	32.58	300		C	VC	201	94.7
1400	35.76	C	M		300		C	VC		151.99
2100	35.73	C	M	34.2	225		C	VC	98	72.62
2101	36.41	C	M	35.21	225		C	VC	137	45.28
2200	35.74	C	M	33.87	300		C	VC	273	19.1
2201	35.76	C	M	33.99	225		C	VC	240	7.21
2202	36.2	C	M	34.73	225		C	VC	42	24.76
2203	35.14	C	M	34.04	225		C	VC	95	19.85
2204		C	J	34.07	225		C	VC	223	15.62
2205	35.79	C	M	34.79	225		C	VC	149	14.87
2206	35.74	C	M	34.66	225		C	VC	87	20.12
2207	35.82	C	M	34.79	225		C	VC	151	16.64
2208	35.76	C	M	34.73	225		C	VC	44	18.36
2209	35.88	C	M	34.83	225		C	VC	248	14.87
2210		C	Q	34	300		C	VC	214	15
2300	36.51	C	M		300		C	VC		87.09
2301	36.52	C	M	32.95	225		C	VC	53	3.16
2302	36.36	C	M	33.19	225		C	VC	68	14.32
2303	36.12	C	M	33.32	225		C	VC	225	27.02
2304	36.38	C	M		225		C	VC		34.83
2305	36.33	C	M	33.62	300		C	VC		87.69
2306	35.85	C	M	34.81	225		C	VC	76	24.21
2306	35.85	C	M	34.87	150		C	VC	29	31.24
2307		C	J	33.8	300		C	VC	272	32.65
2308		C	Q	32.89	300		C	VC	40	2
2400	37.39	C	M	32.49	375		C	VC		82.81
3000	36.34	C	M	34.66	300		C	VC	253	73.39
3001	36.03	C	M	34.36	300		C	VC	97	22.2
3002	35.99	C	M	34.12	300		C	VC	439	79.08
3003	36.28	C	M	34.94	225		C	VC	138	30.36
3100	36.22	C	M	33.93	300		C	VC	394	51.2
3101	36.39	C	M	33.78	300		C	VC	-714	50.01
3200	36.59	C	M	33.8	375		C	VC	410	77.88
3201	35.94	C	M	34.33	225		C	VC	140	81.39
3202	35.98	C	M	34.38	225		C	VC	707	7.07
3203	36.14	C	M	35.03	225		C	VC	145	33.3
3204	36.09	C	M	35.14	225		C	VC	195	15.62
3300	37.44	C	M	33.32	375		C	VC	711	78.24
3301	37.2	C	M	33.72	225		C	VC	46	13.34
3302		C	M		300		C	VC		12.81
3400	37.56	C	M	33.18	375		C	VC	89	60.61
3401	37.63	C	M	35.2	300		C	VC	118	67.18
3402	37.64	C	M	35.79	225		C	VC	103	50.25
4000	36.87	C	M	34.65	375		C	VC		16.49
4001	36.62	C	M	34.86	300		C	VC	368	58.87
4001	36.62	C	M	34.87	225		C	VC	289	63.57
4100	36.92	C	M	34.72	225		C	VC	136	48.84
4101	36.69	C	M	35.13	225		C	VC	125	50.01
4200	37.16	C	M	34.3	300		C	VC	235	70.61
4201	37.52	C	M	35.01	225		C	VC	76	51.2
4300	37.11	C	M	33.59	375		C	VC	192	48.1
4301	37.9	C	M	35.69	225		C	VC	78	49.03
4302	37.76	C	M	35.38	300		C	VC	110	55.87
4303	38.04	C	M	36.34	225		C	VC	108	50.91
4400	38.06	C	M	35.82	300		C	VC	131	55.17
4401	38.45	C	M	36.21	300		C	VC	111	41.04
4402		C	G		225		C	VC		76.03

WASTE WATER SYMBOLOGY

MANHOLE (FOUL, SURFACE, COMBINED, DUAL)
SIDE ENTRY MANHOLE
PRIVATE SEWER
ABANDONED SEWER
SITE TERMINATION
T-JUNCTION (SADDLE)
AIRVALVE
LAMP HOLE
CASCADE
OIL INTERCEPTOR
CONTROL KIOSK
PENSTOCK
CONTROL VALVE
RODDING EYE
GULLEY
SOAKAWAY
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SIDE ENTRY CATCHPIT
CHAMBER
SIDE ENTRY CHAMBER
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SIDE ENTRY DROPSHAFT
SHEET EDGE
VENT COLUMN
SEWER OVERFLOW
DISCHARGE POINT (OUTFALL)
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WASTE WATER TREATMENT WORKS
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EJECTOR STATION
SLUDGE PUMPING STATION

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MANHOLE FUNCTION

F	Foul	T	Transition
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F	Outfall	I	Inlet
V	Combined Sewer Overflow	B	Hydrobrake
		T	Vent Column
P	Pumping Station	X	Valve
S	Soakaway	U	Unspecified
D	Dual Function Manhole	Q	Expediency Node
		G	Ghost (to allow pipe bends)
W	Treatment Works		

SEWER SHAPE

C	Circular	T	Trapezoidal
E	Egg	A	Arch
O	Oval	B	Barrel
F	Flat Top	H	Horseshoe
R	Rectangular	U	Unspecified
S	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
CI	Cast Iron
SI	Spun (Grey) Iron
CO	Concrete
CS	Concrete Segments (Bolted)
CS	Concrete Segments (Unbolted)
CC	Concrete Box Culvert
DI	Ductile Iron
GR	Glass Reinforced Concrete
GR	Glass Reinforced Plastic
PS	Plastic / Steel Composite
PV	Polyvinyl Chloride
PE	Polythene
RP	Reinforced Plastic Matrix
ST	Steel
VC	Vitrified Clay (All Clayware)
PP	Polypropylene
PF	Pitch Fibre
MA	Masonry - In Regular Courses
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U	Unspecified

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OS Sheet No: SJ8592SW
Scale 1:1250 Date: 9-Nov-2010
79 Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS



OS Sheet No: SJ8492SE

Scale 1:1250 Date: 9-Nov-2010

Printed by: H Kay

Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
5000	33.52	C	M	30.87	225		C	VC	852	51.11
5000	33.52	C	M	30.87	225		C	VC	365	47.51
5001	33.74	C	M	31.37	225		C	VC	143	61.4
5001	33.74	C	M	31.38	225		C	VC	139	44.42
5002	33.82	C	M		300			VC		13.6
5002	33.82	C	M	31.5	300		C	VC	66	51.87
5002	33.82	C	M		300			VC		51.48
5003	33.73	C	M	30.71	300		C	VC	176	63.25
5004	33.83	C	M	31.04	225		C	VC	98	88.14
5100	33.33	C	M	30.37	300		C	VC	310	65.19
5100	33.33	C	M	31.21	225		C	VC		50.12
5101	33.66	C	M	30.76	300		C	VC	169	64.07
5200	32.98	C	M	30.53	375		C	VC	159	85.91
5201		C	M							
5202		F	Q				C			18.73
5203		C	M				C			20.43
5204		C	M				C			15.5
5205		C	M				C			20.85
5300	33.09	C	M	31.55	225		C	VC	151	57.31
5301	33.18	C	M	30	900	500	C	BR	412	4.12
5302		C	J	29.99	900	600	C	BR	473	85.09
5303		C	M							
5304		F	J							
5400	33.33	C	M	30.24	900	500	U	BR	418	12.53
5401	33.12	C	M	30.78	300		C	VC	15	8.94
5402		C	J	30.18	900	500	U	BR	464	78.89
5403		C	Q	30.21	900	500	F	BR	463	13.89
6000	33.71	C	M	30.92	300		C	VC	416	62.43
6001	33.8	C	M		300		C	VC		58.25
6002	33.72	C	M	31.73	225		C	VC	47	81.84
6003	33.73	C	M	32.18	225		C	VC	92	61.77
6004	33.95	C	M	31.76	225		C	VC	183	67.68
6100	33.55	C	M	30.9	300		C	VC		163.86
6101	33.76	C	M	31.42	300		C	VC	171	87.09
6200	32.9	C	M	30.69	300		C	VC	-1012	30.36
6201	32.95	C	M	30.7	375		C	VC	345	55.23
6202	33.94	C	M	32.19	225		C	VC	17	22.47
6203	34.27	C	M	32.9	225		C	VC	81	57.01
6204		C	J	30.79	300		C	VC	299	26.93
6400	33.23	C	M	30.9	300		C	VC	-1814	72.56
6401		C	Q	30.6	900	500	F	BR	150	52.48
6509		F	Y							
7000	34.21	C	M	29.94	375		C	VC	403	36.24
7000	34.21	C	M	29.94	300		C	VC	1	3.61
7001	34.14	C	M	27.27	1275		C	BR	410	16.4
7003		C	J	27.23	1275		C	BR		172.8
7004	34.25	C	M	29.85	375		C	VC	395	43.42
7100	33.76	C	M	31.26	225		C	VC	120	70.68
7101	33.62	C	M	32.5	225		C	VC	101	75.77
7200		C	R	31.5	225		C	VC	83	59.03
7201	33.4	C	M	32.19	225		C	VC	102	93.11
7202		C	J				C			9.17
7203		C	J				C			16.46
7204		C	J				C			7.14
7300	33.05	C	M	30.98	300		C	VC	255	5.1
7301	33.09	C	M	31.06	300		T	VC	100	10
7302		C	G		225		C	VC		53.23
7303		C	J	30.96	300		C	VC	303	51.48
7304		C	Q	31.19	300		C	VC	224	44.72
7305		C	J				C			5.49
7306		C	J				C			6.01
7307		C	J				C			5.95
7308		C	J				C			16.17
7401	33.2	C	M	31.21	300		C	VC	260	75.29
7402	33.15	C	K	31.39	300		C	CI	220	43.97
8000	34.15	C	M	30.1	375		C	VC	387	54.2
8001	34.05	C	M	28.46	300		C	VC	5	5.83
8002	34.01	C	M	29.9	300		C	VC	133	54.63
8004		C	J	27.31	1275		C	BR	447	13.42
8100	33.97	C	M	30.4	375		C	VC	368	55.15
8101	33.98	C	M	27.6	1275		C	BR	491	142.27
8102	34.02	C	M	30.24	375		C	VC	234	30.46
8103	33.99	C	M	30.66	225		C	VC	39	6.71
8104	34.02	C	M	30.47	225		C	VC	17	4.47
8105		C	J	30.11	375		C	VC		35.85
8200	33.53	C	M	31.58	225		C	VC	102	40.85
8201	34.11	C	M	31.71	450		C	VC	528	116.06
8202		F	J		225		C	VC		5.56
8203	33.81	C	M	31.17	225		C	VC	86	38.63
8204	34	C	M	30.56	300		C	VC	373	55.97
8207	34.03	C	M	28.49	375		C	VC	9	7.62
8208		C	J	27.67	1275		C	BR	532	31.95
8300	33.38	C	M	31.97	225		C	VC		32.72
8301		C	J				C			9.31
8401		C	L		300		C	VC		51.08
8402	33.62	C	M	31.53	300		C	VC		43.66
9000	34.57	C	M	30.92	375		C	VC	254	53.31
9001	33.91	C	M	30.43	300		C	VC	129	65.8
9002		C	G		300		C	VC		47.01
9100	34.46	C	M	30.16	375		C	VC	91	42.95
9101	34.09	C	M	30.69	375		C	VC	161	70.77
9102		C	G		300		C	VC		31.3
9103		C	Q	29.69	300		C	VC	94	43.46
9200	34.78	C	M	32.63	225		C	VC	98	63.98
9301		C	L		300		C	VC		78.77
9302	34.39	C	M	31.48	450		C	VC	196	23.54
9303	34.25	C	M	27.92	1275		C	BR	557	139.18
9304	34.33	C	M	33.31	225		C	VC	136	45
9305	34.69	C	M	32.97	225		C	VC	87	42.44
9307		C	J		1275		C	BR		53.85
9400		C	M		300		C	BR		14.77
9401	34.5	C	M	31.36	300		C	VC		6.4
9401	34.5	C	M	31.35	450		C	VC	651	78.09
9402		C	Q	31.23	450		C	BR	651	78.09
9403		C	G		1275		C	BR		13.6
9404	34.96	C	M		1275		C	BR		74.73
9405		C	J		1275		C	BR		9.06

WASTE WATER SYMBOLOGY

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SIDE ENTRY MANHOLE

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ABANDONED SEWER

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SIDE ENTRY DROPSHAFT

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GR	Glass Reinforced Concrete
GR	Glass Reinforced Plastic
PS	Plastic / Steel Composite
PV	Polyvinyl Chloride
PE	Polythene
RP	Reinforced Plastic Matrix
ST	Steel
VC	Vitrified Clay (All Clayware)
PP	Polypropylene
PF	Pitch Fibre
MA	Masonry - In Regular Courses
MA	Masonry - Randomly Coursed
U	Unspecified

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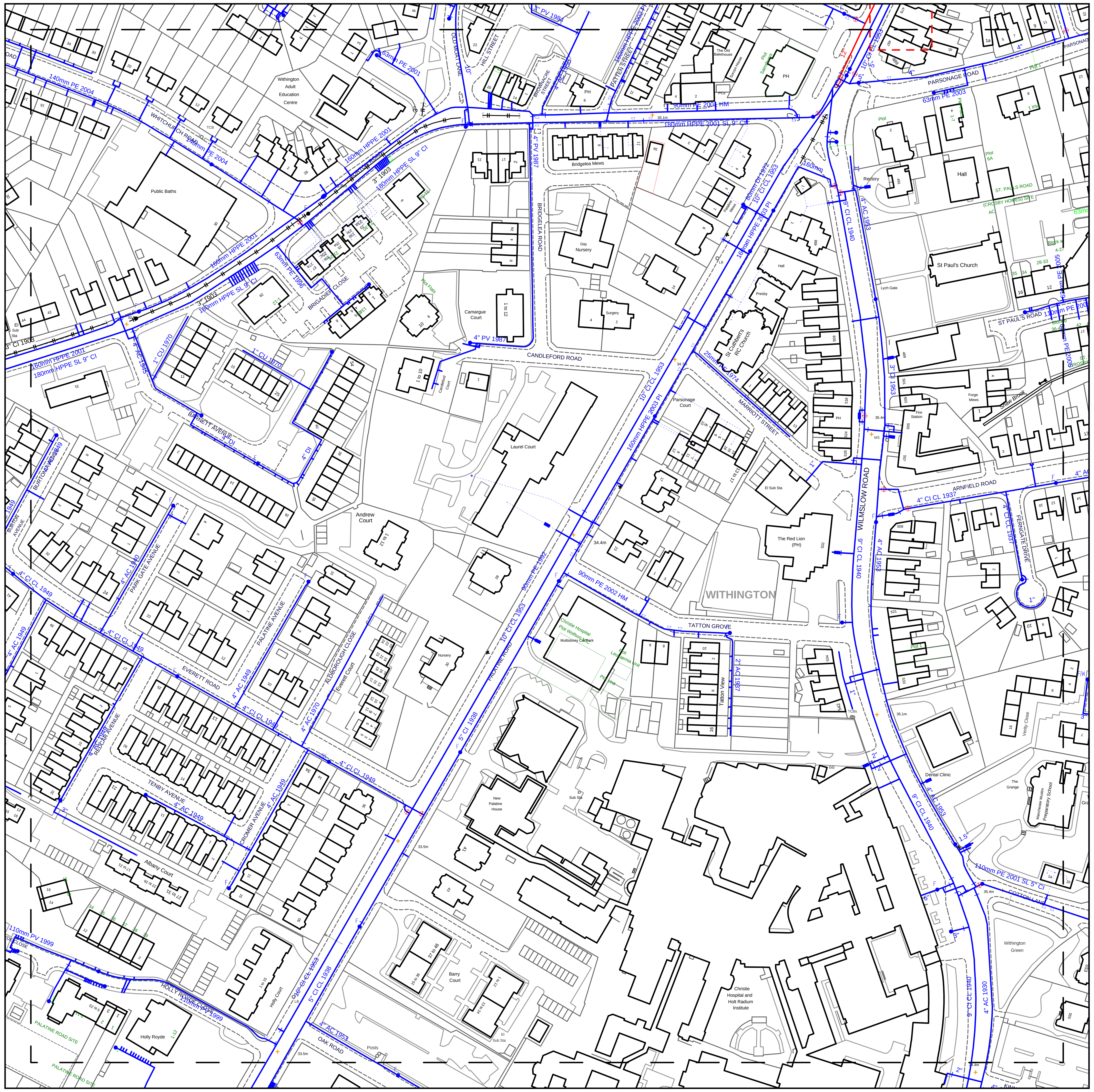
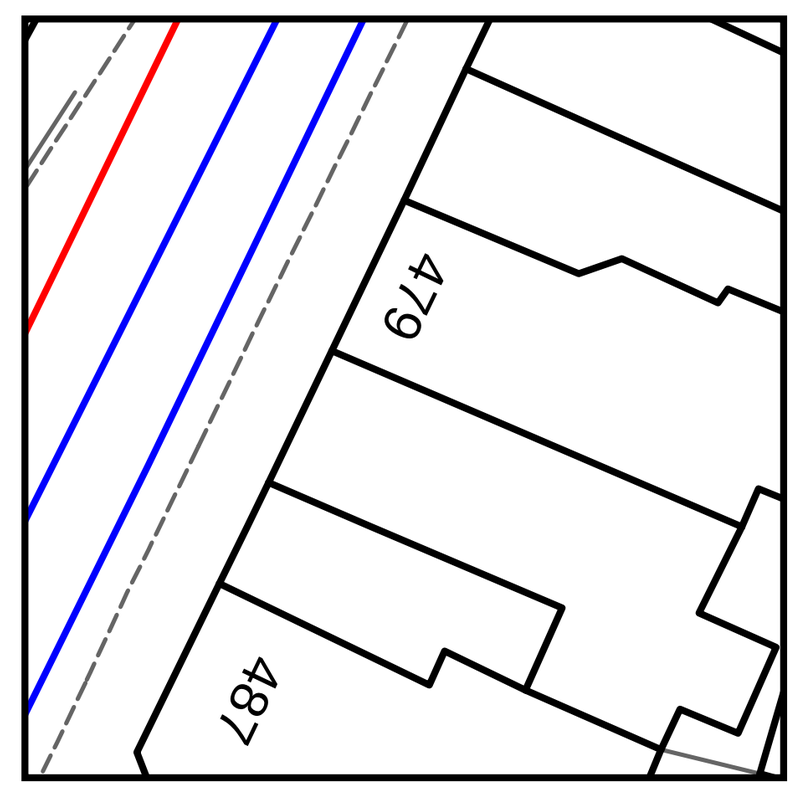
OS Sheet No: SJ8492SE
Scale 1:1250 Date: 9-Nov-2010
107 Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS





S2

S3

S4

L1

L2

M1

M2

M3

M4

OS Sheet No: SJ8492NE

Scale 1:1250 Date: 9-Nov-2010

Printed by: Hazel Kay

PIPEWORK

	TRUNK MAIN		AQUEDUCT
	DISTRICT MAIN		COMMON PIPE
	NON-POTABLE MAIN		PRIVATE PIPE
	PROPOSED		ABANDONED

NODES / FURNITURE

END CAP, CLOCKWISE VALVE, ANTI-CLOCKWISE VALVE, SHEET EDGE

AIR VALVE, TREATED WATER SLUICE VALVE, PRESSURE SUSTAINING VALVE, PRESSURE REDUCING VALVE, REFLUX VALVE

CHANGE OF CHARACTERISTIC, ANODE, CHLORINATION POINT, DE-CHLORINATION POINT

BORE HOLE, ABSTRACTION POINT, INLET POINT, BULK SUPPLY POINT

NWW WASHOUT, F FIRE HYDRANT, F/W SHARED HYDRANT, PUMP

SITE TERMINATION, INTERMEDIATE NODE, CONCESSION START, CONCESSION END

METER, METER AND STOPTAP, STOPTAP, MONITOR LOCATION

SP STRAIN POINT, AP ACCESS POINT, HB HATCHBOX, IP INSERT PROBE POINT

RM ROUTE MARKER, SPT SAMPLING POINT, LB LOGGER BOX

PROPERTY TYPES

CONDITION REPORT, PB PIPE BRIDGE, PT PIPE TUNNEL

TS TELEMETRY STATION, PUMPING STATION, PUMP HOUSE

WATER TREATMENT WORKS, P PRIVATE TREATMENT WORKS, VH VALVE HOUSE, WATER TOWER

CS CONFINED SPACE, DU DIALYSIS UNIT, SR SERVICE RESERVOIR, SUP RES SUPPLY RESERVOIR

MATERIAL TYPES

AC	ASBESTOS CEMENT	OT	OTHERS
CI	CAST IRON	PB	LEAD
CU	COPPER	PV	uPVC
CO	CONCRETE	SI	SPUN IRON
DI	DUCTILE IRON	ST	STEEL
GI	GALVANISED IRON	UN	UNKNOWN
GR	GREY IRON	PE	POLYETHYLENE

LINING TYPES

CL	CEMENT	ER	EPOXY RESIN
TB	TAR OR BITUMEN		

INSERTION TYPES

DD	DIE DRAWN	MO	MOLING

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OS Sheet No: SJ8492NE
Scale 1:1250
Date: 9-Nov-2010

United Utilities

WATER MAINS RECORDS



OS Sheet No: SJ8592NW

Scale 1:1250 Date: 9-Nov-2010

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S1 L1 S2 S3 L2 S4 M1 M2 M3 M4

PIPEWORK

- TRUNK MAIN
- DISTRICT MAIN
- NON-POTABLE MAIN
- PROPOSED
- AQUEDUCT
- COMMON PIPE
- PRIVATE PIPE
- ABANDONED

NODES / FURNITURE

END CAP · CLOCKWISE VALVE · ANTI-CLOCKWISE VALVE · SHEET EDGE

AIR VALVE · TREATED WATER SLUICE VALVE · PRESSURE SUSTAINING VALVE · PRESSURE REDUCING VALVE · REFLUX VALVE

CHANGE OF CHARACTERISTIC · ANODE · CHLORINATION POINT · DE-CHLORINATION POINT

BORE HOLE · ABSTRACTION POINT · INLET POINT · BULK SUPPLY POINT

NWW WASHOUT · FIRE HYDRANT (F) · SHARED HYDRANT (F/W) · PUMP

SITE TERMINATION · INTERMEDIATE NODE · CONCESSION START · CONCESSION END

METER · METER AND STOPTAP · STOPTAP · MONITOR LOCATION

SP STRAIN POINT · AP ACCESS POINT · HB HATCHBOX · IP INSERT PROBE POINT

RM ROUTE MARKER · SPT SAMPLING POINT · LB LOGGER BOX

PROPERTY TYPES

CONDITION REPORT · PB PIPE BRIDGE · PT PIPE TUNNEL

TS TELEMETRY STATION · PUMPING STATION · PUMP HOUSE

WATER TREATMENT WORKS · PRIVATE TREATMENT WORKS · VH VALVE HOUSE · WATER TOWER

CS CONFINED SPACE · DU DIALYSIS UNIT · SR SERVICE RESERVOIR · SUP RES SUPPLY RESERVOIR

MATERIAL TYPES

AC	ASBESTOS CEMENT	OT	OTHERS
CI	CAST IRON	PB	LEAD
CU	COPPER	PV	uPVC
CO	CONCRETE	SI	SPUN IRON
DI	DUCTILE IRON	ST	STEEL
GI	GALVANISED IRON	UN	UNKNOWN
GR	GREY IRON	PE	POLYETHYLENE

LINING TYPES

CL	CEMENT
ER	EPOXY RESIN
TB	TAR OR BITUMEN

INSERTION TYPES

DD	DIE DRAWN
MO	MOLING

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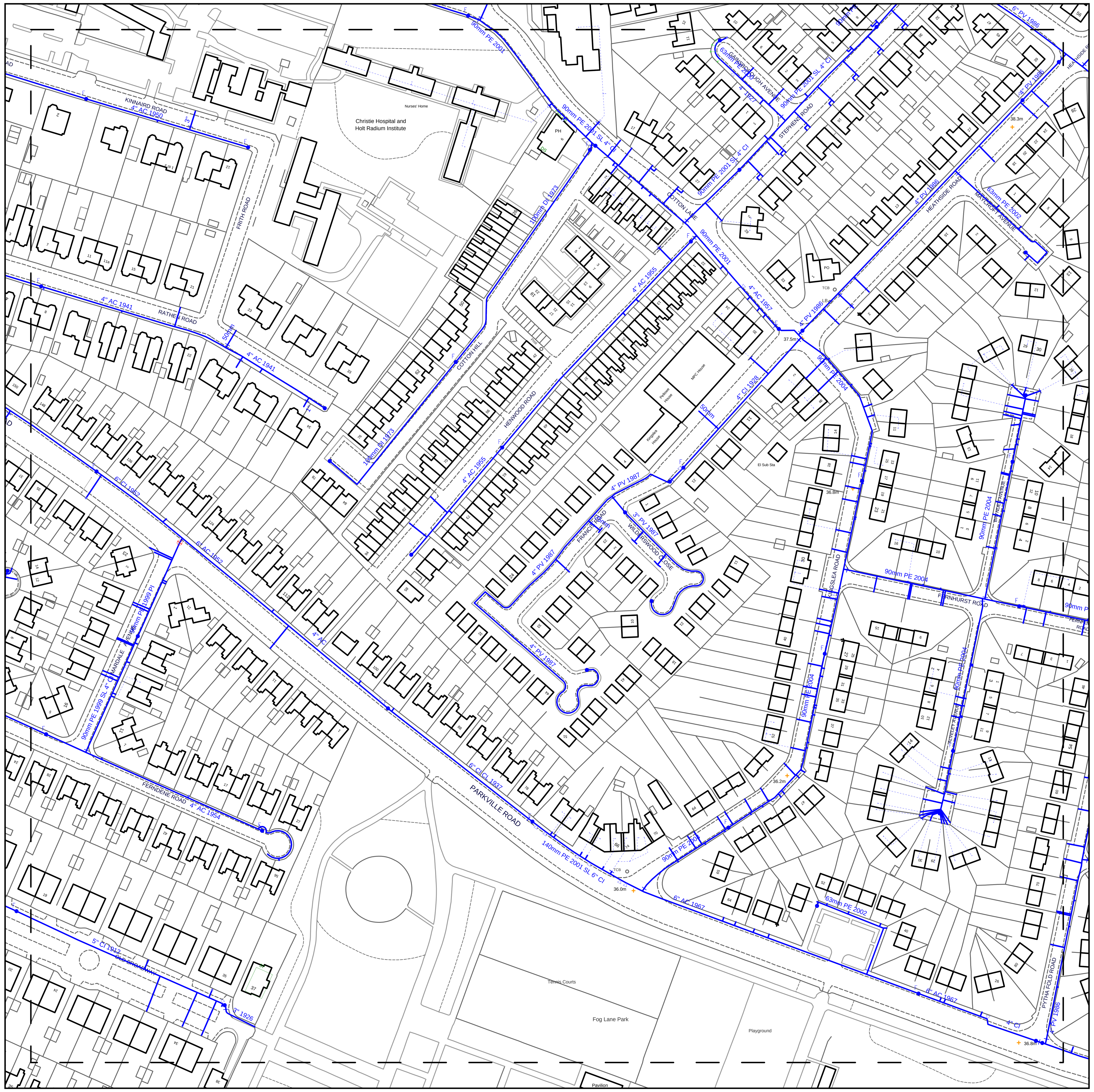
OS Sheet No: SJ8592NW
Scale 1:1250
Date: 9-Nov-2010

United Utilities
WATER MAINS RECORDS



OS Sheet No: SJ8592SW

Scale 1:1250 Date: 9-Nov-2010

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S1 S2 S3 S4 L1 L2 M1 M2 M3 M4

PIPEWORK

TRUNK MAIN · AQUEDUCT · DISTRICT MAIN · COMMON PIPE · NON-POTABLE MAIN · PRIVATE PIPE · PROPOSED · ABANDONED

NODES / FURNITURE

END CAP · CLOCKWISE VALVE · ANTI-CLOCKWISE VALVE · SHEET EDGE
AIR VALVE · TREATED WATER SLUICE VALVE · PRESSURE SUSTAINING VALVE · PRESSURE REDUCING VALVE · REFLUX VALVE
CHANGE OF CHARACTERISTIC · ANODE · CHLORINATION POINT · DE-CHLORINATION POINT
BORE HOLE · ABSTRACTION POINT · INLET POINT · BULK SUPPLY POINT
NWW WASHOUT · F FIRE HYDRANT · F/W SHARED HYDRANT · PUMP
SITE TERMINATION · INTERMEDIATE NODE · CONCESSION START · CONCESSION END
METER · METER AND STOPTAP · STOPTAP · MONITOR LOCATION
SP STRAIN POINT · AP ACCESS POINT · HB HATCHBOX · IP INSERT PROBE POINT
RM ROUTE MARKER · SPT SAMPLING POINT · LB LOGGER BOX

PROPERTY TYPES

CONDITION REPORT · PB PIPE BRIDGE · PT PIPE TUNNEL
TS TELEMETRY STATION · PUMPING STATION · PUMP HOUSE
WATER TREATMENT WORKS · P PRIVATE TREATMENT WORKS · VH VALVE HOUSE · WATER TOWER
CS CONFINED SPACE · DU DIALYSIS UNIT · SR SERVICE RESERVOIR · SUP RES SUPPLY RESERVOIR

MATERIAL TYPES

AC	ASBESTOS CEMENT	OT	OTHERS
CI	CAST IRON	PB	LEAD
CU	COPPER	PV	uPVC
CO	CONCRETE	SI	SPUN IRON
DI	DUCTILE IRON	ST	STEEL
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LINING TYPES

CL	CEMENT	ER	EPOXY RESIN
TB	TAR OR BITUMEN		

INSERTION TYPES

DD	DIE DRAWN	MO	MOLING

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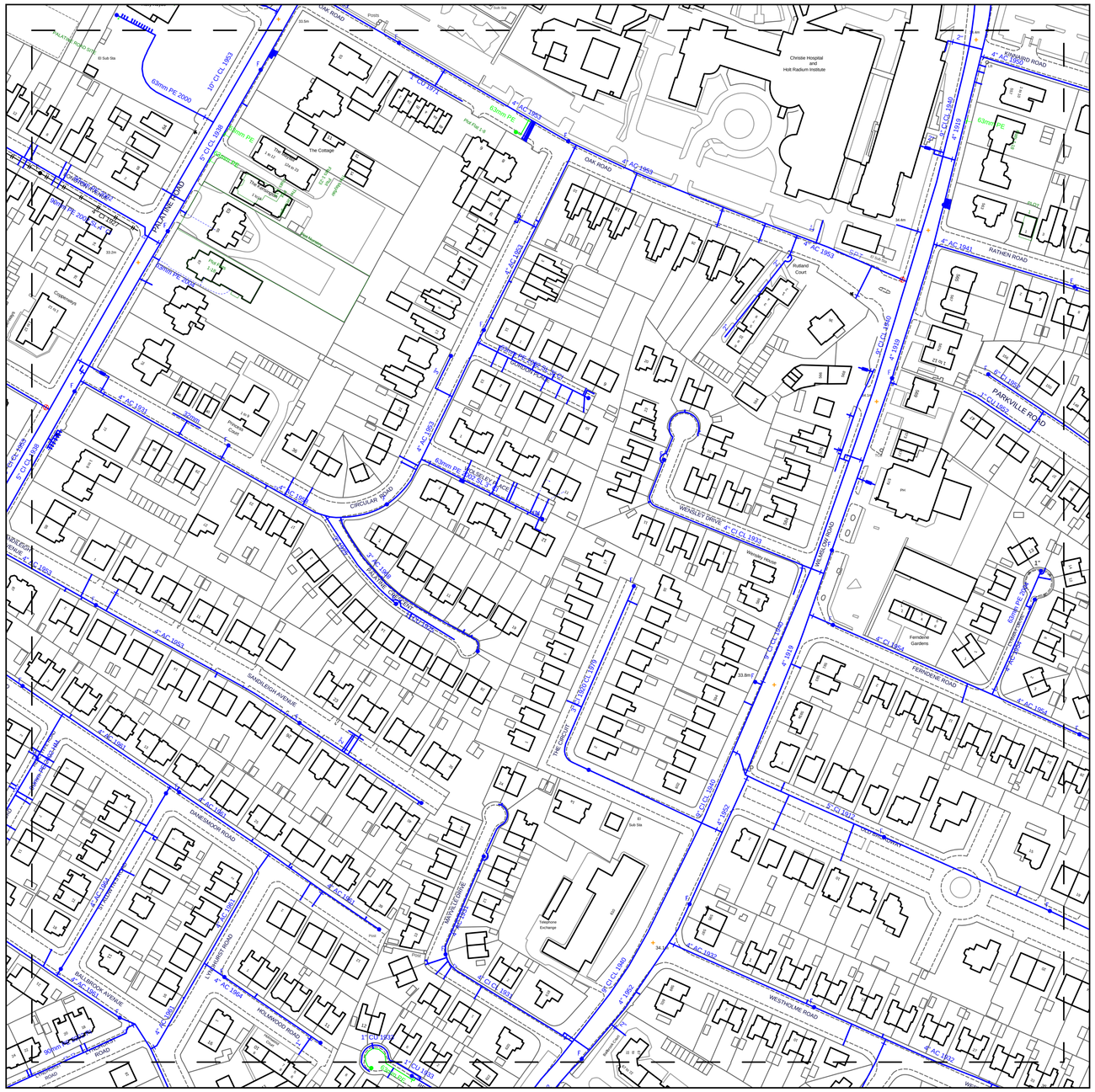
WATER MAINS RECORDS



OS Sheet No: SJ8492SE

Scale 1:1250 Date: 9-Nov-2010

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S1 L1

S2

S3 L2

S4

M1 M2

M3 M4

PIPEWORK

- TRUNK MAIN
- DISTRICT MAIN
- NON-POTABLE MAIN
- PROPOSED
- AQUEDUCT
- COMMON PIPE
- PRIVATE PIPE
- ABANDONED

NODES / FURNITURE

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CHANGE OF CHARACTERISTIC · ANODE · CHLORINATION POINT · DE-CHLORINATION POINT

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CS CONFINED SPACE · DU DIALYSIS UNIT · SR SERVICE RESERVOIR · SUP RES SUPPLY RESERVOIR

MATERIAL TYPES

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CI	CAST IRON	PB	LEAD
CU	COPPER	PV	uPVC
CO	CONCRETE	SI	SPUN IRON
DI	DUCTILE IRON	ST	STEEL
GI	GALVANISED IRON	UN	UNKNOWN
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CL	CEMENT	ER	EPOXY RESIN
TB	TAR OR BITUMEN		

INSERTION TYPES

DD	DIE DRAWN	MO	MOLING

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Date: 9-Nov-2010

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WATER MAINS RECORDS

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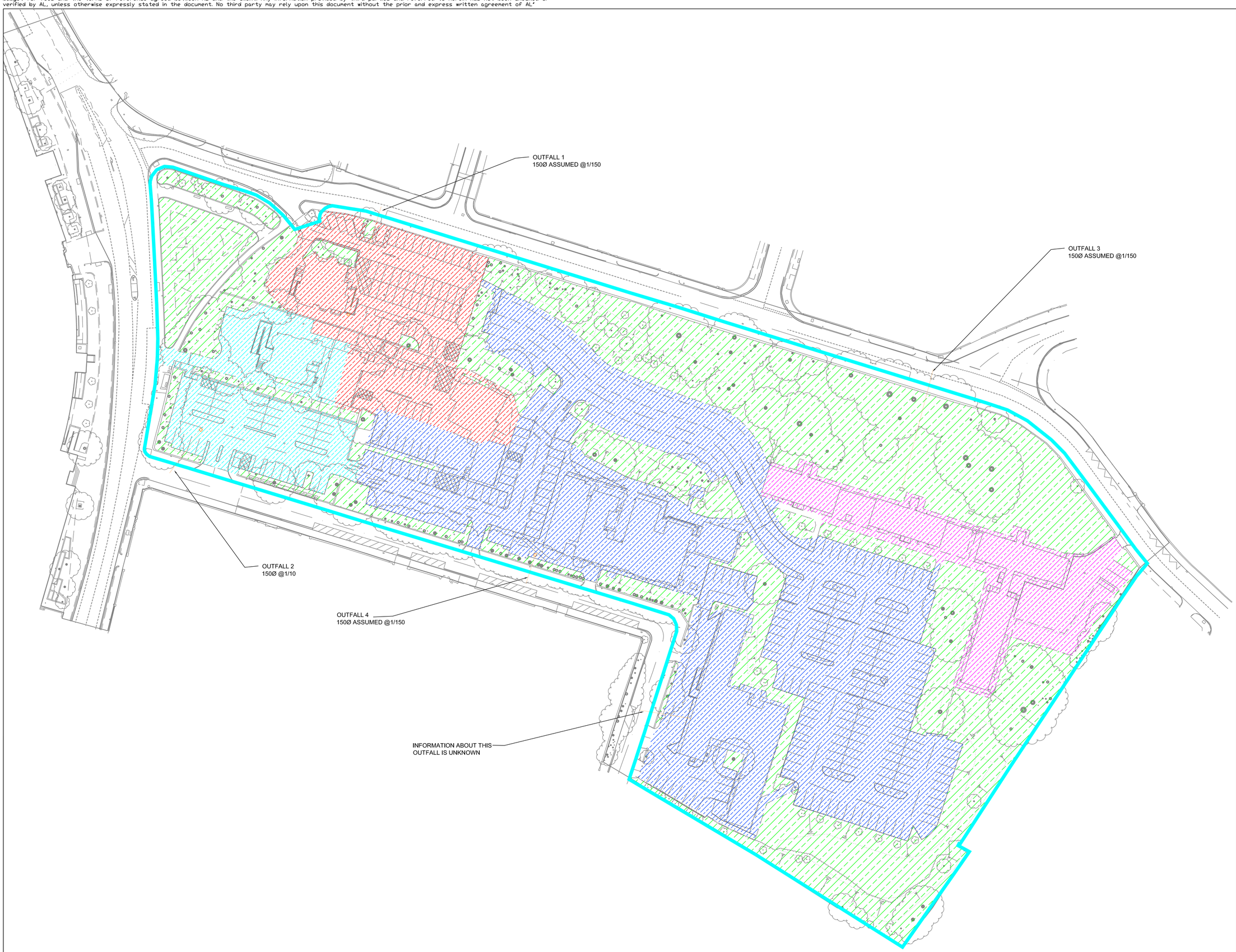

NOTE:- CONTRACTOR TO CONFIRM ALL SITE DIMENSIONS/SETTING OUT PRIOR TO COMMENCEMENT OF WORK

NOTES

1. DO NOT SCALE FROM THIS DRAWING.

KEY

SITE BOUNDARY

EXISTING IMPERMEABLE AREA CONTRIBUTING TO OUTFALL 1

EXISTING IMPERMEABLE AREA CONTRIBUTING TO OUTFALL 2

EXISTING IMPERMEABLE AREA CONTRIBUTING TO OUTFALL 3

EXISTING IMPERMEABLE AREA CONTRIBUTING TO OUTFALL 4

INFORMALLY DRAINED AREA

EXISTING COMBINED OUTFALL SEWER

EXISTING OUTFALL MANHOLE

	m²	ha
Boundary	30516	3.052
Permeable Area	11414	1.141
Outfall 1 Impermeable Area	2753	0.275
Outfall 2 Impermeable Area	2050	0.205
Outfall 3 Impermeable Area	2166	0.217
Outfall 4 Impermeable Area	10409	1.041
Informally Drained Area	1724	0.172

Rev	Date	Detail	Made	Ckd	App	cm

Drawing Status:

STAGE C

Client:

THE UNIVERSITY OF MANCHESTER

Project:

MANCHESTER CANCER RESEARCH CENTRE (MCRC)

Title:

EXISTING OUTFALL ANALYSIS

CAD Ref:

Engineer MF | Made MF

C'k'd | M | E | PH | STR | Date MARCH '11

App. JAG | Scale 1/500 @A1

AECOM
3rd Floor, 8 Princes Parade, Princes Dock, Liverpool L3 1QH
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F +44(0) 151 331 8999
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No. MCRC-AEC-W-95-011 | Rev –

cm | A1

Appendix 2: Correspondence

ENVIRONMENT AGENCY

MANCHESTER CITY COUNCIL

UNITED UTILITIES

ENVIROCHECK

Fenton, Matthew

From: Enquiries, Unit [enquiries@environment-agency.gov.uk]
Sent: 21 February 2011 12:03
To: Fenton, Matthew
Subject: Ref110221SF/12 - Site in Greater Manchester
Attachments: MCRC-site location.bmp

Dear Matthew

Thank you for your enquiry regarding flooding information.

For your information, I have passed your query to our local External Relations Team (Planning and Corporate Services) for advice. They will check whether we hold this information and they will be in touch with you shortly.

The External Relations team have 20 working days from the date we receive your enquiry to provide a response, and they will get this to you as soon as possible.

Should you wish to contact them in the meantime, their details are below. Please quote your Enquiry Ref 110221SF/12 in your correspondence with us.

External Relations
Planning and Corporate Services
Environment Agency
North West Region, Southern Area
Appleton House
430 Birchwood Boulevard
Birchwood
WARRINGTON
WA3 7WD
Tel: 08708 506506

I trust this information is useful.

Thank you for contacting the Environment Agency.

Regards
Stefanie Foster
Customer Service Advisor
National Customer Contact Centre - Sheffield
Enquiries:☎ 08708 506 506

How would you rate the service you've received from us?

Let us know by completing our short online customer survey which is anonymous.

https://web.questback.com/theenvironmentagency/customersatisfaction10/

Please Consider The Environment - Do You Really Need To Print This Email?

Ystyriwch Yr Amgylchedd - Oes Rhaid I Chi Brintio'r E-Bost Hwn

From: Fenton, Matthew [mailto:matthew.fenton@aecom.com]
Sent: 18 February 2011 14:33
To: Enquiries, Unit
Subject: Site in Greater Manchester

Click here to report this email as spam.

Dear Sir or Madam,

I am currently working on a Flood Risk Assessment for the MCRC site located on Kinnaird Road, in Manchester, Greater Manchester (M20 4QL). The Easting's and Northing's of the site are 385107,392467 respectively. Please also find a site location plan attached to this email.

I understand from the Environment Agency online mapping the site is in Flood Zone 1.

We have already contacted the council in relation to flood risk in the area. We would be grateful if you could provide us with any available information you have relating to flood risk at the site in order that we may complete the assessment as soon as possible.

If you would like to discuss my information request please give me a call.

Regards,

Matthew

Matthew Fenton BEng (Hons)
Graduate Engineer, Water
D +44 (0)113 301 2431
mailto:matthew.fenton@aecom.com

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Leeds, LS11 9AR
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Fenton, Matthew

From: NW South, External Relations [NWSouthFolder@environment-agency.gov.uk]
Sent: 25 February 2011 14:48
To: Fenton, Matthew
Subject: WTNFRM33268 - site located on Kinnaird Road, Manchester
Attachments: 89_07_SD01.doc

Dear Matthew

Thank you for your information request regarding a site located on Kinnaird Road, Manchester, M20 4QL

> The site is approximately 4 hectares and is within Flood Zone 1. Therefore a FRA is required. A description of the Flood Risk Assessment can be found in Annex E of Planning Policy Statement 25. A critical drainage assessment will also be required. This can be found by following the link below.
> http://www.manchester.gov.uk/info/100006/environment_and_planning/4700/strategic_flood_risk_assessment_sfra

We have no information about this site.

There is no ongoing modelling that will change this in the near future.



Kim Everson
Customer Services Officer
Appleton House
430 Birchwood Boulevard
Birchwood
Warrington
WA3 7WD

Tel: 01925 543347

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Fenton, Matthew

From: Helen Best [h.best@manchester.gov.uk]
Sent: 18 February 2011 15:30
To: Fenton, Matthew
Subject: Re: FW: Site in Greater Manchester
Attachments: MCRC-site location.bmp

Hi Matthew,

Yes we do have an SFRA completed as part of the Core Strategy evidence base - this is probably the best place to start - there are a series of maps which show different aspects of flood risk, and there is also a User Guide which gives an explanation of these:
http://www.manchester.gov.uk/downloads/download/3871/strategic_flood_risk_assessment-manchester_salford_trafford
Whilst the site is in Flood Zone 1, it is in a Critical Drainage area (as is most of Manchester), there is some indication of low/intermediate surface water susceptibility, and a 'hidden watercourse' nearby

Since our Core Strategy is not yet adopted, the 1995 Manchester UDP is where you need to look for relevant general and area-specific policies:
http://www.manchester.gov.uk/info/856/local_development_framework/2148/unitary_development_plan_udp/1
See in particular WB2, DC21.1, but also you should look at PPS25.

For more detailed advice on site-specific issues, you could contact our Development Control South Area Team (0161 234 4545), and also Highways Drainage - Les Dagnall (email: l.dagnall@manchester.gov.uk;
tel. 0161 922 7421), or Ella Davies (email: e.davies2@manchester.gov.uk; tel.
0161 600 7233
).

I hope this helps,
Regards

Helen Best
Strategy Officer
Planning Strategy Group
Chief Executive's Dept
Manchester City Council

Tel: 0161 234 4958
Internal: 800 4958
Fax: 0161 234 4679
e-mail: h.best@manchester.gov.uk
http://www.manchester.gov.uk
Postal address:- Manchester City Council, PO Box 532 Town Hall Manchester M60 2LA
LOCATION ADDRESS: Number One First Street, Manchester M15 4FN (for satellite navigation systems, please use M1 5DE).
How to get to Number One First Street: http://www.manchester.gov.uk/firststreet

"Fenton, Matthew" <matthew.fenton@aecom.com>

18/02/2011 13:45

To <h.best@manchester.gov.uk>
cc
Subject FW: Site in Greater Manchester

Dear Madam,

I am currently working on a Flood Risk Assessment for the MCRC site located on Kinnaird Road, in Manchester, Greater Manchester (M20 4QL). Please also find a site location plan attached to this email.

I would be interested in any information the Council could provide on flood risk and drainage in the Greater Manchester area. Please note that I have also contacted the Environment Agency regarding this site, as the site is located in Flood Zone 1. I am specifically interested in obtaining the following information from the Council:

- Any records of flooding or drainage problems in the Greater Manchester and site area. If so, could you please provide details.

- Any requirements for development in Flood Zone 1.

- Any drainage standards/ requirements for developments.

- Confirmation as to whether a Strategic Flood Risk Assessment has been completed for the area, and if one has been completed where I can obtain a copy.

I would be grateful for any information you can provide. If you would like to discuss my information request please give me a call.

Regards,

Matthew

Matthew Fenton BEng (Hons)
Graduate Engineer, Water
D +44 (0)113 301 2431
mailto:matthew.fenton@aecom.com

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Leeds, LS11 9AR

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This footnote also confirms that this email message has been swept for the presence of computer viruses.

Please contact internet.administrators@manchester.gov.uk with any queries.

****

Fenton, Matthew

Subject: FW: MCRC: Sewer queries

From: Planning Liaison [mailto:PlanningLiaison@uuplc.co.uk]
Sent: 04 April 2011 14:42
To: Gibson, James
Subject: RE: MCRC: Sewer queries

James,

Below, is sub-section 2 of Section 106, which basically states that you have the right to connect 'domestic sewage' and storm water at unrestricted rates. Sorry, if my comments below were not clear. As long as the liquid being discharged to sewer can be defined as 'domestic' that is it is associated with normal cleaning, washing and toilet use then UU cannot impose any restrictions under the WIA. To be honest I am not too use what kind of waste is associated with cancer research but if nasty chemicals and other nasty materials are discharged to the sewer network then UU can impose restrictions.

(2)Subject to the provisions of Chapter III of this Part, nothing in subsection (1) above shall entitle any person—

(a)to discharge directly or indirectly into any public sewer—

(i)any liquid from a factory, other than domestic sewage or surface or storm water, or any liquid from a manufacturing process; or

(ii)any liquid or other matter the discharge of which into public sewers is prohibited by or under any enactment; or

Unfortunately, due to the Data Protection Act I can not provide any more information on the flooders in the area.

Regards

Neil

From: Gibson, James [mailto:james.gibson@aecom.com]
Sent: 04 February 2011 16:13
To: Planning Liaison
Cc: Platt, Kevin; Hughes, Philip M.
Subject: RE: MCRC: Sewer queries

Dear Neil,

Thank you for your response. This is great news, but could you clarify that domestic wastewater includes discharges from roofs and paving as I was under the impression that these discharges are classed as surface water. If not we will allow for unrestricted flows of "wastewater" into the sewer in our design, where this does not include trade effluent type discharges.

With regards to "flooding hot spots", can you provide any further information? There is a need to undertake a Flood Risk Assessment for the development, and in accordance with PPS25, sewer flooding is relevant.

Finally, we will ensure that any applications are undertaken as you requested, but please note that as the project is in its early stages we have not yet submitted a planning application and our enquiry was to get you involved early to identify issues with both foul and surface water drainage. Your help is therefore important and appreciated.

Regards,

James.

James Gibson MEng CEng C.WEM MCIWEM
Associate Director, Water
D +44 (0)113 3916871 M +44 (0)7808 940756
james.gibson@aecom.com

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5th Floor
2 City Walk
Leeds
LS11 9AR
T +44 (0)113 3916800 F +44 (0)113 3916899
www.aecom.com

From: Planning Liaison [mailto:PlanningLiaison@uuplc.co.uk]
Sent: 04 February 2011 14:03
To: Gibson, James
Subject: RE: MCRC: Sewer queries

James

Please see my response to your questions below (in red)

Regards

Neil

From: Gibson, James [mailto:james.gibson@aecom.com]
Sent: 03 February 2011 08:52
To: dlm.uu.planning.liaison
Cc: Platt, Kevin
Subject: RE: MCRC: Sewer queries

Dear Sirs,

Further to my e-mail below I wondered how you were progressing with a response?

Regards,

James.

James Gibson MEng CEng C.WEM MCIWEM
Associate Director, Water

D +44 (0)113 3916871 M +44 (0)7808 940756
james.gibson@aecom.com

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5th Floor

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www.aecom.com

From: Gibson, James
Sent: 21 January 2011 14:55
To: 'planning.liaison@uuplc.co.uk'
Cc: 'kevin.platt@uuplc.co.uk.'
Subject: MCRC: Sewer queries

Dear Sirs,

We are in the early stages of design for the proposed University of Manchester Cancer Research Centre (MCRC) project on behalf of the University of Manchester and I am the engineer responsible for the foul and surface water drainage scheme. The site is to the south of Cotton Lane, north of Kinnaird Road and east of Wilmslow Road (as below):

<< OLE Object: Picture (Device Independent Bitmap) >>

The site is to be developed in Phases and from sewer records already obtained we know there are UU sewers in the vicinity at:

- Cotton Lane
- Kinnaird Road
- Wilmslow Road
- Frith Road
- Cotton Hill
- Rathen Road

We are in the process of obtaining the site wide private sewer plans and below ground asset surveys which will hopefully provide confirmation of the foul and surface water outfalls.

My queries in relation to **surface water** discharges are:

- If flows are proven to connect into UU public sewers:

  - Can we continue to discharge into the sewers at the current rates – Under Section 106 of the Water Industry Act you have the to the right to discharge to the nearest public sewer for 'domestic' wastewater without any restrictions. 'Domestic' refers to wastewater from roofs and paving, as well as toilets and sinks. If this facility produces wastewater that is contaminated with hazardous products/chemicals then

this wastewater could be classed as trade effluent and will need a trade effluent consent. UU are not obliged to accept trade effluent.

- If so, what rate? Unrestricted for domestic wastewater, trade effluent is restricted to the rate in the trade effluent consent.
- If not, what rate will be acceptable?
- Can we continue to discharge into the UU sewers at the same point? Please see above
- If not, where?

- If flows are not proven into UU public sewers, would you allow a new connection or connections into the UU sewers? Please see above
  - And if so, at what rate? Please see above
  - And where?
- Are there any operational issues or flooding issues associated with your sewers in the area? There are two flooding (hydraulic) hotspots to the west of the site
  - And if so, what?
  - What should we do to take these into account? Do not discharge surface water to the combined sewer

With regards foul water, am I correct in presuming that we can maintain connections that already exist? Is there any issues you might have in relation to flow rates or flow constituents? If the foul water is 'domestic', that just from toilet and normal cleaning then there will be no issue with the discharge of foul water but if the foul water contains hazardous chemicals/products associated with research then that may be classed as trade effluent

I would also appreciate it if you could confirm what applications have to be made also. To make a Section 106 Sewer Connection Application follow www.unitedutilities.com/wastewaterconnections.aspx

I wanted to get your involvement at this early stage so we can inform the design and not have any surprises down the line. Any assistance you can give us at this stage and moving forward will be greatly appreciated. Please check the planning conditions associated with this site. If consulted by the Local Planning Authority UU will request certain planning conditions are imposed on the development. Please check UU's website for the trade effluent consent requirements.

Please note that the SUDS element of the Floods and Water Management Act is expected to come into force in 2012 and the responsibility for approval and subsequent adoption of surface water drainage systems will then rest with the appropriate SUDS Approval Body and not United Utilities

Regards,

James.

James Gibson MEng CEng C.WEM MCIWEM
Associate Director, Water

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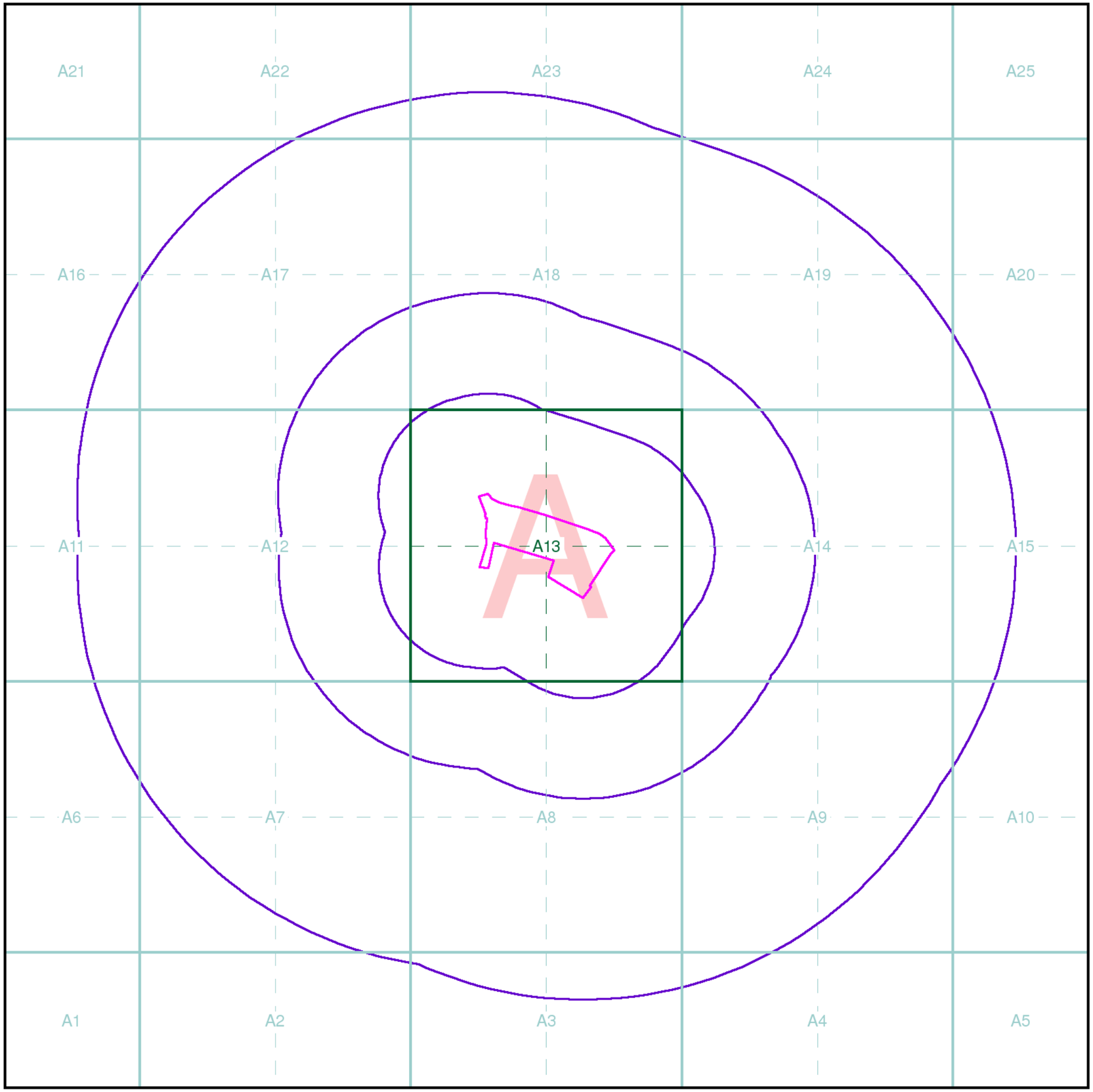

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Licensed Partner

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms D Carr, AECOM Ltd, 5th Floor, 2 CIty Walk, Leeds, LS11 9AR

Order Details

Order Number:	33951429_1_1
Customer Ref:	MCRC
National Grid Reference:	385090, 392490
Site Area (Ha):	3.94
Search Buffer (m):	1000

Site Details

Site at 385110, 392470

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

LANDMARK TERMS AND CONDITIONS

Version 6.04 28 Jul 2007

Definitions

"Authorised Reseller" means an agent or reseller of Landmark whom Landmark has duly appointed to resell its Reports and Services.

"Content" means any data, computing and information services and software, and other content and documentation or support materials and updates included in and/or supplied by or through the Websites, in Reports or Services or in any other way by Landmark and shall include Landmark developed and Third Party Content.

"First Purchaser" means the first person, or legal entity to purchase the Property Site following provision of a Report.

"First Purchaser's Lender" means the funding provider for the First Purchaser

"Information Pack" means a pack compiled by or on behalf of the owner or prospective buyer of the Property Site, designed to aid the marketing or purchase of the Property Site and containing information provided by or on behalf of the owner or prospective buyer of the Property Site.

"Intellectual Property Rights" means copyright, patent, design right (registered or unregistered), service or trade mark (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right.

"Order" means the request for Services from Landmark by You.

"Property Site" means a land site on which Landmark provides a Service.

References to **"We"**, **"Us"** and **"Our"** are references to Landmark Information Group Limited ("Landmark"), whose registered office is 7 Abbey Court, Eagle Way, Exeter, EX2 7HY. Where You are not ordering the Services directly from Landmark, but from an Authorised Reseller, references to "Landmark" or "We", "Us" and "Our" shall be construed so as to mean either Landmark and/or the Authorised Reseller as the context shall indicate.

References to **"You/Your/Yourself"** refer to the contracting party who accesses the Website or places an Order with Landmark.

"Report" includes any information that Landmark supplies to You including all reports, services, datasets, software or information contained in them.

"Services" means the provision of any service by Landmark pursuant to these Terms, including without limitation, any Report.

"Landmark Fees" means any charges levied by Landmark for Services provided to You.

"Suppliers" means any organisation who provides data or information of any form to Landmark.

"Terms" means these Terms & Conditions.

"Third Party Content" means the services, software, information and other content or functionality provided by third parties and linked to or contained in the Services.

"Websites" means websites hosted by Landmark and includes the Content and any report, service, document, data-set, software or information contained therein, derived there from or thereby.

1. Terms & Conditions

a. These Terms govern the relationship between You and Landmark whether You are an unregistered visitor to the Website or are purchasing Services. Where these Terms are not expressly accepted by You they will be deemed to have been accepted by You, and You agree to be bound by these Terms when You place any Order, or pay for any Services provided

b. If the person communicating with Landmark is an Authorised Reseller, they must ensure that You agree to these Terms.

c. The headings in these Terms are for convenience only and shall not affect the meaning or interpretation of any part of these Terms.

d. Landmark may modify these Terms, and may discontinue or revise any or all other aspects of the Services at our sole discretion, with immediate effect and without prior notice, including without limitation changing the Services available at any given time. Any amendment or variation to these Terms shall be posted on our Websites. Continued use of the Services by You shall be deemed an acceptance by You to be bound by any such amendments to the Terms.

e. These Terms, together with the prices and delivery details set out on our Websites, Landmark's Privacy Policy and Your Order comprise the whole agreement relating to the supply of Services to You by Landmark. No prior stipulation, agreement, promotional material or statement whether written or oral made by any sales or other person or representative on our behalf should be understood as a variation of these Terms. Save for fraud or misrepresentation, Landmark shall have no liability for any such representation being untrue or misleading.

f. These Terms shall prevail at all times to the exclusion of all other terms and conditions including any terms and conditions which You may purport to apply even if such other provisions are submitted in a later document or purport to exclude or override these Terms and neither the course of conduct between parties nor trade practice shall act to modify these Terms.

2. Services

a. Landmark will use reasonable care and skill in providing the Services to You, however, the Services are provided on the express basis that the information and data supplied in the Services are derived from third party sources and Landmark does not warrant the accuracy or completeness of such information or data. Such information is derived solely from those sources specifically cited in the Services and Landmark does not claim that these sources represent an exhaustive or comprehensive list of all sources that might be consulted.

3. Intellectual Property

a. You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either Landmark or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights.

b. Subject always to these Terms You may, without further charge, make the Services available to;
   i. the owner of the Property at the date of the Report,
   ii. any person who purchases the whole of the Property Site,
   iii. any person who provides funding secured on the whole of the Property Site,
   iv. any person for whom You act in a professional or commercial capacity,
   v. any person who acts for You in a professional or commercial capacity; and
   vi. prospective buyers of the Property Site as part of an Information Pack but for the avoidance of doubt, Landmark shall have no liability to such prospective buyer unless the prospective buyer subsequently purchases the Property Site, and the prospective (or actual) buyer shall not be entitled to make the Service available to any other third party.
   Accordingly Landmark shall have the same duties and obligations to those persons in respect of the Services as it has to You.

c. Each of those persons referred to in clause 3.b. shall have the benefit and the burden of Your rights and obligations under these Terms. The limitations of Landmark's liability as set out in clause 6 shall apply to all users of the Service in question in aggregate and Landmark shall not be liable to any other person.

d. All parties given access to the Services agree that they will treat as strictly private and confidential the Services and all information which they obtain from the Services and shall restrict any disclosure to employees or professional advisors to enable the relevant party to conduct its internal business. The requirement in this clause to treat the Services as confidential shall include a requirement to maintain adequate security measures to safeguard the Services from unauthorised access, use or copying.

e. Each recipient of the Services agrees (and agrees it will cause its employees, agents or contractors who may from time to time have access to the Services to agree) it will not, except as permitted herein or by separate agreement with Landmark:-
   i. effect or attempt to effect any modification, merger or change to the Service, nor permit any other person to do so; or
   ii. copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or
   iii. remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party.
   iv. create any product which is derived directly or indirectly from the data contained in the Services

f. The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.

g. You are permitted to make five copies of any Report, but are not authorised to re-sell the Report, any part thereof or any copy thereof unless you are an Authorised Reseller. Further copies may not be made in whole or in part without the prior written permission of Landmark who shall be entitled to make a charge for each additional copy.

4. Charges

a. VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.

b. An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.

c. We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.

d. Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

a. Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-
   i. You fail to make any payment due in accordance with clause 4;
   ii. You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
   iii. You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.

b. If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.

c. Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.

6. Liability

a. We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.

b. Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or wilful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.

c. As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or willful default and subject to clause 6.o below neither Landmark nor any person providing information contained in any Services shall in any circumstances be liable for any inaccuracies, faults or omissions in the Services, nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.

d. Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.

e. In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.

f. Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.

g. You acknowledge that:-
   i. Subject to clause 6.o below You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts of omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
   ii. Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
   iii. no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining saleability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
   iv. Subject to clause 6.o below, Landmark shall not be responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.
   v. Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
   vi. the Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
   vii. Landmark offer no warranty for the performance of any linked internet service not operated by Landmark;
   viii. You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery;
   ix. Any support or assistance provided to You in connection with these Terms is at Your risk;

h. All liability for any insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.

i. Professional opinions contained in Reports are provided to Landmark by third parties, and such third parties are solely liable for the opinion provided. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Wilbourn Associates Limited, and any issues with regard to the provision of such opinion should be taken up with the relevant third party.
   If Landmark provides You with any additional service obtained from a third party, including but not limited to any interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, subject to clause 6.o below Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties.

j. In any event no person may rely on a Service more than 12 months after its original date.

k. If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.

l. Time shall not be of the essence with respect to the provision of the Services.

m. Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Subject to clause 6.o below, Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.

n. Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6i above.

o. Landmark obtains much of the information contained in its Report from third parties. Landmark will not accept any liability to You for any negligent or incorrect entry, or error or corruption in the Third Party Content supplied to Landmark, but Landmark's Suppliers may be liable for such negligent or incorrect entries, or errors or corruptions, subject to the terms and conditions on which they supply the Third Party Content to Landmark.

7. Contribution

a. Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.

b. Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")

c. In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms:
   i. the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
   ii. the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
   iii. the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
   iv. the Contribution will not be paid in respect of any of the following:
   Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
   Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures.
   Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
   Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.
   Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
   Any condition which is caused by acts of War or an Act of Terrorism.
   Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
   Any fines liquidated damages punitive or exemplary damages.
   Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
   Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
   Any losses incurred following a material change in use of, alteration or development of the Property Site.

d. The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £60,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.

e. Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.

f. Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.

g. In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 3 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.

h. In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under PartII(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e.

i. Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.

8. Events Beyond Our Control

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

9. Severability

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

10. Governing Law

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

11. General; Complaints

a. Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.

b. Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.

c. No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.

d. Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and subject to paragraph e below all notices from Landmark to You will be displayed on our Websites from time to time.

e. Any complaints in relation to the Services should, in the first instance, be in writing addressed to the Customer Service Support Manager at the Landmark registered office. Landmark or its agents will respond to any such complaints in writing as soon as practicably possible.

f. A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.

g. Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.

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