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architecture : engineering : building consultancy



MANCHESTER COMMS ACADEMY

McARDLE SPORT TEC

DRAINAGE STRATEGY

12805-WMS-ZZ-XX-T-C-39211-S8-P2

October 2024

Contract: Manchester Comms Academy

Document Title: Drainage Strategy

Our Ref: 12805-WMS-ZZ-XX-T-C-39211-S8-P2

Prepared by: S.Eccleston MEng (Hons) GMICE Date: October 2024

RECORD OF AMENDMENTS TO DOCUMENT

Ref	Description	Date
P1	Initial Issue	July 2024
P2	Updated to latest drainage layout	October 2024

Verified by:  IEng MCIHT MICE FIHE Date: October 2024

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3.0	FLOOD RISK
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1.0 INTRODUCTION

- 1.1 William Saunders have been commissioned by McArdle Sport Tec to prepare a Drainage Strategy for a proposed car park development.

2.0 PROPOSED DEVELOPMENT

2.1 Site Location and Description

- 2.1.1 The site is located off Lathbury Road. The centre of Manchester is approx. 3.66km south-west.
- 2.1.2 The grid reference for the site is 385921E, 400826N or SD 85921 00826. The postcode of the site is M40 8NT. The site area is approximately 1452m² or 0.145 hectares. A location plan can be seen below.

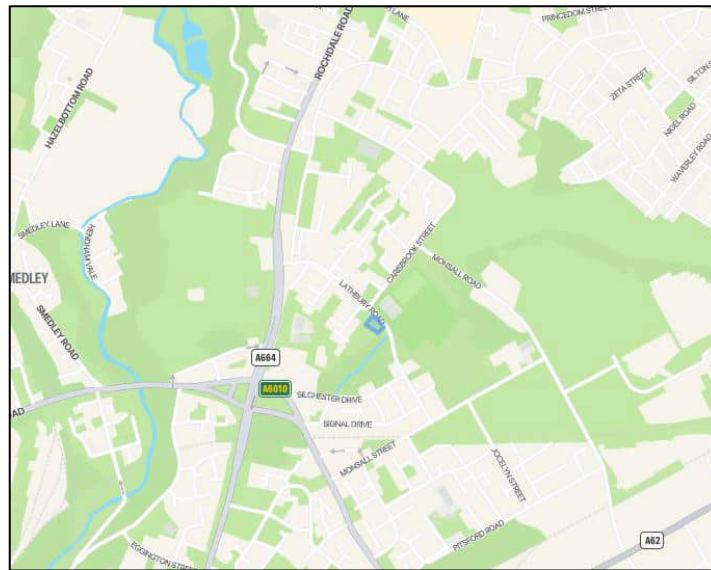


Figure 1: Location Plan

- 2.1.3 The proposed access into the site is off Lathbury Road.
- 2.1.4 The site currently comprises an undeveloped area of greenfield land. It is currently covered in a mixture of grass, shrubbery and trees. Site boundaries consist of fencing to the northeast (along Lathbury Road) and to the north-west. The south-west side of the site is open and the south-eastern side is bounded by trees and Moston Brook.
- 2.1.5 The site is bordered by Lathbury Road to the North-east (beyond which is a series of sports pitches), residential housing to the north-west, open grassland to the south-west and Moston Brook to the south-east.
- 2.1.6 The topographic survey indicates the site has a fall from north-west to south-east with levels between 63.20mAOD and 62.45mAOD.

2.2 Development Proposals

- 2.2.1 The proposals are to construct a 50-bay car park, including 3 accessible bays and 5 electrical vehicle charging parking bays to serve some 3G sports pitches being developed immediately south-east of the site, Appendix A.

3.0 FLOOD RISK

- 3.1 The nearest surface water feature is the Moston Brook 30m south-east of the site which flows to the north-east to south-west.
- 3.2 The Environment Agency's Flood Map (Appendix B) indicates that the site is located within Flood Zone 1 (land assessed as having an annual probability of flooding of less than 1 in 1000 from rivers or the sea, without flood defences).
- 3.3 The site falls within Flood Zone 1 and is under 1ha in area. Manchester City Councils Strategic Flood Risk Assessment Future Surface Water Flooding Map (Appendix C) also indicates that the site isn't located in an area with susceptibility to future flooding. As such there is no requirement for a site-specific flood risk assessment.

4.0 FOUL DRAINAGE STRATEGY**4.1 Existing Drainage**

An underground utility and topographical survey (Appendix D) has indicated the presence of a 600mm dia combined sewer adjacent the site running beyond the sites south-eastern boundary.

As the sewer is outside the site boundary, there are no proposals to carry out any remedial work to the existing sewer.

4.2 Proposed Drainage

The development is the construction of a small car park and is not anticipated to produce domestic foul discharge, as such a proposed foul drainage strategy is not required.

5.0 SURFACE WATER DRAINAGE STRATEGY

5.1 Existing Drainage

Existing public sewer records were obtained from United Utilities, Appendix D. United Utilities records indicate that there are no assets located within the site.

Records do indicate the presence of a 2700mm dia culvert which runs beneath Lathbury road and is assumed to open into Moston Brook, south of the site.

5.2 Proposed Drainage

In accordance with requirement H3 of the Building Regulations 2000 all possible options for disposal of surface water have been considered using the preferred hierarchy i.e.

- Soakaways,
- Infiltration,
- Watercourse,
- Sewer.

Infiltration Drainage

An intrusive ground investigation was carried out in October 2023 by Soiltechnics. Percolation tests from the ground investigations were undertaken within 2 of the excavated trial pits at depths of 0.31m and 1.05m below ground level. Tests undertaken in pits recorded negligible infiltration rates in both pits.

Due to the results of the infiltration tests indicating the site has minimal potential for infiltration both via a surface discharge method (permeable paving) and deeper discharge method (soakaway), discharge via infiltration is not currently being considered.

Discharge to Watercourse

Moston Brook runs past the south-eastern boundary of the site, within a reasonable distance. It's proposed to discharge surface water from the car park into Moston Brook, subject to an agreement with the lead local flood authority.

A QBar ICP SUDS Greenfield Run-off calculation has been undertaken for the area of the proposed development (Approx Area: 1340 sqm), which returns a rate of 0.8 l/s. LLFA guidance states that run-off rates are limited to 1l/s or the 1 in 1-year greenfield rate, whichever is higher.

As 0.8 l/s is less than the minimum rate, a restricted discharge of 1 l/s will be adopted.

It is proposed to restrict the discharge via the use of a Hydro-Brake. Due to the need for a restricted discharge suitable attenuation will be needed to provide storage, this will be provided in the form of a geocellular attenuation tank.

Calculations for the above system can be found in Appendix E, which show that there is no flooding on the site during the 1-year event through to the 100+40 year event.

Discharge to Sewer

Due to the viability of a connection into the watercourse Moston Brook, a connection to a sewer is not being considered.

5.3 Water Quality

The quality of the discharge has been assessed in accordance with 'CIRIA SuDS Manual C753' Chapter 4 (Designing for Water Quality) and Chapter 26 (Water Quality Management: Design Methods). Table 4.3 of CIRIA SuDS Manual C753' (see Table 1 below) was consulted to determine the appropriate levels of treatment stages from the resultant surface water discharge for the site.

The site does not lie within a source protection zone in regard to the protection of groundwater resources for potable supply.

As a commercial car park development, the pollution hazard level is considered medium.

The current proposal is to discharge to a watercourse. To discharge to a watercourse a 'Simple Index Approach' needs to be undertaken with an initial groundwater risk screening to assess the pollution risk to groundwater, as per 'Table 4.3' of CIRIA C753.

Land use	Pollution hazard level	Requirements for discharge to surface waters, including coasts and estuaries	Requirements for discharge to groundwater
<u>Commercial yard and delivery areas</u> , non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	Simple index approach Note: extra measures may be required for discharges to protected resources	Simple index approach Risk Screening must be undertaken first to determine whether consultation with the environmental regulator is required.

Table 1. Minimum water quality management requirements of proposed drainage areas. Table 4.3 of CIRIA C753.

Simple Index Approach

A simple index approach has been carried out to determine whether the proposed drainage system has enough mitigation to prevent pollutants of each type from entering the infiltration system.

The system includes a petrol and fuel interceptor unit which will provide treatment to all surface water discharging from the car park into watercourse. As such the simple index approach is considered completed and the proposed method of treatment acceptable.

5.4 Climate Change Allowances

The NPPF requires that climate change is taken into account when assessing the flood risk for developments. This applies to both 1 in 30-year (3.3% AEP) events and 1 in 100-year (1%AEP) events.

The Environment Agency publishes peak rainfall intensity climate change allowances which are determined by management catchments. The proposed development is within the Irwell Management Catchment.

The NPPF guidance states that non-residential developments should be considered to have a minimum design life of 75 years.

The appropriate peak rainfall intensity climate change allowance category for the development can be determined using the tables below.

	Design Life of Development		
	Up to 2060	Between 2061 and 2100	Beyond 2100
Appropriate Peak Rainfall Intensity Allowance	2050s central allowance	<u>2070s central allowance</u>	2070s upper end allowance

Table 6. Peak rainfall intensity climate change allowance by development design life.

Irwell Management Catchment			
Climate change allowance		Central	Upper End
1 in 30-year	2050s	25%	35%
	2070s	<u>30%</u>	40%
1 in 100-year	2050s	25%	40%
	2070s	<u>20%</u>	45%

Table 7. Peak rainfall intensity climate change allowances by management catchment.

Table 6 shows that for developments with a between 2061 and 2100, the central climate change allowance for the 2070s epoch should be used. Table 7 shows that the climate change allowances shown below are appropriate and should be used for the design of the drainage system.

5.5 Drainage Strategy

In order to reduce the run-off from the developed site and accommodate future climate change, the detailed design of the surface water drainage system will need to include the following: -

- Attenuation Storage Volume
 - Suitably sized attenuation in the form of Geocellular Attenuation Tanks designed to provide the required storage volume necessary with an allowance for climate change to prevent flooding at the surface.
- Pre-Treatment Systems
 - Pre-treatment systems in the form of a Petrol interceptor to provide groundwater protection in the event of an unexpected pollution event.
- Flood Flow Routes
 - To address the residual risks of surface water flows and potential infrastructure failure, flow routes for such waters has been analysed and demonstrated to not present a hazard to the development or adjacent properties.
- Drainage Maintenance
 - Routine inspections of the surface water drainage should be undertaken with findings recorded to inform future inspections or maintenance. Inspections should also be carried out following high intensity storms or hydrocarbon spills.

The proposed drainage layout can be viewed in Appendix F.

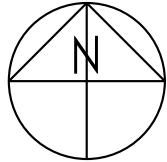
Private drainage will be designed in accordance with part H of the Building Regulations.

6.0 CONCLUSIONS

- 6.1 The proposed development is within EA Flood Zone 1 and is under 1ha in area, as such there is no requirement for a site-specific flood risk assessment.
- 6.2 Infiltration rates are considered unsuitable for surface water to be discharged through infiltration.
- 6.3 United Utility Water records indicate that there are no Sewers located within the site boundary.
- 6.4 The development will produce water of a surface water nature only, with no domestic foul discharge being proposed.
- 6.5 It is proposed to discharge surface water to the nearby Moston Brook Watercourse. Discharge will be restricted to 1 l/s and treatment will be provided in the form of a Petrol Interceptor.
- 6.6 The surface water runoff generated by the proposed development will be managed in a manner which will ensure no risk of flooding or increased risk to surrounding properties, at present and considering allowances for future climate change.
- 6.7 The residual risks from surface water flooding will be addressed by consideration of flood flow routes through the development.

APPENDIX A

Development Proposals



General Notes:

- 1 - Do not scale this drawing. If in any doubt ask.
- 2 - This drawing is to be read in conjunction with all relevant engineers and specialists drawings and specifications.
- 3 - All setting out is to be checked on site prior to any works commencing. Any discrepancies are to be reported to the Engineer immediately.
- 4 - All dimensions are shown in millimetres unless otherwise noted. All levels are shown in metres unless otherwise noted.
- 5 - Additional Spaces:

- Standard Parking = 36

- Accessible Parking = 3

- EV Parking = 10

- Total Additional Bays = 49



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Contractors must verify all dimensions, levels and co-ordinates at the site before commencing any work or making any shop drawings: no dimensions to be taken from drawing.

P2	Layout updated to suit comments	SE		06/24
P1	Initial Issue for information	SE	CM	05/24
Rev	Description	Drn	Vf'd	Date
As outlined in section 2.3 of the CITB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8, 9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus:  ☒ No significant risks have been identified. ☐ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed. Refer to the current Designer's Risk Assessment sheets for further details.				
Designer's Signature		SE		Date 05/24

Drawing Status

INFORMATION

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Title			
General Arrangement			
WmS Project Ref.	Drawn	Date	Scale
12805	SE	13/05/24	1:200
Drawing/Document Reference			
Project	Originator	Zone	Level
12805 - WMS - ZZ - XX - D - C - 39501 - S2 - P2			

APPENDIX B

Environment Agency Flood Map for Planning & Pluvial Flood Risk Map

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
385924/400808

Created
31 Jul 2024 9:13

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

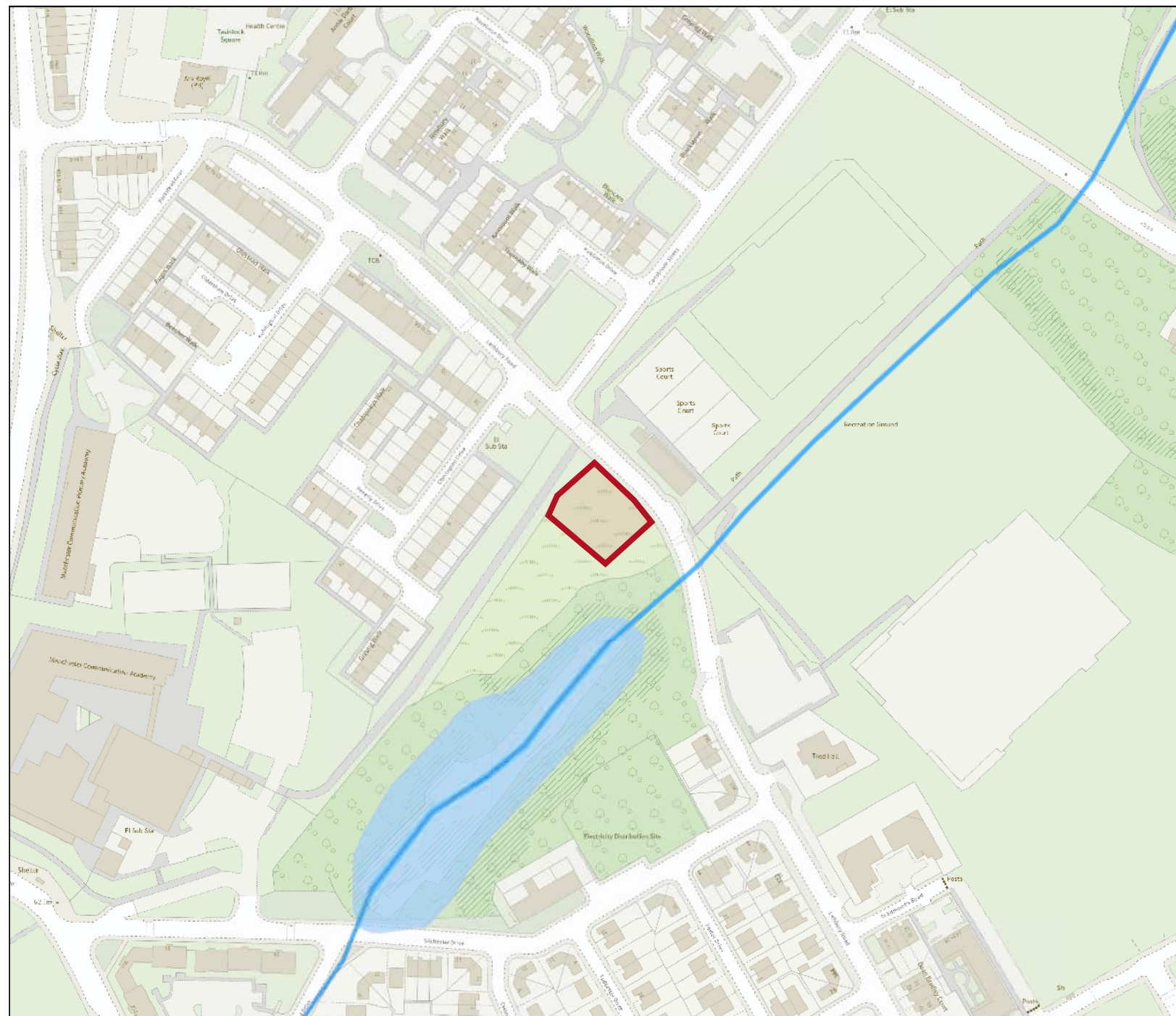
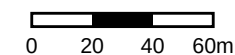
Your reference
<Unspecified>

Location (easting/northing)
385924/400808

Scale
1:2500

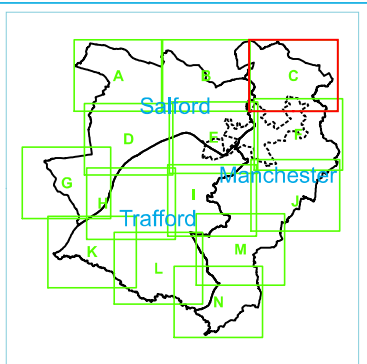
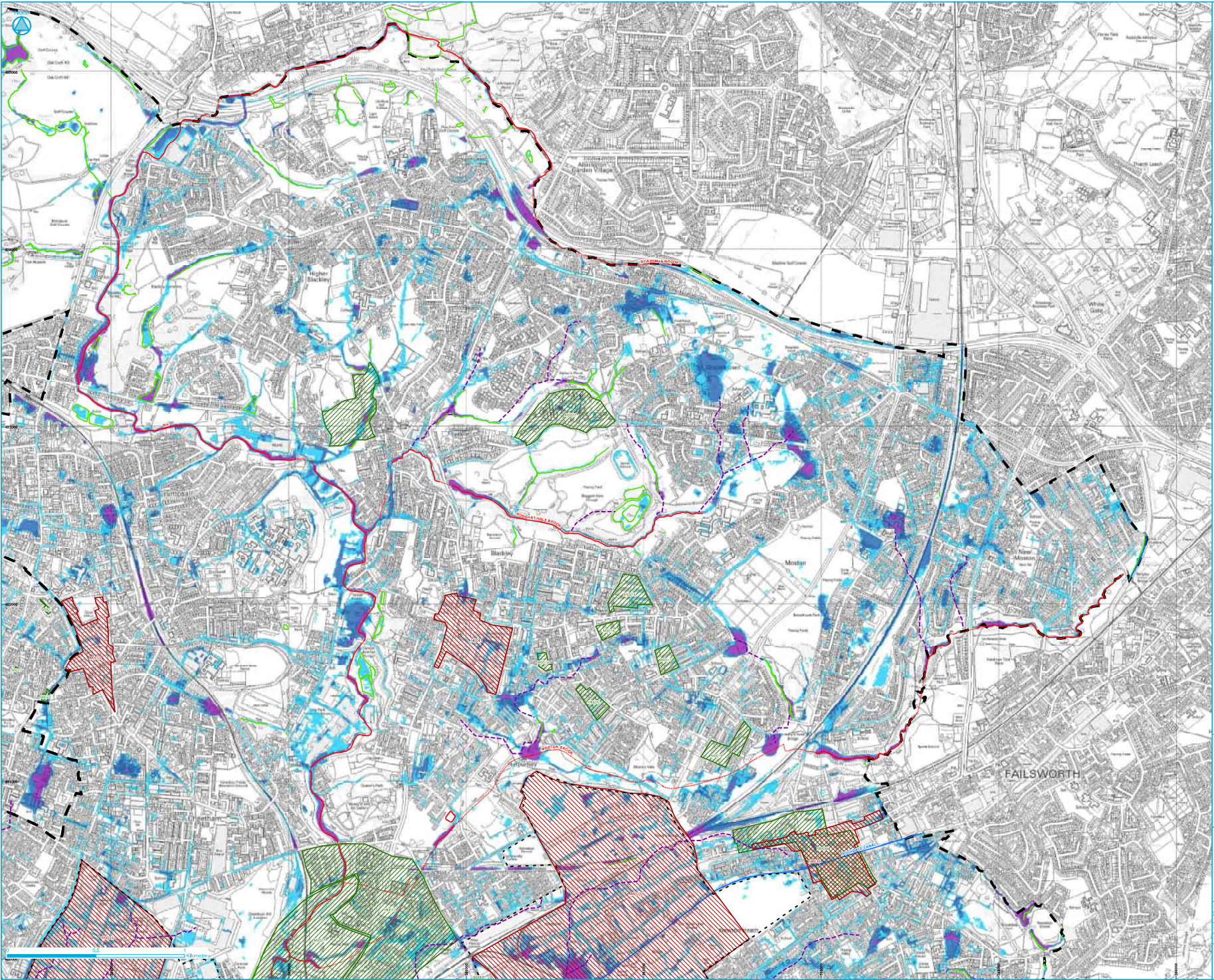
Created
31 Jul 2024 9:13

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



APPENDIX C

Manchester Strategic Flood Risk Assessment Future Flood Risk Map



- Council Boundary
- Lost Watercourses
- Ashton, Bridgewater and Rochdale Canals
- Manchester Ship Canal / Grey Irwell
- Other Waterbodies
- High Susceptibility
- Intermediate Susceptibility
- Low Susceptibility
- Employment
- Housing
- Mixed Use
- Other
- Regional Centre Boundary
- Culverted
- Open
- Main Rivers (V8.0)
- Culverted
- Open

This map has been produced in accordance with PP255, Development and Flood Risk.

The map refines the Environment Agency's map of Areas Susceptible to Surface Water Flooding based on more detailed modelling outputs produced for this SFRA. This map can be used to assess the sensitivity of surface water flooding to climate change and urban development.

The Main River information shown in the SFRA is provided by the Environment Agency; the cartographic data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overlapping/braiding and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

This map should be used to apply the Exception Test and to scope what the Flood Risk Assessment should consider in its placement of surface development and the management of runoff.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Susceptibility to Surface Water Flooding - Future Scenario

Drawn by: J Creedham	Date: 31/01/2011	This map is based upon Ordnance Survey data with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office. Crown copyright. See Ordnance Survey website for more information and details. Ordnance Survey is not responsible for any errors or omissions in this map.
Checked by: J Dimelow	Date: 01/02/2011	
Approved by: J Cooper	Date: 01/02/2011	
File Name: ...Arc\new\Mapproj\Level2\MS1_Surface\WaterFloodRisk_Current_V1.1.mxd		
Drawing Number: SS_4.2 C	Status: FINAL	Scale: 1:10,000

APPENDIX D

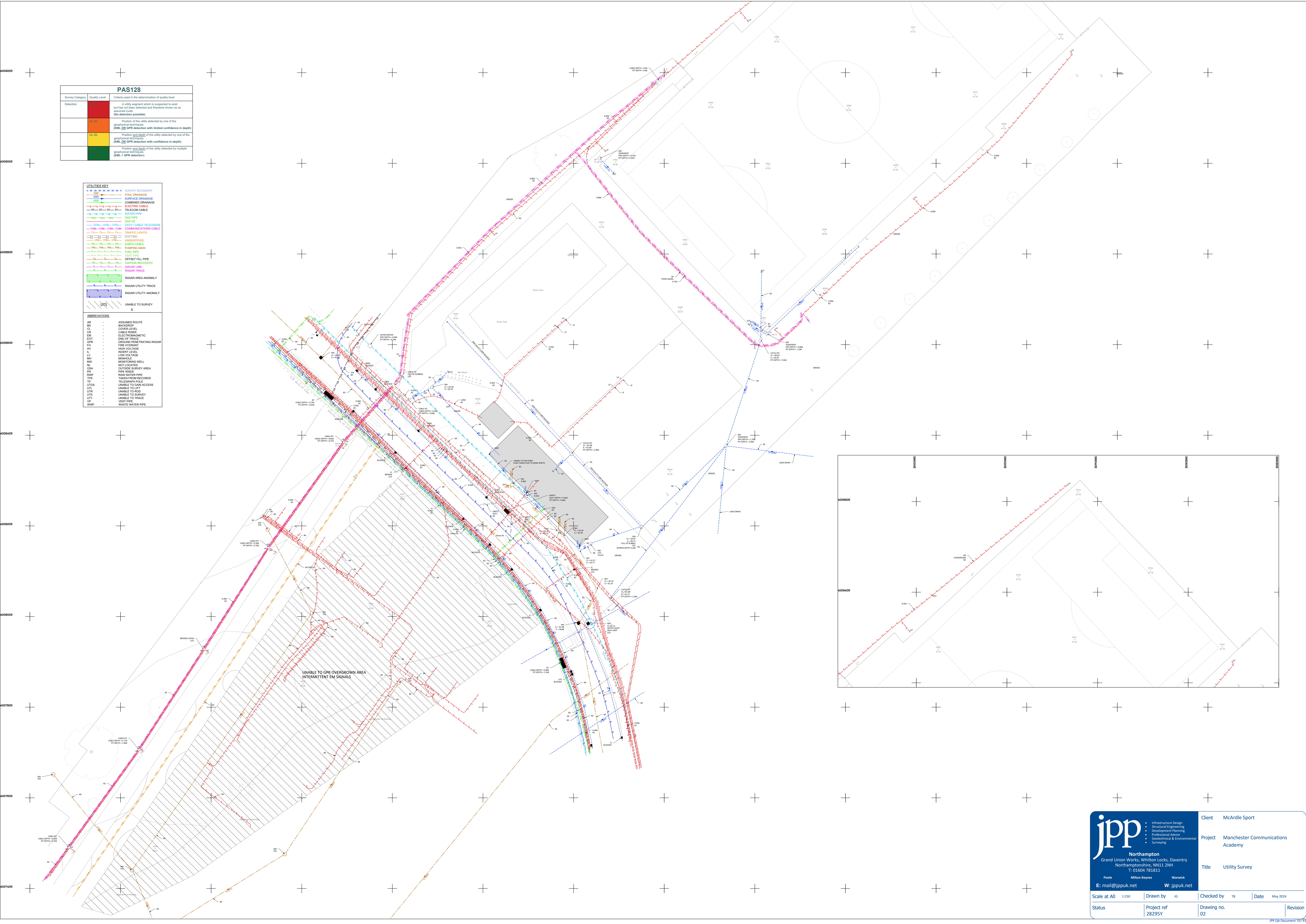
Topographic & Utility Survey

PAS128		
Survey Category	Quality Level	Criteria used in the determination of quality level
Detection		Utility segment which is suspected to exist but has not been detected and therefore shown as an assumed route. (No detection possible)
	QL-B3	Position of the utility detected by one of the geophysical techniques. (EM+ GPR detection with limited confidence in depth)
	QL-B2	Position and <u>depth</u> of the utility detected by one of the geophysical techniques. (EM+ GPR detection with confidence in depth)
		Position and <u>depth</u> of the utility detected by multiple geophysical techniques. (EM+ + GPR detection)

UTILITY KEY

SURVEY BOUNDARY
 FOUL DRAINAGE
 SURVEY DRAINAGE
 COMBINED DRAINAGE
 ELECTRIC CABLE
 ELECTRIC CABLE
 WATER PIPE
 GAS PIPE
 GAS QZ
 CATV / CABLE TELEVISION
 COMB. COMB. COMB. COMB.
 TRAFFIC LIGHTS
 DUCTING
 UNIDENTIFIED
 PARTICLE CABLE
 PUMPING MARK
 FUEL PIPE
 VEST PIPE
 OFFSET FILL PIPE
 VAPOR RECOVERY
 GAUGE LINE
 RADAR TRACE
 RADAR AREA ANOMALY
 RADAR UTILITY TRACE
 RADAR UTILITY ANOMALY
 UTS
 UNABLE TO SURVEY

ABBREVIATIONS	
AR	ASSUMED ROUTE
BD	BACKDROP
CL	COVER LEVEL
CR	CABLE RISER
EM	ELECTROMAGNETIC
EOT	END OF TRACE
GPR	GROUND PENETRATING RADAR
PH	FIRE HYDRANT
HV	HIGH VOLTAGE
IL	INVERT LEVEL
LV	LOW VOLTAGE
MH	MANHOLE
MW	MONITORING WELL
NO	NOT COATED
OSA	OUTSIDE SURVEY AREA
PR	PIPE RISER
RWP	RAIN WATER PIPE
TER	TRANSFER FROM RECORDS
TF	TELEGRAPH POLE
UTGA	UNABLE TO GAIN ACCESS
UTL	UNABLE TO LEFT
UTR	UNABLE TO ROAD
UTS	UNABLE TO SURVEY
UTV	UNABLE TO TRACE
VP	VENT PIPE
WWP	WASTE WATER PIPE





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- Professional Advice
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Client **McArdle Sport**

Project **Manchester Communications Academy**

Title **Utility Survey**

Scale at A0	1:250	Drawn by	JG	Checked by	TB	Date	May 2024
Status	Project ref 28295V	Drawing no. 02					Revision

soiltechnics

environmental • geotechnical • building fabric

Desktop Study: Site Review

Refurbishment and Extension of Existing 3G FTP

Manchester Communication Academy

April 2023

Contents

Desk Study Information

Review and Recommendations

Statutory Undertaker Records



Desk Study Information

Site Setting

The current floodlit Football Turf Pitch (FTP) is located within the Manchester Communication Academy grounds, approximately 2km to the northeast of Manchester City Centre. Lathbury Road to the southwest of the site provides access, and the approximate postcode is M40 8NT.

The proposed development comprises the redevelopment and extension of the existing 95m x 52m FTP which currently occupies the majority of the wider site towards the northeast. The area where the existing FTP will be extended is currently occupied by well-kempt grass and a footpath (south-eastern side). Rough vegetation is also observed along the north-eastern and north-western parts of the existing pitch. Mature trees (up to approximately 12m in height) are also present in these areas. To the southwest of existing FTP, there is a single storey building, two small MUGAs and a BMX pump track. It is understood that the MUGAs and BMX pump track will be redeveloped into a car park as part of the development.

The wider site is bounded to the northwest by Carisbrook Street, Lathbury Road to the southwest, a grassed sports field to the southeast and rough vegetation to the northwest. Residential properties align the northwest of Carisbrook Street and southwest of Lathbury Road. It is understood as part of the proposed development access to the site will be constructed off Carisbrook Street to the northwest.

The closest water feature to the site is Moston Brook which has been culverted to the southeast of the site. Moston Brook is exposed at the surface approximately 75m to the southwest of the site. The brook eventually feeds into the River Irk recorded some 1.25km southwest of site.

Surface levels are variable across the wider site and the proposed FTP extension ranging from approximately 67m to 73m AOD. The highest elevation on the site is located in the northeast of the wider site with elevation reducing towards the southwest.

A site location plan is presented below, with the wider site boundary shown in red.



Figure 1-1: Aerial photography with approximate site boundary (red line)

Site History

An attempt to trace the history of the site has been carried out by reviewing readily available ordnance survey maps. Earliest records date back to the late 19th century and show the wider site to comprise an open area with a earthwork feature towards Moston Brook located along the south-eastern boundary of the site trending northeast-southwest (see Figure 1-2 below). By c.1888-1913, the site appears to have been reprofiled towards the north as indicated by newly formed sloping/terracing. In addition, the Monsall Dye Works (containing reservoir and filter beds) is recorded beyond the northeast/east of the site and Monsall Lane Farm recorded beyond the southeast of site. It is anticipated the Moston Brook was culverted near the site during this time.

By c.1892-1914 allotment gardens (containing small buildings) occupy the entire site footprint. Residential properties largely align the north-western and south-western site boundary. By c.1949-72 the Monsall Dye Works is no longer recorded. In addition, the land to the southeast of the site had also been largely reprofiled (see Figure 1-3 below).

Whilst it is unclear from mapping when the allotment gardens were removed from site, aerial imagery shows the site as a field containing mature trees, vegetation and a single footpath from c.2000. Construction of the current site (FPT, MUGA, BMX pump track and changing facility) is clear within the aerial imagery from as early as 2009. The site appears to have remained largely unchanged thereafter to present day expect for the addition of the footpath to the southeast of the existing FPT.



Figure 1-2: 1840s-1890s Historical map extract overlay showing approximate site boundary (red line)



Figure 1-3: 1949-1972 Historical map extract overlay showing approximate site boundary (red line)

Geology and Hydrogeology

Open-source British Geological Survey (BGS) mapping for the area shows superficial deposits consist of Devensian Till (predominantly clays) underneath the entire wider site footprint. The site is also recorded within a 'hidden valley' whereby superficial deposits are recorded between 20-30m in thickness across the southern half of the site and 30-40m thickness across the northern half of the site.

The underlying bedrock is recorded as the Chester Formation (sandstone) across the site. The Pennine Middle Coal Measures Formation (mudstone, siltstone, sandstone and commonly coal) aligns the southern boundary of the site.

Whilst several historic BGS borehole records are noted within the site boundary, there is no permission to view these publicly. The nearest publicly available borehole (immediately southwest of site) recorded a loose cinder fill to ~4.5m depth, with Devensian Till clay soils (with silt inclusion) recorded beyond the maximum borehole depth of ~9.1m bgl. A ground water strike was recorded at a depth of 7.9m bgl. A borehole beyond the northeast of the site similarly observed cinder brick fill to ~1.8m depth overlying Devensian Till (sandy clay) beyond the maximum borehole base depth of 9.1m bgl. No groundwater was observed.

Other surrounding boreholes show that there is a varying degree of Made Ground locally. Based on this and site history, it is anticipated there will be a varying depth of Made Ground on site which is underlain by a clay.



Figure 1-4: Superficial geology



Figure 1-5: Bedrock geology

A summary of the anticipated geology within the wider site can be seen below.

Strata	Bedrock or superficial	Approximate thickness (m)	Typical soil type	Likely permeability
Topsoil	-	0.3	Organic soil	-
Made Ground	Superficial	1-4.5	Variable	Variable
Devensian Till	Superficial	20-40m	Clay, silt and sand	Low
Chester Formation	Bedrock	Basal unit	Sandstone	Moderate

Table 1: Summary of geology and hydrogeology

Coal Mining

Coal Authority mapping data shows the site lies within a Coal Mining Reporting Area, but outside of a Development High Risk Area as shown in Figure 1-6. As such, it is likely that the potential for land instability to occur at the site due to coal mining legacy is very low. However, we would recommend a coal mining consultant's report is obtained to verify such assessments.

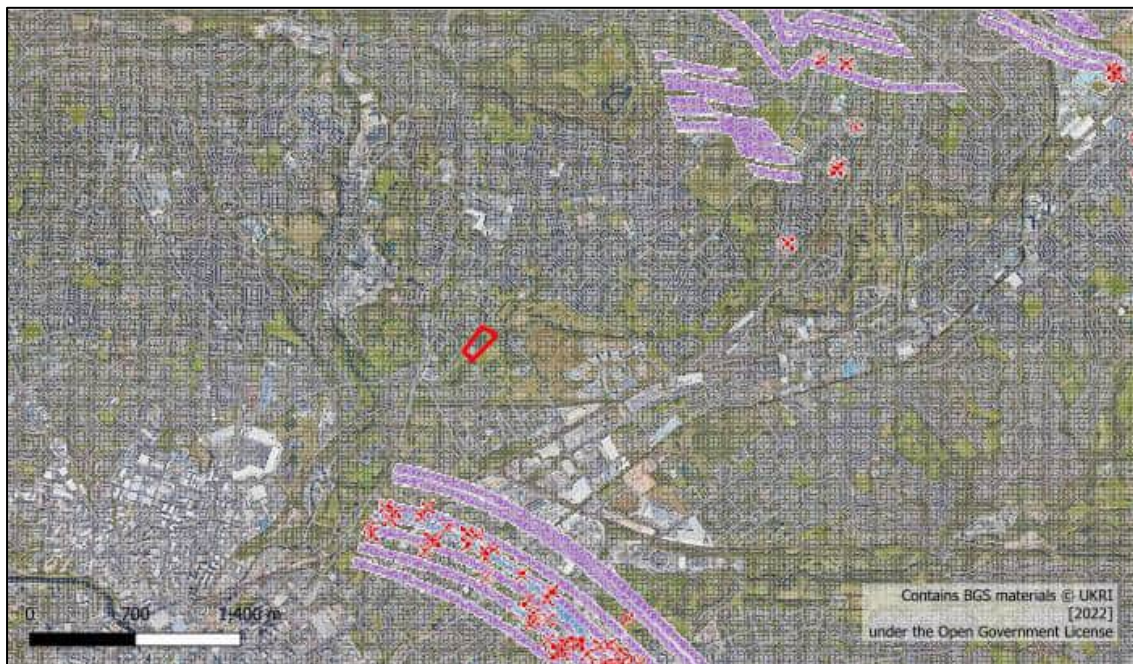


Figure 1-6: Coal mine entries (red 'X') and areas at high risk (purple).

Landfilling and ground gases

Open-source Environment Agency landfill mapping data indicates the site is within 250m of a recorded landfill as shown in Figure 1-7 below.



Figure 1-7: Record landfill near to site

Based on the above, the nature of the proposed development (open setting) and anticipated ground conditions on site, the risk from ground gases affecting the proposed FTP extension and car park development is considered low.

Flooding and Hydrology

The site is situated near to Moston Brook, which is likely culverted to the southeast of the site.

According to Environment Agency flood maps, the site does not lie in a flood risk area as shown in Figure 1-8 below. There is a small section of the wider site in the southeast which is at a medium risk of surface water flooding by river and the sea, however, the area of the proposed FTP and car parking is considered to be at low risk.

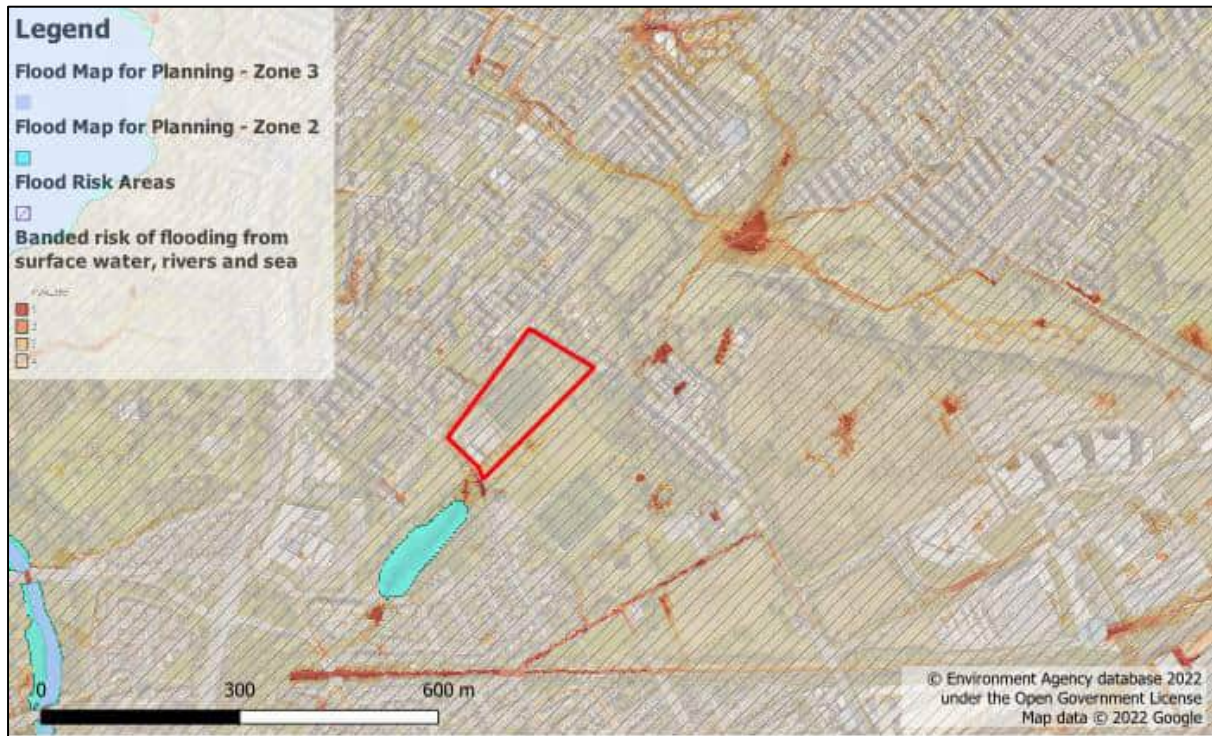


Figure 1-8: Flood risk mapping

Statutory Undertaker Records

We have contacted a number of Statutory Undertakers and obtained a Linesearch report to obtain copies of available records to avoid damaging buried apparatus during fieldwork activities. Copies of their records are appended; however, it should be noted that private runs are typically excluded from these records, we nevertheless expect electrical cabling to surround the existing FTP owing to the presence of the existing floodlighting on site.

A review of the information shows that there is BT cabling present on site. The cabling is likely to be outside the proposed pitch extension area, but within the boundary of the new access road proposed off Carisbrook Street.

Furthermore, electrical cabling, aligns the footpath along the north-western and south-western site boundaries along Carisbrook Street and Lathbury Road. In addition, a low pressure gas main also feeds the existing building on site from Lathbury Road to the south.

Notably, a 2.7m diameter surface water private sewer is also recorded by United Utilities running immediately offsite and parallel to the wider site's south-eastern boundary. It is likely this sewer represents the culverted Moston Brook.

Review and Recommendations

The following site specific factors have been considered to determine the most appropriate ground investigation on site:

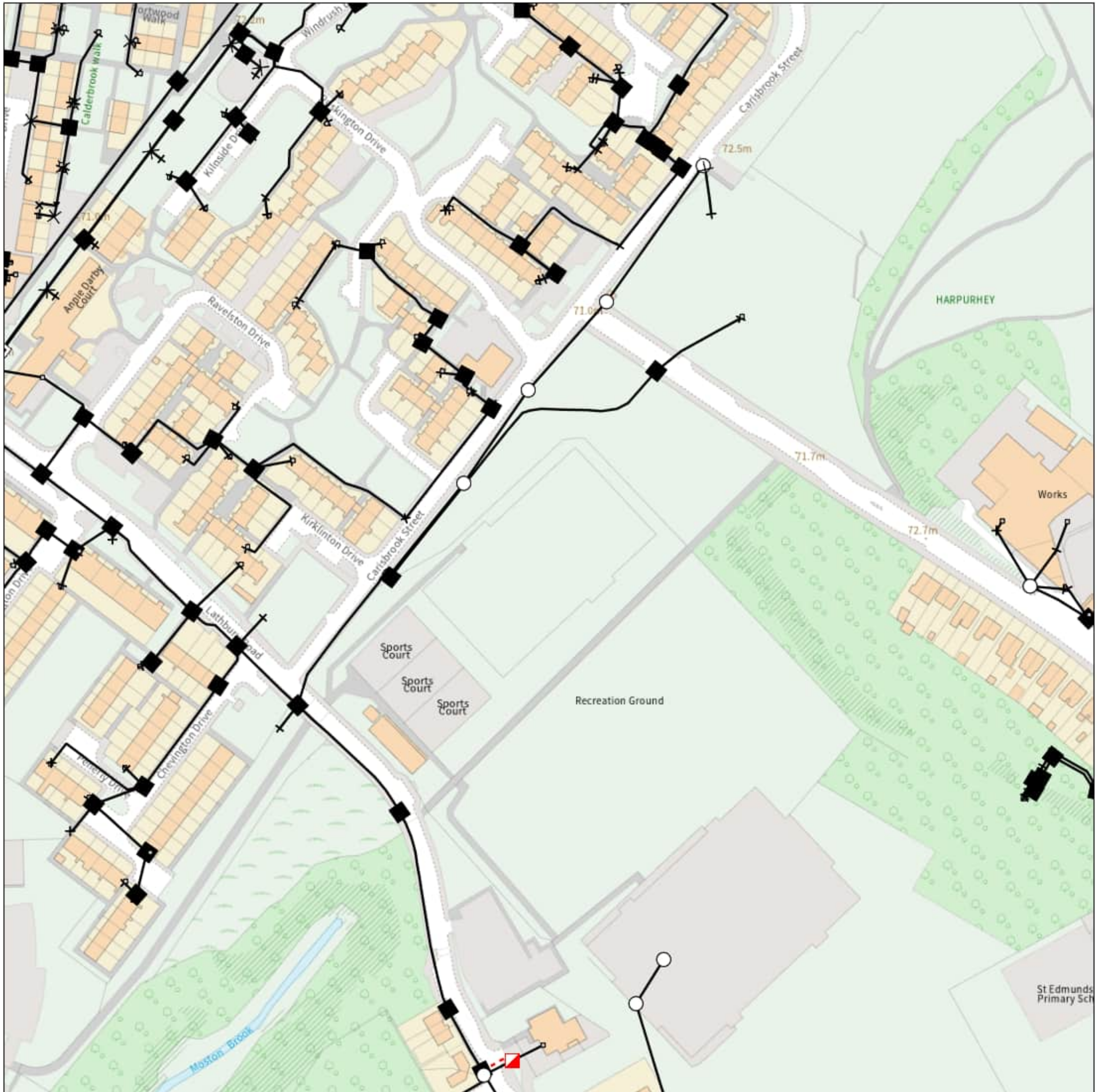
- Geological records indicate that superficial deposits of Devensian Till are present onsite, which are typically considered suitable for floodlight foundations, however Made Ground is recorded locally to the site. Owing to the historic reprofiling of the site, the Made Ground could be recorded to varying depths (likely up to 4.5m in thickness based on records) across the wider site footprint. Depending on the thickness of Made Ground, the near surface soils may not be sufficiently competent to support traditional foundations/pitch formation.
- The underlying Devensian Till is considered to have a low permeability and as such unsuitable for sustainable drainage design. The underlying Chester Formation would also be considered too deep beneath the site (30-40m) to facilitate soakaway design. This would need to be confirmed through onsite investigations.
- The site is within a Coal Mining Reporting Area, but falls outside of a Development High Risk Area, as such we recommend a Coal Authority Consultants report is obtained to further refine to onsite risk.
- It is anticipated spoil retention is unlikely. Any surplus material generated will require suitable classification for offsite disposal.
- With the presence of the existing building within the south of the site, an electrical capacity survey is recommended in order to ascertain if there is enough capacity on site to support the demands of the proposed floodlights.
- Overall, a bespoke approach is recommended to cover both the refurbishment requirements for the existing pitch, and to investigate the ground conditions outside the pitch area for extension and floodlight foundation design, and proposed car park/access road.
- A standard 101 x 63m pitch refurbishment investigation is recommended (appropriate size to proposed development), confirming existing subbase/subgrade make-up below the existing pitch to determine the potential for reuse (15 No. pits), CBR (10 No. DCP tests) and percolation testing of subbase and subgrade.
- Due to the potential for deep Made Ground to be present, the refurbishment investigation is to be supplemented by the standard borehole ground investigation scope of works, which includes a day of dynamic sampling along with laboratory analysis and additional CBR and percolation testing of shallow soils. This scope of works will aim to determine the presence, composition and depth of Made Ground and any natural soils to assist in the design of the floodlighting and the new pitch extension.
- Due to the proposed borehole investigation and UXO risk identified, a preliminary risk review report will be required for the site.
- Furthermore, the borehole investigation will include shallow boreholes (1m depth) and CBR testing within the area of the proposed car park/access road.

Costs to complete the above are as follows;

Item	Service	Fee (£) excl. VAT	Timescale (weeks)	Comments
1.0	Desktop Study Site Review	£415	Complete	
2.2	Borehole investigation inc drainage survey for pitch extension and car parking area	£2,790	8 weeks	Assumed welfare in existing building can be used.
2.3.2	Refurbishment pitch investigation (101m x 63m)	£5,785		15 No. hand pits, 10 No. CBR testing with percolation testing
2.4	Topographical survey	£1250		Covering entire redline boundary
2.5	Electrical capacity survey	£575		
2.6	Topsoil Laboratory testing	£210		Testing Topsoil for chemical suitability
3.1	Coal mining report and review	£205		Consultants report obtained
3.41	UXO preliminary risk review	£90		Online mapping indicates medium risk
3.5	Waste classification and WAC analysis – single stream	£550		Classification of Made Ground for waste disposal if present.
TOTAL		£11,870		

Statutory Undertaker Records

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.



openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

	Planned	Live	Change Of State	+	Hatchings	
PCP			Split Coupling	×	Built	
Pole			Duct Tee	▲	Planned	
Box			Building		Inferred	
Manhole			Kiosk		Duct	
Cabinet			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.			
	Pending Add	In Place	Pending Remove	Not In Use		
Power Cable						
Power Duct				N/A		

BT Ref : MUR04271K

Map Reference : (centre) SD8602300919

Easting/Northing : (centre) 386023,400919

Issued : 22/03/2023 16:28:07

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Controller of Her Majesty's Stationary Office
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WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Soiltechnics

**Soiltechnics
Cedar Barn,
Walgrave,
NN6 9PY**

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: STV5997
Our Ref: UUPS-ORD-474070
Date: 23/03/2023**

Dear Sirs

**Location: Manchester Communications Academy Manchester Communications Academy
Silchester Drive, Harpurhey, M40 8NT**

I acknowledge with thanks your request dated 22/03/2023 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

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

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

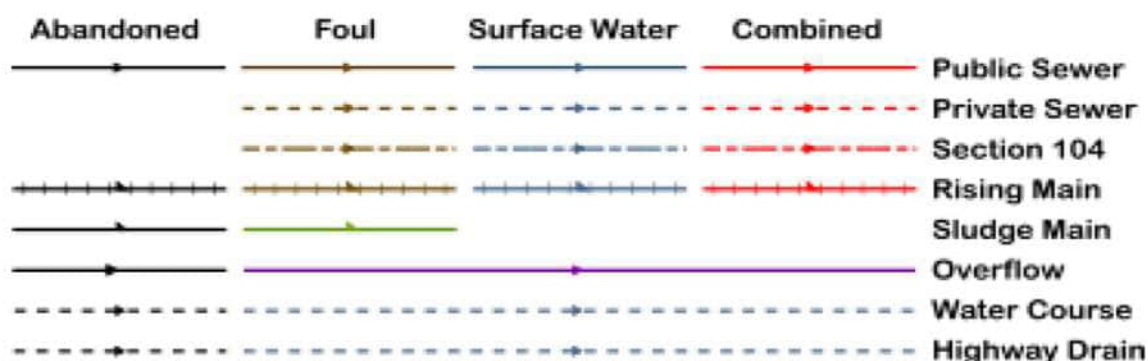
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

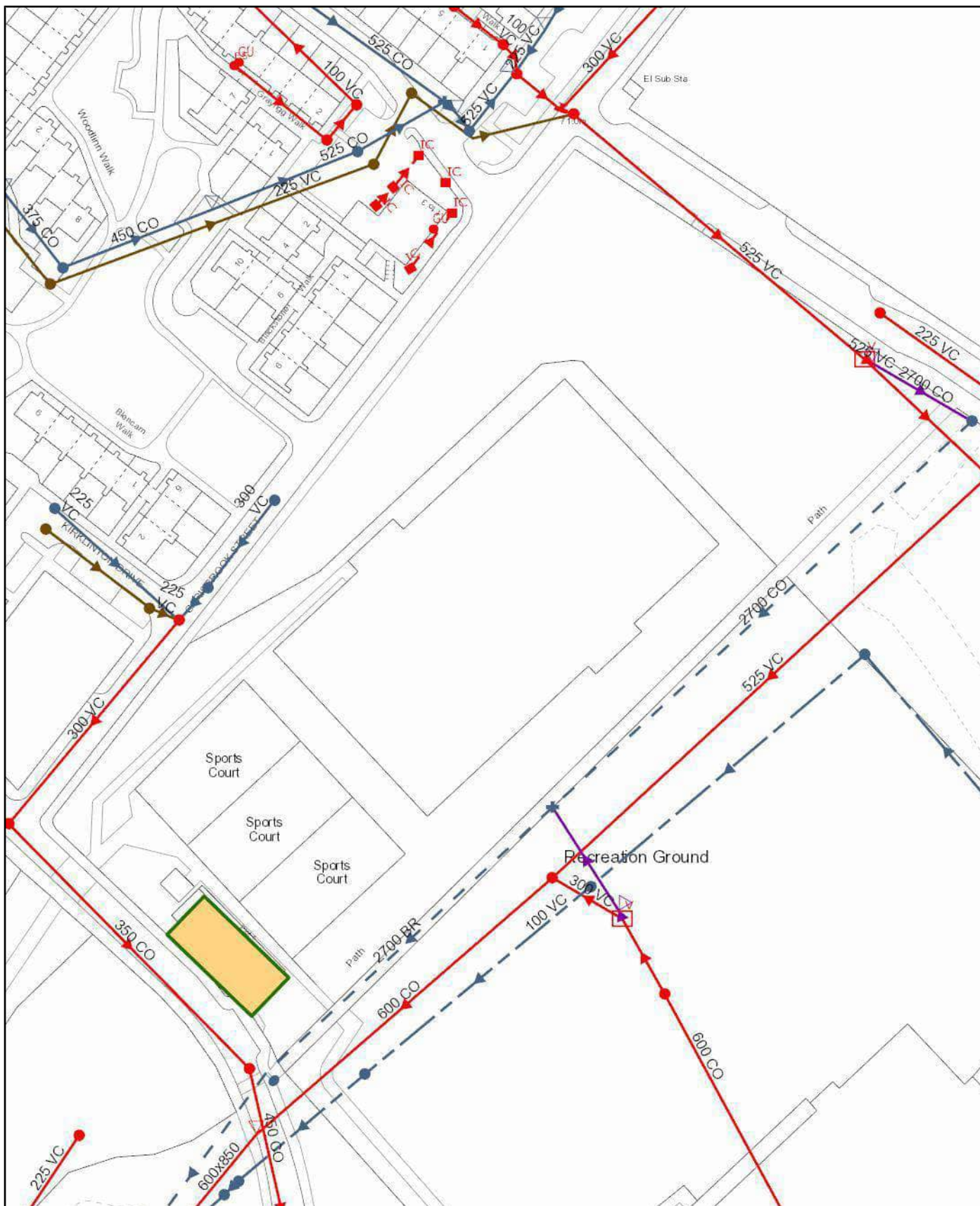
- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	



Scale: 1:1282
Date: 23/03/2023

SEWER RECORDS



Address or Site Reference: Manchester Communications Academy Manchester
Communications Academy Silchester Drive,
Harpurhey, M40 8NT
Printed by: Property Searches

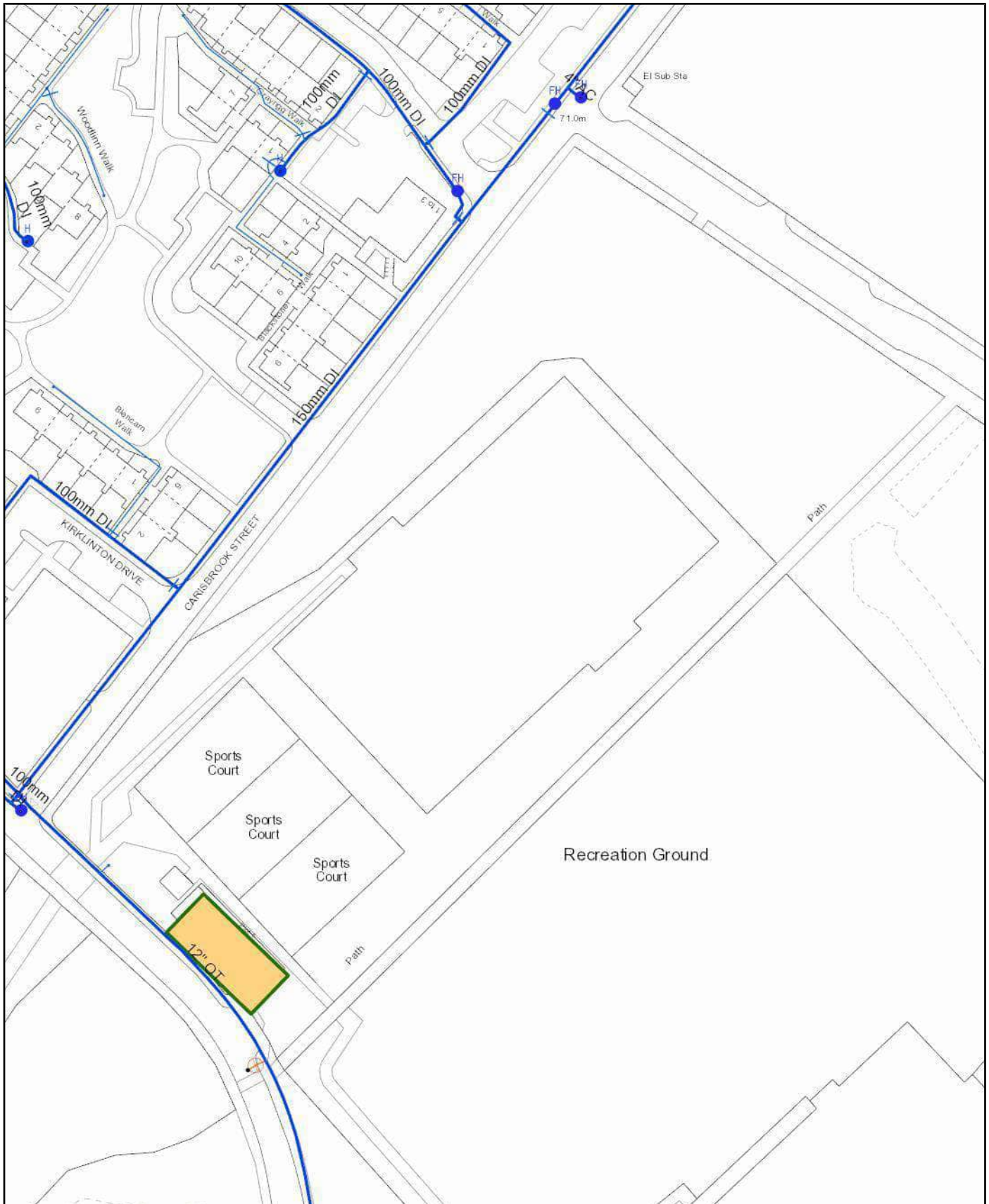
The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Clean Water Symbolology

Proposed	Abandoned	Live	
			Distribution Main
			Trunk Main
			Comms Pipe
			Private Pipe
			Concessionary Service
			Raw Water
			LDTM Raw Water
			LDTM Treated Water
			Air Valve
			AC Valve, open
			AC Valve, closed
			CC Valve, open
			CC Valve, closed
			Non Return Valve
			Pressure Management Valve
			OMS Valve
			Stop Tap
			Flow Meter
			Domestic Meter
			Commercial Meter
			Pump
			Hydrant
			Fire Hydrant
			Anode
			Chlorination Point
			De-chlorination Point
			Strainer Point
			Access Point
			Hatch Box
			IP Point
			Sampling Station
			Logger Box
			Bore Hole
			Inlet Point
			Bulk Supply Point
			End Cap
			Site Termination
			Change of Characteristic
			Condition Report
			<u>Property Types</u>
			Water Tower
			Valve House
			Booster Pumping Station
			Intake Pumping Station
			Water Treatment Works
			Supply Reservoir
			Service Reservoir
			Impounding Reservoir
			Pipe Bridge

Symbology for proposed assets is the same as above, but shown in **green**
 Symbology for abandoned assets is the same as above, but shown in **black**



Scale: 1:1282
Date: 23/03/2023

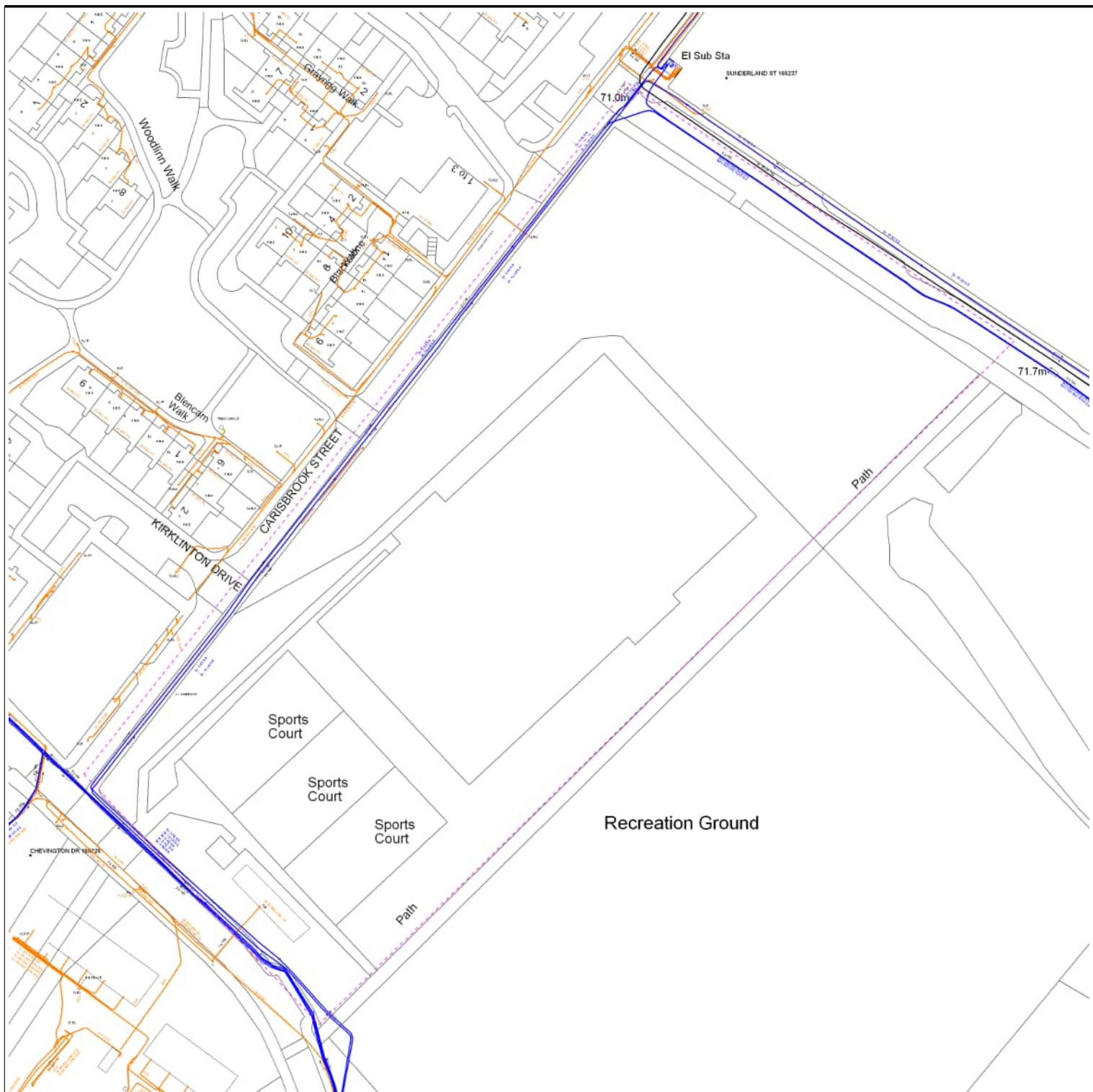
WATER MAINS RECORDS

Address or Site Reference: Manchester Communications Academy Manchester
Communications Academy Silchester Drive,
Harpurhey, M40 8NT
Printed by: Property Searches



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Requested by: Lauren Wenham
 Company: Soiltechnics Ltd
 Date Requested: 22/03/2023
 Job Reference: 28933129
 Your Scheme/Reference: STV5997

Dig Sites:
 Area  Line 

Operating Voltage	Colour Code	Line Colour
132kV	Black	
33kV	Green	
22kV-25kV	Yellow	
11kV	Red	
6kV-6.6kV	Blue	
1kV-6kV	Violet	
LV	Orange	
Unknown Voltage	Brown	



Data Management
 Electricity North West
 Linley House
 Dickinson Street
 Manchester, M1 4LF
 Phone: 0800 195 4141
 Email: planrequest@enwl.co.uk

Scales on A4 paper:
 1:1250 Area dig site
 1:250 Line dig site

Unless otherwise indicated the depth of Electricity North West Limited cables are in accordance with NUUG (450mm for Low Voltage & 600mm for 11kV cables) 33kV and 132kV cables are laid at depths as marked. The depth and positions of Electricity North West Limited equipment was accurate as shown when the equipment was installed. However third parties may have altered the level & other reference data. Therefore Electricity North West Limited accept no responsibility for the position of Electricity North West Limited equipment being different from shown. No person, body or company, shall be relieved from liability for damage caused to Electricity North West Limited equipment by reason of being located differently to the indications on this drawing or from any regulatory loss of income or incentive, or expense, which may be suffered by Electricity North West Limited and which is caused or contributed to by any loss of supply as a result of any damage caused to Electricity North West Limited's equipment. Service cables are not necessarily shown but must be assumed to exist to all premises, streetlights and signs. There may be other Electricity North West Limited apparatus in the vicinity which is not indicated on the cable records. Other apparatus may also be present which is owned by a third party other than Electricity North West Limited.

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Reference should be made to HSE Guidance, HS(G)47 "Avoiding Danger from Underground Services" and GS6 "Avoidance of Danger from Overhead Power Lines".

Electricity North West Limited 304 Bridgewater Place, Birchwood Park, Warrington WA3 6XG. Registered in England and Wales. Registered No 02366949

Conditions and information regarding electricity mains

These general conditions and precautions apply to the electricity distribution system of Electricity North West Limited.

Please ensure that a copy of these conditions is passed to your representative and contractor on site.

1. There may be other Electricity North West Limited apparatus in the vicinity, which is not indicated on the cable records. Other apparatus may also be present which a third party owns other than Electricity North West Limited
2. Before any machines are used all of Electricity North West's underground apparatus should be located by manual excavation taking the appropriate safety precautions in accordance with the **Health and Safety Executive Guidance note HS(G)47 "Avoiding danger from underground services"**. This contains advice to site personnel when working near underground services.

Underground services, particularly electricity and gas, can be dangerous. Damage to electricity cables can cause a dangerous flash, leading to severe burns or even death. Gas leaks can cause fire or explosion.

Damage can result from excavation or penetration of the ground, e.g. by a road pin.

Underground services may be found in roads, footpaths and on sites. Always assume that they are present. Treat any services found anywhere as live.

Accidents have happened because people have mistaken one service for another, e.g. black plastic covered electricity cables look like black plastic water pipes and cast iron gas and water mains look alike. Check before you act.

3. Before starting work you must:
 - Make sure you have plans of the underground services in the area. This may not always be possible for emergency or unforeseen works. **Remember that service connection cables and pipes from the main to building or streetlight may not be shown.**
 - Use a cable and pipe locator to trace electricity cables and metal pipes.
 - Look for signs of service connection cables or pipes, e.g. a gas meter or service connection entry into a house or a streetlight.
 - Hand dig trial holes (as many as necessary) to confirm the position of services in close proximity to the area of work.

4. When you start work:

- Hand dig near buried services whenever possible. Spades and shovels are safer than picks, pins or forks.
- Remember that cables may be embedded in concrete. Electricity cables embedded in concrete **must** either be made dead before the concrete is broken out or another safe way of working agreed with the cable owner.
- Watch out for signs of services as work continues.
- Report damage to a cable, pipe or pipe coating however slight.
- Do not use hand held power tools within 0.5m of the marked position of an electricity cable, unless this is impracticable and the line of the cable has been identified by plans and positively confirmed by a locator.
- Do not use hand held power tools directly over the marked line of cable unless:
 - a) You have already found the cable at that position by careful hand digging beneath the surface and it is at a safe depth (at least 300mm) below the bottom of the surface to be broken, or
 - b) Physical means have been used to prevent the tool striking it.
- If an excavator is used near an electricity cable keep everyone clear of the bucket while it is digging. Buckets should not be used near cable – hand dig.
- Do not use exposed services as a convenient step or handhold.
- Do not handle or attempt to alter the position of an exposed service.
- Do not install plant close to an existing service.
- Do not build existing services into a manhole or other structure or encase them in concrete.

Would you also ensure that all site operators have this information and if any electrical apparatus is damaged, they/you should contact Electricity North West Limited fault desk on **0800 195 4141 (option 1)**

5. Overhead lines are not necessarily shown on the Electricity North West Limited cable records but may be present. In the event of work being carried out adjacent to overhead lines (including access, storage etc.) please always ensure strict adherence to the requirements of the **Health and Safety Executive's Document GS6 "Avoidance of Danger from Overhead Electric Lines"**.

Extreme personal danger can result from contact, or near contact, with live conductors or overhead lines.

Treat all overhead lines and other electrical apparatus as live. If in doubt, get advice.

6. Electricity North West Limited must be consulted if work is to take place within 15 metres of overhead lines on steel towers or 9 metres of overhead lines on wood, concrete or steel pylons. (All distances should be measure at ground level from a position estimated by eye to be vertically under the outermost conductor at a tower or pole position) Any person involved in work in the vicinity of overhead lines should:
- Understand and follow the instructions given on safe working areas and methods of work.
 - Make sure that warning notices are in the cabs of machines working in the vicinity of an overhead line.
 - Make sure that barriers and warning notices are erected as required.
 - Not tip soil or stack material underneath overhead lines as this may reduce the clearance to an unsafe distance.
 - Make sure when handling or using platforms, scaffold, poles, piping, ladders, hand tools etc., that they are kept at a safe distance from overhead lines.
 - Not steady a suspended load, skip, hoist wire, slings etc., unless satisfied that there isn't any danger from overhead lines.
 - Remember that when mobile plant, such as a crane or excavator, is operating near overhead lines, the raising or slewing of the jib may introduce danger.
 - Always keep overhead lines in view when manoeuvring mobile plant.
 - Never operate a machine unless carefully guided by an experienced banksman.
 - Not approach or touch any broken or fallen conductors or any plant in contact with an overhead line before Electricity North West Limited confirms that conditions are safe. Warn others to keep well clear.

Machine operators should note that: if a machine comes into contact with an overhead line and cannot be disentangled by backing off, remain seated in the cab and warn others to keep clear of the machine until Electricity North West Limited confirms that conditions are safe. If it is essential to

leave the machine while it is in contact with the overhead line, for example if it catches fire, jump well clear – and **do not** attempt to climb down in the normal way nor touch any part of the machine when on the ground.

7. Electricity North West Limited provides approximate locations of its electricity mains or apparatus according to its records but these records are not necessarily accurate or complete and do not always show the position of private cables from mains to properties. No person or company shall be relieved from liability for any damage caused by reason of the actual positions and/or depths being different from those indicated.

8. Care should be taken when excavating near cables. Known road crossings are highlighted on the enclosed plans. Should any cable, or Electricity North West Limited apparatus indicated on the attached plans, be affected by your proposals please contact us as follows:

Data Management
Linley House
Dickinson St
Manchester
M1 4LF

Telephone: **0800 195 4141 (option 2)**

Details of diversion costs, if any, will be provided on request once your firm proposals have been submitted.

9. Please note that service cables may be affected by some of the works being carried out on site.

If any services do require temporary disconnection please phone **0800 195 4141 (option 2)** for domestic and commercial disconnection, so that arrangement can be made to disconnect before work commences on site.

10. For information regarding supplies please contact us on **0800 195 4141 (option 2)**.

11. Please note that cable records supplied may not be up to date, or may be incomplete, if the area concerned is a new site.

12. For information regarding wayleave or easement agreements contact:

Manchester	08433 115157
Preston	08433 113969
Kendal	08433 115155

13. The latest cable records are always available for inspection during normal working hours and you should satisfy yourself that the information you have is up to date at the time you commence work. This service is consistent with the requirement of Regulation 36 of the Electricity Supply Regulations and paragraph 79 of the New Road and Street Works Act.

Please contact Data Management on **0800 195 4141 (option 2)** to arrange an appointment to view the records.

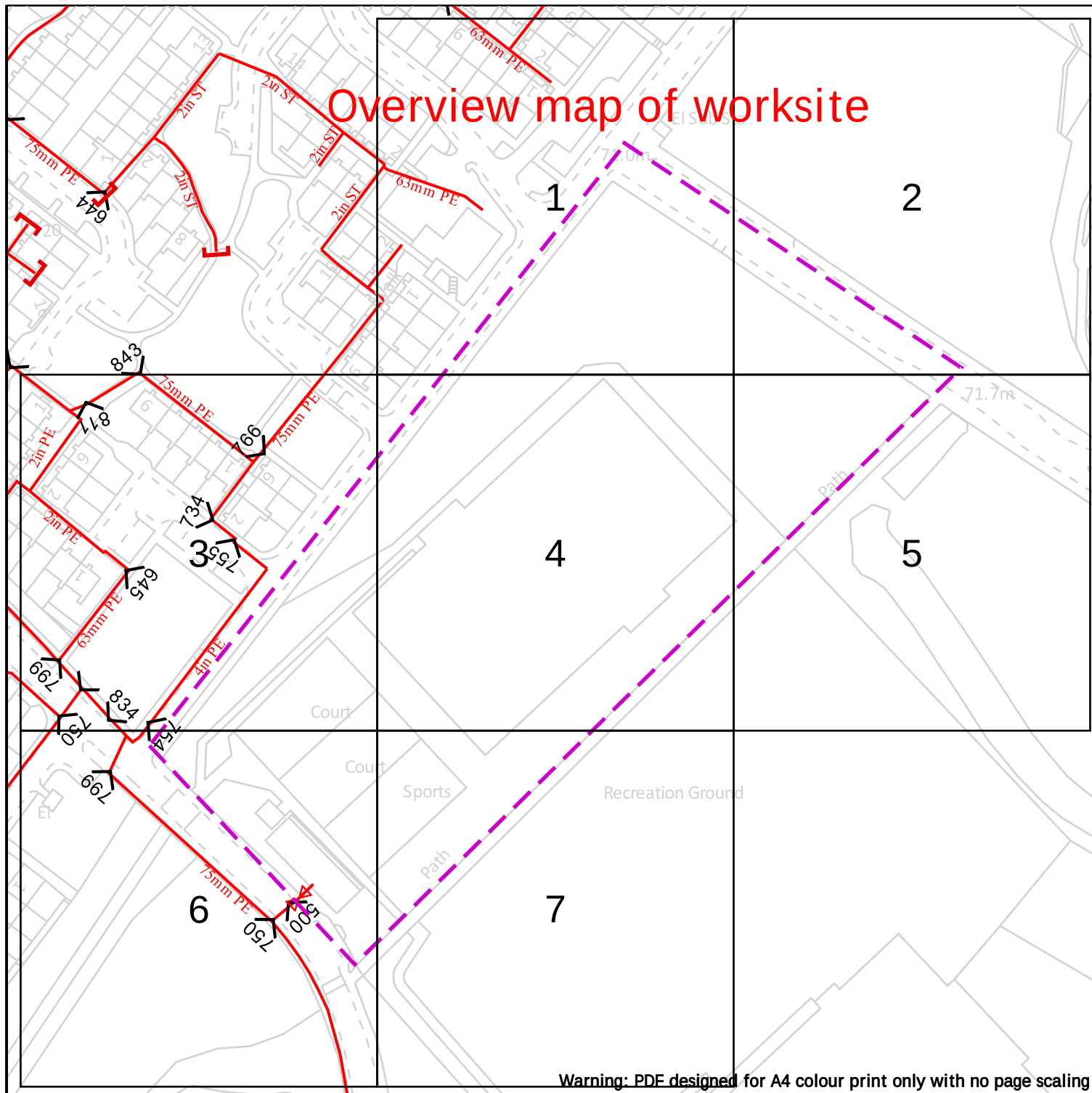


304 Bridgewater Place
Birchwood Park
Warrington
WA3 6XG

www.enwl.co.uk

Registered in England and Wales
Registered Number 2366949

Overview map of worksite



Warning: PDF designed for A4 colour print only with no page scaling



Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

IMPORTANT NOTICES

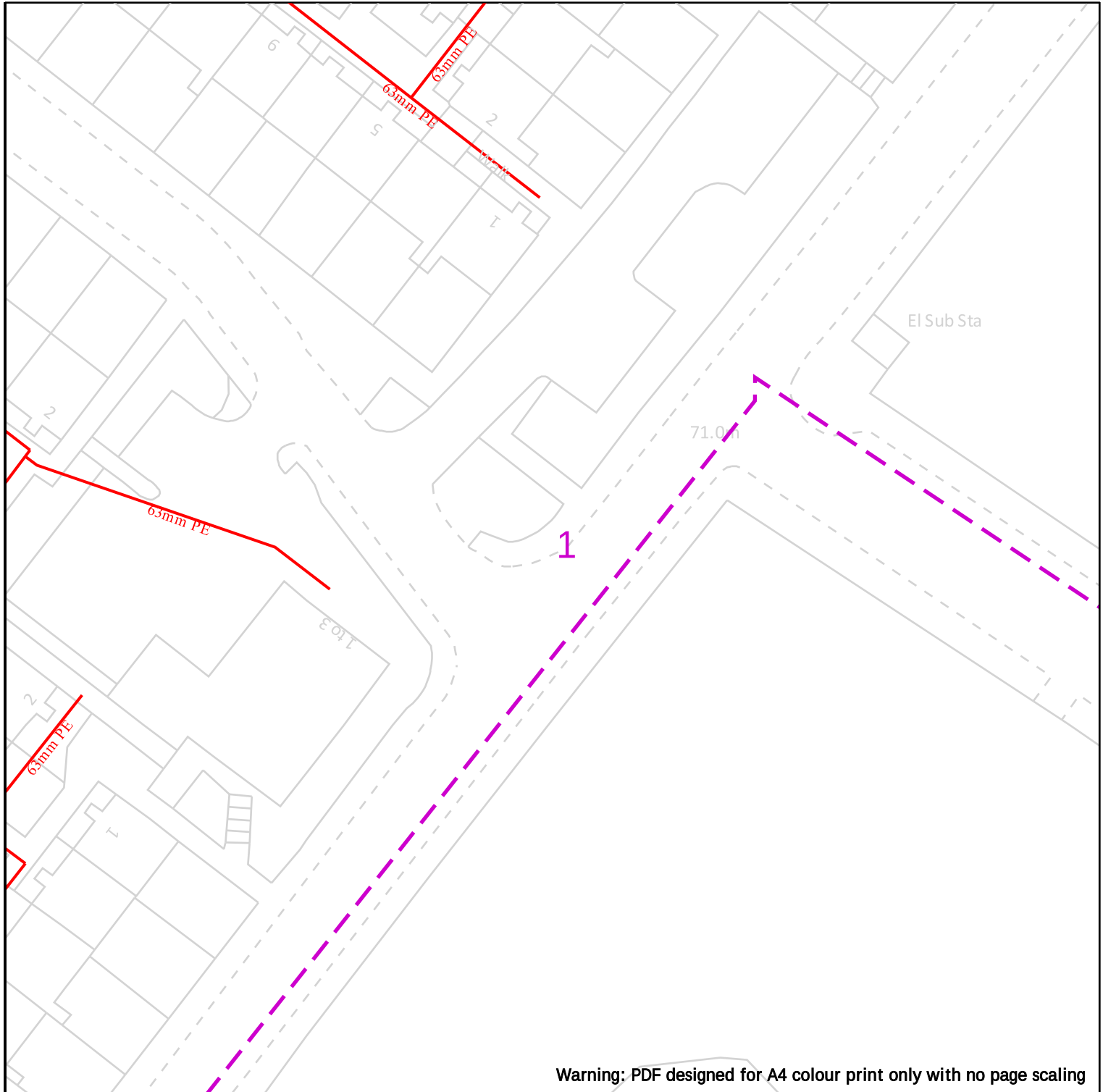
This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

View extent: 100m, 100m

Scale: 1:1538 (When plotted at A4)

In case of emergency call - 0800 111 999

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25m

Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Cadent
Your Gas Network

Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

View extent: 100m, 100m

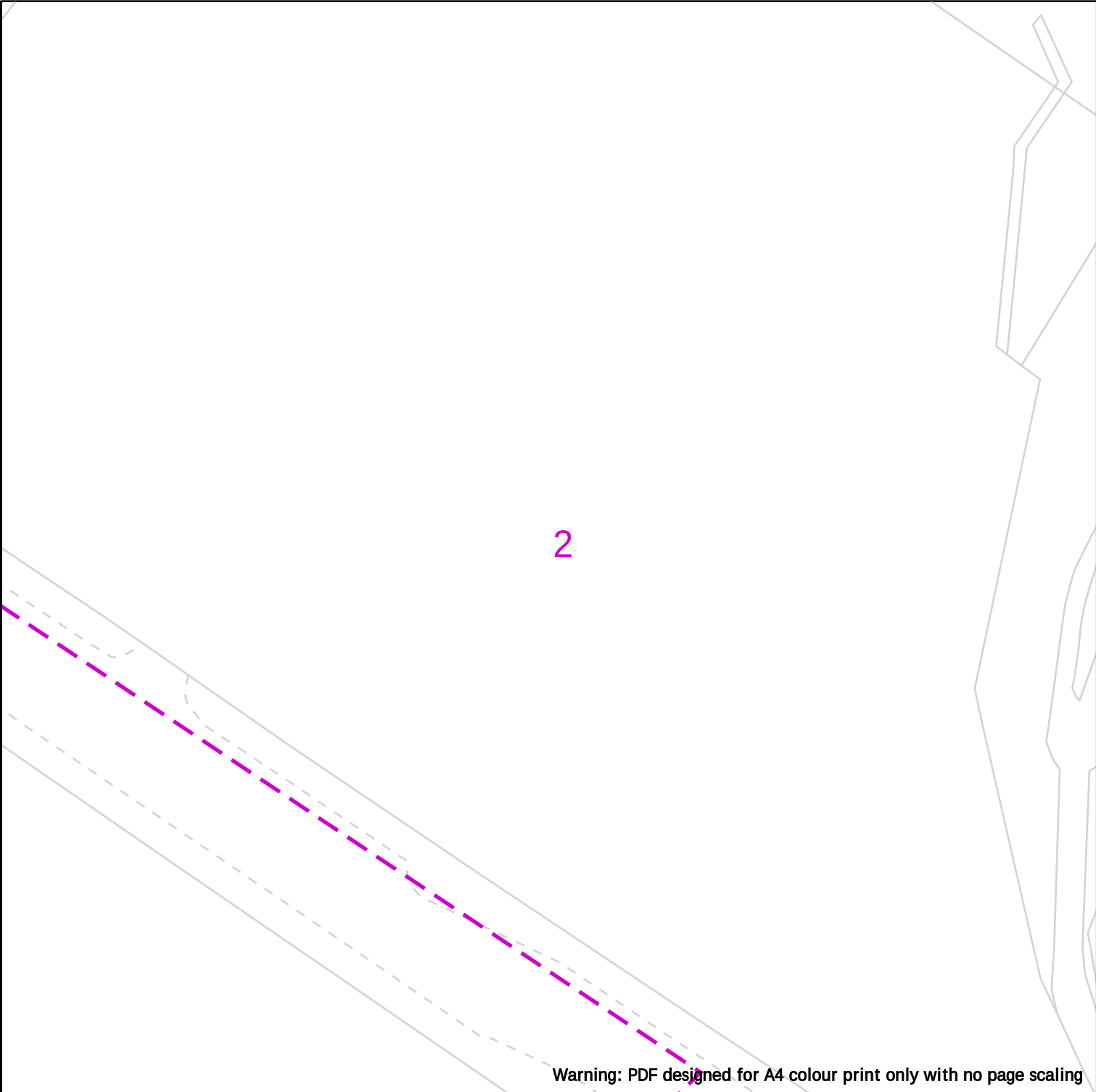
Scale: 1:500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999

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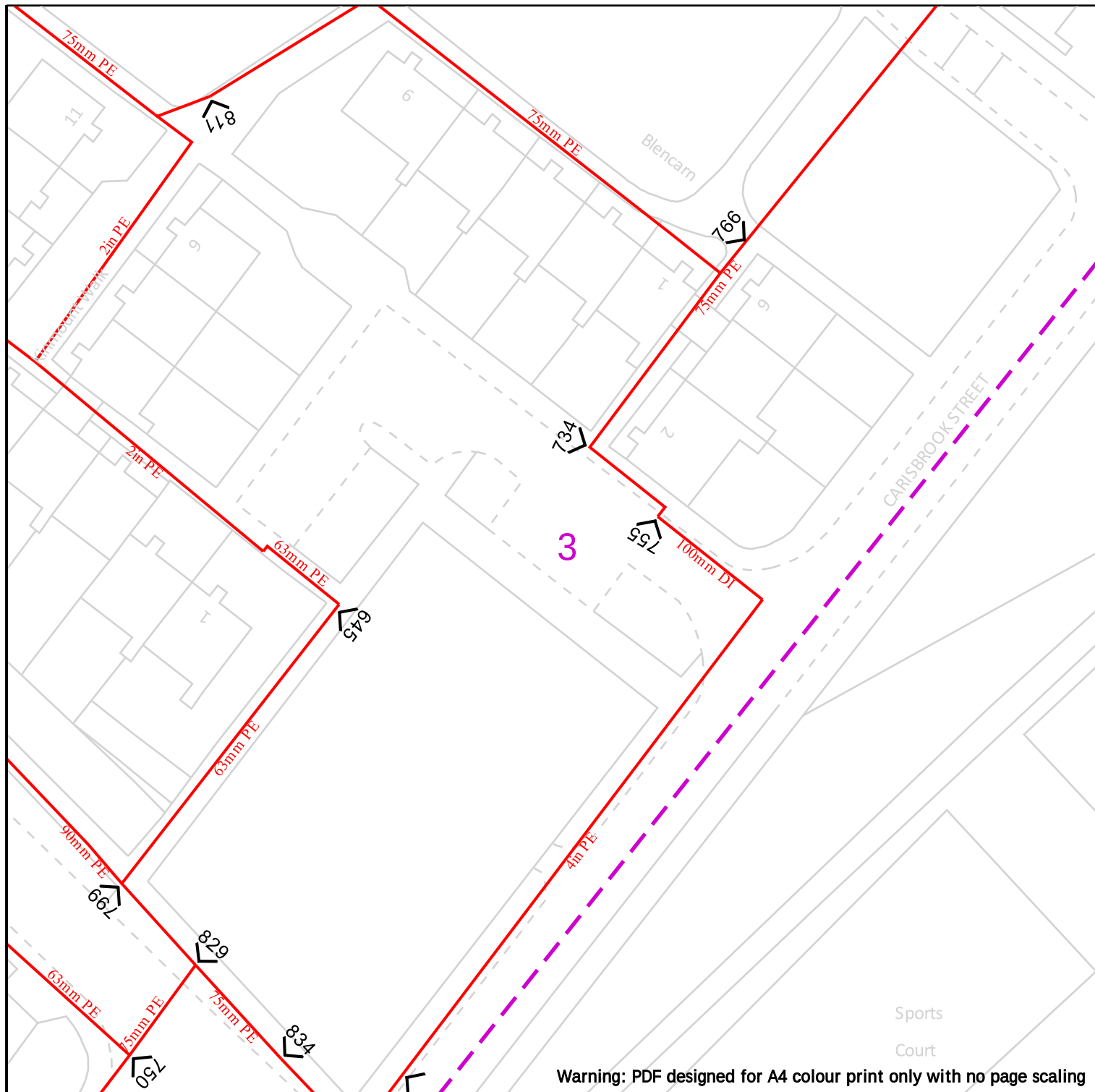


	Dig Sites Area: Line: LP Mains MP Mains IP Mains LHP Mains	
--	---	---

Valve

Depth of cover

Syphon



Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Cadent
Your Gas Network

Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

View extent: 100m, 100m

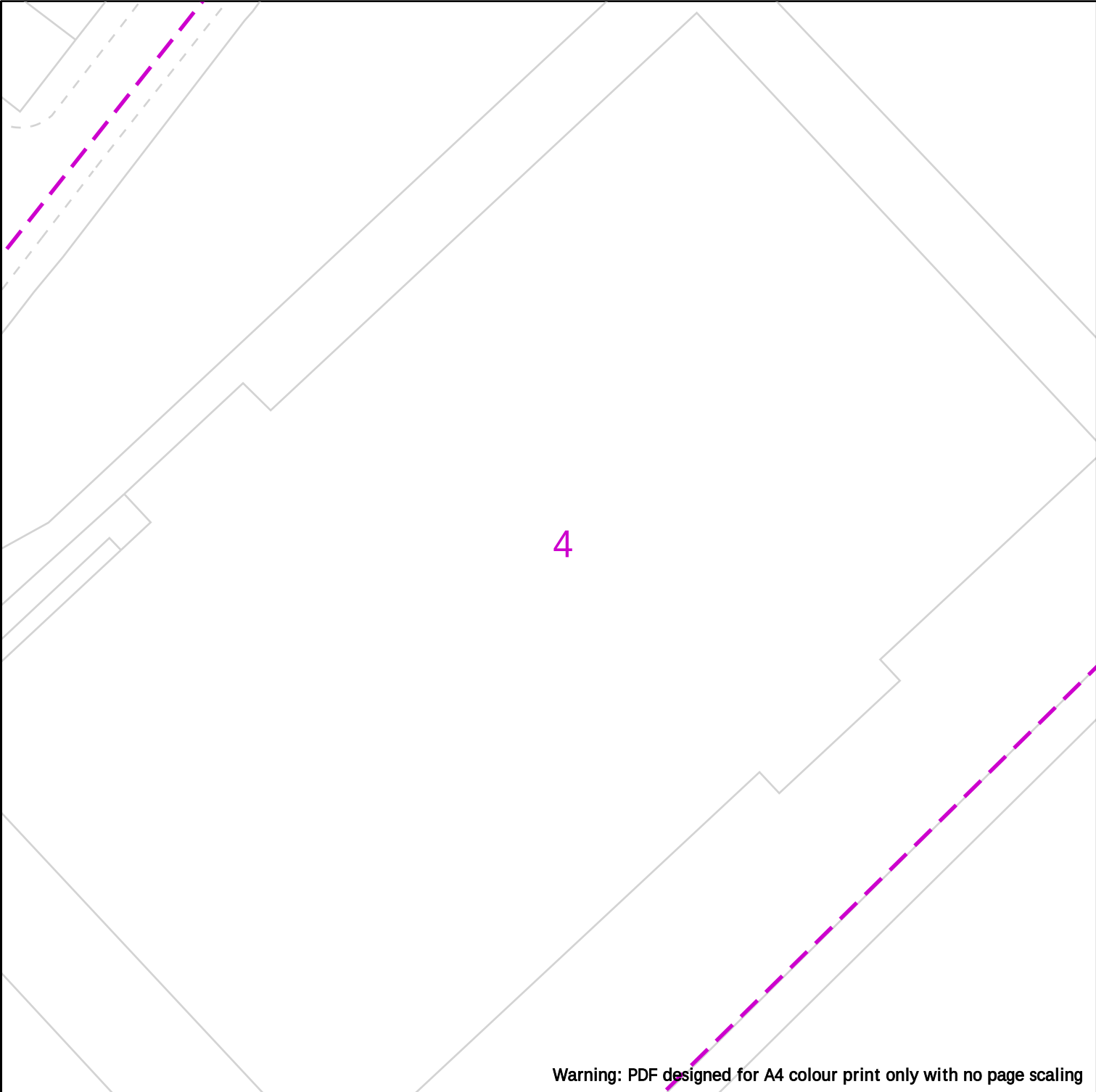
Scale: 1:500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999

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4

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Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

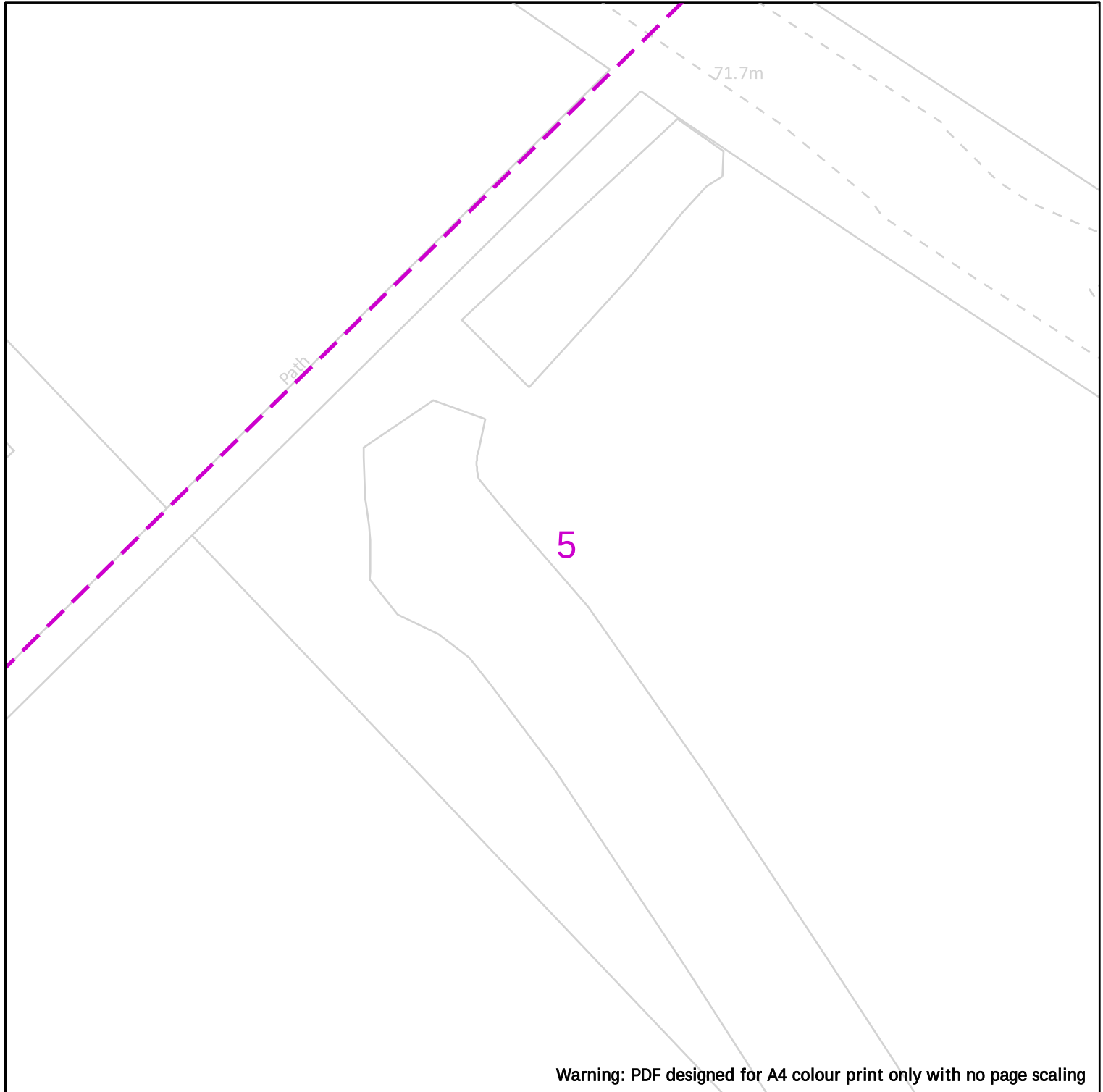
View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999



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Dig Sites

Area:



Line:



Cadent
Your Gas Network



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

View extent: 100m, 100m

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999

Scale: 1:500 (When plotted at A4)

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-  Diameter Change
-  Material Change
-  Out of Standard Service

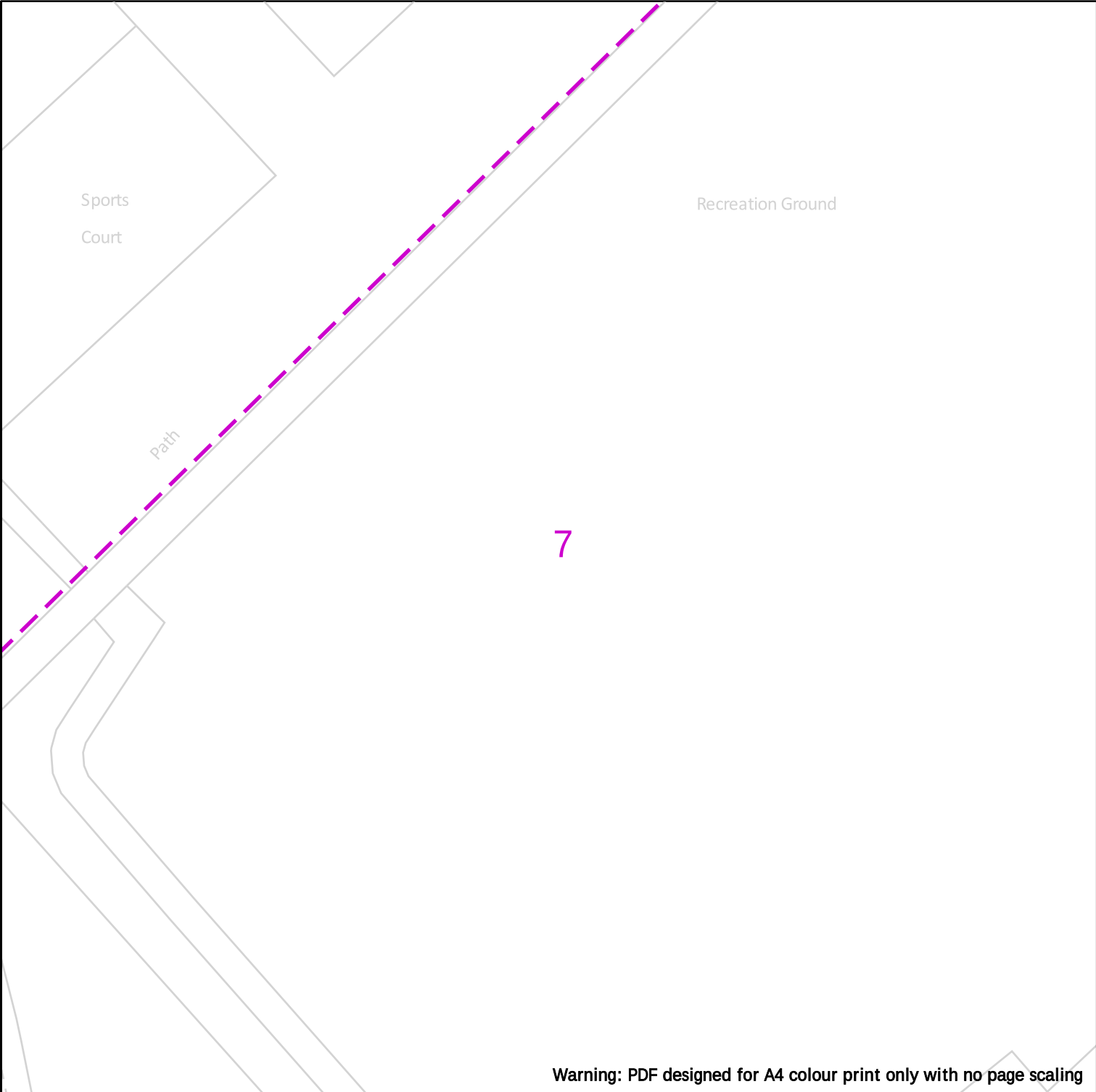


Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999



Warning: PDF designed for A4 colour print only with no page scaling



Cadent
Your Gas Network

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Area: 

Line: 

 LP Mains

 MP Mains

 IP Mains

 LHP Mains

 Valve

 Depth of cover

 Syphon

 Diameter Change

 Material Change

 Out of Standard Service

In case of emergency call - 0800 111 999

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Date Requested: 22/03/2023
Job Reference: 28933129
Site Location: 386016 400915
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV5997

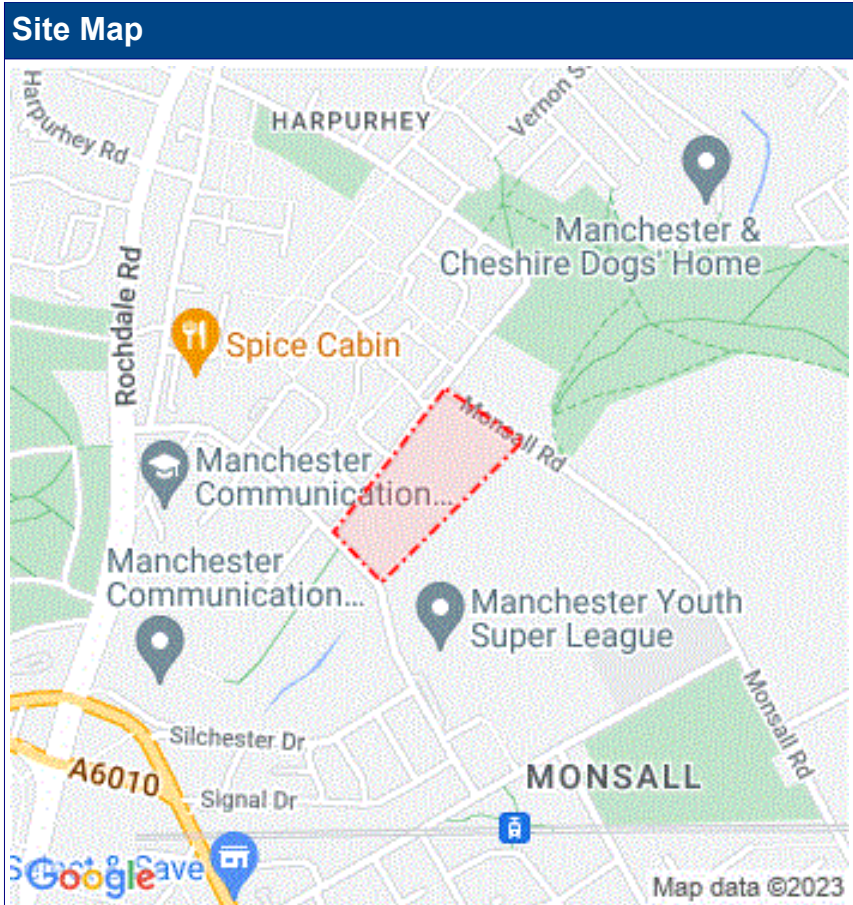
View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

Enquirer			
Name	Miss Lauren Wenham	Phone	01604 781877
Company	Soiltechnics Ltd	Mobile	Not Supplied
Address	Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY		
Email	admin@soiltechnics.net		

Enquiry Details			
Scheme/Reference	STV5997		
Enquiry type	Planned Works	Work category	Development Projects
Start date	23/03/2023	Work type	Commercial/industrial
End date	23/03/2023	Site size	22123 metres square
Searched location	XY= 386023, 400919	Work type buffer*	75 metres
Confirmed location	386016 400915		
Site Contact Name	Not Supplied	Site Phone No	Not Supplied
Description of Works			

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.



Asset Owners

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lineasearchbeforeudig.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

Notes. Please ensure your contact details are correct and up to date on the system in case the LSBUD Members need to contact you.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LineasearchbeforeUdig accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Asset Owners & Responses. Please note the enquiry results include the following:

1. "LSBUD Members" who are asset owners who have registered their assets on the LSBUD service.
2. "Non LSBUD Members" are asset owners who have not registered their assets on the LSBUD service but LSBUD is aware of their existence. Please note that there could be other asset owners within your search area.

Below are three lists of asset owners:

1. **LSBUD Members who have assets registered within your search area. ("Affected")**
 - a. **These LSBUD Members will either:**
 - i. **Ask for further information ("Email Additional Info" noted in status).** The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.
 - ii. **Respond directly to you ("Await Response").** In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.
2. **LSBUD Members who do not have assets registered within your search area. ("Not Affected")**
3. **Non LSBUD Members who may have assets within your search area.** Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

LSBUD Members who have assets registered on the LSBUD service within the vicinity of your search area.

List of affected LSBUD members

Asset Owner	Phone/Email	Emergency Only	Status
Cadent Gas	0800688588	0800111999	Await response
Electricity North West Limited	08001954141	08001954141	Await response

LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area. Please be aware that LSBUD Members make regular changes to their assets and this list may vary for new enquiries in the same area.

List of not affected LSBUD members

Angus Energy	AWE Pipeline	B & D Energy Limited
Balfour Beatty Investments Limited	BOC Limited (A Member of the Linde Group)	Box Broadband
BP Exploration Operating Company Limited	BPA	Carrington Gas Pipeline
CATS Pipeline c/o Wood Group PSN	Cemex	Centrica Storage Ltd
CNG Services Ltd	Concept Solutions People Ltd	ConocoPhillips (UK) Teesside Operator Ltd
D.S.Smith	Diamond Transmission Corporation	DIO (MOD Abandoned Pipelines)
DIO (MOD Live Pipelines)	E.ON UK CHP Limited	EDF Energy Renewables Ltd
EirGrid	Eleclink Limited	Energy Assets Networks
ENI & Himor c/o Penspen Ltd	EnQuest NNS Limited	EP Langage Limited
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Fulcrum Pipelines Limited	Gamma
Gas Networks Ireland (UK)	Gateshead Energy Company	Gigaclear Ltd
Harbour Energy	Heathrow Airport LTD	Humbly Grove Energy
IGas Energy	INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)
INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)
Jurassic Fibre Ltd	Last Mile	Mainline Pipelines Limited
Manchester Jetline Limited	Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)
Melbourn Solar Limited	Moray East Offshore Windfarm	MUA Group Limited
National Gas Transmission	National Grid Electricity Distribution	National Grid Electricity Transmission
Neos Networks	Northern Gas Networks Limited	Northumbrian Water Group
NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd	NYnet Ltd
Ogi	Oikos Storage Limited	Ørsted
Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)	Petroineos
Phillips 66	Portsmouth Water	Premier Transmission Ltd (SNIP)
Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)	RWEnpower (Little Barford and South Haven)
SABIC UK Petrochemicals	SAS Utility Services Ltd	Scottish and Southern Electricity Networks
Scottish Power Generation	Seabank Power Ltd	SES Water
SGN	Shell	Shell NOP

SP Energy Networks	Squire Energy Networks	SSE Generation Ltd
SSE Transmission	SSE Utility Solutions Limited	Storengy
Tata Communications (c/o JSM Construction Ltd)	Total Colnbrook Pipelines	Total Finaline Pipelines
Transmission Capital	UK Power Networks	Uniper UK Ltd
University of Cambridge Granta Backbone Network	Vattenfall	Veolia ES SELCHP Limited
Veolia ES Sheffield Ltd	Voneus Limited	VPI Power Limited
Wales and West Utilities	West of Duddon Sands Transmission Ltd	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

The following Non-LSBUD Members may have assets in your search area. It is **YOUR RESPONSIBILITY** to contact them before proceeding. Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.

Non-LSBUD members (Asset owners not registered on LSBUD)			
Asset Owner	Preferred contact method	Phone	Status
Arelion UK Ltd	check-network@arelion.com	0800526015	Not Notified
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
Equans	nrsua.uk@equans.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@instalcom.co.uk	02087314613	Not Notified
Manchester City Council	https://www.manchester.gov.uk		Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Sky UK Limited	nrsua@sky.uk	02070323234	Not Notified
Sota	SOTA.plantenquiries@instalcom.co.uk		Not Notified
United Utilities	WastewaterDeveloperServices@uuplc.co.uk	08707510101	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

Disclaimer

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APPENDIX E

MicroDrainage Calculations

William Saunders		Page 1
Sheppard Lockton House Cafferata Way Newark, NG24 2TN		
Date 26/07/2024 15:01 File	Designed by samE Checked by	
Innovyze		Source Control 2020.1.3
ICP SUDS Mean Annual Flood Input Return Period (years) 1 Soil 0.450 Area (ha) 0.134 Urban 0.000 SAAR (mm) 864 Region Number Region 10 Results 1/s QBAR Rural 0.8 QBAR Urban 0.8 Q1 year 0.7 Q1 year 0.7 Q30 years 1.3 Q100 years 1.6		
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William Saunders

Page 1

Sheppard Lockton House

Cafferata Way

Newark, NG24 2TN

Date 26/07/2024 15:13

Designed by samE

File FSR 100 + 40% CC.SRCX

Checked by

Innovyze

Source Control 2020.1.3

Micro Drainage

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1243 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.256	0.256	0.0	0.6	0.6	28.9	O K
30 min Summer	8.342	0.342	0.0	0.6	0.6	38.6	O K
60 min Summer	8.433	0.433	0.0	0.6	0.6	48.9	O K
120 min Summer	8.524	0.524	0.0	0.6	0.6	59.3	O K
180 min Summer	8.574	0.574	0.0	0.6	0.6	64.9	O K
240 min Summer	8.604	0.604	0.0	0.6	0.6	68.3	O K
360 min Summer	8.637	0.637	0.0	0.6	0.6	72.0	O K
480 min Summer	8.654	0.654	0.0	0.6	0.6	73.9	O K
600 min Summer	8.661	0.661	0.0	0.6	0.6	74.8	O K
720 min Summer	8.663	0.663	0.0	0.6	0.6	74.9	O K
960 min Summer	8.654	0.654	0.0	0.6	0.6	73.9	O K
1440 min Summer	8.628	0.628	0.0	0.6	0.6	71.0	O K
2160 min Summer	8.593	0.593	0.0	0.6	0.6	67.0	O K
2880 min Summer	8.561	0.561	0.0	0.6	0.6	63.5	O K
4320 min Summer	8.503	0.503	0.0	0.6	0.6	56.9	O K
5760 min Summer	8.448	0.448	0.0	0.6	0.6	50.7	O K
7200 min Summer	8.396	0.396	0.0	0.6	0.6	44.7	O K
8640 min Summer	8.345	0.345	0.0	0.6	0.6	38.9	O K
10080 min Summer	8.284	0.284	0.0	0.6	0.6	32.1	O K
15 min Winter	8.287	0.287	0.0	0.6	0.6	32.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.266	0.0	29.7	26
30 min Summer	79.293	0.0	39.8	41
60 min Summer	50.812	0.0	51.0	70
120 min Summer	31.514	0.0	63.3	130
180 min Summer	23.516	0.0	70.9	188
240 min Summer	18.989	0.0	76.3	248
360 min Summer	13.928	0.0	83.9	366
480 min Summer	11.185	0.0	89.9	484
600 min Summer	9.428	0.0	93.3	604
720 min Summer	8.195	0.0	93.7	722
960 min Summer	6.563	0.0	93.5	930
1440 min Summer	4.791	0.0	91.9	1154
2160 min Summer	3.490	0.0	126.2	1544
2880 min Summer	2.784	0.0	134.2	1964
4320 min Summer	2.021	0.0	146.1	2776
5760 min Summer	1.608	0.0	155.2	3632
7200 min Summer	1.346	0.0	162.2	4464
8640 min Summer	1.164	0.0	168.4	5272
10080 min Summer	1.028	0.0	173.5	5968
15 min Winter	118.266	0.0	33.2	26

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Page 2

Sheppard Lockton House
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Newark, NG24 2TN

Date 26/07/2024 15:13
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Micro
Drainage

InnovyzeSource Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	8.384	0.384	0.0	0.6	0.6	43.4	O K
60 min Winter	8.487	0.487	0.0	0.6	0.6	55.1	O K
120 min Winter	8.592	0.592	0.0	0.6	0.6	66.9	O K
180 min Winter	8.649	0.649	0.0	0.6	0.6	73.4	O K
240 min Winter	8.686	0.686	0.0	0.6	0.6	77.5	O K
360 min Winter	8.726	0.726	0.0	0.6	0.6	82.1	O K
480 min Winter	8.750	0.750	0.0	0.7	0.7	84.8	O K
600 min Winter	8.762	0.762	0.0	0.7	0.7	86.2	O K
720 min Winter	8.768	0.768	0.0	0.7	0.7	86.8	O K
960 min Winter	8.766	0.766	0.0	0.7	0.7	86.6	O K
1440 min Winter	8.737	0.737	0.0	0.7	0.7	83.4	O K
2160 min Winter	8.693	0.693	0.0	0.6	0.6	78.3	O K
2880 min Winter	8.647	0.647	0.0	0.6	0.6	73.2	O K
4320 min Winter	8.561	0.561	0.0	0.6	0.6	63.4	O K
5760 min Winter	8.479	0.479	0.0	0.6	0.6	54.1	O K
7200 min Winter	8.400	0.400	0.0	0.6	0.6	45.2	O K
8640 min Winter	8.317	0.317	0.0	0.6	0.6	35.9	O K
10080 min Winter	8.220	0.220	0.0	0.6	0.6	24.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	79.293	0.0	44.4	41
60 min Winter	50.812	0.0	57.1	70
120 min Winter	31.514	0.0	70.9	128
180 min Winter	23.516	0.0	79.4	186
240 min Winter	18.989	0.0	85.5	244
360 min Winter	13.928	0.0	94.0	360
480 min Winter	11.185	0.0	95.2	474
600 min Winter	9.428	0.0	95.7	590
720 min Winter	8.195	0.0	95.9	702
960 min Winter	6.563	0.0	95.9	922
1440 min Winter	4.791	0.0	95.6	1314
2160 min Winter	3.490	0.0	141.3	1648
2880 min Winter	2.784	0.0	150.4	2112
4320 min Winter	2.021	0.0	163.7	3028
5760 min Winter	1.608	0.0	173.7	3920
7200 min Winter	1.346	0.0	181.7	4760
8640 min Winter	1.164	0.0	188.6	5632
10080 min Winter	1.028	0.0	194.4	6248

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Sheppard Lockton House Cafferata Way Newark, NG24 2TN		
Date 26/07/2024 15:13 File FSR 100 + 40% CC.SRCX	Designed by samE Checked by	
Innovyze Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	119.0	119.0	0.801	0.0	157.4
0.800	119.0	157.4			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0039-1000-2050-1000
Design Head (m) 2.050
Design Flow (l/s) 1.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 39
Invert Level (m) 7.950
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.050	1.0
Flush-Flo™	0.174	0.6
Kick-Flo®	0.352	0.5
Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	1.200	0.8	3.000	1.2	7.000	1.8
0.200	0.6	1.400	0.8	3.500	1.3	7.500	1.8
0.300	0.5	1.600	0.9	4.000	1.4	8.000	1.9
0.400	0.5	1.800	0.9	4.500	1.4	8.500	1.9
0.500	0.5	2.000	1.0	5.000	1.5	9.000	2.0
0.600	0.6	2.200	1.0	5.500	1.6	9.500	2.0
0.800	0.7	2.400	1.1	6.000	1.6		
1.000	0.7	2.600	1.1	6.500	1.7		

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Page 1

Sheppard Lockton House
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Date 26/07/2024 15:17
File FEH 100 + 40% CC.SRCX

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Micro
Drainage

InnovyzeSource Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1533 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.344	0.344	0.0	0.6	0.6	47.0	O K
30 min Summer	8.400	0.400	0.0	0.6	0.6	54.7	O K
60 min Summer	8.463	0.463	0.0	0.6	0.6	63.3	O K
120 min Summer	8.530	0.530	0.0	0.6	0.6	72.6	O K
180 min Summer	8.570	0.570	0.0	0.6	0.6	78.0	O K
240 min Summer	8.597	0.597	0.0	0.6	0.6	81.7	O K
360 min Summer	8.631	0.631	0.0	0.6	0.6	86.4	O K
480 min Summer	8.651	0.651	0.0	0.6	0.6	89.0	O K
600 min Summer	8.662	0.662	0.0	0.6	0.6	90.5	O K
720 min Summer	8.667	0.667	0.0	0.6	0.6	91.2	O K
960 min Summer	8.677	0.677	0.0	0.6	0.6	92.7	O K
1440 min Summer	8.675	0.675	0.0	0.6	0.6	92.4	O K
2160 min Summer	8.662	0.662	0.0	0.6	0.6	90.6	O K
2880 min Summer	8.648	0.648	0.0	0.6	0.6	88.7	O K
4320 min Summer	8.591	0.591	0.0	0.6	0.6	80.9	O K
5760 min Summer	8.541	0.541	0.0	0.6	0.6	74.0	O K
7200 min Summer	8.494	0.494	0.0	0.6	0.6	67.6	O K
8640 min Summer	8.450	0.450	0.0	0.6	0.6	61.5	O K
10080 min Summer	8.408	0.408	0.0	0.6	0.6	55.8	O K
15 min Winter	8.385	0.385	0.0	0.6	0.6	52.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	190.142	0.0	45.1	27
30 min Summer	111.302	0.0	44.6	41
60 min Summer	65.152	0.0	65.4	70
120 min Summer	38.137	0.0	76.6	130
180 min Summer	27.880	0.0	84.0	190
240 min Summer	22.324	0.0	89.7	248
360 min Summer	16.320	0.0	92.8	366
480 min Summer	13.068	0.0	93.3	486
600 min Summer	10.998	0.0	93.5	604
720 min Summer	9.553	0.0	93.6	724
960 min Summer	7.753	0.0	94.0	962
1440 min Summer	5.777	0.0	95.2	1250
2160 min Summer	4.305	0.0	155.7	1632
2880 min Summer	3.494	0.0	168.4	2044
4320 min Summer	2.523	0.0	167.2	2864
5760 min Summer	2.003	0.0	193.1	3696
7200 min Summer	1.675	0.0	201.9	4536
8640 min Summer	1.447	0.0	209.2	5360
10080 min Summer	1.278	0.0	215.7	6152
15 min Winter	190.142	0.0	44.8	27

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	8.449	0.449	0.0	0.6	0.6	61.4	O K
60 min Winter	8.520	0.520	0.0	0.6	0.6	71.2	O K
120 min Winter	8.598	0.598	0.0	0.6	0.6	81.8	O K
180 min Winter	8.644	0.644	0.0	0.6	0.6	88.1	O K
240 min Winter	8.676	0.676	0.0	0.6	0.6	92.5	O K
360 min Winter	8.718	0.718	0.0	0.6	0.6	98.3	O K
480 min Winter	8.743	0.743	0.0	0.7	0.7	101.7	O K
600 min Winter	8.759	0.759	0.0	0.7	0.7	103.8	O K
720 min Winter	8.768	0.768	0.0	0.7	0.7	105.1	O K
960 min Winter	8.787	0.787	0.0	0.7	0.7	107.7	O K
1440 min Winter	8.794	0.794	0.0	0.7	0.7	108.6	O K
2160 min Winter	8.777	0.777	0.0	0.7	0.7	106.3	O K
2880 min Winter	8.757	0.757	0.0	0.7	0.7	103.5	O K
4320 min Winter	8.675	0.675	0.0	0.6	0.6	92.4	O K
5760 min Winter	8.601	0.601	0.0	0.6	0.6	82.2	O K
7200 min Winter	8.531	0.531	0.0	0.6	0.6	72.6	O K
8640 min Winter	8.465	0.465	0.0	0.6	0.6	63.6	O K
10080 min Winter	8.402	0.402	0.0	0.6	0.6	55.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	111.302	0.0	44.3	41
60 min Winter	65.152	0.0	73.3	70
120 min Winter	38.137	0.0	85.8	128
180 min Winter	27.880	0.0	92.5	186
240 min Winter	22.324	0.0	93.6	244
360 min Winter	16.320	0.0	94.6	360
480 min Winter	13.068	0.0	95.2	476
600 min Winter	10.998	0.0	95.7	592
720 min Winter	9.553	0.0	96.2	706
960 min Winter	7.753	0.0	97.9	932
1440 min Winter	5.777	0.0	100.1	1362
2160 min Winter	4.305	0.0	174.4	1712
2880 min Winter	3.494	0.0	187.5	2172
4320 min Winter	2.523	0.0	175.6	3112
5760 min Winter	2.003	0.0	216.3	3992
7200 min Winter	1.675	0.0	226.2	4896
8640 min Winter	1.447	0.0	234.4	5720
10080 min Winter	1.278	0.0	241.6	6648

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	144.0	144.0	0.801	0.0	184.0
0.800	144.0	184.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0039-1000-2050-1000
Design Head (m) 2.050
Design Flow (l/s) 1.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 39
Invert Level (m) 7.950
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

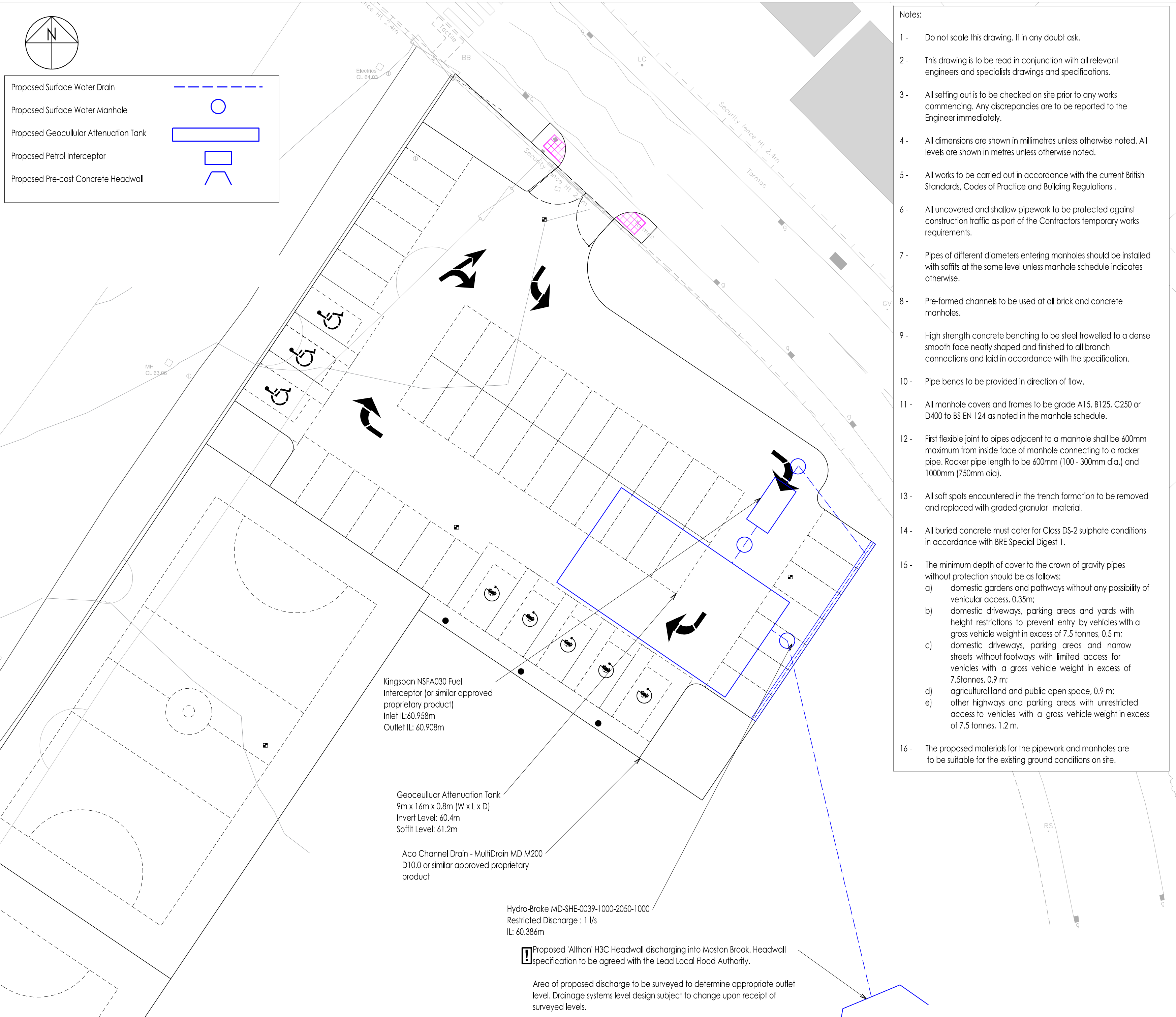
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.050	1.0
Flush-Flo™	0.174	0.6
Kick-Flo®	0.352	0.5
Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	1.200	0.8	3.000	1.2	7.000	1.8
0.200	0.6	1.400	0.8	3.500	1.3	7.500	1.8
0.300	0.5	1.600	0.9	4.000	1.4	8.000	1.9
0.400	0.5	1.800	0.9	4.500	1.4	8.500	1.9
0.500	0.5	2.000	1.0	5.000	1.5	9.000	2.0
0.600	0.6	2.200	1.0	5.500	1.6	9.500	2.0
0.800	0.7	2.400	1.1	6.000	1.6		
1.000	0.7	2.600	1.1	6.500	1.7		

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APPENDIX F
Drainage Layout



- Notes:
- 1 - Do not scale this drawing. If in any doubt ask.
 - 2 - This drawing is to be read in conjunction with all relevant engineers and specialists drawings and specifications.
 - 3 - All setting out is to be checked on site prior to any works commencing. Any discrepancies are to be reported to the Engineer immediately.
 - 4 - All dimensions are shown in millimetres unless otherwise noted. All levels are shown in metres unless otherwise noted.
 - 5 - All works to be carried out in accordance with the current British Standards, Codes of Practice and Building Regulations .
 - 6 - All uncovered and shallow pipework to be protected against construction traffic as part of the Contractors temporary works requirements.
 - 7 - Pipes of different diameters entering manholes should be installed with soffits at the same level unless manhole schedule indicates otherwise.
 - 8 - Pre-formed channels to be used at all brick and concrete manholes.
 - 9 - High strength concrete benching to be steel trowelled to a dense smooth face neatly shaped and finished to all branch connections and laid in accordance with the specification.
 - 10 - Pipe bends to be provided in direction of flow.
 - 11 - All manhole covers and frames to be grade A15, B125, C250 or D400 to BS EN 124 as noted in the manhole schedule.
 - 12 - First flexible joint to pipes adjacent to a manhole shall be 600mm maximum from inside face of manhole connecting to a rocker pipe. Rocker pipe length to be 600mm (100 - 300mm dia.) and 1000mm (750mm dia).
 - 13 - All soft spots encountered in the trench formation to be removed and replaced with graded granular material.
 - 14 - All buried concrete must cater for Class DS-2 sulphate conditions in accordance with BRE Special Digest 1.
 - 15 - The minimum depth of cover to the crown of gravity pipes without protection should be as follows:
 - a) domestic gardens and pathways without any possibility of vehicular access, 0.35m;
 - b) domestic driveways, parking areas and yards with height restrictions to prevent entry by vehicles with a gross vehicle weight in excess of 7.5 tonnes, 0.5 m;
 - c) domestic driveways, parking areas and narrow streets without footways with limited access for vehicles with a gross vehicle weight in excess of 7.5tonnes, 0.9 m;
 - d) agricultural land and public open space, 0.9 m;
 - e) other highways and parking areas with unrestricted access to vehicles with a gross vehicle weight in excess of 7.5 tonnes, 1.2 m.
 - 16 - The proposed materials for the pipework and manholes are to be suitable for the existing ground conditions on site.

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Contractors must verify all dimensions, levels and co-ordinates at the site before commencing any work or making any shop drawings; no dimensions to be taken from drawing.

P3	Layout updated to remove 5 EV bays and replace with regular bays	SE		10/24
P2	Drainage layout updated to suit discharge to watercourse	SE	CM	07/24
P1	Initial Issue	SE	CM	07/24
Rev	Description	Drn	Vf'd	Date
As outlined in section 2.3 of the CITB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8, 9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus:				
☐ No significant risks have been identified.				
☒ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.				
Refer to the current Designer's Risk Assessment sheets for further details.				
Designer's Signature		SE		Date 07/24

Drawing Status

PRELIMINARY

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McARDLE SPORT TEC

Title

Drainage Layout

WmS Project Ref.	Drawn	Date	Scale	@ A2
12805	SE	16/07/24	1:200	

Drawing/Document Reference

Project	Originator	Zone	Level	Type	Role	Number	Status	Rev.
12805	WMS	ZZ	XX	D	C	39201	S3	P3

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