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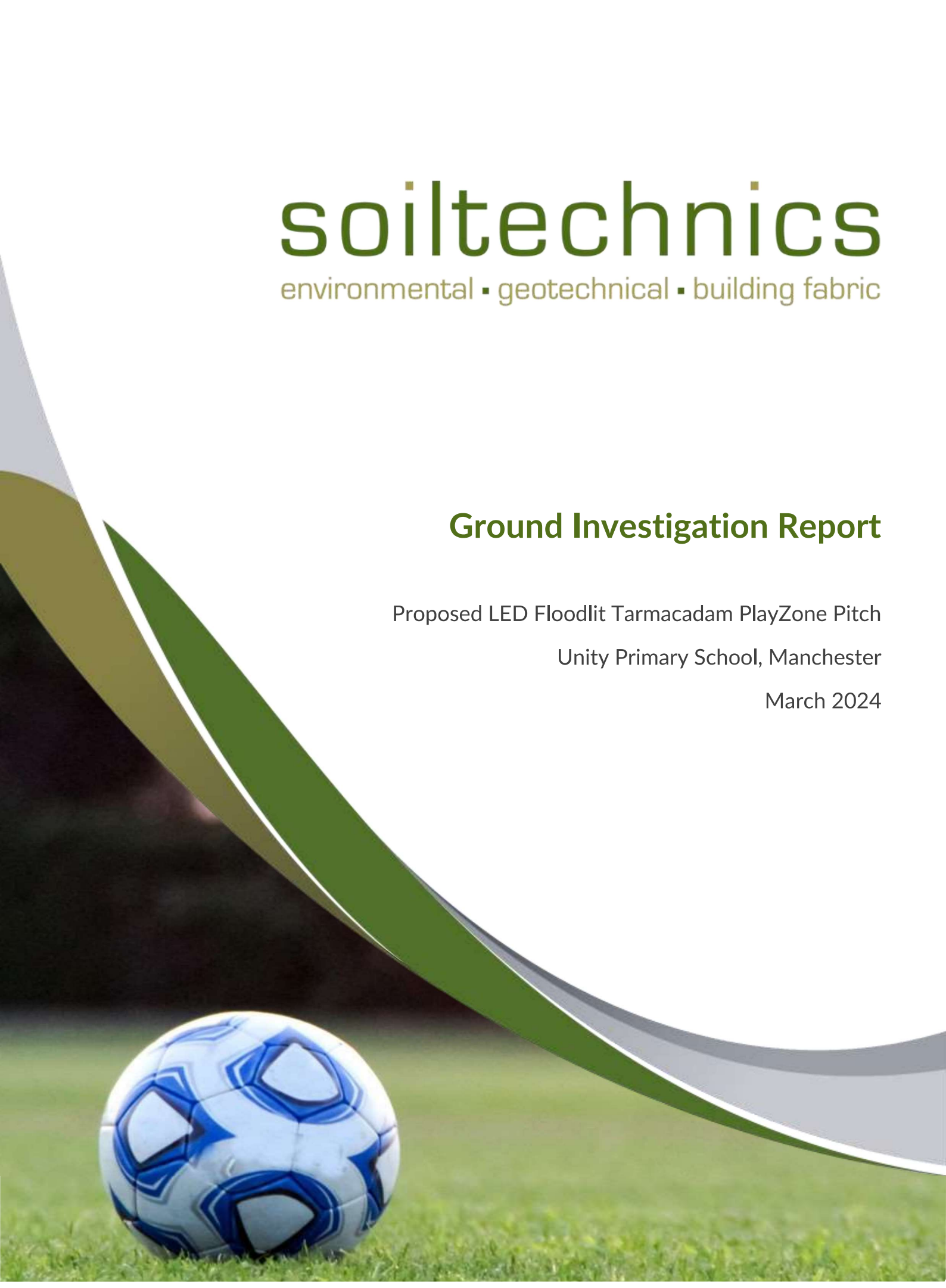
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Ground Investigation Report

Proposed LED Floodlit Tarmacadam PlayZone Pitch

Unity Primary School, Manchester

March 2024



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Table of Contents

Non-technical Summary v

1 Introduction 1
1.1 Scheme Outline 1
1.2 Brief 1
1.3 Limitations 1

2 Desk Study 2
2.1 Sources of Information 2
2.2 Site Location and Description 2
2.3 Site History 5
2.4 Anticipated Geology and Hydrogeology 7
2.5 Flood Risk 9
2.6 Mining and Ground Stability 9
2.7 Landfill and Infilled Ground 10
2.8 Underground Infrastructure 10
2.9 Unexploded Ordnance (UXO) Hazard Screen 11

3 Ground Investigation 12
3.1 Objectives 12
3.2 Fieldwork Summary 12
3.3 Unexploded Ordnance (UXO) 12
3.4 Sampling 12
3.5 In-situ Testing 13
3.6 Investigation Constraints 13

4 Laboratory testing 14
4.1 Overview 14
4.2 Geotechnical Testing 14
4.3 Chemical Testing 14

5 Ground Investigation Findings 15
5.1 Ground Model 15
5.2 Topsoil 15
5.3 Made Ground 15
5.4 Devensian Till 16
5.5 Groundwater 16
5.6 Evidence of Possible Contamination 16
5.7 Obstructions and Instability 17

6 Chemical Assessment 18
6.1 Topsoil Suitability 18
6.2 Waste Disposal 18
6.3 Materials Management 19

7 Geotechnical Discussion 20
7.1 Scheme Overview 20
7.2 Key Geotechnical Issues 20
7.3 Made Ground 20
7.4 Mining Legacy 20
7.5 Foundation Strategy 21
7.6 Floodlight Foundations 21

7.7 Artificial Pitch Foundations 22
7.8 Drainage 22
7.9 Aggressiveness of the Ground to Buried Concrete 23

8 Recommendations for further works 24

Appendix A Drawings

Appendix B Exploratory Hole Logs

Appendix C In Situ Test Results

Appendix D Geotechnical Laboratory Test Results

Appendix E Geoenvironmental Laboratory Test Results

Appendix F Contamination Assessment Screening

Appendix G Waste Characterisation Assessment

Appendix H Statutory Undertakers Responses

Drawing Register

Title	Produced by	Date	Reference
Exploratory hole location plan	Soiltechnics Limited	Feb 2024	D-STV6309-01_RevA

List of Tables

Table 2-A: Site Description 3
Table 2-B: Summary of site history 5
Table 2-C: Summary of anticipated geology and hydrogeology 9
Table 2-D: UXO Hazard Screen 11
Table 3-A: Summary of fieldwork undertaken 12
Table 3-B: Summary of field testing undertaken 13
Table 4-A: Summary of geotechnical laboratory testing 14
Table 4-B: Summary of chemical laboratory testing 14
Table 5-A: Ground Model 15
Table 5-B: Summary of groundwater observations during the fieldworks 16
Table 5-C: Summary of obstructions encountered during the investigation works 17
Table 6-A: Summary of chemical analysis 18
Table 6-B: Summary of waste characterisation 19
Table 7-A: Summary of infiltration test results undertaken in accordance with BRE 365 23
Table 7-B: Summary of the aggressiveness of the ground to buried concrete 23

List of Figures

Figure 2-A: Aerial photograph of site boundary (red) and PlayZone footprint (blue) 3
Figure 2-B: Photograph looking east from the western boundary of the site 4
Figure 2-C: Photograph looking towards the northwest corner of the site and grass embankment 4
Figure 2-D: Photograph looking towards the southeast from the northwest of the site 5
Figure 2-E: 1892-1914 Historical map extract overlay showing the site boundary (red) and proposed PlayZone (blue) 6
Figure 2-F: 1933 aerial image showing infilling of the former clay pit. Approximate location of PlayZone shown in area highlighted yellow (note truck on south of highlighted area tipping waste into the excavation). 6
Figure 2-G: 1949-1972 Historical map extract overlay showing the site boundary (red), proposed PlayZone (blue) 7

Figure 2-H: Aerial imagery dated 2017 showing stockpiling of soils in the PlayZone area (blue) 7
Figure 2-I: Extract from BGS showing superficial geology at the site 8
Figure 2-J: Extract from BGS showing bedrock geology at the site 9
Figure 2-K: Extract from EA showing proximity of the site to landfills. 10
Figure 2-L: Electricity Northwest extract, dated: 24/11/23. 11
Figure 5-A: Made Ground encountered in WS01 16
Figure 5-B: Devensian Till encountered in WS04 16

Non-technical Summary

Topic	Commentary
Site description	The development site currently forms part of a grassed field associated with Unity Primary School.
Development proposals	The proposed development is for construction of a LED floodlit tarmacadam PlayZone pitch (measuring approximately 30m x 25m in size) for football and basketball use.
Site history	The site was part of a brick works clay pit from the late-1800s until the 1930s when backfilling of the clay pit occurred. Aerial imagery from the early 2000s shows the presence of Unity Primary School, with the current site layout observed from 2017 onwards.
Ground conditions	Ground conditions comprised Topsoil to a typical depth of 0.3m bgl. Made Ground was observed underlying Topsoil in all exploratory positions extending beyond the maximum exploratory depth of 5.45m bgl in WS01 and WS02. WS03 terminated on an obstruction within the Made Ground at 1.7m. Naturally derived Devensian Till deposits were encountered at a depth of 4.30m bgl within WS04. Some perched water was present in Made Ground.
Development constraints	No significant constraints were encountered which limited the design of the scope of works or the undertaking of fieldworks.
Mining and ground stability risk	The site falls inside of a Coal Mining Reporting Area, but outside a high development risk area. The risk from ground instability associated with coal mining legacy is considered to be low.
Floodlight foundation solution	The Made Ground deposits are considered unsuitable to support the proposed floodlight foundations - piled foundations or ground improvement of existing Made Ground are possible solutions. A concrete classification of DS-1 and AC-1/AC1s is required.
CBR assessment and pitch foundations	Based on the anticipated founding depth and DCP results, a CBR design value of 10% can be adopted for soils that are likely to be representative of those which remain at or near pitch formation levels. Conditioning of the deposits will be required to minimise levels of differential settlement across the site.
Drainage potential	Disposal of stormwater via a soakaway is not considered viable at the site. As an alternative, it is possible that the PlayZone drainage could key into the existing surface water drainage system currently used by the school to the southwest.
Chemical contamination (Topsoil)	Topsoil in-situ would be chemically suitable for reuse onsite, or offsite within a residential development.
Waste characterisation	A composite sample of Made Ground was taken from each exploratory hole, referenced as WAC01. The Made Ground is indicated to be suitable for disposal at a non-hazardous landfill (not inert due to elevated TOC, PAHs and antimony).
Recommendation for further works	If a piled foundation solution is adopted for the proposed floodlighting across the proposed development area, it is recommended this investigation is supplemented with further onsite deeper boreholes providing parameters to facilitate design and construction. If ground improvement (such as dynamic compaction, rapid impact compaction or controlled modulus columns) is utilised, potentially allowing adoption of shallow foundations, or lime/cement stabilisation is utilised below the proposed pitch, specialist input at an early stage is recommended.

1 Introduction

1.1 Scheme Outline

1.1.1 The proposed development is for construction of a LED floodlit tarmacadam PlayZone pitch (measuring approximately 30m x 25m in size) for football and basketball use. The development will be located within the northern part of the grounds to Unity Primary School, Manchester. The approximate footprint of the proposed PlayZone pitch is presented in Figure 2-A below.

1.1.2 The report is based on the project proposals and information outlined above; should the scheme change then it will be necessary to review the conclusions and recommendations presented in this report.

1.2 Brief

1.2.1 This report has been prepared following instructions received from our client, The Football Foundation.

1.2.2 The scope of works has been completed in accordance with the 2024 PlayZone framework agreement for a ground investigation utilising windowless sampling methods. The principal objectives of the ground investigation are to establish ground conditions at the site sufficient to assess the infiltration potential and provide information necessary to allow design of the PlayZone pitch and floodlight foundations. The report will also advise on abnormal ground conditions and provide recommendations for further investigation works where applicable.

1.2.3 In addition to the above, a topographical survey and electrical capacity survey have been commissioned for the project, provided under separate cover.

1.3 Limitations

1.3.1 Soiltechnics disclaims any responsibility to our Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence in accordance with the terms of our contract, taking account of the resources, investigations and testing devoted to it by agreement with our Client. This report is confidential to our Client and Soiltechnics accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

2 Desk Study

2.1 Sources of Information

2.1.1 Reference has been made to the following sources of information:

- British Geological Survey (BGS) GeoIndex – Onshore database.
- BGS Sheet 85 (Scale 1:50 000) – Manchester (2011).
- Ordnance Survey OpenData.
- Environment Agency open-source databases.
- Google mapping services.
- Interrogation of search engines for anecdotal information on the site history and other readily available online resources.
- Phase 1 desk study report produced for the Unity Community Primary School by Integra Consulting Environmental Ltd in August 2015.

2.2 Site Location and Description

2.2.1 The proposed development lies within Manchester, approximately 2.4km north of the city centre, at the following postal address:

Unity Primary School
41 Allesley Drive
Cheetwood
Manchester
M7 4YE

2.2.2 An aerial image showing the approximate site boundary and approximate development footprint is presented below, followed by a table summarising the key site features and a series of site photographs. A site plan is provided within Appendix A.



Figure 2-A: Aerial photograph of site boundary (red) and PlayZone footprint (blue)

Theme	Feature
Current site use	The development site currently forms part of grassed playing fields associated with school. Allesley Drive provides access to the site from the west.
Local area land use	Adjacent land use comprises residential housing. The school buildings associated with Unity Primary School are located to the southwest of the proposed PlayZone.
Topography	Surface levels fall marginally from northwest to southeast across the proposed PlayZone pitch. A 1-1.5m high grassed embankment is noted along the western boundary of the proposed PlayZone, see Figure 2-C below.
Buildings, surfacing and other permanent features	The wider site comprises the school buildings, situated western central part of the stie, bound by grassed playing fields to the north, east and south.
Boundary features	There are no physical boundaries to the proposed PlayZone area. The wider site is bound by palisade fencing.
Vegetation	Significant vegetation is not present on or near the PlayZone site. Grass was noted to be thin/sparse in the north of the site where the pitch is proposed.
On-site / adjacent surface water features	None observed. The River Irwell is located approximately 1.5km to the west of the site.
Injurious and invasive weeds	No invasive weeds were identified during the site reconnaissance.
Evidence for ground instability	None observed.

Table 2-A: Site Description

2.2.3 The observations provided above are made by a Geoenvironmental Engineer, who is not a specialist in asbestos surveying or invasive weed identification. Any associated comments are intended for use by this report only, and not for any other purpose.

2.2.4 A selection of site photographs are presented below.



Figure 2-B: Photograph looking east from the western boundary of the site



Figure 2-C: Photograph looking towards the northwest corner of the site and grass embankment



Figure 2-D: Photograph looking towards the southeast from the northwest of the site

2.3 Site History

2.3.1 An attempt to trace the history of the site has been carried out by reviewing readily available ordnance survey maps. A chronological summary of the site's history is provided below.

Date	On-site	Off-site
Late-1800s	The PlayZone location is noted to have been situated on the western high wall of an old clay pit associated with a brickworks to the southwest of the site (see Figure 2-E).	Adjacent land uses are noted to have comprised residential properties to the north and west, with the brick works/pit extending off site to the south and east.
Early 1900s	Historic aerial imagery dated 1933, shows the PlayZone location in relation to the clay pit, see Figure 2-F below. The old clay pit beneath the proposed PlayZone area was infilled at this time.	Residential properties are noted to the north and west of the wider site.
Mid to late 1900s	The clay pit is no longer present beneath the proposed PlayZone and the wider site is undeveloped open land at this time (See Figure 2-G).	Further residential development is noted to the south of the wider site.
Early-2000s to present day	Aerial imagery (Google Earth) shows the Unity Primary School to be present from the early 2000s, only comprising one building at the time. The proposed PlayZone is noted as being grassed fields during this time. Construction of the school's present layout is observed circa. 2017, with possible reprofiling/stockpiling noted within the area of the proposed PlayZone (see Figure 2-H). The present layout is observed from 2019 onwards.	No significant changes.

Table 2-B: Summary of site history



Figure 2-E: 1892-1914 Historical map extract overlay showing the site boundary (red) and proposed PlayZone (blue)

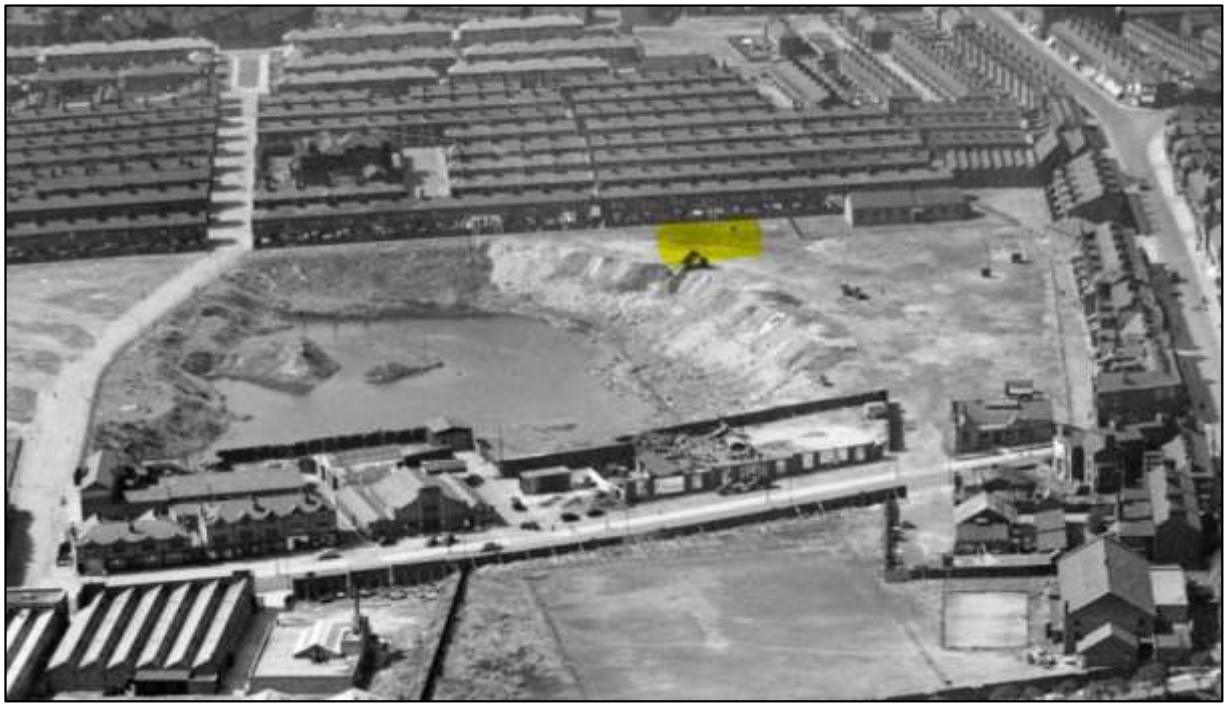


Figure 2-F: 1933 aerial image showing infilling of the former clay pit. Approximate location of PlayZone shown in area highlighted yellow (note truck on south of highlighted area tipping waste into the excavation).



Figure 2-G: 1949-1972 Historical map extract overlay showing the site boundary (red), proposed PlayZone (blue)



Figure 2-H: Aerial imagery dated 2017 showing stockpiling of soils in the PlayZone area (blue)

2.4 Anticipated Geology and Hydrogeology

2.4.1 Based on a review of available records, the site is anticipated to be underlain by superficial deposits of Devensian Till (refer to Figure 2-I below). The site is observed to be within an area of superficial thickening associated with a hidden valley, extending to anticipated depths of 10m to 20m bgl.

2.4.2 Artificial ground is noted across the wider site footprint, likely associated with backfilling of the former clay pit.

2.4.3 Review of a Phase 1 desk study report produced for the Unity Community Primary School by Integra Consulting Environmental Ltd in August 2015, provides historical ground investigation data for the redline site under consideration. Borehole data indicated at least 6-10m of Made Ground, comprising dark brown firm clay with coarse and fine brick, concrete and asphalt fragments or crushed hardcore and asphalt as well as possible ash.

2.4.4 Testing of soils indicated the presence of quantifiable Chrysotile asbestos fibre bundles and free fibres within 6 No. of 12 No. samples tested (4 No. of 9No. 'shallow' samples).

2.4.5 The underlying bedrock is recorded as the Chester Formation across the entirety of the site, comprising mudstone (refer to Figure 2-J below).



Figure 2-I: Extract from BGS showing superficial geology at the site



Figure 2-J: Extract from BGS showing bedrock geology at the site

2.4.6 A summary of the anticipated geology underlying the site is summarised as follows:

Stratum	Bedrock/ superficial	Approximate thickness (m)	Typical soil type	Aquifer Designation	Likely permeability
Topsoil	-	~0.3m	Organic soil	-	-
Made Ground	Superficial	6-10m	Variable but including demolition materials	-	Variable
Devensian Till	Superficial	Up to 20m	Clays	Secondary (undifferentiated)	Low
Chester Formation	Bedrock	Basal unit	Sandstone	Principal	Low to moderate

Table 2-C: Summary of anticipated geology and hydrogeology

2.5 Flood Risk

2.5.1 The site lies within a Flood Zone 1 where the risk from flooding from rivers or the sea is <0.1% in any given year. The risk from surface water flooding is considered very low.

2.5.2 It should be noted that this information does not constitute a site-specific Flood Risk Assessment and one may be required for the scheme.

2.6 Mining and Ground Stability

2.6.1 The site is located within a Coal Mining Reporting Area, but outside of a Development High Risk Area. No recorded or probable unrecorded workings, coal seams, mine entries or opencast sites are located within 100m of the site.

2.6.2 Review of a Coal Authority report contained in the Integra consulting Phase 1 report indicates no shallow mining risk, or presence of mine shafts and open cast sites in close proximity.

2.6.3 On the basis of the above, the risk from ground instability associated with coal mining legacy is considered to be very low.

2.7 Landfill and Infilled Ground

2.7.1 Open-source Environment Agency landfill mapping data indicates the proposed development lies within a historic landfill site, associated with the historic clay pit (refer to Figure 2-K below). The landfill is noted to comprise commercial and household waste. 6-10m of Made Ground has been recorded beneath the wider site during previous investigation, however, landfill materials were recorded as being dominantly inert demolition materials, rather than household waste.

2.7.2 Based on the above and anticipated ground conditions on site, whilst there is a potential for elevated ground gases beneath the site, the risk to the PlayZone is considered to be low due to the nature of the development (open air pitch and floodlighting).



Figure 2-K: Extract from EA showing proximity of the site to landfills.

2.8 Underground Infrastructure

2.8.1 Copies of all utility plans obtained are presented as Appendix H. The plans are provided for information only and should not be relied upon to be accurate. In addition, it is worth noting that the public utility plans provided by the asset owners typically exclude private service runs.

2.8.2 A review of the information shows an LV electrical line runs parallel to the proposed development's eastern boundary (see Figure 2-L).

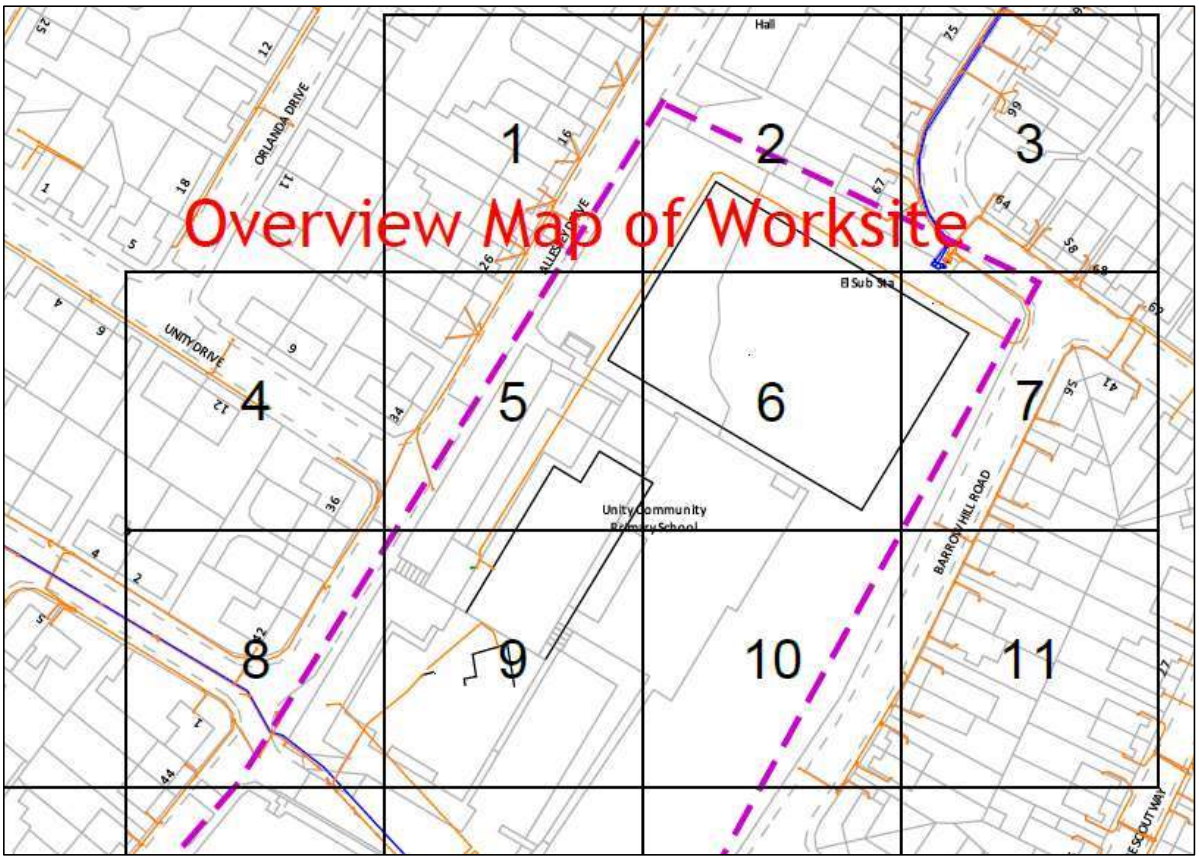


Figure 2-L: Electricity Northwest extract, dated: 24/11/23.

2.9 Unexploded Ordnance (UXO) Hazard Screen

2.9.1 A UXO hazard screen has been undertaken by Soiltechnics (as a non-specialist) in accordance with CIRIA C785 to determine if further specialist risk assessment is required. This has been carried out with reference to the Zetica bomb density maps, area-specific bomb strike maps (where available), and a review of historical mapping and possible military sites in the area. A summary is presented below.

Hazard	Outcome	Discussion
Question 1: Are there any indicators of former military land use on site?	No	A review of the site's history has not identified indicators of former military use on site.
Question 2: Are there any indicators of historical bombing on or near the site?	Yes	The site falls within a moderate bombing density area, and therefore bombing may have occurred on or near the site.

Table 2-D: UXO Hazard Screen

2.9.2 A preliminary risk review has been undertaken by a UXO specialist to assess the risk of encountering UXO during ground investigation works undertaken by Soiltechnics only and to identify any precautionary measures required. It should be noted that the risk assessment has not been carried out fully in accordance with CIRIA report C785 'Unexploded Ordnance (UXO) A guide for the construction Industry'.

2.9.3 The risk review concluded that there was a credible risk of encountering UXO during the ground investigation. It should be noted that this preliminary risk review does not consider risks to the construction phase.

3 Ground Investigation

3.1 Objectives

3.1.1 The ground investigation scope and location of exploratory holes was determined by Soiltechnics Ltd, based upon the overall brief outlined in Section 1.

3.1.2 The objectives of the fieldwork were to:

a) Establish ground and groundwater conditions at the site.
b) Obtain samples for subsequent laboratory testing.

3.2 Fieldwork Summary

3.2.1 Fieldwork was undertaken on 1st February 2024.

3.2.2 A summary of the works completed is set out in the table below, along with the location of the exploratory records. The exploratory hole location plan is presented within Appendix A.

Exploratory records	Method	Qty	Final Depth Range (m bgl)	Comments
Appendix C	Dynamic Cone Penetrometer Tests	5	0.678 - 0.839	DCP01, DCP03, DCP04 and DCP05 Terminated at scheduled depth.
			0.367	DCP02 Terminated due to obstruction.
Appendix B	Dynamic windowless sampling boreholes	3	5.45	WS01, WS02 and WS04 Boreholes terminated at scheduled depth.
		1	1.70	WS03 Borehole terminated due to obstruction.

Table 3-A: Summary of fieldwork undertaken

3.2.3 It should be noted that WS04 was completed on the grassed embankment some 1m above the level of the surrounding area.

3.2.4 All soils encountered were described in accordance with BS EN ISO 14688 "Identification and Classification of soil".

3.3 Unexploded Ordnance (UXO)

3.3.1 Due to the risk identified during the initial hazard screening of the site, Soiltechnics commissioned a UXO specialist to undertake a preliminary risk review for the purpose of the ground investigation works phase only.

3.3.2 The review concluded that the UXO risk to the ground investigation works was moderate within the site boundary, and therefore the works were supervised by a UXO specialist. No ferrous anomalies were identified during the works.

3.4 Sampling

3.4.1 During the fieldwork, sampling of soil, rock and groundwater for geotechnical purposes has been undertaken in accordance with BS EN ISO 22475-1 *"Geotechnical Investigation and testing – sampling by drilling and excavation and groundwater measurements".*

3.4.2 Samples collected for chemical analysis have been taken and handled in accordance with BS ISO 18400-105:2017 *"Soil quality — Sampling Part 105: Packaging, transport, storage and preservation of samples".*

3.4.3 Various sampling and sub-sampling methodologies have been adopted as appropriate, with the primary aim of obtaining the highest quality sample class practicable.

3.4.4 Untested chemical and geotechnical samples will be held for a period of 4 weeks from the date of the first report issue, after which they will be disposed of with no further notice.

3.5 In-situ Testing

3.5.1 The following table summarises the field testing carried out. The results are summarised on individual exploratory hole logs where appropriate and detailed within the Appendices indicated.

Tests	Qty	Applicable standard / guidance	Location of Results
Standard penetration test (SPT)	17	BS EN ISO 22476-3	Included within logs Detailed in Appendix C
Pocket penetrometer	12	Manufacturer's instructions	Included within logs Detailed in Appendix C
Dynamic cone penetrometer (DCP) using TRL probe	5	DMRB: CS229	Detailed in Appendix C
Variable head permeability	2	BS EN ISO 22282-2	Detailed in Appendix C

Table 3-B: Summary of field testing undertaken

3.6 Investigation Constraints

3.6.1 No significant constraints were encountered which limited the design of the scope of works or the undertaking of fieldworks.

4 Laboratory testing

4.1 Overview

4.1.1 Samples obtained from exploratory holes were sent to independent accredited laboratories for geotechnical and chemical testing.

4.2 Geotechnical Testing

4.2.1 The geotechnical testing schedule was prepared by Soiltechnics using a targeted and judgemental approach, based upon the scheme proposals and ground conditions encountered.

4.2.2 Geotechnical laboratory test results are presented in Appendix D, and the total number of geotechnical tests undertaken is summarised below:

Geological Unit	Test	Quantity
Made Ground	Atterberg limits	1
	Particle size distribution (coarse)	1
	BRE SD1 Suite D	2
Devensian Till	Atterberg limits	1
	BRE SD1 Suite D	1

Table 4-A: Summary of geotechnical laboratory testing

4.3 Chemical Testing

4.3.1 The chemical testing schedule was prepared by Soiltechnics using a targeted and judgemental approach, based upon fieldwork observations.

4.3.2 Chemical laboratory test results are presented in Appendix E, and the total number of chemical tests undertaken is summarised below:

Geological Unit	Testing Suite	Quantity
Topsoil	ST Basic classification suite (Metals, inorganics, PAH, banded TPH, asbestos)	1
Made Ground	ST Basic classification suite (Metals, inorganics, PAH, banded TPH, asbestos)	1
	Full WAC Suite (solid and 2-stage leachate)	1

Table 4-B: Summary of chemical laboratory testing

5 Ground Investigation Findings

5.1 Ground Model

5.1.1 Ground conditions encountered were relatively consistent across the site and were broadly in line with those anticipated from the desk study.

5.1.2 The table below interprets the geological conditions at the site. Unless otherwise stated in subsequent interpretive report sections, this represents the adopted ground model.

Stratum	Brief description	Top depth range (m bgl)	Adopted model top depth (m bgl)	Thickness (m)	Water
Soft surfacing	Topsoil	G.L	G.L.	0.3	-
Made Ground	Brown clayey sand and gravel including brick, ash, concrete, coal	0.20 to 0.60	0.40	0.4 - >5.2	Water strike at 3.0m
Devensian Till	Clay with gravels	3.5 to 4.30	4.30	Not proven	-

Table 5-A: Ground Model

5.1.3 Further detail about the ground conditions encountered is provided in the relevant sub-sections below.

5.2 Topsoil

5.2.1 Topsoil was encountered in all exploratory holes, comprising brown slightly gravelly silty sand and locally sandy slightly gravely clay. Gravel comprised brick and sandstone. The base of the unit was typically 0.3m bgl and varied between 0.2m and 0.3m in thickness.

5.3 Made Ground

5.3.1 Made Ground was encountered underlying topsoil across all exploratory boreholes. The base of the unit was observed within WS04 at 4.30m bgl. The base depth of the unit was not observed in WS01 asn WS02 within the maximum exploratory depth of 5.45m. WS03 refused at 1.7m due to a suspected obstruction within the Made Ground.

5.3.2 Made Ground was observed as dominantly granular soils typically observed to be very gravelly silty sand with demolition type materials. On the western side of the site (WS03 & WS04) clay fill was present, comprising reworked natural soils, and at depth in WS02 in the northeast of the site.

5.3.3 A photograph of the Made Ground encountered is shown below in Figure 5-A.



Figure 5-A: Made Ground encountered in WS01

5.4 Devensian Till

5.4.1 Devensian Till was encountered underlying Made Ground in WS02 and WS04 comprising soft grey/brown gravelly sandy clay. The base of the unit was not encountered within 5.45m.

5.4.2 A photograph of the Devensian Till can be seen below in Figure 5-B.



Figure 5-B: Devensian Till encountered in WS04

5.5 Groundwater

5.5.1 A summary of the groundwater level data obtained during the fieldworks phase is presented below.

Exploratory hole ID	Groundwater observation
WS01	Perched groundwater encountered at 3m depth, remaining stable after 20 minutes.
WS02	Perched groundwater encountered at 3m depth, remaining stable after 20 minutes.

Table 5-B: Summary of groundwater observations during the fieldworks

5.5.2 Groundwater levels are expected to vary seasonally and in response to recent weather conditions. Long term monitoring will provide a reasonable quantification of such variation.

5.6 Evidence of Possible Contamination

5.6.1 During the ground investigation works, no significant visual or olfactory evidence of contamination was noted, except for the presence of anthropogenic materials contained within the Made Ground (ash, brick, concrete).

5.7 Obstructions and Instability

5.7.1 The table below summarises the obstructions = encountered that affected the progress of the investigation works.

Strata / Area	Depth range (m bgl)	Issue	Description
Made Ground	1.70	Obstruction	WS03 terminated due to suspected obstruction within the Made Ground.

Table 5-C: Summary of obstructions encountered during the investigation works

5.7.2 Significant instability of borehole sides was not experienced during the investigation.

6 Chemical Assessment

6.1 Topsoil Suitability

6.1.1 A composite sample of the Topsoil was obtained and tested for the sole purpose of assessing the suitability of such soils for either reuse onsite within the existing playing fields or offsite, potentially within a residential development. As such generic screening values have been adopted based upon a 'residential with home grown produce' as a precaution.

6.1.2 Assessment of laboratory test data has been carried out using published generic assessment criteria (GACs). The GACs act as screening values to provide a 'trigger' to an assessor that soil concentrations above these limits might present an unacceptable risk. Specific details regarding the published GAC sources chosen and any parameter refinements made are summarised within Appendix F, along with the order of preference where multiple GAC sources are available.

6.1.3 Asbestos does not currently have published GACs which can be used for generic assessment purposes, at this stage a present / absent trigger limit has been adopted.

6.1.4 A table analysing the test data is presented in Appendix F, and the following table summarises the outcome of the analysis.

Receptor group	CLEA model	Inorganic contaminants	Organic contaminants
Residential users (child)	Residential with homegrown produce	No exceedances	No exceedances

Table 6-A: Summary of chemical analysis

6.1.5 Based on the above, the testing indicates that the Topsoil in-situ would be chemically suitable for reuse onsite, or offsite within a residential development.

6.1.6 In addition, no asbestos was detected within the reworked Topsoil sample analysed and no suspected asbestos containing materials were observed during the site works.

6.2 Waste Disposal

6.2.1 Sampling has been undertaken to characterise the in-situ soils encountered on site for the potential disposal to landfill. The classification of soils for disposal to landfill is undertaken in accordance with WM3 (v1.2GB), and a Waste Acceptance Criteria assessment (WAC) undertaken in accordance with the limits in Annex II of the Landfill Directive (Directive 1999/31/EC).

6.2.2 A single composite sample of the Made Ground was obtained using soils from each exploratory hole, referenced as WAC01.

6.2.3 The assessment sheets are enclosed within Appendix G, and a summary of the findings is presented in the table below.

Potential waste population	Hazardous classification (LoW code)	Landfill classification
Topsoil	Non-Hazardous	Topsoil is typically unsuitable for disposal to inert landfill sites due to high organic carbon content.
Made Ground (WAC01)	Non-Hazardous (17-05-04)	Non-hazardous landfill site due to elevated total organic carbon, total PAHs and antimony.

Natural soils	Non-Hazardous (17-05-04)	Inert based on soils being of natural origin and unaffected by artificial contamination.

Table 6-B: Summary of waste characterisation

6.3 Materials Management

6.3.1 In terms of the development, where reasonably practicable, landfill disposal should be minimised through the reuse of site-won materials on site, or off-site transfer of surplus soils to other development schemes or Soil Treatment Facilities. Early consideration of the site's overall material balance at the design stage is also critical in reducing the need for off-site disposal, limiting costs, and increasing the overall sustainability of the development.

6.3.2 Where Made Ground soils are to be reused onsite or materials transferred between sites, a Materials Management Plan (MMP) or Waste Exemption is recommended.

6.3.3 The process of an MMP allows soils that are suitable for reuse and have a certainty of use to not be considered a waste, and therefore not fall under the waste regulations. This scheme is self-regulated within the industry and is supported in principle by the Environment Agency.

7 Geotechnical Discussion

7.1 Scheme Overview

7.1.1 The following assessments are made on the investigatory data presented in the preceding sections of this report and are made with reference to the specific nature of the development. Should scheme proposals change then it is recommended that the validity of the conclusions of this report in relation to the revised scheme are checked.

7.1.2 The project will comprise construction of a LED floodlit tarmacadam PlayZone pitch (measuring approximately 30m x 25m in size) for football and basketball use. In view of the scheme proposals, the geotechnical elements considered in this report are outlined below:

a) Floodlight and pitch foundations
b) Drainage

7.2 Key Geotechnical Issues

7.2.1 In view of the ground conditions, the following list summarises the key geotechnical issues that may i mpact the scheme and will therefore need to be appropriately managed during the lifecycle of the project:

- Made Ground
- Mining legacy

7.3 Made Ground

7.3.1 The Made Ground deposits recorded in all exploratory holes are considered unsuitable for supporting concentrated foundation loads due to their low strength/density and variable/compressible nature. Accordingly, foundations should extend, as a minimum, through such deposits.

7.3.2 The full thickness of Made Ground was only proven in WS04 in the south-western part of the site, with deposits of Devensian Till present at depths of 4.3m bgl. It is noted that WS03 in the north-western part of the site terminated at shallow depth, however, based on ground conditions encountered elsewhere, Made Ground in anticipated to extend to similar depths.

7.3.3 Due to the thickness of the Made Ground, adoption of pad foundations for the proposed floodlights is highly unlikely to be feasible, with such deposits promoting excessive amounts of total and differential settlement. Some form of ground improvement could allow adoption of such foundations, alternatively a piled foundation could be utilised.

7.4 Mining Legacy

7.4.1 The site is located within a Coal Mining Reporting Area, but outside of a Development High Risk Area. No recorded or probable unrecorded workings, coal seams, mine entries or opencasts are located within 100m of the site.

7.4.2 Review of a Coal Authority report contained in the Integra consulting Phase 1 report indicates no shallow mining risk, or presence of mine shafts and open cast sites in close proximity.

7.4.3 On the basis of the above, the risk from ground instability associated with coal mining legacy is considered to be very low.

7.5 Foundation Strategy

7.5.1 In view of the key geotechnical issues discussed above and anticipated loadings the following foundation types are considered suitable for the project;

- Piles
- Ground Improvement

7.6 Floodlight Foundations

7.6.1 Due to the depth of Made Ground present across site, as discussed in in Section 5.3 above, piled foundations would be necessary, or some form of ground improvement (vibrotreatment, rapid impact compaction or controlled modulus columns) in order to provide suitable support to the proposed floodlights and allowing adoption of shallow foundations. The latter options would need specialist input.

7.6.2 A driven/bored piled solution would transmit superstructural loads down through the Made Ground and into more competent Devensian Till deposits at depth to obtain end bearing and shaft adhesion support.

7.6.3 It is recommended the type, design and installation of the piles are determined by a specialist piling contractor who has experience in pile installation in these or similar ground conditions and may be able to interpret the observed ground conditions in a different and potentially more beneficial manner. It is possible that if piled foundations are adopted, a further ground investigation comprising of deeper boreholes will be required on site to establish design parameters ahead of construction.

7.6.4 Due to a combination of cost, programme and site constraints, some alternative foundation or ground improvement solutions to minimise settlement below floodlight foundations could be viable for the development. The following solutions may be technically feasible for the site and are discussed in brief below: -

- Controlled Modulus Columns (CMC)
- Rapid Impact Compaction (RIC)
- Soil Mixing

7.6.5 Controlled Modulus Columns (CMC) provide a fast and economical alternative to piling. The technique installs low strength concrete columns (280mm to 500mm) in diameter, utilising a displacement tool attached to a rig. The concrete columns would enhance the bearing capacity beneath proposed floodlights, which would in turn reduce total/ differential settlement.

7.6.6 Rapid Impact Compaction (RIC) compacts granular/mixed soil surfaces through introduction of high frequency energy impacts. The RIC consists of a compaction foot which is placed on the ground and repeatedly struck by a 7-12 tonne hydraulic rammer, resulting in top-down compaction of the soil, thus enhancing bearing capacities, reducing settlement and allowing adoption of shallow pad foundations.

7.6.7 Soil mixing involves modifying the properties of weak soils to improve load carrying and permeability characteristics. The process uses a single or multi tool auger to break up the soil, which is then injected at low pressures with a specifically designed binder and mixed within the soils.

7.6.8 Should an alternative approach to foundation design be considered, it is recommended the advice of a specialist in the field of the above processes is sought ahead of design. It is also possible that further site investigation would be required to facilitate design of such specialist techniques.

7.7 Artificial Pitch Foundations

7.7.1 It is anticipated that the proposed PlayZone will be located at or about existing ground levels, with the formation located on Made Ground following removal of any Topsoil type material. Some of the existing embankment along the west of the site may require removal/relocation to facilitate construction of the pitch.

7.7.2 CBR value has been determined for the proposed PlayZone using in-situ Dynamic Cone Penetrometer testing following the methodology defined by the Highways England Document CS229 Data for Pavement Assessment. The results are presented in Appendix C and the location of test positions are shown on Drawing 01.

7.7.3 Based on the anticipated founding depth and DCP results, a CBR design value of 10% can be adopted for soils that are likely to be representative of those which remain at or near pitch formation levels. It should be noted that values range from 7% to >100% within 0.5m depth below Topsoil.

7.7.4 The Made Ground materials are anticipated to exhibit a degree of variability and compaction It is recommended that the formation level is trimmed and rolled following the requirements outlined in the Specification for Highway Works Series 600. Such a process will identify any soft/loose areas, which should either be excavated out and backfilled with a suitable well compacted material similar to those exposed in the sides of the resulting excavation, or large cobbles of a good quality stone rolled into the formation to stabilise the ‘soft/loose’ area.

7.7.5 Alternatively, consideration should be given to excavating, sorting and compacting the initial 1m depth of Made Ground to achieve consistent levels of compaction across the proposed PlayZone and minimising the potential effects of differential settlement, in addition to the use of a geosynthetic reinforcement.

7.7.6 In addition, increasing and homogenising the density of the Made Ground through ground improvement techniques such as rolling dynamic compaction (RDC) or permeation grouting/lime & cement stabilisation could be undertaken. These are notably expensive and would require specialist input at the feasibility stage.

7.8 Drainage

7.8.1 In situ permeability testing has been undertaken at the site in accordance with BS EN ISO 22282 Geotechnical investigation and testing – Geohydraulic testing (2012).

7.8.2 The results are presented in Appendix C and summarised below:

Exploratory hole ID	Stratum tested	Cycle	Infiltration rate (m/s)
WS03	Made Ground	1	N/A
WS04		1	7.24×10^{-7}

Table 7-A: Summary of infiltration test results undertaken in accordance with BRE 365

7.8.3 Due to insufficient infiltration over a test period of 90 minutes, permeability could not be determined within cohesive Made Ground soils within WS03. In addition, whilst a fall in water was noted in WS04, it is likely this water is draining into the more granular Made Ground above the clay soils of the Devensian Till, the latter considered to be effectively impermeable.

7.8.4 Discharge of stormwater collected by the proposed development into Made Ground deposits are not considered amenable. Water freely/directly discharged into the Made Ground could cause collapse of air voids contained in these deposits, which promotes compaction of the soils around the soakaway causing depression of the general area around the soakaway as well as potentially affecting pipe runs leading to the soakaway. In addition, soakaways would promote leaching of contaminants within the Made Ground soil.

7.8.5 On this basis, disposal of stormwater via a soakaway is not considered viable.

7.8.6 No existing soakaway features were observed on site during ground investigation works; however, a full drainage survey was not undertaken.

7.8.7 As an alternative, it is possible that the PlayZone drainage could key into the existing surface water drainage system currently used by the school to the southwest. A manhole cover was presnet to the southwest of the PlayZone area. If this is considered an option for the development a comprehensive drainage assessment will be required to determine the potential impact on the capacity of the existing systems, to identify the invert levels of existing features, and to confirm drainage gradients achievable across the proposed PlayZone area.

7.9 Aggressiveness of the Ground to Buried Concrete

7.9.1 The aggressiveness of the ground with respect to buried concrete has been assessed in accordance with Building Research Establishment Special Digest 1: Concrete in Aggressive Ground Third Edition (2005).

7.9.2 The site is interpreted to be a brownfield site where pyrite is likely to be present.

7.9.3 The classification of the strata is tabulated below:

Stratum	Disturbed / Undisturbed	Design sulphate class	Aggressive chemical environment for concrete class
Made Ground	Disturbed	DS-1	AC-1
Devensian Till	Disturbed	DS-1	AC-1s
	Undisturbed	DS-1	AC-1s

Table 7-B: Summary of the aggressiveness of the ground to buried concrete

7.9.4 It should be noted that where concrete is in contact with more than one soil type then the most onerous DS and ACEC classification should be adopted.

8 Recommendations for further works

8.1.1 If a piled foundation solution is adopted for the proposed floodlighting across the proposed development area, it is recommended this investigation is supplemented with further onsite deeper boreholes providing parameters to facilitate design and construction.

8.1.2 If ground improvement (such as vibrotreatment, dynamic compaction, rapid impact compaction or controlled modulus columns) is utilised, potentially allowing adoption of shallow foundations, or lime/cement stabilisation is utilised below the proposed pitch, specialist input at an early stage is recommended.

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Appendix A Drawings



Key:

Site Features

- Site Boundary
- Pitch Boundary

Exploratory Holes

- Windowless Sampling Borehole
- DCPs (CBR)
- Infiltration Testing

Notes

1) Base image provided by Google.

2) All drawn features are approximate.

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Map data © 2023 Google

REV	DATE	COMMENT ON VARIATION
A	March 2024	First issue

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PROJECT
Unity Primary School, Manchester

TITLE
Exploratory Hole Location Plan

DRAWING No.
STV6309-D01-A

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Appendix B Exploratory Hole Logs

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Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.

Sampling		
From (m) To (m)	Records depth of sampling	
Type	D	Disturbed sample
	B	Bulk disturbed sample
	ES	Environmental sample
	W	Water sample
	U	Undisturbed thick-walled sample 100mm diameter sampler
	UT	Undisturbed thin walled sample 100mm diameter sampler
	UTF	Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

Water level observed after specified delay in drilling

Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT RESULT	SPT CASING DEPTH (m)	SPT WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto brown slightly gravelly silty fine SAND with frequent rootlets. Gravel is fine subrounded sandstone. (TOPSOIL)											0.10		D
		0.25												
	Greyish brown slightly sandy fine subrounded GRAVEL of sandstone. (MADE GROUND)	0.33												
	Stiff to very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded brick, concrete, sandstone and coal. (MADE GROUND)									PP 0.70 PP 0.80	PP=225 PP=175	0.80		D
		1.00				C 1.00 - 1.45	(19) 20					1.00	2.00	B
	Medium dense black and brown clayey sandy fine to coarse GRAVEL of angular to subangular brick, concrete, coal, clinker, chalk and sandstone. (MADE GROUND)													
	...between 2m and 3m depth, becoming very clayey.					C 2.00 - 2.45	(5) 11							
		3.00			▼	C 3.00 - 3.45	(5) 7					3.00	4.00	B
	Loose becoming very loose dark grey very gravelly silty medium to coarse SAND. Gravel is fine to coarse angular to subangular brick, concrete, coal and sandstone. (MADE GROUND)					C 4.00 - 4.45	(1) 2							
						C 5.00 - 5.45	(2) 1							
		5.45												
	BOREHOLE TERMINATED AT 5.45m													

Notes
Terminated at scheduled depth.

Groundwater observations
Groundwater encountered at 3m depth. Water level remained constant after 20 minutes.

Title
Dynamic Windowless Sampling record

Recovery details		Method	Logged by	Date(s)
Range (m)	Recovery (%)	Windowless sampler	JT	01/02/2024
1.20 - 2.00	70	**Level (m OD)**	**Compiled by**	**Sheet number**
2.00 - 3.00	70	-	KD	Sheet 1 of 1
3.00 - 4.00	40	**Co-ordinates**	**Checked by**	**Revision**
4.00 - 5.00	20	-	DH	A

WS01

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INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown slightly gravelly slightly silty fine SAND with frequent rootlets. Gravel is fine subangular brick. (TOPSOIL)											0.10		D
	Stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular to subangular brick and concrete. (MADE GROUND)	0.30								PP 0.80	PP=197	0.90		D
	Medium dense becoming loose black mottled brown and grey very gravelly silty medium SAND. Gravel is fine to coarse subangular to angular brick, coal and sandstone. Occasional very thin bands of clay. (MADE GROUND)	1.00				C 1.00 - 1.45	(13) 18					1.00	2.00	B
						C 2.00 - 2.45	(3) 9							
	Loose brown sandy silty fine to medium angular to subangular GRAVEL of brick and sandstone. (MADE GROUND)	3.00				C 3.00 - 3.45	(7) 8					3.00	3.50	B
	Soft grey sandy gravelly CLAY. Gravel is fine to medium subrounded to rounded sandstone and coal. (MADE GROUND)	3.50								PP 3.60	PP=25	3.70		D
						C 4.00 - 4.45	(1) 3							
						C 5.00 - 5.45	(1) 2			PP 4.80	PP=25			
	BOREHOLE TERMINATED AT 5.45m	5.45												

Notes
Terminated at scheduled depth.

Groundwater observations
Groundwater encountered at 3m depth. Water level remained constant after 20 minutes.

Recovery details	
Range (m)	Recovery (%)
1.20 - 2.00	90
2.00 - 3.00	20
3.00 - 4.00	80
4.00 - 5.00	50

Title
Dynamic Windowless Sampling record

Method
Windowless sampler

Logged by
JT

Level (m OD)
-

Compiled by
KD

Co-ordinates
-

Checked by
DH

Date(s)
01/02/2024

Sheet number
Sheet 1 of 1

Revision
A

WS02

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto soft brown slightly gravelly silty medium SAND with frequent rootlets. Gravel is fine to medium subangular to rounded sandstone. (TOPSOIL)											0.10		D
	Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded brick, sandstone and coal. (MADE GROUND)	0.30												
	...between 0.3m and 0.4m depth, becoming subangular medium sandstone.									PP 0.80	PP=225	0.80		D
						C 1.00 - 1.45	(4) 37							
										PP 1.50	PP=117	1.60		D
	BOREHOLE TERMINATED AT 1.70m	1.70				C 1.70 - 2.14	(19) 46/295mm			PP 1.70	PP=117			

Notes
Terminated due to obstruction.

Groundwater observations
Groundwater not encountered.

Title
Dynamic Windowless Sampling record

Recovery details		Method	Logged by	Date(s)
Range (m)	Recovery (%)	Windowless sampler	JT	02/02/2024
1.20 - 1.70	40	**Level (m OD)** -	**Compiled by** KD	**Sheet number** Sheet 1 of 1
		Co-ordinates -	**Checked by** DH	**Revision** A

WS03

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto soft brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to medium angular to subangular brick and sandstone. (TOPSOIL)	0.20										0.10		D
	Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular subangular sandstone and brick. (MADE GROUND)											0.50		D
						C 1.00 - 1.45	(4) 10							
										PP 1.30	PP=50			
												1.50		D
										PP 1.80	PP=58			
						C 2.00 - 2.45	(12) 27							
	Loose dark brown to black gravelly slightly silty fine SAND. Gravel is fine subangular brick. (MADE GROUND)	3.00				C 3.00 - 3.45	(3) 7					3.00	4.00	B
						C 4.00 - 4.45	(3) 2							
	Soft brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine subangular sandstone. (DEVENSIAN TILL)	4.30								PP 4.60	PP=104	4.70		D
										PP 4.80	PP=100			
						C 5.00 - 5.45	(2) 2							
	BOREHOLE TERMINATED AT 5.45m	5.45												

Notes
Terminated at scheduled depth.

Groundwater observations
Groundwater not encountered.

Title
Dynamic Windowless Sampling record

Recovery details Range (m)	Recovery (%)
1.20 - 2.00	70
2.00 - 3.00	80
3.00 - 4.00	70
4.00 - 5.00	80

Method
Windowless sampler

Logged by
JT

Level (m OD)
-

Compiled by
KD

Co-ordinates
-

Checked by
DH

Date(s)
01/02/2024

Sheet number
Sheet 1 of 1

Revision
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WS04

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Appendix C In Situ Test Results

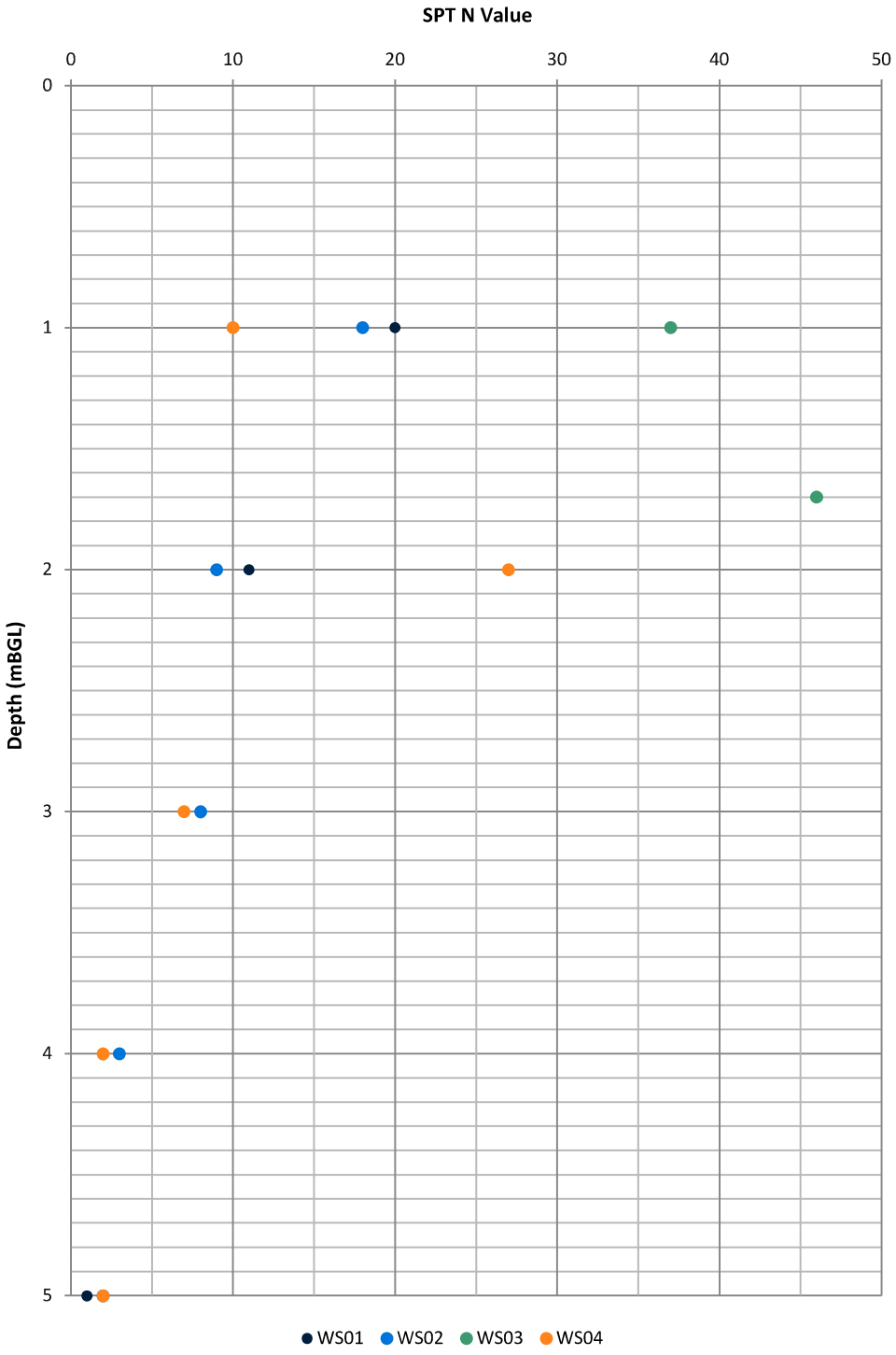
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Table summarising Standard Penetration Test (SPT) results

Location	Start Depth (m)					Penetration (mm)	
		Seating 1-2	Main 1-4	Total Seating	Total Main	Total Seating	Total Main
WS01	1.00	8/11	5/5/5/5	19	20	150	300
WS01	2.00	3/2	3/2/3/3	5	11	150	300
WS01	3.00	3/2	2/2/1/2	5	7	150	300
WS01	4.00	1/0	0/1/0/1	1	2	150	300
WS01	5.00	1/1	0/0/1/0	2	1	150	300
WS02	1.00	6/7	6/5/4/3	13	18	150	300
WS02	2.00	2/1	1/2/3/3	3	9	150	300
WS02	3.00	3/4	2/1/2/3	7	8	150	300
WS02	4.00	0/1	1/0/1/1	1	3	150	300
WS02	5.00	1/0	0/1/0/1	1	2	150	300
WS03	1.00	2/2	4/10/12/11	4	37	150	300
WS03	1.70	8/11	13/13/12/8	19	46	150	295
WS04	1.00	2/2	2/4/2/2	4	10	150	300
WS04	2.00	4/8	9/6/7/5	12	27	150	300
WS04	3.00	1/2	1/2/2/2	3	7	150	300
WS04	4.00	2/1	1/0/1/0	3	2	150	300
WS04	5.00	1/1	1/0/0/1	2	2	150	300

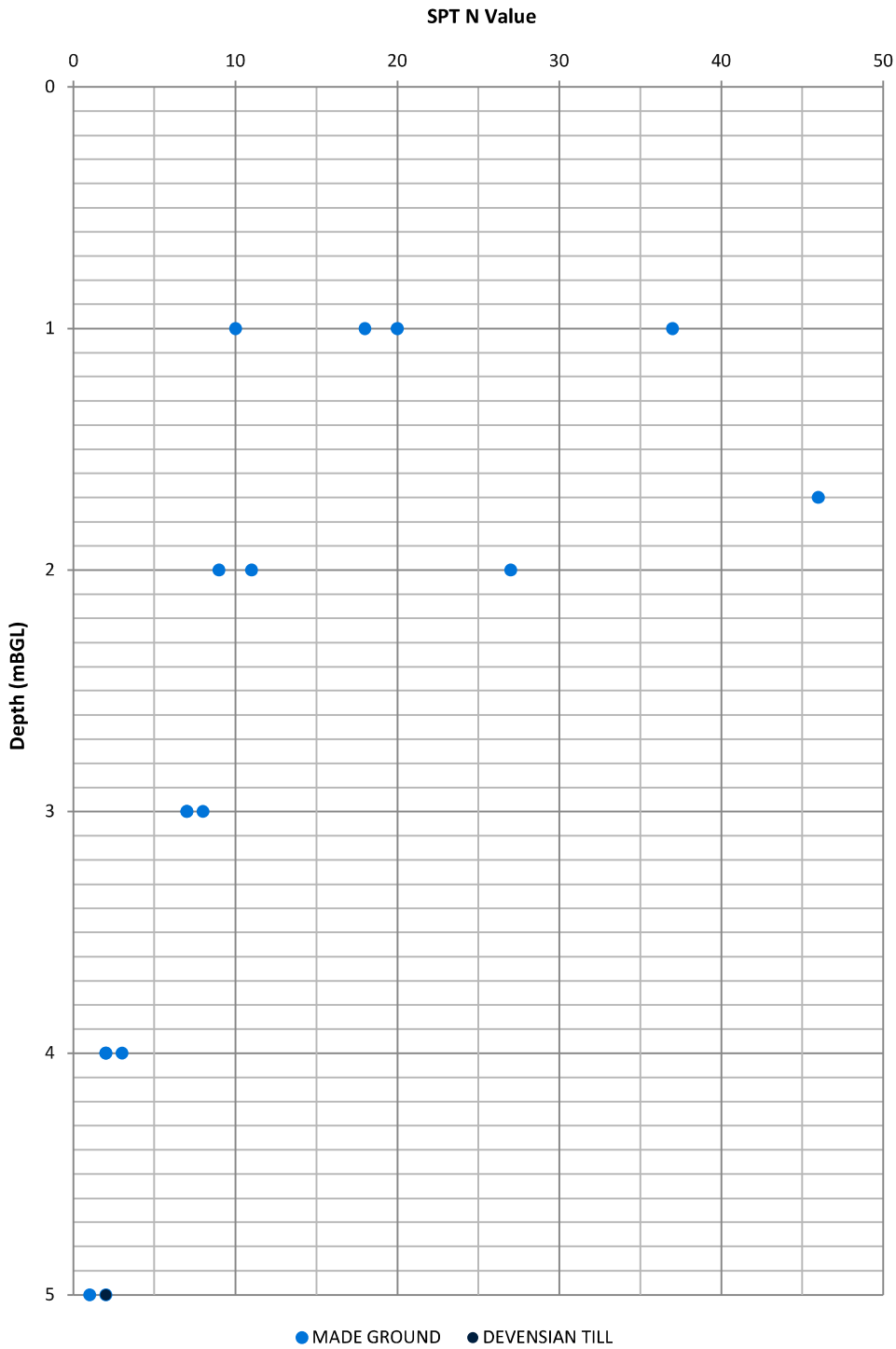
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Plot summarising Standard Penetration Test (SPT) results versus depth filtered by location



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Plot summarising Standard Penetration Test (SPT) results versus depth filtered by geology



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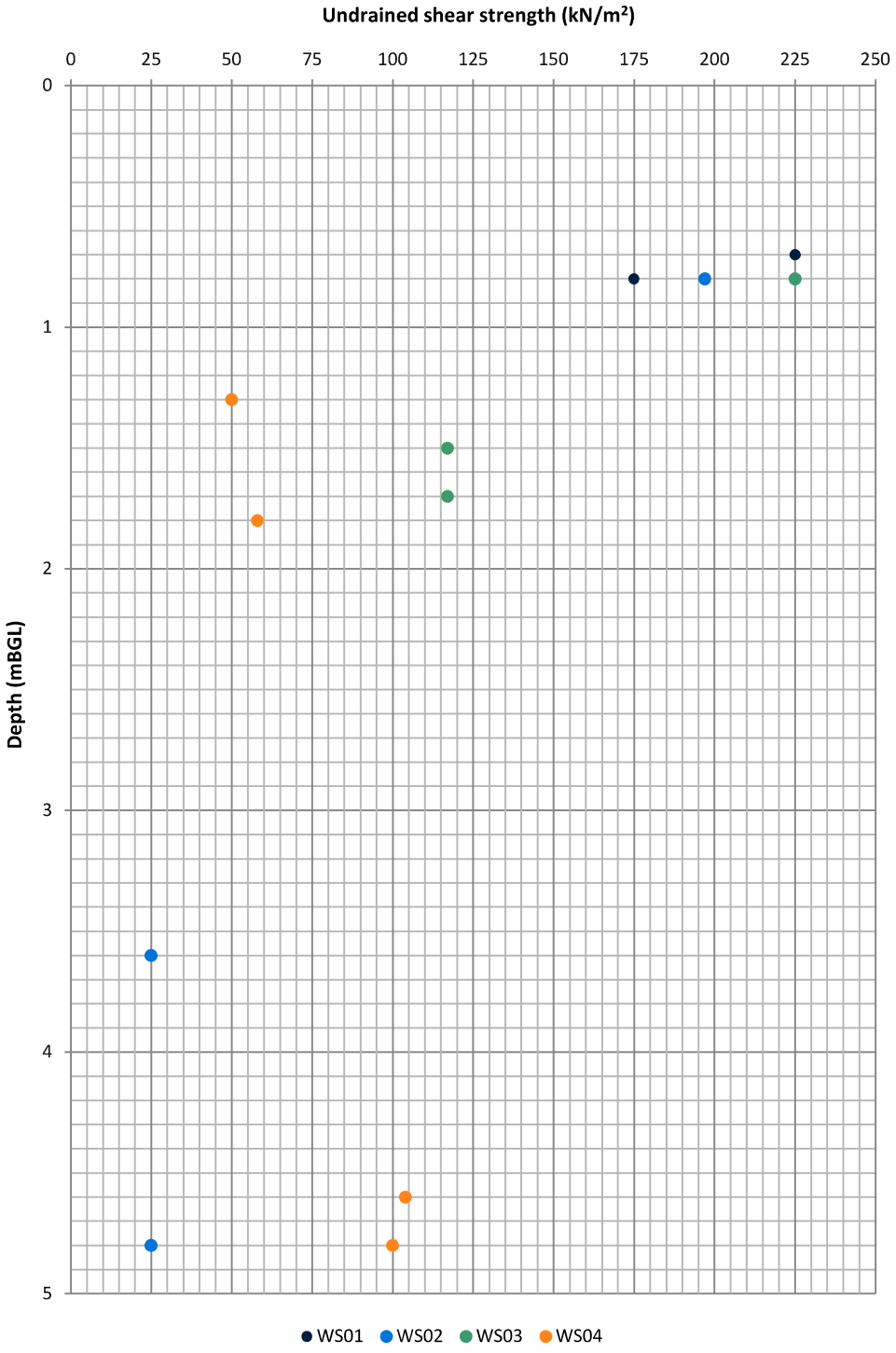
Table summarising Pocket Penetrometer results

** Instrument limit reached.*

Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m^2)
WS01	0.70	4.5/4.5/4.5	4.50	225
WS01	0.80	3/4/3.5	3.50	175
WS02	0.80	3.5/3.5/4.8	3.93	197
WS02	3.60	0.5/0.5/0.5	0.50	25
WS02	4.80	0.5/0.5/0.5	0.50	25
WS03	0.80	4.5/4.5/4.5	4.50	225
WS03	1.50	3/2/2	2.33	117
WS03	1.70	2.5/2/2.5	2.33	117
WS04	1.30	0.5/1.5/1	1.00	50
WS04	1.80	1.5/1/1	1.17	58
WS04	4.60	2.5/2/1.75	2.08	104
WS04	4.80	2/2/2	2.00	100

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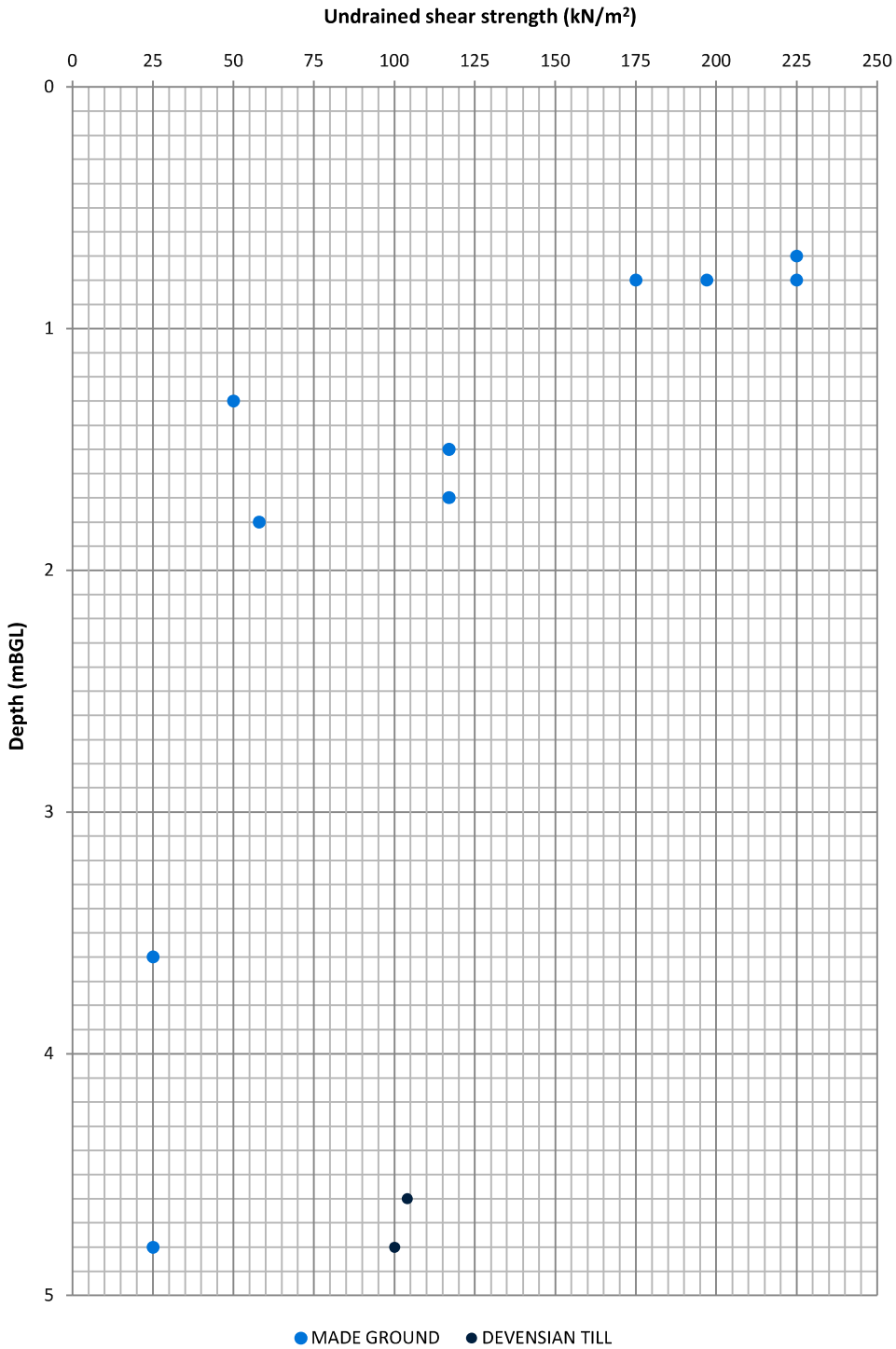
Plot summarising Pocket Penetrometer results versus depth filtered by location



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Plot summarising Pocket Penetrometer results versus depth filtered by geology



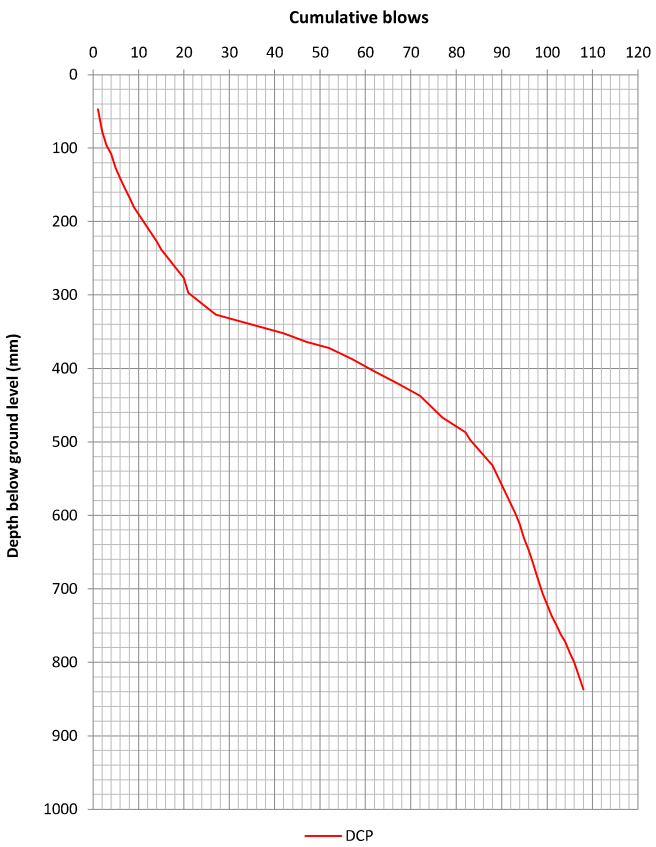
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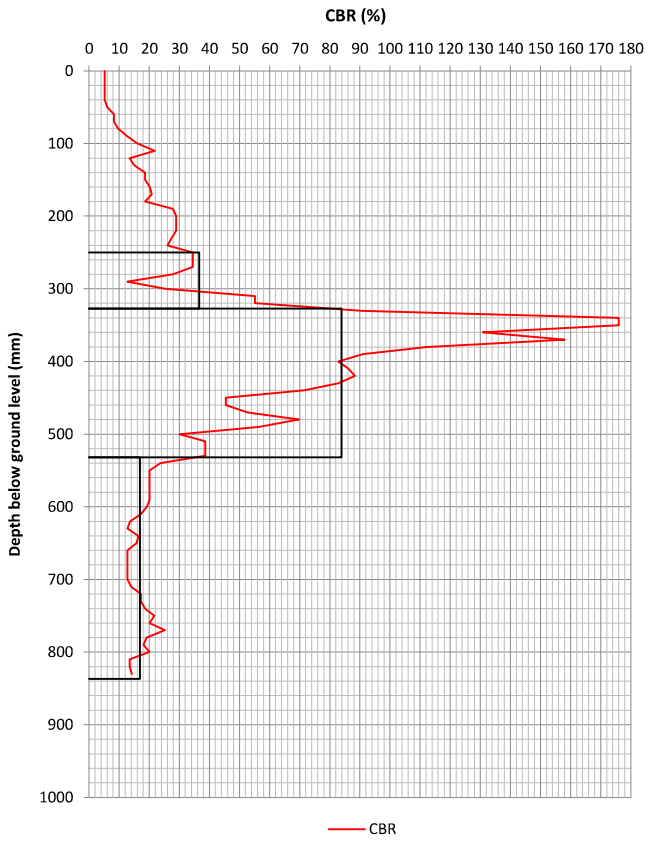
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP01	02/02/2024	0	63	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**36.6**	77	250	327
2	**83.9**	205	327	532
3	**17.0**	305	532	837

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

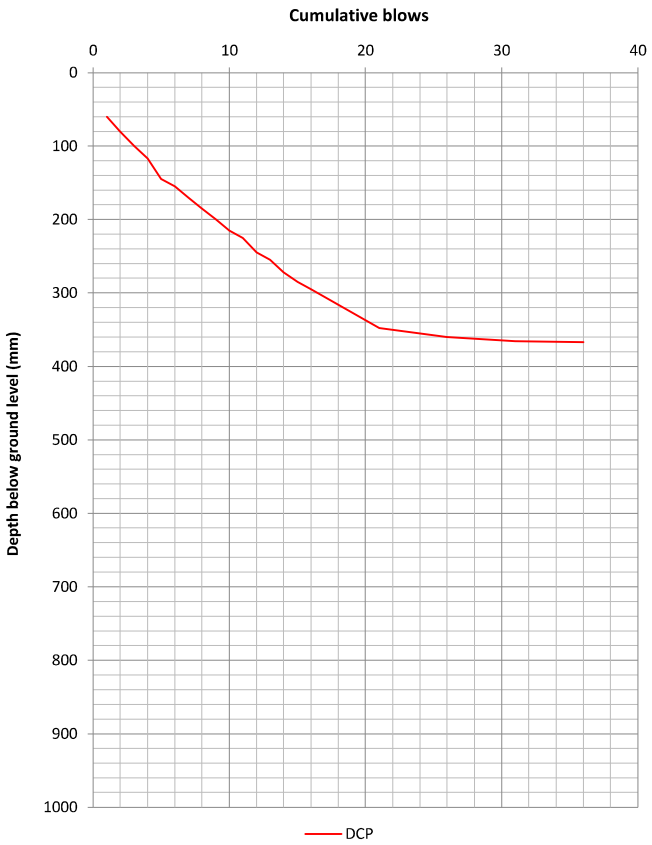
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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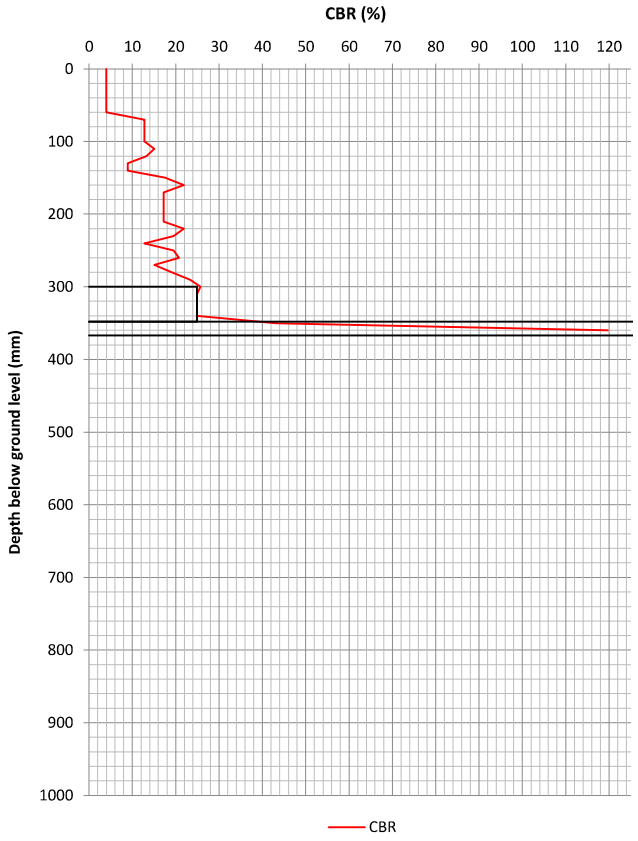
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP02	01/02/2024	0	145	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**24.9**	48	300	348
2	**235.2**	19	348	367

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

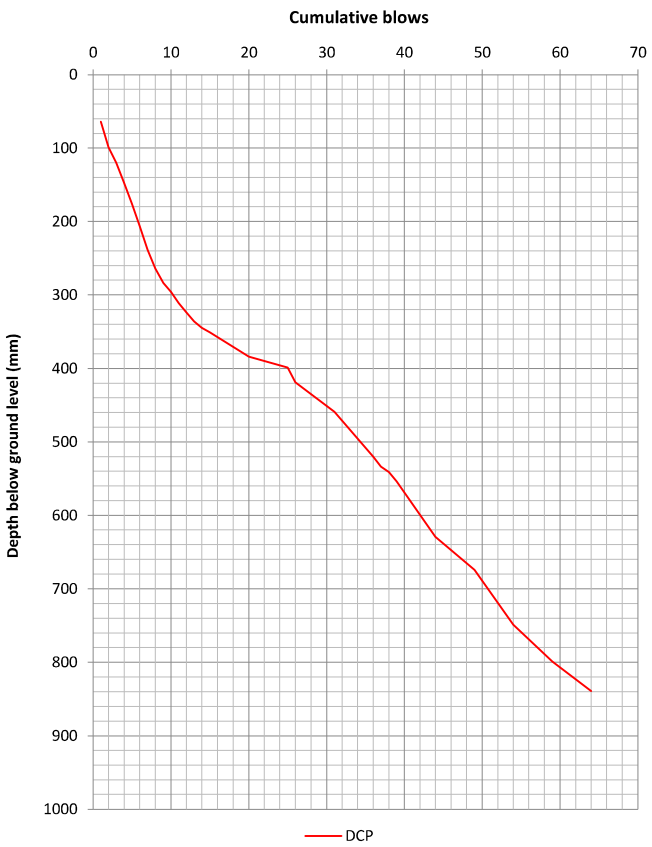
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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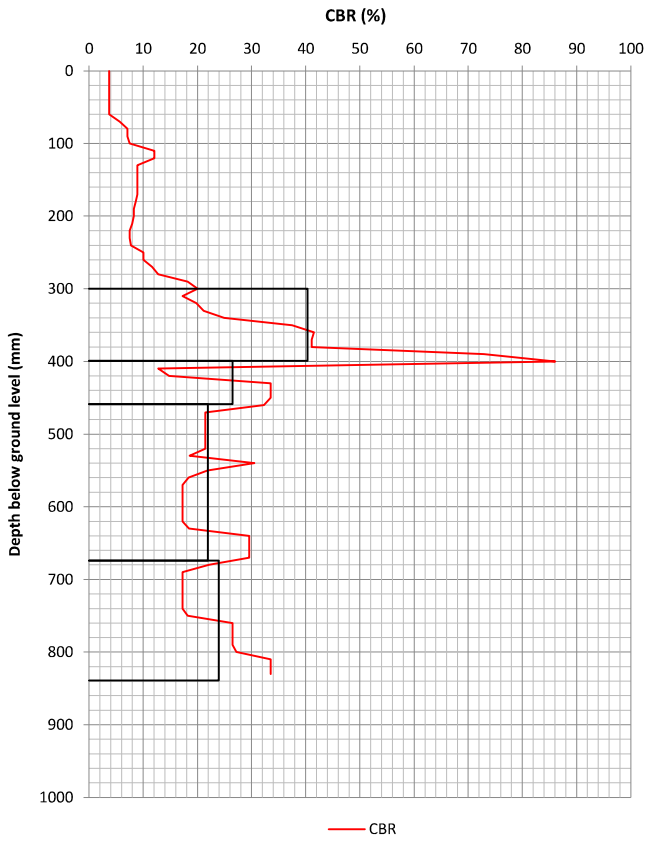
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP03	02/02/2024	0	71	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**40.3**	99	300	399
2	**26.5**	60	399	459
3	**22.0**	215	459	674
4	**23.9**	165	674	839

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

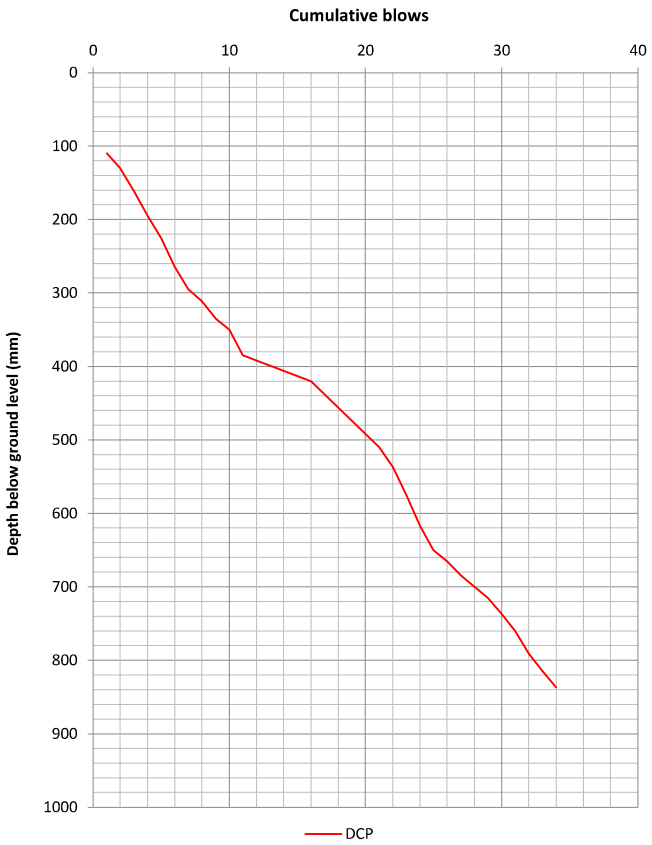
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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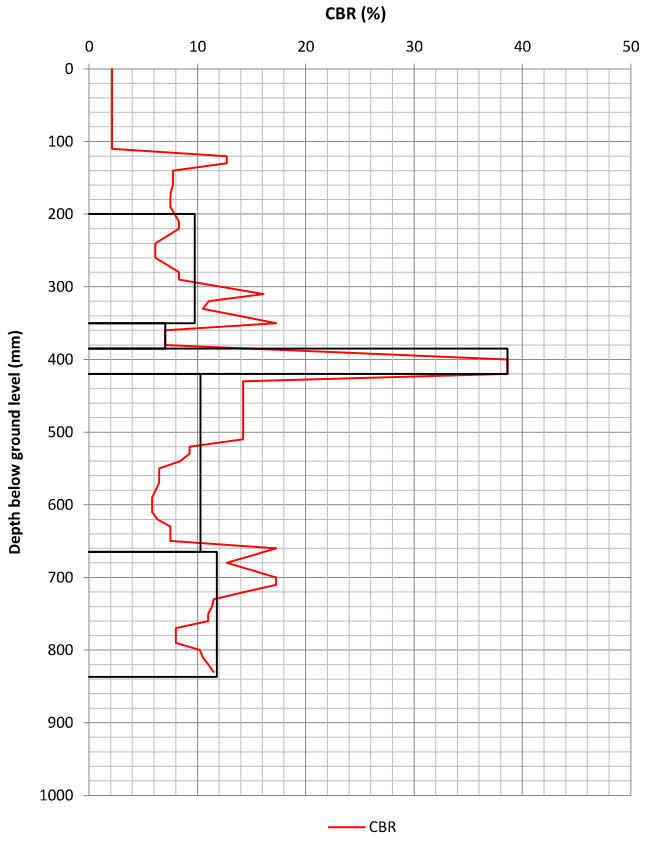
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP04	01/02/2024	0	75	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**9.8**	150	200	350
2	**7.0**	35	350	385
3	**38.6**	35	385	420
4	**10.3**	245	420	665
5	**11.8**	172	665	837

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

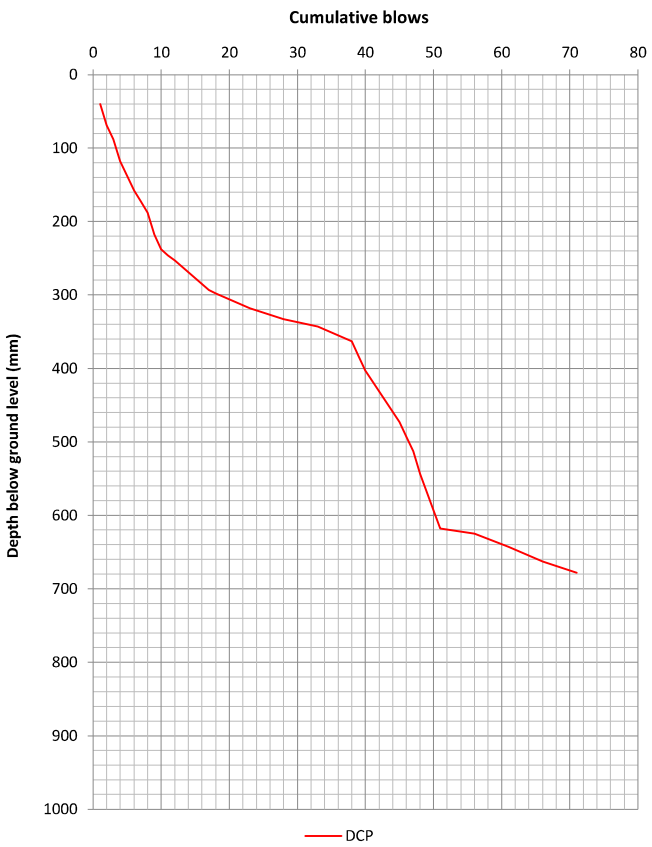
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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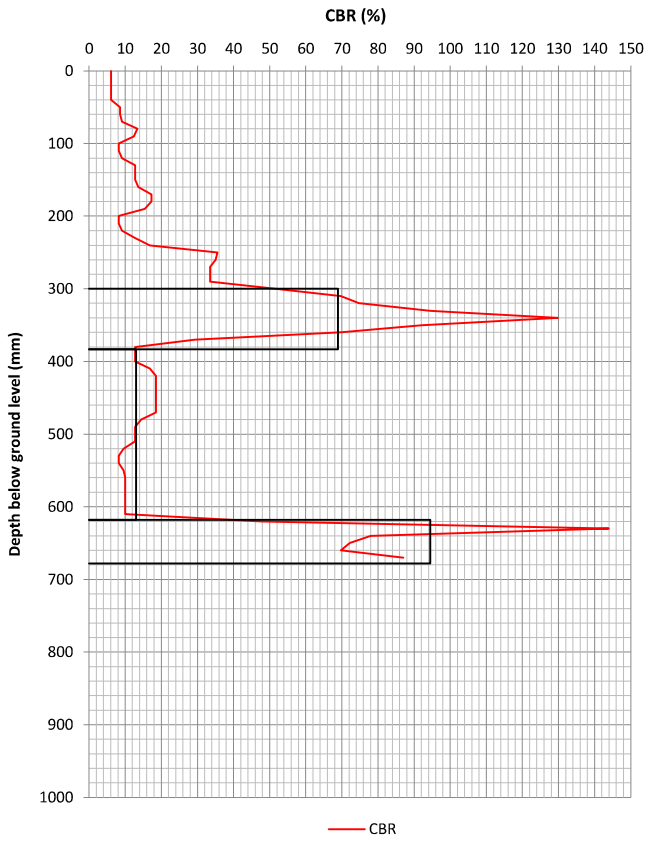
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP05	02/02/2024	0	87	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**68.9**	83	300	383
2	**13.0**	235	383	618
3	**94.6**	60	618	678

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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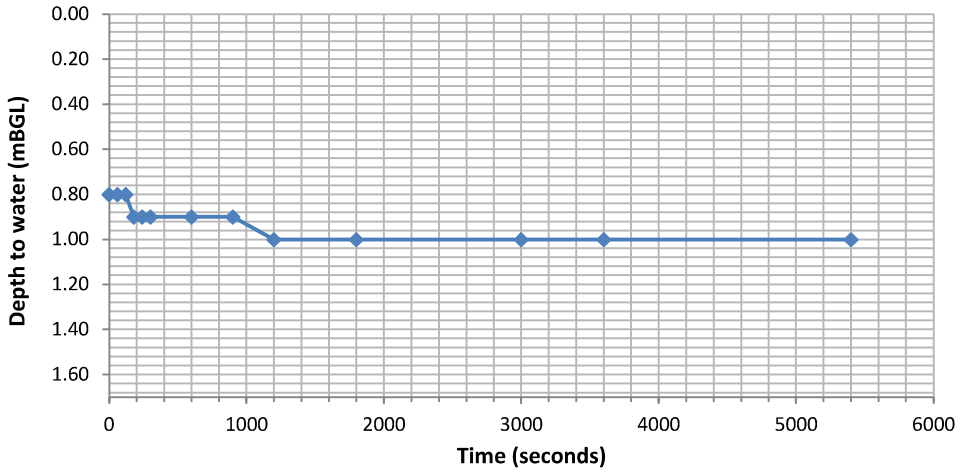
Permeability test in a borehole using open systems (BS EN ISO 22282-2:2012)

Location	Test number	Test method	Test system	Test date
WS03	1	Falling head	Open borehole	02/02/2024

Top of test section (m)	Bottom of test section (m)	Test section length (m)	Test diameter (m)
0.80	1.70	0.9	0.1

Variables at start of test

Groundwater (mBGL)	Water after injection (mBGL)	Change in head (m)
No Groundwater	0.8	0.90



Insufficient infiltration over 90 minutes of monitoring, therefore unable to determine permeability.

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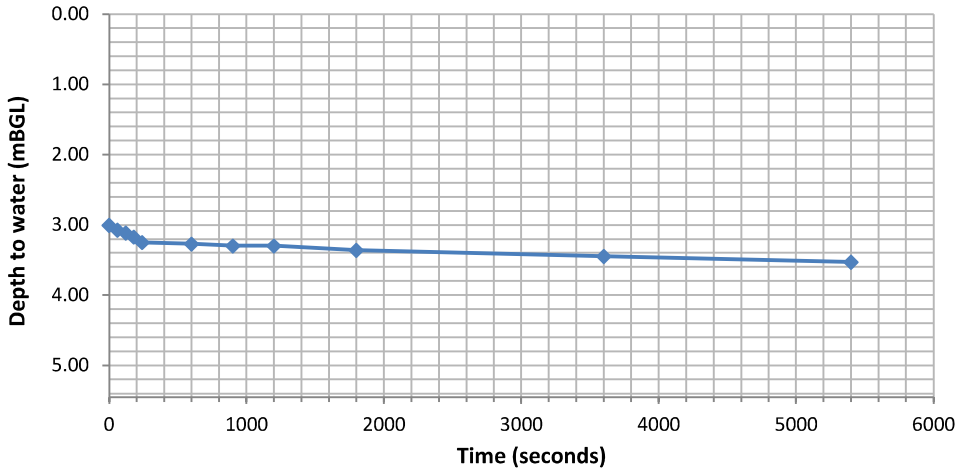
Permeability test in a borehole using open systems (BS EN ISO 22282-2:2012)

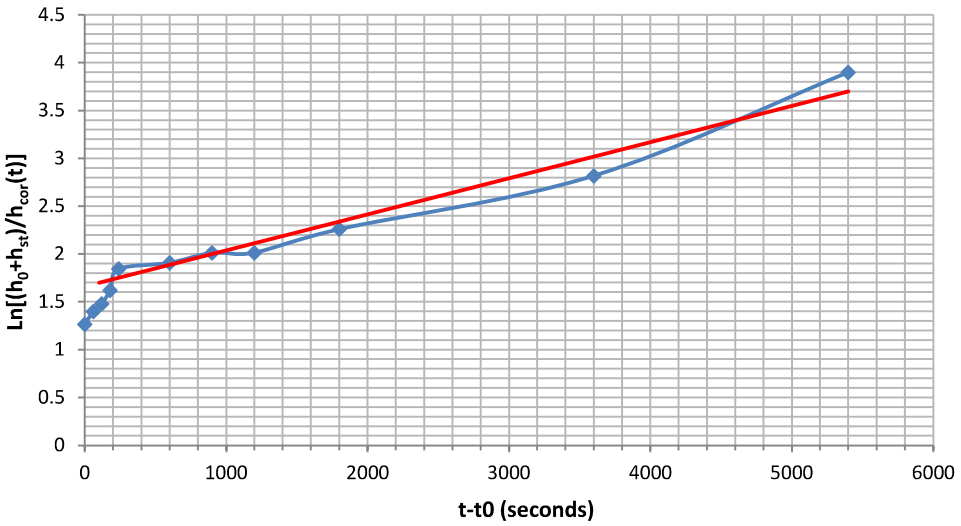
Location	Test number	Test method	Test system	Test date
WS04	1	Falling head	Open borehole	01/02/2024

Top of test section (m)	Bottom of test section (m)	Test section length (m)	Test diameter (m)
3.00	4.30	1.3	0.075

Variables at start of test

Groundwater (mBGL)	Water after injection (mBGL)	Change in head (m)
No Groundwater	3	1.30





F	Shape factor according BS EN ISO 22282-1:2012	2.304 m
S	Cross sectional area of measurement tube	0.0044 m^2
h_{st}	Corrective term to initial static level	7.29E-01 m
α	Gradient of line alpha	3.77E-04 s^{-1}
k	**Permeability (α S / F)**	**7.24E-07 m/s**

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Appendix D Geotechnical Laboratory Test Results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

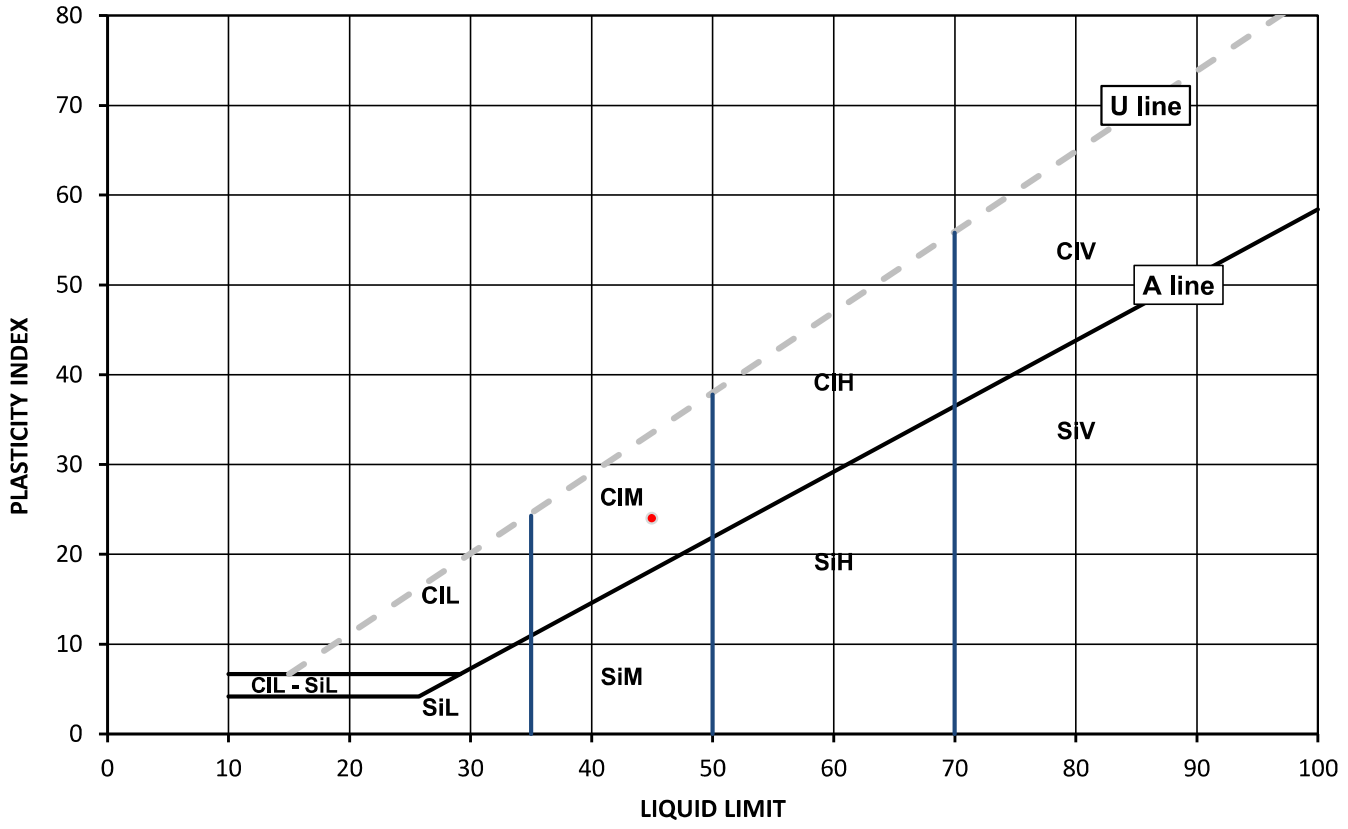
Client:	Soiltechnics Limited	Client Reference:	STV6309
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	24-001432-1
		Date Sampled:	01/02/2024
		Date Received:	05/02/2024
Contact:	Admin	Date Tested:	13/02/2024
Site Address:	Unity Primary School, Manchester	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	109174	Depth Top [m]:	0.90
Hole No.:	WS02	Depth Base [m]:	Not Given
Sample Reference:	WS020.903	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
23	45	21	24	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Banys

Katarzyna Banys
Junior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 20/02/2024

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

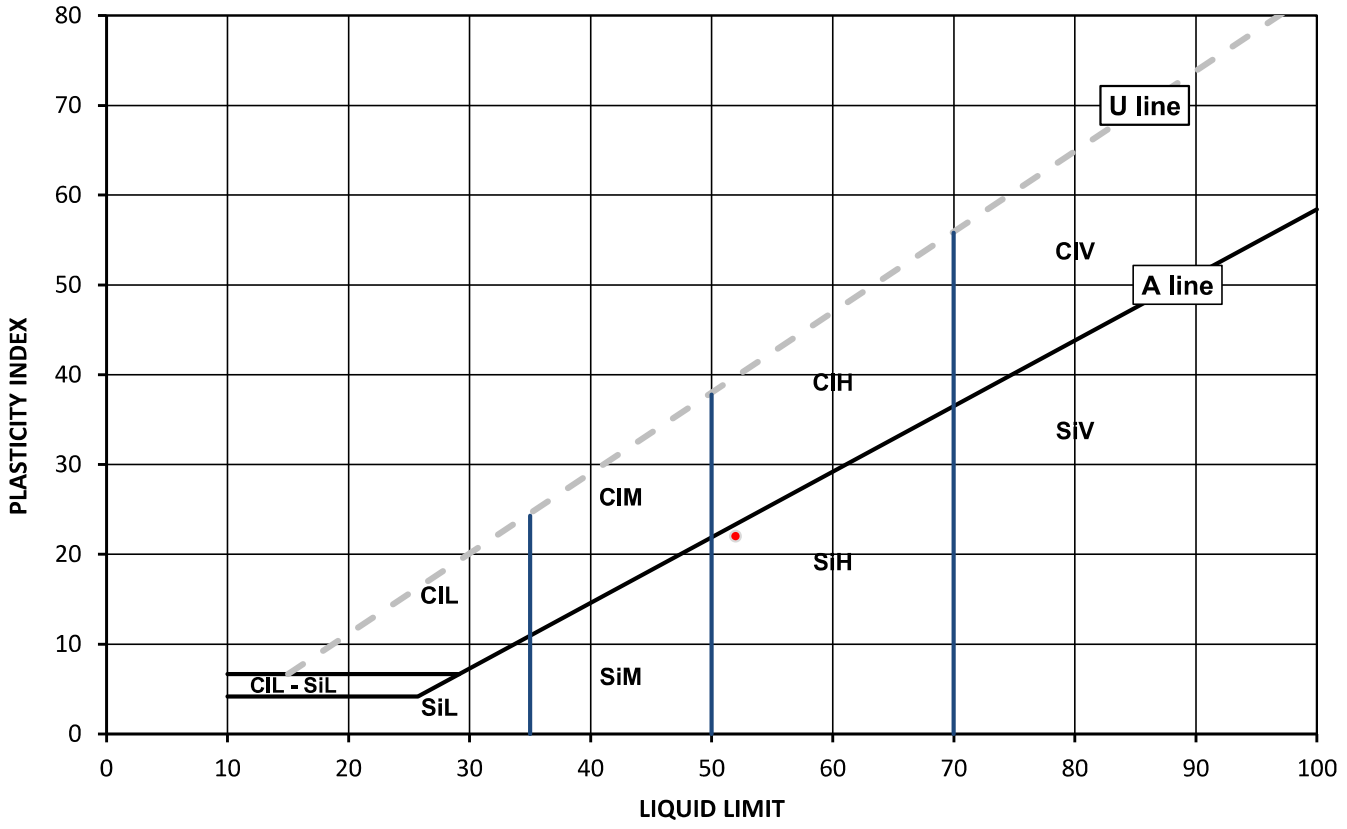
Client:	Soiltechnics Limited	Client Reference:	STV6309
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	24-001432-1
		Date Sampled:	01/02/2024
		Date Received:	05/02/2024
Contact:	Admin	Date Tested:	13/02/2024
Site Address:	Unity Primary School, Manchester	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	109175	Depth Top [m]:	4.70
Hole No.:	WS04	Depth Base [m]:	Not Given
Sample Reference:	WS044.705	Sample Type:	D
Sample Description:	Dark brown gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
22	52	30	22	52



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Banys

Katarzyna Banys
Junior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 20/02/2024

GF 232.13

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY

Contact: Admin

Site Address: Unity Primary School, Manchester

Client Reference: STV6309
Job Number: 24-001432-1
Date Sampled: 01/02/2024
Date Received: 05/02/2024
Date Tested: 13/02/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
109174	WS02	WS020.903	0.90	Not Given	D	Brown slightly sandy CLAY	Atterberg 1 Point	23		100	45	21	24						
109175	WS04	WS044.705	4.70	Not Given	D	Dark brown gravelly slightly sandy silty CLAY	Atterberg 1 Point	22		52	52	30	22						

Note: # Non accredited; NP - Non plastic

Comments:

Signed: Katarzyna Banys

Katarzyna Banys
Junior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Date Reported: 20/02/2024

GF 234.16

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton, NN6 9PY

Contact: Admin

Site Address: Unity Primary School, Manchester

Client Reference: STV6309
Job Number: 24-001432-1
Date Sampled: 01/02/2024
Date Received: 05/02/2024
Date Tested: 13/02/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
109174	WS02	WS020.903	0.90	Not Given	D	Brown slightly sandy CLAY		23	Sample was quartered, oven dried at 106.5 °C			
109175	WS04	WS044.705	4.70	Not Given	D	Dark brown gravelly slightly sandy silty CLAY		22	Sample was quartered, oven dried at 106.5 °C			

Comments:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Banys

Katarzyna Banys
Junior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 20/02/2024

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

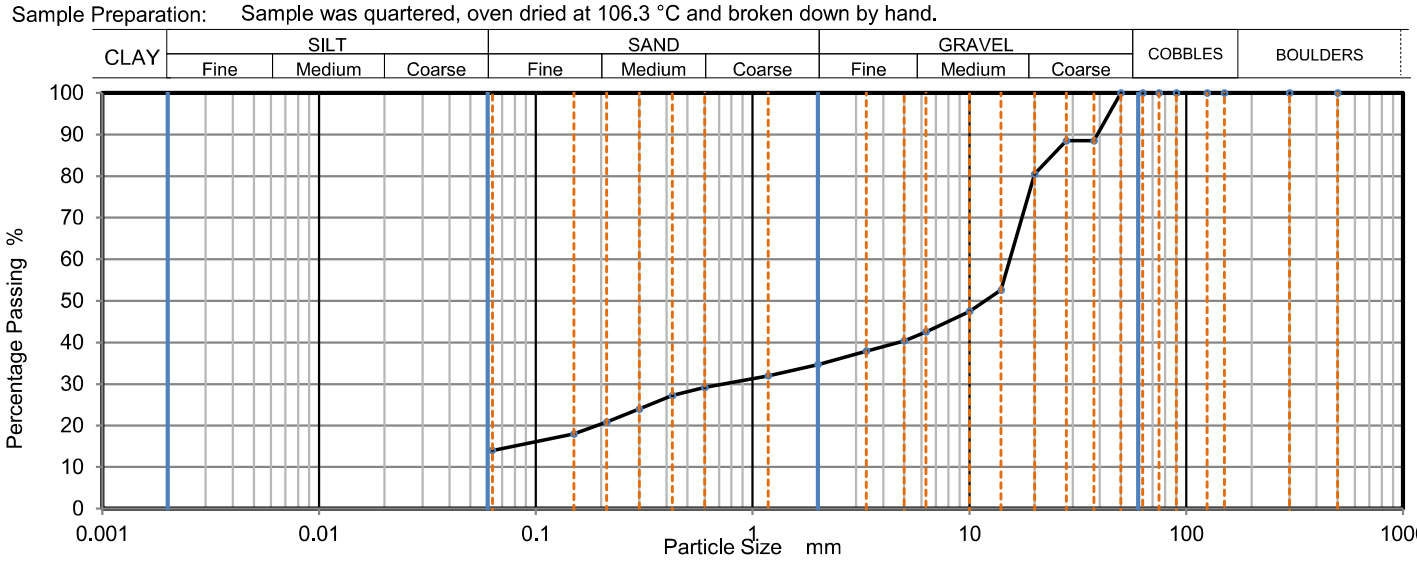
4041

Client:	Soiltechnics Limited	Client Reference:	STV6309
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	24-001432-1
		Date Sampled:	01/02/2024
		Date Received:	05/02/2024
Contact:	Admin	Date Tested:	13/02/2024
Site Address:	Unity Primary School, Manchester	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	109173	Depth Top [m]:	1.00
Hole No.:	WS01	Depth Base [m]:	2.00
Sample Reference:	WS011.002	Sample Type:	B
Sample Description:	Dark brown sandy clayey GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 106.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	89		
20	81		
14	53		
10	48		
6.3	43		
5	40		
3.35	38		
2	35		
1.18	32		
0.6	29		
0.425	27		
0.3	24		
0.212	21		
0.15	18		
0.063	15		

Sample Proportions	% dry mass
Very coarse	0
Gravel	65
Sand	20
Fines <0.063mm	15

Grading Analysis		
D100	mm	50
D60	mm	15.4
D30	mm	0.733
D10	mm	
Uniformity Coefficient		> 240
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Banys

Katarzyna Banys
Junior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 20/02/2024

GF 100.23

Soiltechnics Limited
Cedar Barn
White Lodge
Walgrave, Northampton
NN6 9PY

e: admin@soiltechnics.net

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-001435

Project / Site name:	Unity Primary School, Manchester	**Samples received on:**	05/02/2024
Your job number:	STV6309	**Samples instructed on/ Analysis started on:**	05/02/2024
Your order number:	POR017711	**Analysis completed by:**	16/02/2024
Report Issue Number:	1	**Report issued on:**	21/02/2024
Samples Analysed:	3 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-001435
Project / Site name: Unity Primary School, Manchester
Your Order No: POR017711

Lab Sample Number				109180	109181	109182
Sample Reference				WS01	WS04	WS04
Sample Number				WS011.002	WS041.503	WS044.705
Depth (m)				1.00-2.00	1.50	4.70
Date Sampled				01/02/2024	01/02/2024	01/02/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	59	37	< 0.1
Moisture Content	%	0.01	NONE	13	10	16
Total mass of sample received	kg	0.1	NONE	2	0.5	0.5
General Inorganics						
pH (L099)	pH Units	N/A	MCERTS	8.4	8.4	8.2
Total Sulphate as SO4	%	0.005	MCERTS	0.083	0.063	0.028
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	86	160
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	52.1	43.1	81.9
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.6	2.9	3.8
Total Sulphur	mg/kg	50	MCERTS	390	350	180
Total Sulphur	%	0.005	MCERTS	0.039	0.035	0.018
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	2.9	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0
Heavy Metals / Metalloids						
Magnesium (leachate equivalent)	mg/l	2.5	NONE	7.2	4.2	24
Magnesium (water soluble)	mg/kg	5	NONE	14	8.4	47

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 24-001435
Project / Site name: Unity Primary School, Manchester

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
109180	WS01	WS011.002	1.00-2.00	Brown loam and sand with gravel and brick
109181	WS04	WS041.503	1.5	Brown clay and sand with gravel and brick
109182	WS04	WS044.705	4.7	Brown loam and clay with gravel

Analytical Report Number : 24-001435
Project / Site name: Unity Primary School, Manchester

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	D	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

soiltechnics
environmental ▪ geotechnical ▪ building fabric

Appendix E Geoenvironmental Laboratory Test Results

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

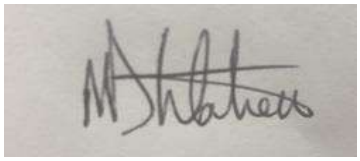
Final Report

Report No.:	24-03259-1
Initial Date of Issue:	13-Feb-2024
Re-Issue Details:	
Client	Soiltechnics Limited
Client Address:	Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY
Contact(s):	Admin
Project	STV6309 Unity Primary School, Manchester

Quotation No.:		**Date Received:**	05-Feb-2024
Order No.:	POR017710	**Date Instructed:**	05-Feb-2024
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	09-Feb-2024
Date Approved:	13-Feb-2024		

Approved By:





Details: Stuart Henderson, Technical Manager
Nick Watson, Operations Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: STV6309 Unity Primary School, Manchester

Client: Soiltechnics Limited				**Chemtest Job No.:**		24-03259	24-03259
Quotation No.:				**Chemtest Sample ID.:**		1761983	1761984
Order No.: POR017710				Client Sample Ref.:		1	1
				Client Sample ID.:		TS010.101	WAC010.501
				Sample Location:		TS01	WAC01
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.10	0.50
				Date Sampled:		01-Feb-2024	01-Feb-2024
				Asbestos Lab:		DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type		U	2192		N/A	-	Fibres/Clumps
Asbestos Identification		U	2192		N/A	No Asbestos Detected	Chrysotile
Moisture		N	2030	%	0.020	17	18
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones
Soil Texture		N	2040		N/A	Sand	Sand
pH at 20C		M	2010		4.0	7.4	8.3
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	0.66
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	8.7
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	8.7
Arsenic		M	2455	mg/kg	0.5	6.9	28
Beryllium		U	2455	mg/kg	0.5	< 0.5	1.8
Cadmium		M	2455	mg/kg	0.10	0.14	0.73
Chromium		M	2455	mg/kg	0.5	18	22
Copper		M	2455	mg/kg	0.50	20	160
Mercury		M	2455	mg/kg	0.05	0.13	0.52
Nickel		M	2455	mg/kg	0.50	9.6	34
Lead		M	2455	mg/kg	0.50	43	370
Selenium		M	2455	mg/kg	0.25	< 0.25	0.59
Vanadium		U	2455	mg/kg	0.5	16	41
Zinc		M	2455	mg/kg	0.50	51	360
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
LOI		M	2610	%	0.10	4.2	12
Organic Matter		M	2625	%	0.40	2.4	14
TPH >C5-C6	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C6-C7	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C7-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	7.6
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	28
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	3.0	110
TPH >C21-C35	EH_1D_Total	N	2670	mg/kg	1.0	40	230
Total TPH >C5-C35		N	2670	mg/kg	10	43	380
Naphthalene		M	2800	mg/kg	0.10	< 0.10	1.7

Results - Soil

Project: STV6309 Unity Primary School, Manchester

Client: Soiltechnics Limited				**Chemtest Job No.:**		24-03259	24-03259
Quotation No.:				**Chemtest Sample ID.:**		1761983	1761984
Order No.: POR017710				Client Sample Ref.:		1	1
				Client Sample ID.:		TS010.101	WAC010.501
				Sample Location:		TS01	WAC01
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.10	0.50
				Date Sampled:		01-Feb-2024	01-Feb-2024
				Asbestos Lab:		DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	0.48
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	1.6
Fluorene		M	2800	mg/kg	0.10	< 0.10	1.7
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	14
Anthracene		M	2800	mg/kg	0.10	< 0.10	3.2
Fluoranthene		M	2800	mg/kg	0.10	0.25	17
Pyrene		M	2800	mg/kg	0.10	0.28	15
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	7.4
Chrysene		M	2800	mg/kg	0.10	< 0.10	7.8
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	9.1
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	3.5
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	7.5
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	4.3
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	1.0
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	4.8
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	100
Total Phenols		M	2920	mg/kg	0.10	0.36	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water

Report Information

RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	24-03259-2		
Initial Date of Issue:	13-Feb-2024	**Date of Re-Issue:**	14-Feb-2024
Re-Issue Details:	This report has been revised and directly supersedes 24-03259-1 in its entirety		
Client	Soiltechnics Limited		
Client Address:	Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY		
Contact(s):	Admin		
Project	STV6309 Unity Primary School, Manchester		
Quotation No.:		**Date Received:**	05-Feb-2024
Order No.:	POR017710	**Date Instructed:**	05-Feb-2024
No. of Samples:	2		
Turnaround (Wkdays):	12	**Results Due:**	20-Feb-2024
Date Approved:	14-Feb-2024		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: STV6309 Unity Primary School, Manchester

Client: Soiltechnics Limited				**Chemtest Job No.:**		24-03259	24-03259
Quotation No.:				**Chemtest Sample ID.:**		1761983	1761984
Order No.: POR017710				Client Sample Ref.:		1	1
				Client Sample ID.:		TS010.101	WAC010.501
				Sample Location:		TS01	WAC01
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.10	0.50
				Date Sampled:		01-Feb-2024	01-Feb-2024
				Asbestos Lab:		DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type		U	2192		N/A	-	Fibres/Clumps
Asbestos Identification		U	2192		N/A	No Asbestos Detected	Chrysotile
Asbestos by Gravimetry		U	2192	%	0.001		0.014
Total Asbestos		U	2192	%	0.001		0.014
Moisture		N	2030	%	0.020	17	18
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones
Soil Texture		N	2040		N/A	Sand	Sand
pH at 20C		M	2010		4.0	7.4	8.3
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	0.66
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	8.7
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	8.7
Arsenic		M	2455	mg/kg	0.5	6.9	28
Beryllium		U	2455	mg/kg	0.5	< 0.5	1.8
Cadmium		M	2455	mg/kg	0.10	0.14	0.73
Chromium		M	2455	mg/kg	0.5	18	22
Copper		M	2455	mg/kg	0.50	20	160
Mercury		M	2455	mg/kg	0.05	0.13	0.52
Nickel		M	2455	mg/kg	0.50	9.6	34
Lead		M	2455	mg/kg	0.50	43	370
Selenium		M	2455	mg/kg	0.25	< 0.25	0.59
Vanadium		U	2455	mg/kg	0.5	16	41
Zinc		M	2455	mg/kg	0.50	51	360
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
LOI		M	2610	%	0.10	4.2	12
Organic Matter		M	2625	%	0.40	2.4	14
TPH >C5-C6	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C6-C7	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
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TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	7.6
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	28
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	3.0	110
TPH >C21-C35	EH_1D_Total	N	2670	mg/kg	1.0	40	230

Results - Soil

Project: STV6309 Unity Primary School, Manchester

Client: Soiltechnics Limited				**Chemtest Job No.:**		24-03259	24-03259
Quotation No.:				**Chemtest Sample ID.:**		1761983	1761984
Order No.: POR017710				Client Sample Ref.:		1	1
				Client Sample ID.:		TS010.101	WAC010.501
				Sample Location:		TS01	WAC01
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.10	0.50
				Date Sampled:		01-Feb-2024	01-Feb-2024
				Asbestos Lab:		DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
Total TPH >C5-C35		N	2670	mg/kg	10	43	380
Naphthalene		M	2800	mg/kg	0.10	< 0.10	1.7
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	0.48
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	1.6
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Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	7.4
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Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	9.1
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	3.5
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Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	4.8
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	100
Total Phenols		M	2920	mg/kg	0.10	0.36	< 0.10

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SOP	Title	Parameters included	Method summary	Water Accred.
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2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

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Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	24-03260-1
Initial Date of Issue:	13-Feb-2024
Re-Issue Details:	
Client	Soiltechnics Limited
Client Address:	Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY
Contact(s):	Admin
Project	STV6309 Unity Primary School, Manchester

Quotation No.:		**Date Received:**	05-Feb-2024
Order No.:	POR017710	**Date Instructed:**	05-Feb-2024
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	13-Feb-2024
Date Approved:	13-Feb-2024		

Approved By:



Details: Stuart Henderson, Technical Manager

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - 2 Stage WAC

Project: STV6309 Unity Primary School, Manchester

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-03260								
Chemtest Sample ID:	1761985								
Sample Ref:	1						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	WAC010.501								
Sample Location:	WAC01								
Top Depth(m):	0.50								
Bottom Depth(m):									
Sampling Date:	01-Feb-2024								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			7.9	3	5	6
Loss On Ignition	2610	M	%			8.7	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			240	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			120	100	--	--
pH at 20C	2010	M				8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.015	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0028	0.0040	0.0054	0.039	0.5	2	25
Barium	1455	U	0.048	0.023	0.093	0.25	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0005	< 0.0005	0.0047	0.5	10	70
Copper	1455	U	0.0039	0.0026	0.0075	0.0027	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.051	0.0089	0.10	0.12	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	0.0014	0.0020	0.0026	0.020	0.5	10	50
Antimony	1455	U	0.018	0.0057	0.035	0.065	0.06	0.7	5
Selenium	1455	U	0.0015	0.0009	0.0029	0.0090	0.1	0.5	7
Zinc	1455	U	0.015	0.019	0.030	0.19	4	50	200
Chloride	1220	U	4.9	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.65	0.27	1.3	3.0	10	150	500
Sulphate	1220	U	90	12	180	170	1000	20000	50000
Total Dissolved Solids	1020	N	310	64	600	810	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.5	3.1	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	19

Leachate Test Information	
Leachant volume 1st extract/l	0.308
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.121

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water

Report Information

RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
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FC - Florisil Clean Up

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Appendix F Contamination Assessment Screening

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GQRA Screening

Assessments	Status	Date	Created by	Reviewed By
Acute human health risk - Soils	*Not undertaken*			
Chronic human health risk - Soils	Completed	05.03.24	DH	SCD
Chronic human health risk - Groundwater vapour	*Not undertaken*			
Controlled waters risk - Surface water	*Not undertaken*			
Controlled waters risk - Drinking water	*Not undertaken*			
Controlled waters - Free phase indicator	*Not undertaken*			
Phytotoxicity	*Not undertaken*			
Ecotoxicity	*Not undertaken*			

Key

Assessment	Abbr.	GQRA Source (in order of preference)	Last Update
All	NGA	No guideline value available	-
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010

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Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	TS01
				Depth (m)	0.10
				Date	01/02/24
Inorganics - Metals					
Arsenic	C4SL	37	6.9		6.9
Beryllium	S4UL	1.7	<LoD		< 0.5
Boron	S4UL	290	<LoD		< 0.40
Cadmium	C4SL	22	0.14		0.14
Chromium (III)	S4UL	910	18		18
Chromium (VI)	C4SL	21	<LoD		< 0.50
Copper	S4UL	2400	20		20
Cyanide - Free	ATK	34	<LoD		< 0.50
Lead	C4SL	200	43		43
Mercury	S4UL	40	0.13		0.13
Nickel	S4UL	130	9.6		9.6
Selenium	S4UL	250	<LoD		< 0.25
Vanadium	S4UL	410	16		16
Zinc	S4UL	3700	51		51
Inorganics - Asbestos					
Asbestos Type		N/A			-
Asbestos Screen		N/A			No Asbestos Detected
Inorganics - Soil Parameters					
Organic matter		N/A			2.4
Organics - PAH & Phenol					
Acenaphthene	S4UL	210	<LoD		< 0.10
Acenaphthylene	S4UL	170	<LoD		< 0.10
Anthracene	S4UL	2400	<LoD		< 0.10
Benzo(a)anthracene	S4UL	7.2	<LoD		< 0.10
Benzo(a)pyrene	C4SL	5	<LoD		< 0.10
Benzo(b)fluoranthene	S4UL	2.6	<LoD		< 0.10
Benzo(ghi)perylene	S4UL	320	<LoD		< 0.10
Benzo(k)fluoranthene	S4UL	77	<LoD		< 0.10
Chrysene	S4UL	15	<LoD		< 0.10
Dibenz(a,h)anthracene	S4UL	0.24	<LoD		< 0.10
Fluoranthene	S4UL	280	0.25		0.25
Fluorene	S4UL	170	<LoD		< 0.10
Indeno(1,2,3-cd)pyrene	S4UL	27	<LoD		< 0.10
Naphthalene	S4UL	2.3	<LoD		< 0.10
Phenanthrene	S4UL	95	<LoD		< 0.10
Phenol	S4UL	120	0.36		0.36
Pyrene	S4UL	620	0.28		0.28
Organics - Banded TPH (unspeciated)					
EC >5-EC6 (unspeciated)	S4UL	42	<LoD		< 1.0
EC >6-EC7 (unspeciated)	S4UL	70	<LoD		< 1.0
EC >7-EC8 (unspeciated)	S4UL	100	<LoD		< 1.0
EC >08-EC10 (unspeciated)	S4UL	27	<LoD		< 1.0
EC >10-EC12 (unspeciated)	S4UL	74	<LoD		< 1.0
EC >12-EC16 (unspeciated)	S4UL	140	<LoD		< 1.0
EC >16-EC21 (unspeciated)	S4UL	260	3		3
EC >21-EC35 (unspeciated)	S4UL	1100	40		40

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Appendix G Waste Characterisation Assessment

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Waste Classification Assessment Summary

Waste population	Made Ground
Hazard assessment	Non-hazardous waste
List of waste code	17-05-04
List of waste description	Soil and stones other than those mentioned in 17-05-03

Hazard property	Assessment
HP1 - Explosive	Not hazardous by HP1
HP2 - Oxidising	Not hazardous by HP2
HP3 - Flammable	Not hazardous by HP3
HP4 - Irritant	Not hazardous by HP4
HP5 - STOT & aspiration toxicity	Not hazardous by HP5
HP6 - Acute toxicity	Not hazardous by HP6
HP7 - Carcinogenic	Not hazardous by HP7
HP8 - Corrosive	Not hazardous by HP8
HP9 - Infectious	Not hazardous by HP9
HP10 - Toxic for reproduction	Not hazardous by HP10
HP11 - Mutagenic	Not hazardous by HP11
HP12 - Release of an acute toxic gas	Not hazardous by HP12
HP13 - Sensitising	Not hazardous by HP13
HP14 - Ecotoxic	Not hazardous by HP14

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Waste classification

Overall assessment	
Waste population	Made Ground
Hazard assessment	Non-hazardous waste
List of Waste code	17 05 04
List of waste description	Soil and stones other than those mentioned in 17 05 03
Is the statistical approach non-parametric method if utilised?	No
Moisture content correction factor	No correction made

Asbestos assessment		
Query	Value	Assessment
Are bulk ACMs visually identifiable?	No	Non-hazardous
Have free fibres been detected?	Yes	See below
What is the free fibre concentration (%)?	0.01%	Non-hazardous

Flammability assessment	
Comment	Assessment
The waste is not considered flammable as it is a solid waste without a free draining liquid phase, and the TPH concentration and composition is not considered to present a likely flammable hazard.	Non-hazardous

Hydrocarbon assessment	
Query	Assessment
Is the origin of the oil contamination known?	Unknown oil
B(a)P : TPH ratio (%)	Not required
B(a)P marker assessment	Not required

pH assessment		
Query	Value	Assessment
Are all substances present in the waste known?	No	See pH assessment below
pH - Min	7.40	Non-hazardous
pH - Max	8.30	Non-hazardous

Oxidising assessment	
Comment	Assessment
Cr (VI) is the only compound with an oxidising hazard statement (H271). On review, the concentration is considered too low to present a viable oxidising hazard in a waste soil	Non-hazardous

Ecotoxic assessment			
Equation	Sum	Criteria	Assessment
WM3. Eq. 2	0.00%	25%	Non-hazardous
WM3 Eq. 3	0.00%	25%	Non-hazardous
WM3 Eq. 4	0.00%	25%	Non-hazardous

Compound hazard assessments

						Hazard Property Description	Irritant			Specific Target Organ Toxicity / Aspiration Toxicity				Acute Toxicity										Carcinogenic		Corrosive	Toxic for reproduction		Mutagenic		Sensitising		Ecotoxic				Substance specific concentration limits							
						Hazard Property	HP4			HP5				HP6										HP7		HP8	HP10		HP11		HP13		HP14				STOT				Carc.	Repr.
						Hazard Statement	H314	H315 and/or H319	H318	H304	H335	H372	H373	H300	H301	H302	H310	H311	H312	H330	H330	H331	H332	H350	H351	H314	H360	H361	H340	H341	H317	H334	H400	H410	H411	H413	H335 (CVO)	H372 (GB)	H373 (GB)	H373 (Mn04)	H350 (BaP5 (Bu)Sn)	H361 (Mn04)	HP7	HP10
Contaminant	Max. concentration (mg/kg)	Realistic worst case compound	Mass conversion factor	MC applied?	Hazard Class / Compound concentration (%)		Skin Corr.1A	Skin Irrit.2 Eye Irrit.2	Eye Dam.1	Asp.Tox.1	STOT SE 3	STOT RE 1	STOT RE 2	Acute Tox.2 (Ora)	Acute Tox.3 (Ora)	Acute Tox.4 (Ora)	Acute Tox.1 (Dermal)	Acute Tox.3 (Dermal)	Acute Tox.4 (Dermal)	Acute Tox.1 (Inhal.)	Acute Tox.2 (Inhal)	Acute Tox.3 (Inhal)	Acute Tox.4 (Inhal)	Carc.1A Carc.1B	Carc.2	Skin Corr.1A Skin Corr.1B	Repr.1A Repr.1B	Repr.2	Muta.1A Muta.1B	Muta.2	Skin Sens.1	Resp. Sens. 1	Aquatic Acute.1	Aquatic Chronic.1	Aquatic Chronic.2	Aquatic Chronic.4	STOT SE.3	STOT RE.1	STOT RE.2	STOT RE.2	Carc.1B	Repr.2
Cyanide - Total	81.7	Salts of hydrogen cyanide, using sodium cyanide	1.88	N/A	0.002									0.002			0.002			0.002	0.002												0.002	0.002								
Arsenic	28.0	Nickel diarsenide	1.78	N	0.005							0.005												0.005							0.005											
Arsenic (secondary)	26.0	Arsenic trioxide	1.32	N	0.006		0.004							0.004												0.004																
Beryllium	1.8	Beryllium oxide	2.78	N	0.000			0.000			0.000	0.000			0.000					0.000	0.000			0.000							0.000											
Cadmium	0.7	Cadmium sulfide	1.29	N	0.000							See specific assessment	See specific assessment			0.000								0.000				0.000		0.000												
Cadmium (secondary)	0.7	Cadmium oxide	1.14	N	0.000															0.000	0.000												0.000	0.000								
Chromium (III)	27.0	Chromium (III) oxide	1.46	N	0.003			0.003								0.003											0.003				0.003	0.003					0.003				
Chromium (VI)	0.5	Chromium (VI) trioxide	1.92	N/A	0.000		0.000				See specific assessment	0.000			0.000			0.000			0.000			0.000		0.000		0.000		0.000			0.000	0.000				0.000				
Copper	160.0	Copper (I) oxide	1.25	N	0.020																												0.020	0.020								
Copper (secondary)	160.0	Copper(I) oxide	1.13	N	0.018				0.018							0.018							0.018																			
Lead	370.0	Lead compounds, using lead sulphate	1.46	N	0.054								See specific assessment			0.054							0.054		0.054		See specific assessment						0.054						0.054		0.054	
Mercury	0.5	Mercury dichloride	1.35	N	0.000		0.000					0.000		0.000												0.000		0.000		0.000			0.000	0.000								
Nickel	34.0	Nickel carbonate	2.02	N	0.007			0.007				0.007				0.007							0.007	0.007			0.007		0.007		0.007	0.007									
Selenium	0.8	Selenium compounds, using selenium dioxide	1.41	N	0.000								0.000		0.000							0.000											0.000	0.000								
Zinc	360.0	Zinc sulphide	1.49	N	0.054			0.054																						0.054	0.054		0.054									
Vanadium	41.0	Vanadium pentoxide	1.79	N	0.007						0.007	0.007				0.007							0.007				0.007		0.007					0.007								
Naphthalene	1.7	Naphthalene	1	N/A	0.000											0.000									0.000							0.000	0.000								
Acenaphthylene	0.5	Acenaphthylene	1	N/A	0.000			0.000			0.000				0.000		0.000			0.000	0.000																					
Acenaphthene	1.6	Acenaphthene	1	N/A	0.000			0.000																									0.000	0.000								
Fluorene	1.7	Fluorene	1	N/A	0.000			0.000			0.000																						0.000	0.000								
Phenanthrene	14.0	Phenanthrene	1	N/A	0.001											0.001																	0.001	0.001								
Anthracene	3.2	Anthracene	1	N/A	0.000			0.000			0.000																			0.000			0.000	0.000								
Fluoranthene	17.0	Fluoranthene	1	N/A	0.002			0.002								0.002																	0.002	0.002								
Pyrene	15.0	Pyrene	1	N/A	0.002			0.002			0.002																						0.002	0.002								
Benzo(a)anthracene	7.4	Benzo(a)anthracene	1	N/A	0.001																			0.001									0.001	0.001								
Chrysene	7.8	Chrysene	1	N/A	0.001																			0.001						0.001			0.001	0.001								
Benzo(b)fluoranthene	9.1	Benzo(b)fluoranthene	1	N/A	0.001																			0.001									0.001	0.001								
Benzo(k)fluoranthene	3.5	Benzo(k)fluoranthene	1	N/A	0.000																			0.000									0.000	0.000								
Benzo(a)pyrene	7.5	Benzo(a)pyrene	1	N/A	0.001																			See specific assessment			0.001		0.001				0.001	0.001						0.001		
Indeno(1,2,3-cd)pyrene	4.3	Indeno(1,2,3-cd)pyrene	1	N/A	0.000																				0.000																	
Dibenz(a,h)anthracene	1.8	Dibenz(a,h)anthracene	1	N/A	0.000																			See specific assessment									0.000	0.000						0.020		
Benzo(ghi)perylene	4.8	Benzo(ghi)perylene	1	N/A	0.000																												0.000	0.000								
Total TPH	380.0	Unknown oil	1	N/A	0.038					0.038			0.038											See specific assessment				0.038		See specific assessment					0.038							
Benzene		Benzene	1	N/A																																						
Toluene		Toluene	1	N/A																																						
Ethylbenzene		Ethylbenzene	1	N/A																																						
Xylenes		Xylenes	1	N/A																																						
Note:																																											
					Cut-off value (%)	1%	1%	1%	N/A	N/A	N/A	N/A	0.1%	0.1%	1%	0.1%	0.1%	1%	0.1%	0.1%	0.1%	1%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1%	0.1%	1%	1%	N/A	N/A	N/A	N/A	N/A	N/A
					Total (or greatest)	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**(0.01%)**	**(0.01%)**	**(0.04%)**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**(0.01%)**	**(0.05%)**	**0.00%**	**(0.05%)**	**(0.05%)**	**(0.04%)**	**(0%)**	**(0.01%)**	**(0.05%)**	**(0.05%)**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**(0%)**	**(0%)**	**(0%)**	**(0.05%)**	**(0.001%)**	**(0.05%)**
					Hazard threshold	1%	20%	10%	10%	20%	1%	10%	0.25%	5%	25%	0.25%	15%	55%	0.1%	0.5%	3.5%	22.5%	0.1%	1%	5%	0.8%	3%	0.1%	1%	10%	10%	WM3 eq.2	WM3 eq.2 & eq.4		WM3 eq.4	1.0%	10.0%	0.1%	0.5%	0.001%	2.5%
					Hazardous	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

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Waste acceptance

Parameter	Inert waste landfill	Stable non-reactive hazardous waste in a non-hazardous landfill cell (SNRHW)	Hazardous waste landfill	Location	WAC01
				Depth (m)	0.50
				Date	01/02/24
Parameters determined on the waste					
Total organic carbon	3	5	6		7.9
Loss on ignition			10		12
BTEX	6				< 0.010
PCBs (7 congeners)	1				< 0.10
Mineral oil	500				240
PAH (17 congeners)	100				120
pH		6			8.2
Acid neutralisation capacity (pH 6)		To be evaluated	To be evaluated		0.015
Limit values (mg kg^{-1}) for compliance test using BN 12457-3 at L/S 10 l					
Arsenic	0.5	2	25		0.039
Barium	20	100	300		0.25
Cadmium	0.04	1	5		< 0.00011
Chromium (III)	0.5	10	70		0.0047
Copper	2	50	100		0.0027
Mercury	0.01	0.2	2		< 0.00005
Molybdenum	0.5	10	30		0.12
Nickel	0.4	10	40		< 0.0005
Lead	0.5	10	50		0.02
Antimony	0.06	0.7	5		0.065
Selenium	0.1	0.5	7		0.009
Zinc	4	50	200		0.19
Chloride	800	15,000	25,000		< 10
Fluoride	10	150	500		3
Sulphate	1,000	20,000	50,000		170
Total dissolved solids	4,000	60,000	100,000		810
Phenol	1				< 0.50
Dissolved organic carbon	500	800	1000		< 50
Classifications					
Waste classification					**Non-hazardous**
Landfill type					Non-hazardous

Key Notes:

1) The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride.

2) Soils with TOC values over the limit value may still be accepted provided the DOC value falls are below it's respective limit value.

3) In a hazardous waste, either the TOC or LOI must be used.

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Appendix H Statutory Undertakers Responses

Water for the North West

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: STV6309
Our Ref: UUPS-ORD-534496
Date: 28/11/2023

Soiltechnics

Soiltechnics
Cedar Barn,
Walgrave,
NN6 9PY

FAO:

Dear Sirs

Location: 41 ALLESLEY DRIVE, SALFORD, M7 4YE

I acknowledge with thanks your request dated 24/11/2023 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

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

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)".

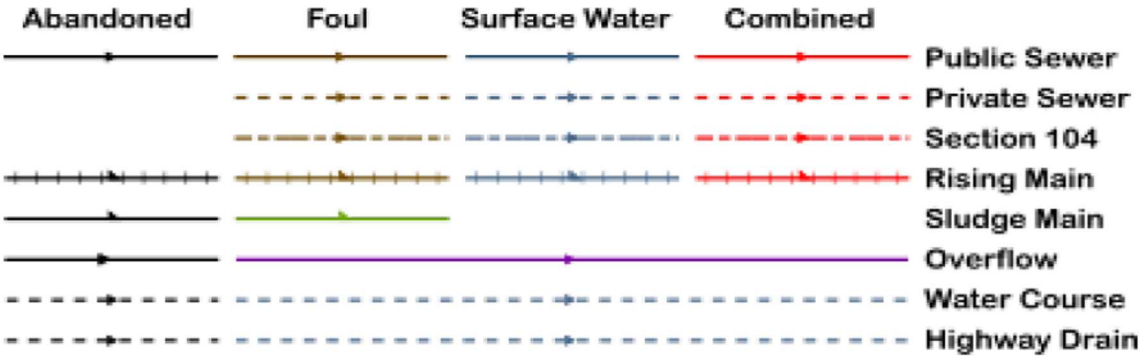
TERMS AND CONDITIONS:

- 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.

United Utilities Water Limited
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Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

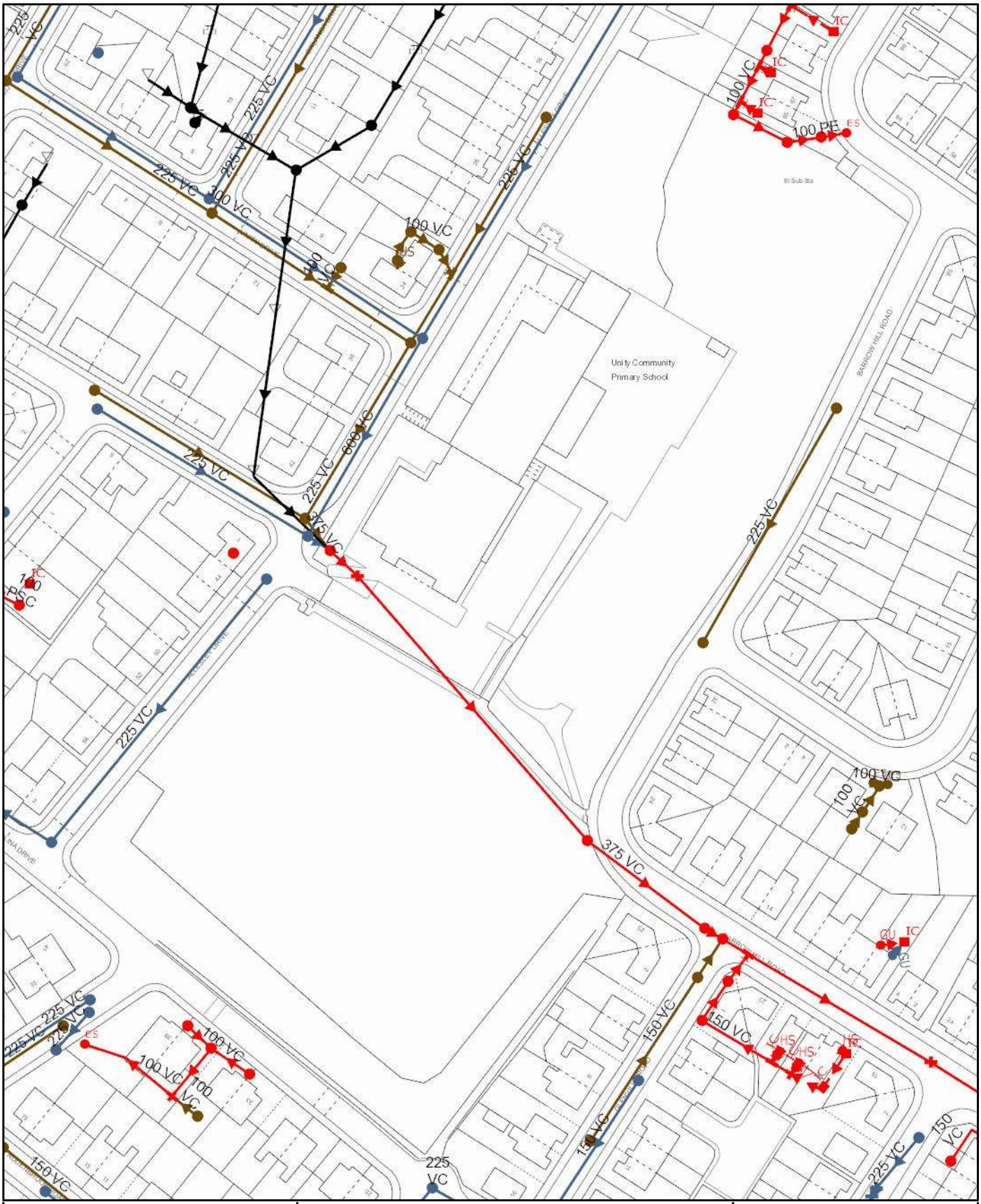
United Utilities
Water for the North West

Wastewater Symbology



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

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- Change of Characteristic



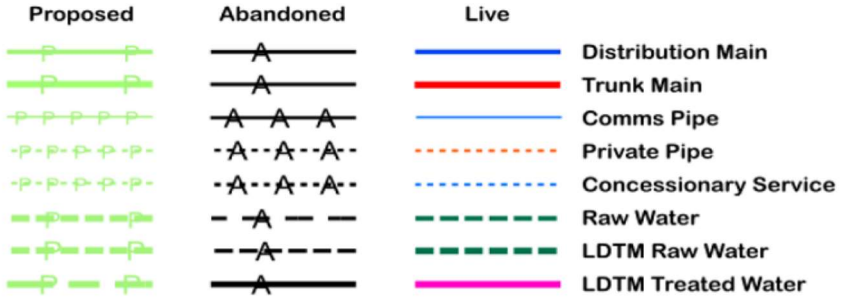
Scale:	1:1264	**SEWER RECORDS**	United Utilities Water for the North West
Date:	28/11/2023		
Address or Site Reference:	41 ALLESLEY DRIVE, SALFORD, M7 4YE		
Printed by:	Property Searches		

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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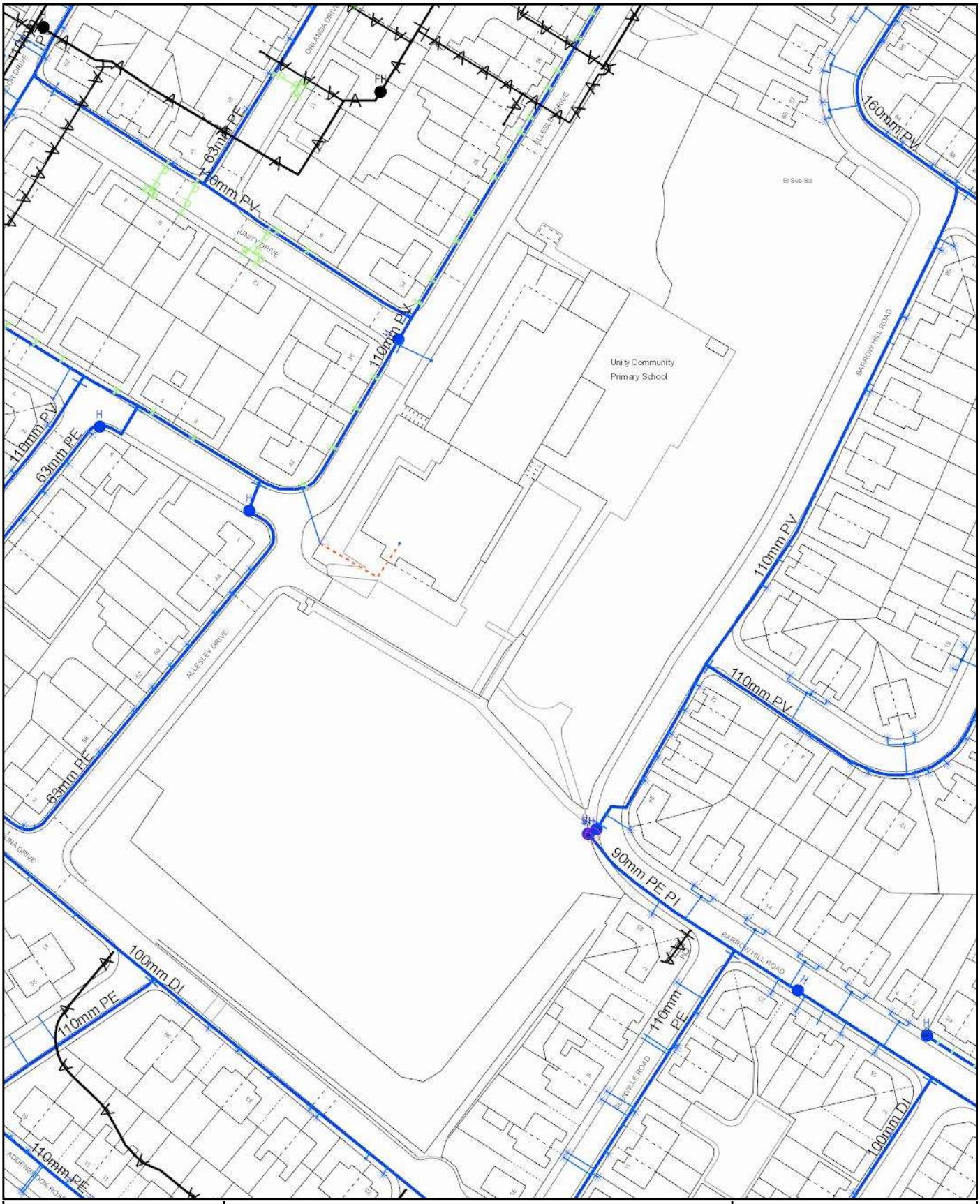
United Utilities
Water for the North West

Clean Water Symbology





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:	1:1264
Date:	28/11/2023

WATER MAINS RECORDS

United Utilities
Water for the North West

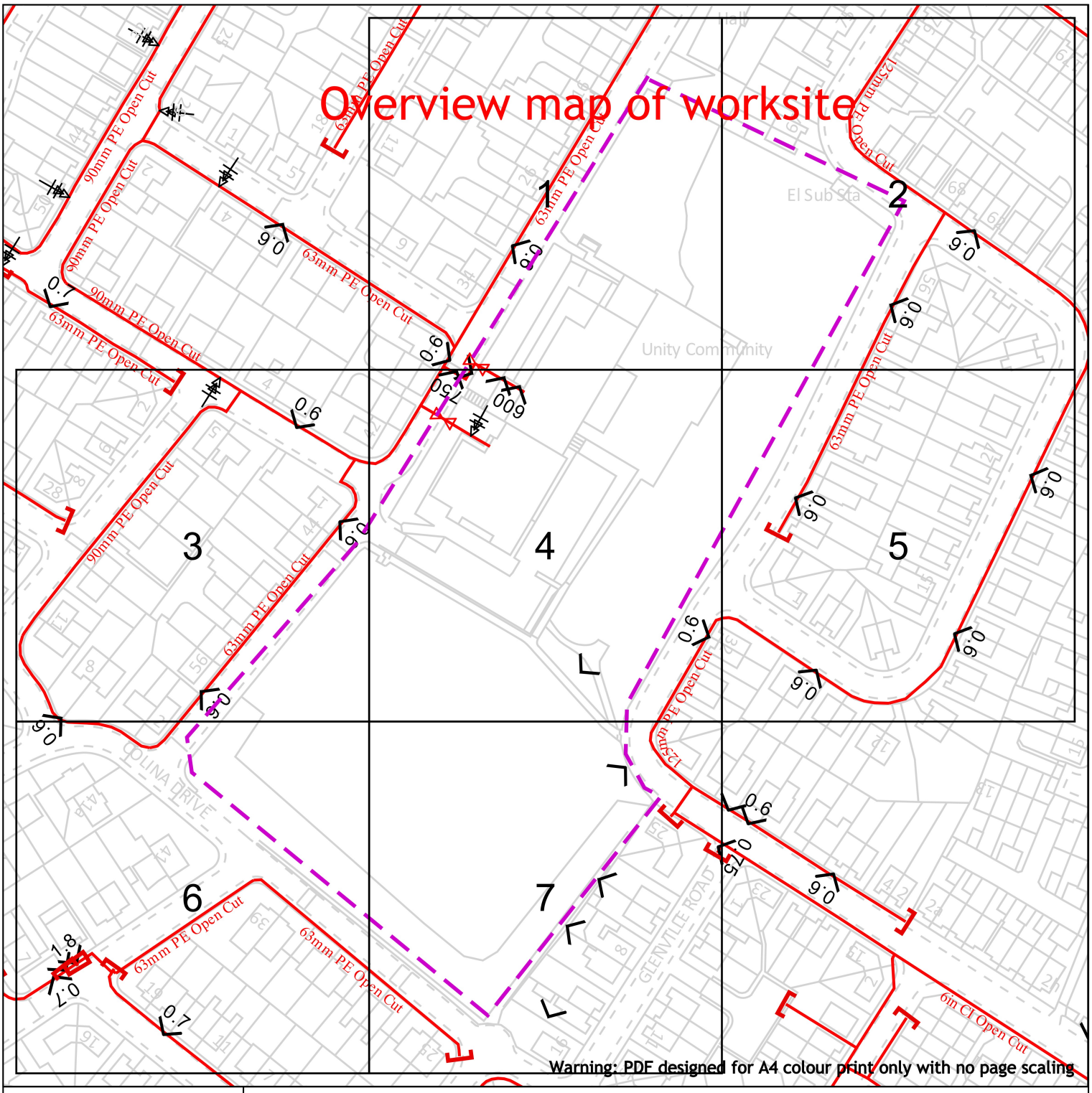
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Overview map of worksite



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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

Where an out-of-standard service is present please contact plant protection 0800 688 588 for further information.

Out-of-standard service symbology may be used to indicate one or more of the following:

- Identification of shallow services
- Identification of dual services
- Recording of non-perpendicular services

A perpendicular service/connection is laid in a straight line from the entry point at the property to the connection at the main – this includes a pipe that has a perpendicular connection and is not straight but does not deviate more than 1m off centre line.

Cadent
Your Gas Network

Date Requested: 24/11/2023
Job Reference: 31658496
Site Location: 383607 400435
Requested by: Miss Lauren Wenham

Your Scheme/Reference: STV6309

View extent: 100m, 100m

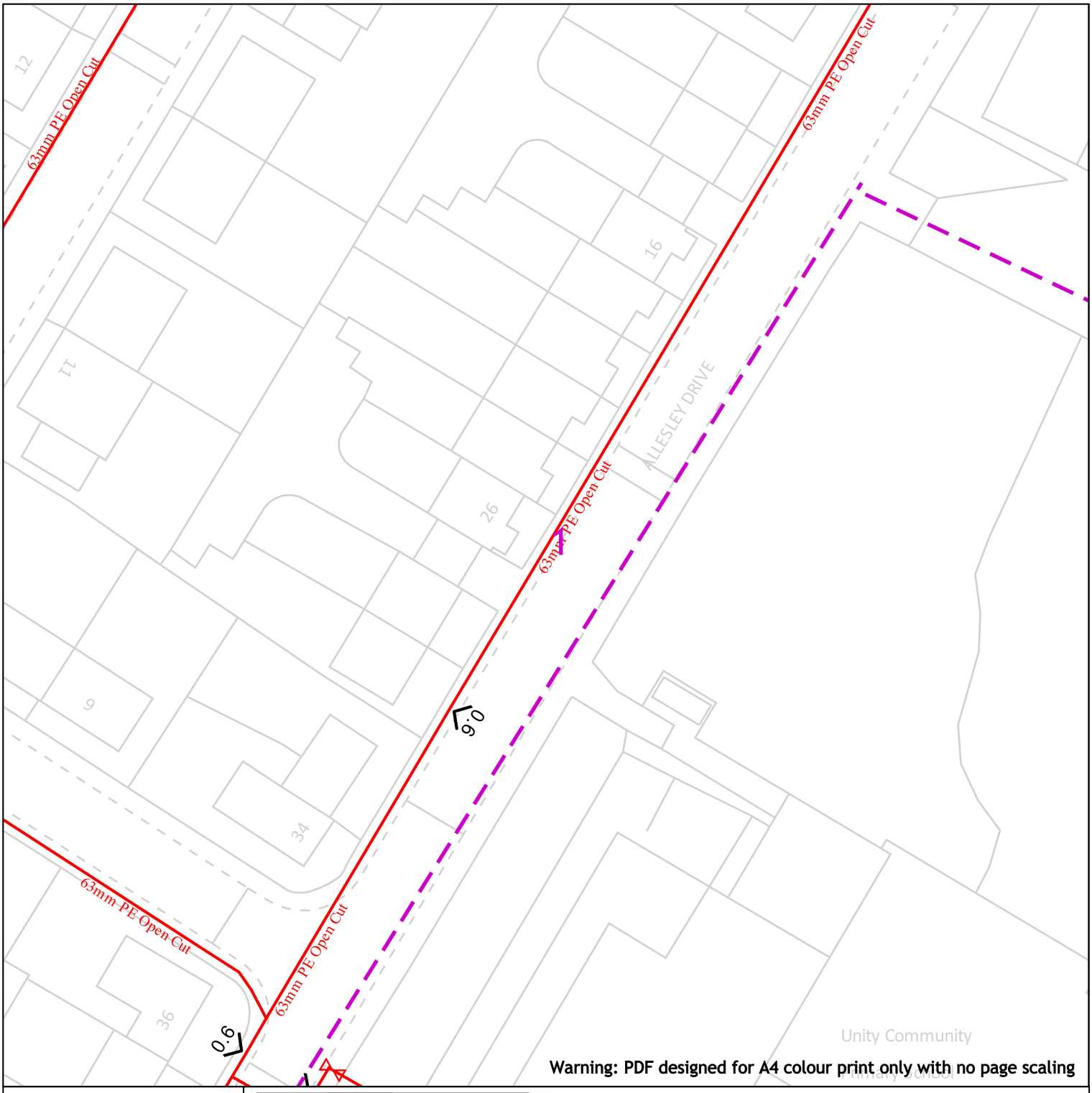
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IMPORTANT NOTICES

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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
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Syphon
Diameter Change
Material Change
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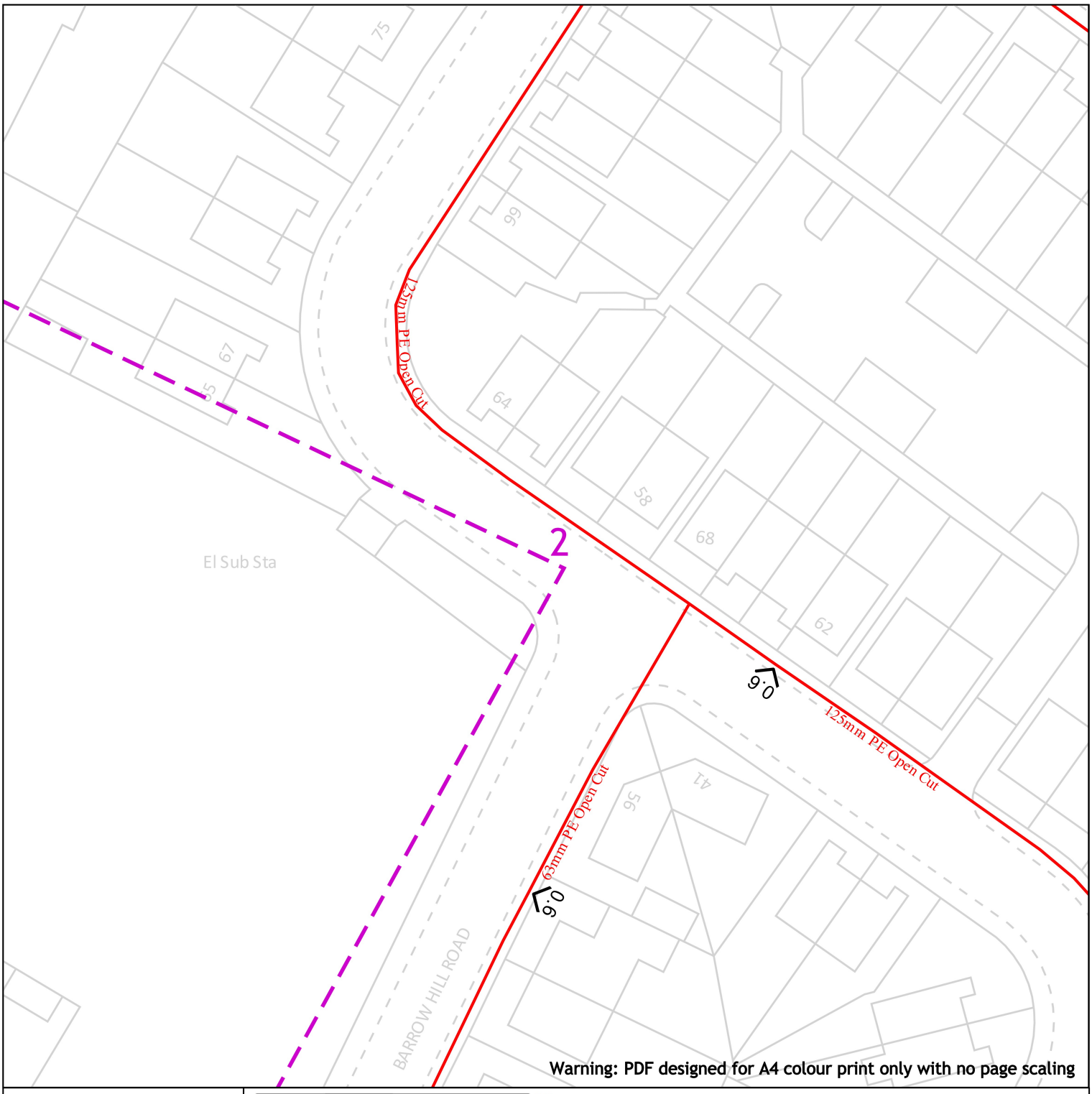
Scale: 1:500 (When plotted at A4)

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
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Valve
Depth of cover
Syphon

Diameter Change
Material Change
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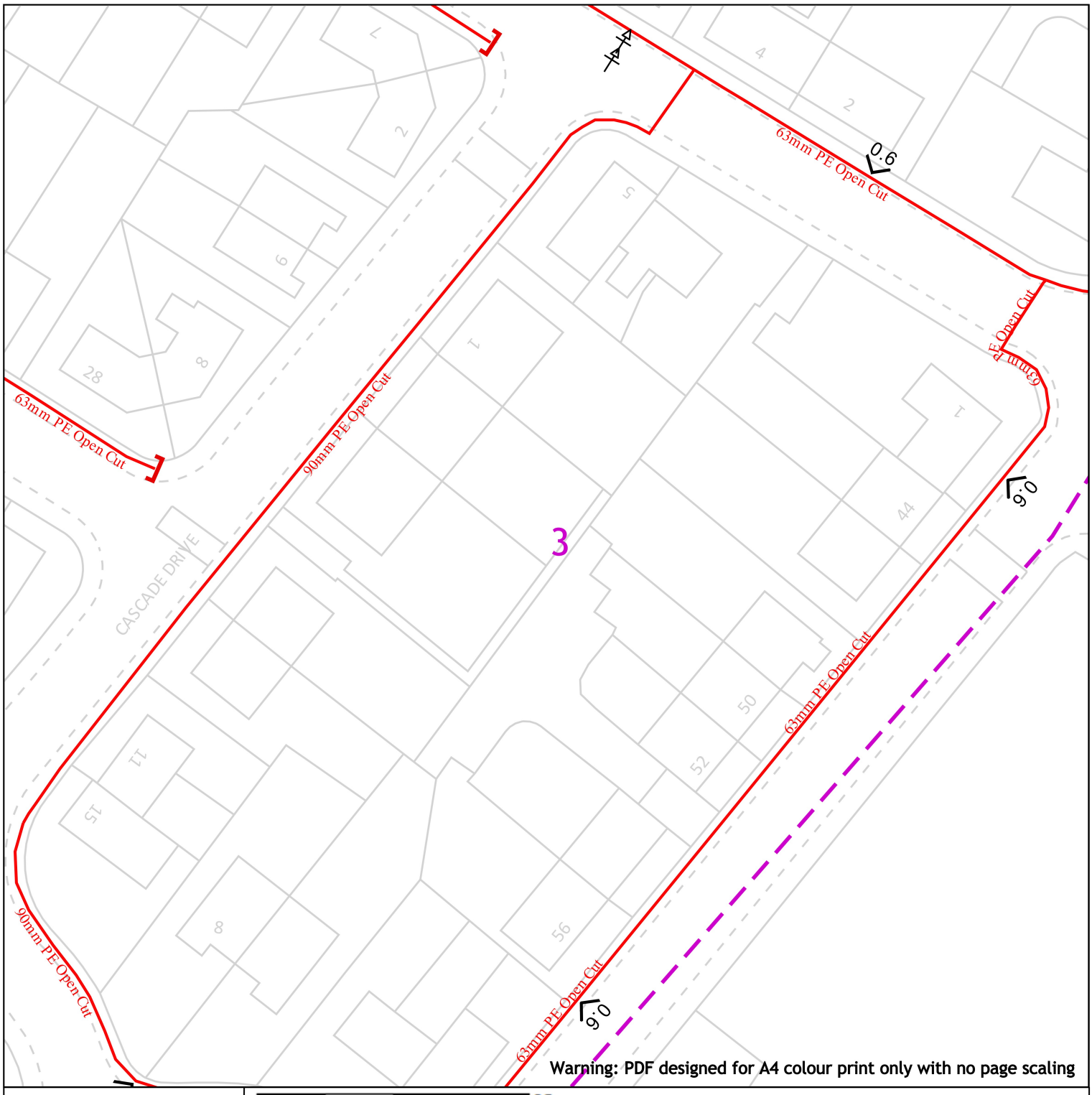
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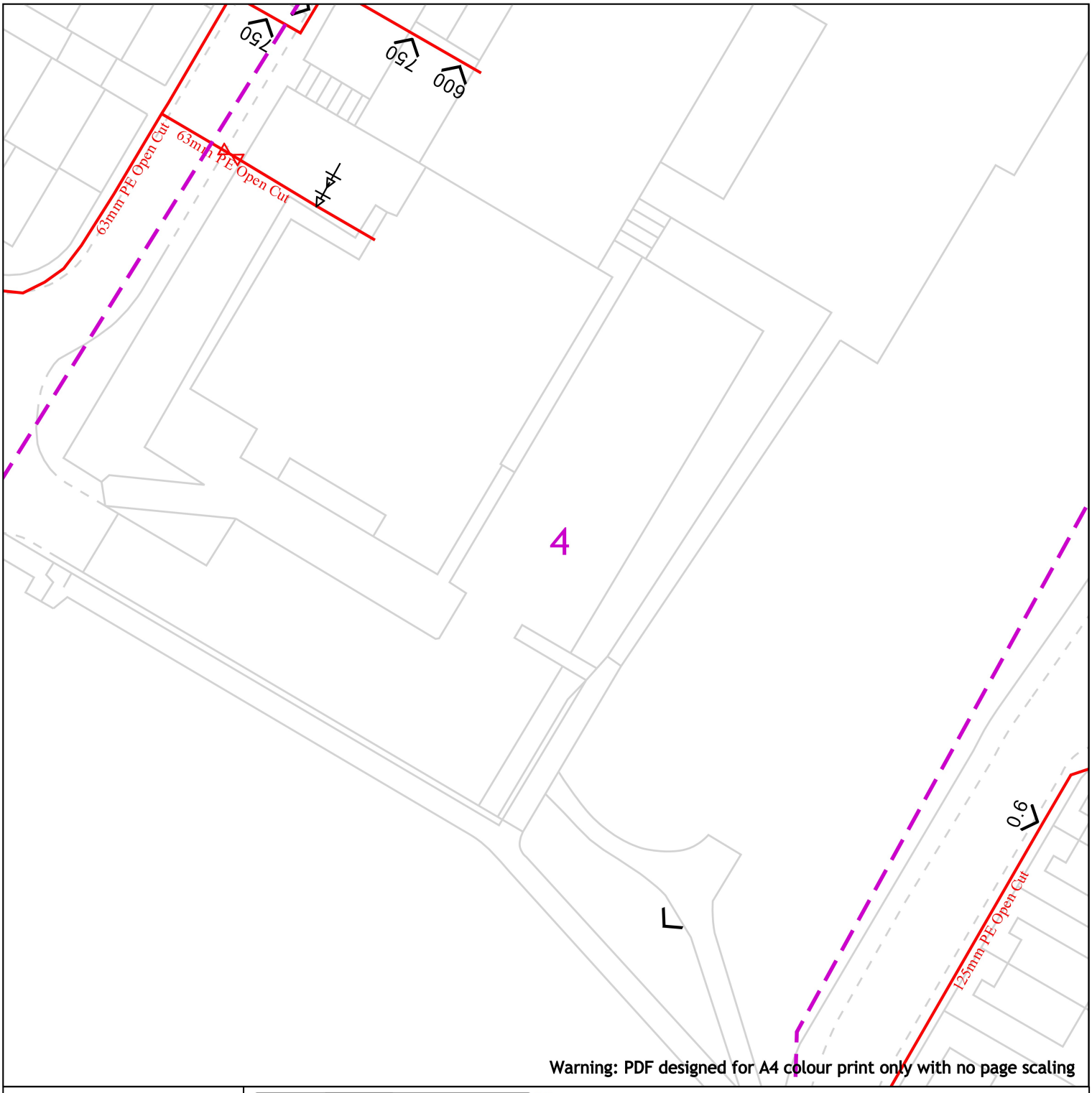
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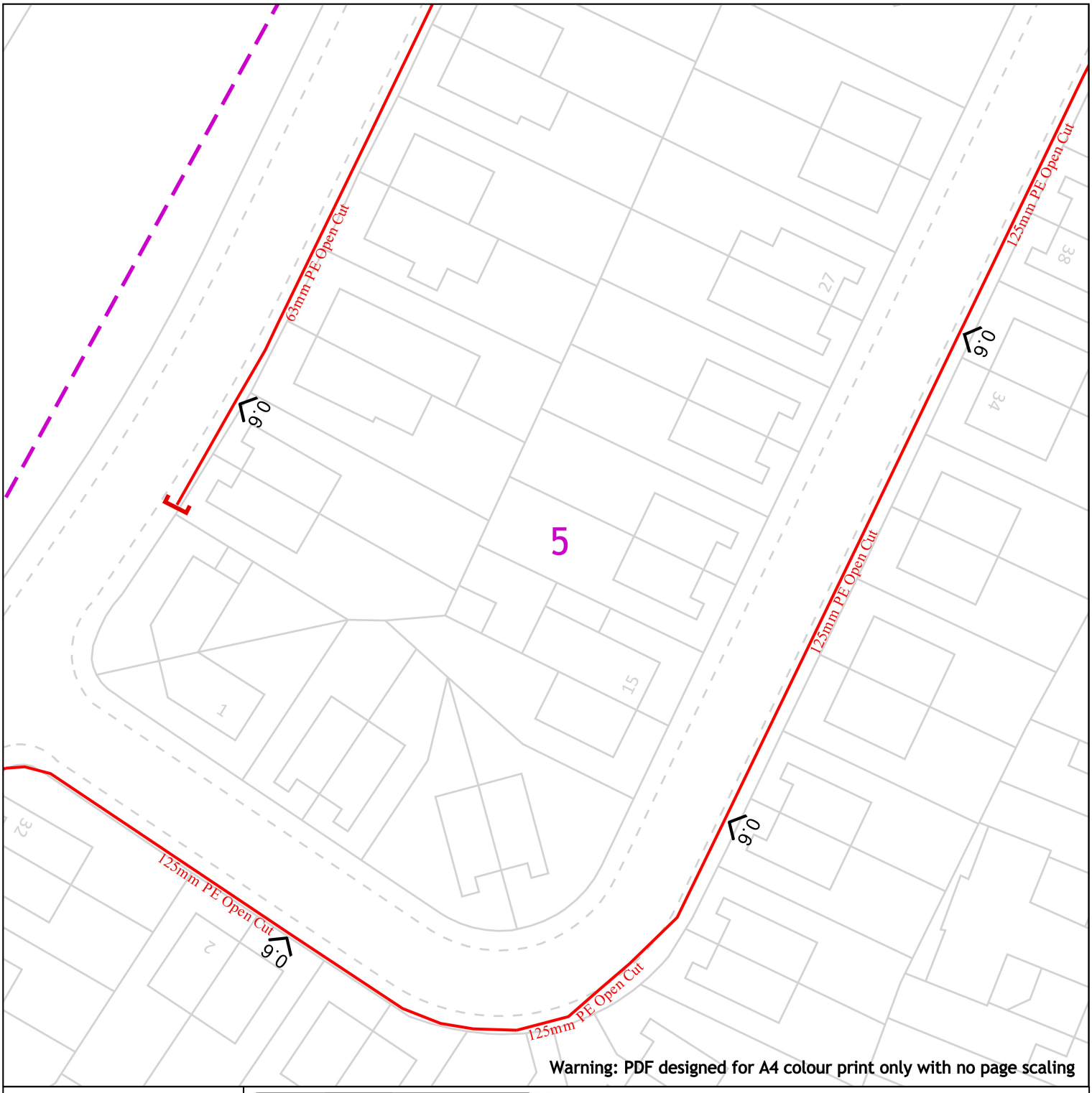
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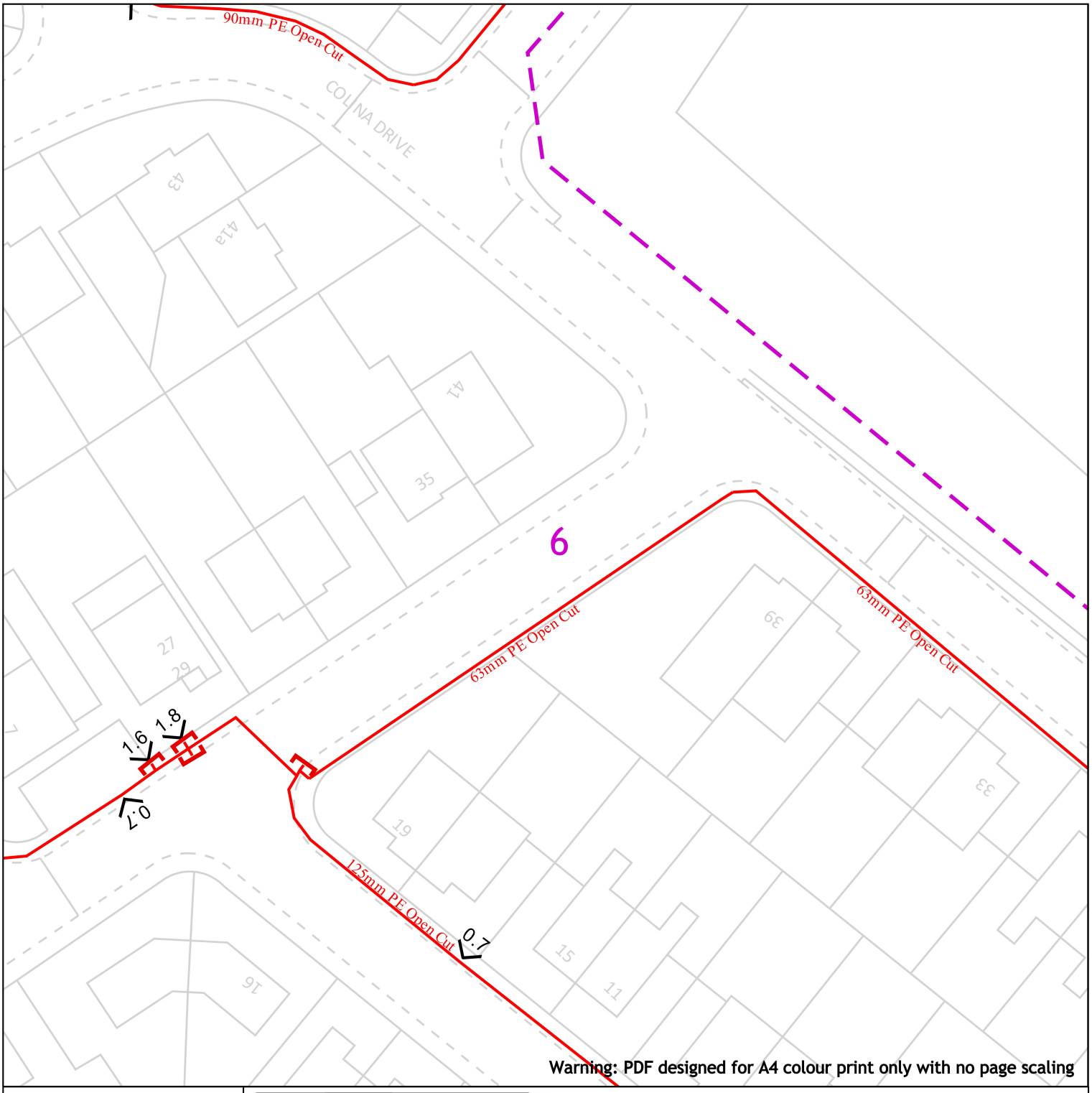
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Out of Standard Service

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Out-of-standard service symbology may be used to indicate one or more of the following:
- Identification of shallow services
- Identification of dual services
- Recording of non-perpendicular services

A perpendicular service/connection is laid in a straight line from the entry point at the property to the connection at the main – this includes a pipe that has a perpendicular connection and is not straight but does not deviate more than 1m off centre line.

Cadent
Your Gas Network

Date Requested: 24/11/2023
Job Reference: 31658496
Site Location: 383607 400435
Requested by: Miss Lauren Wenham
Your Scheme/Reference: STV6309

View extent: 100m, 100m

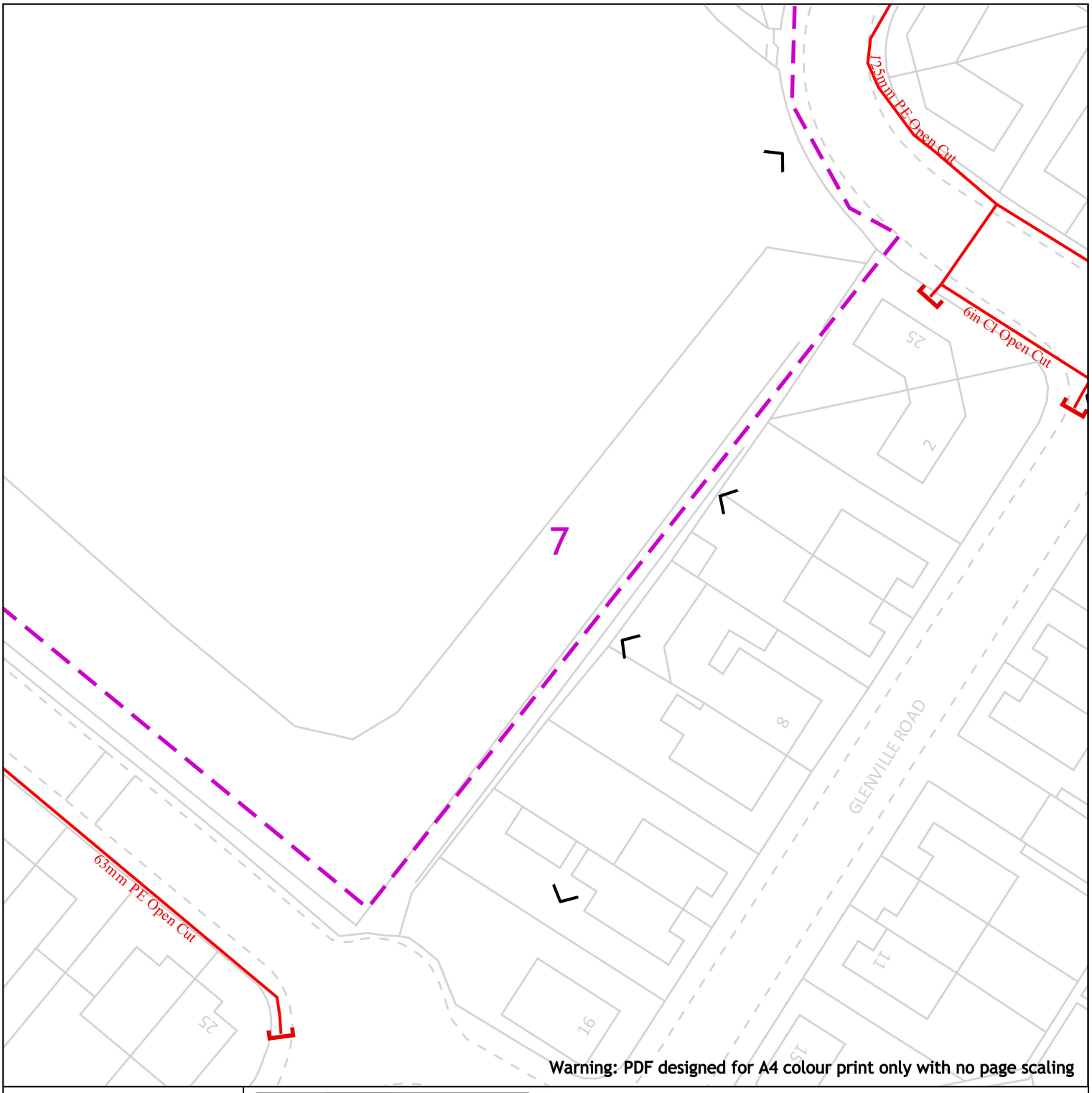
Scale: 1:500 (When plotted at A4)

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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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

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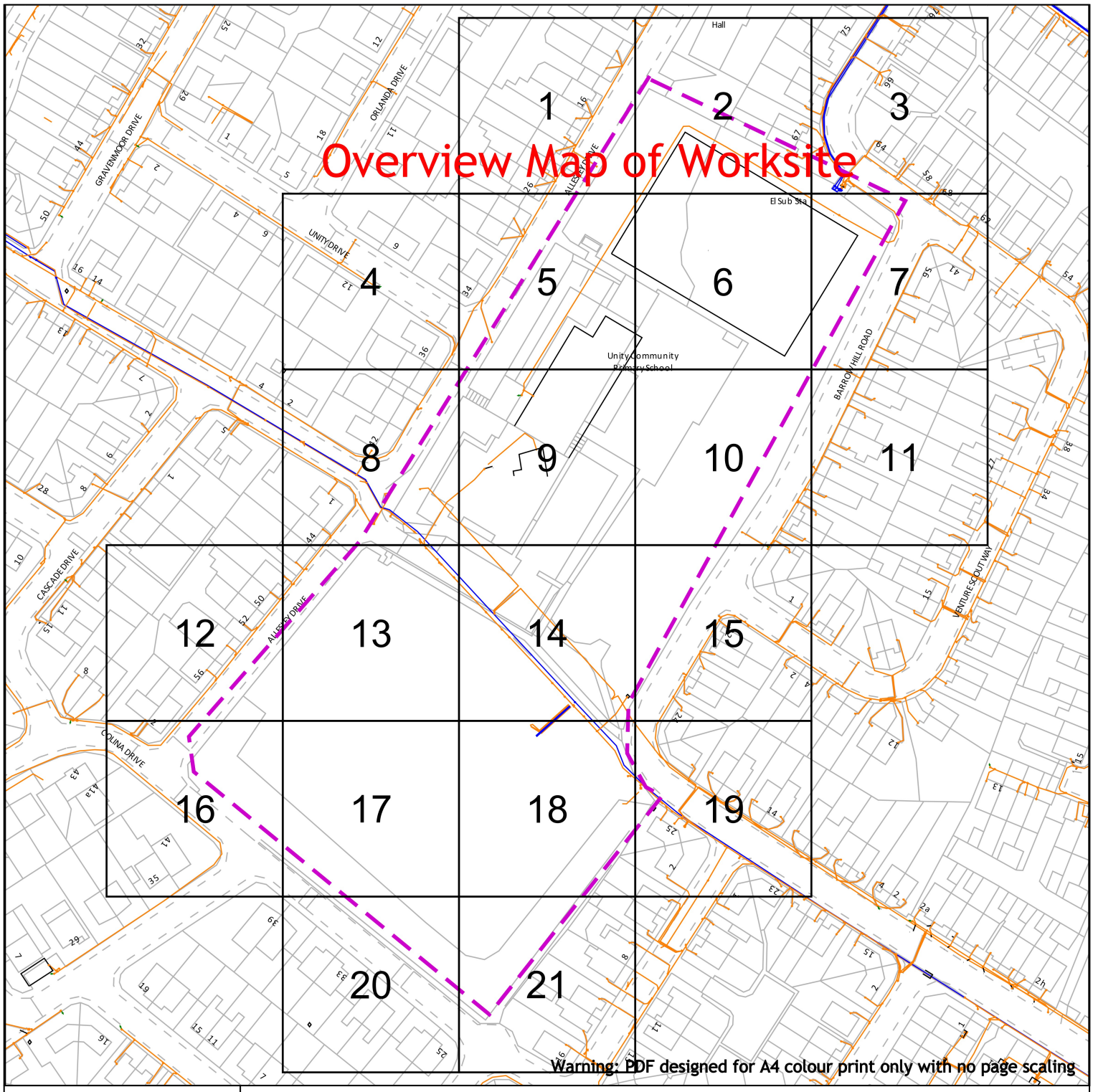
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electricity north west

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

Date Requested: 24/11/2023
Job Reference: 31658496
Site Location: 383607 400435
Requested by: Miss Lauren Wenham

Your Scheme/Reference: STV6309

Scale: 1:1537 (When plotted at A4)

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	

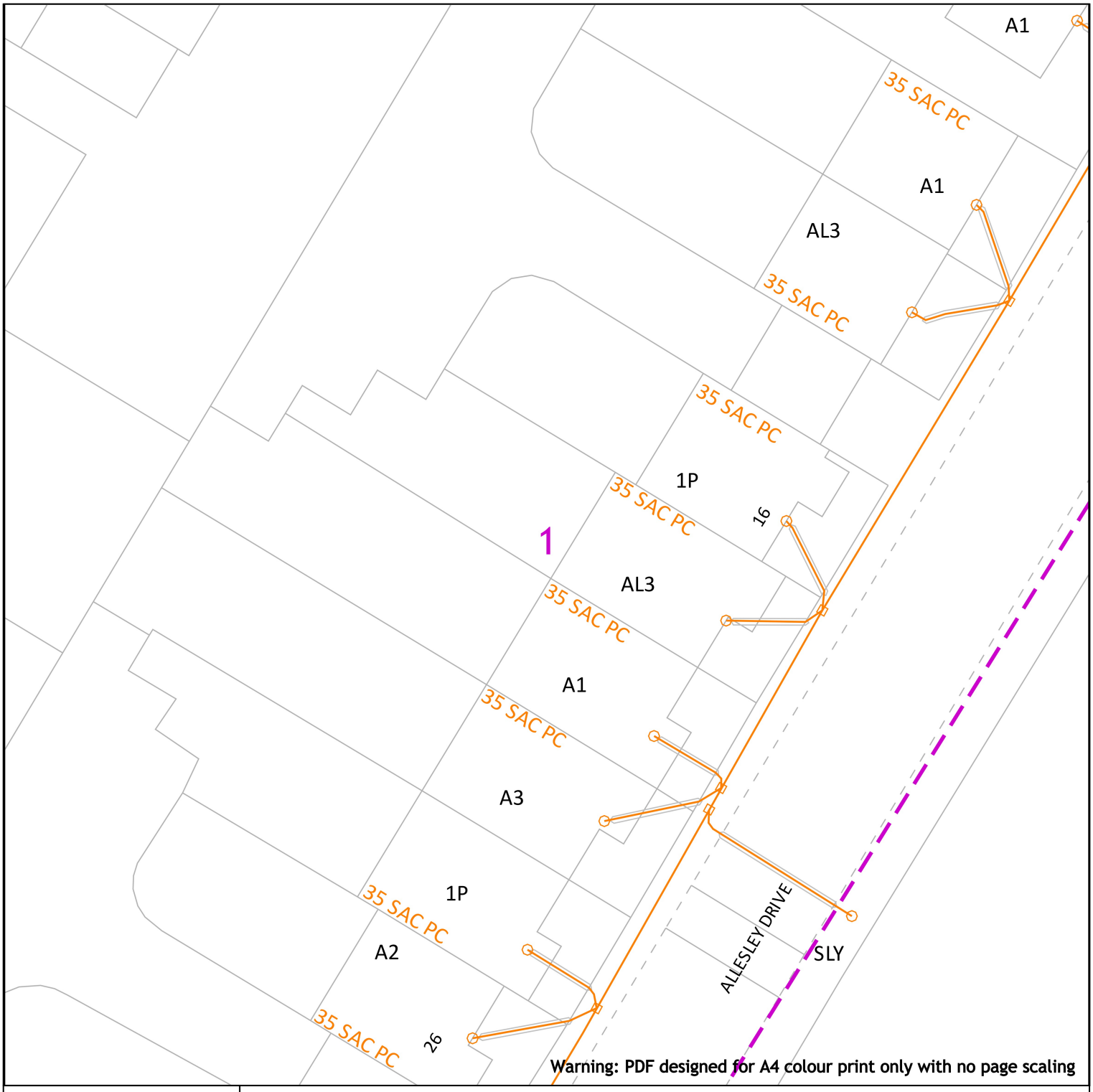
In an emergency call 105, 24 hours a day

Dig Sites
Line:
Area:

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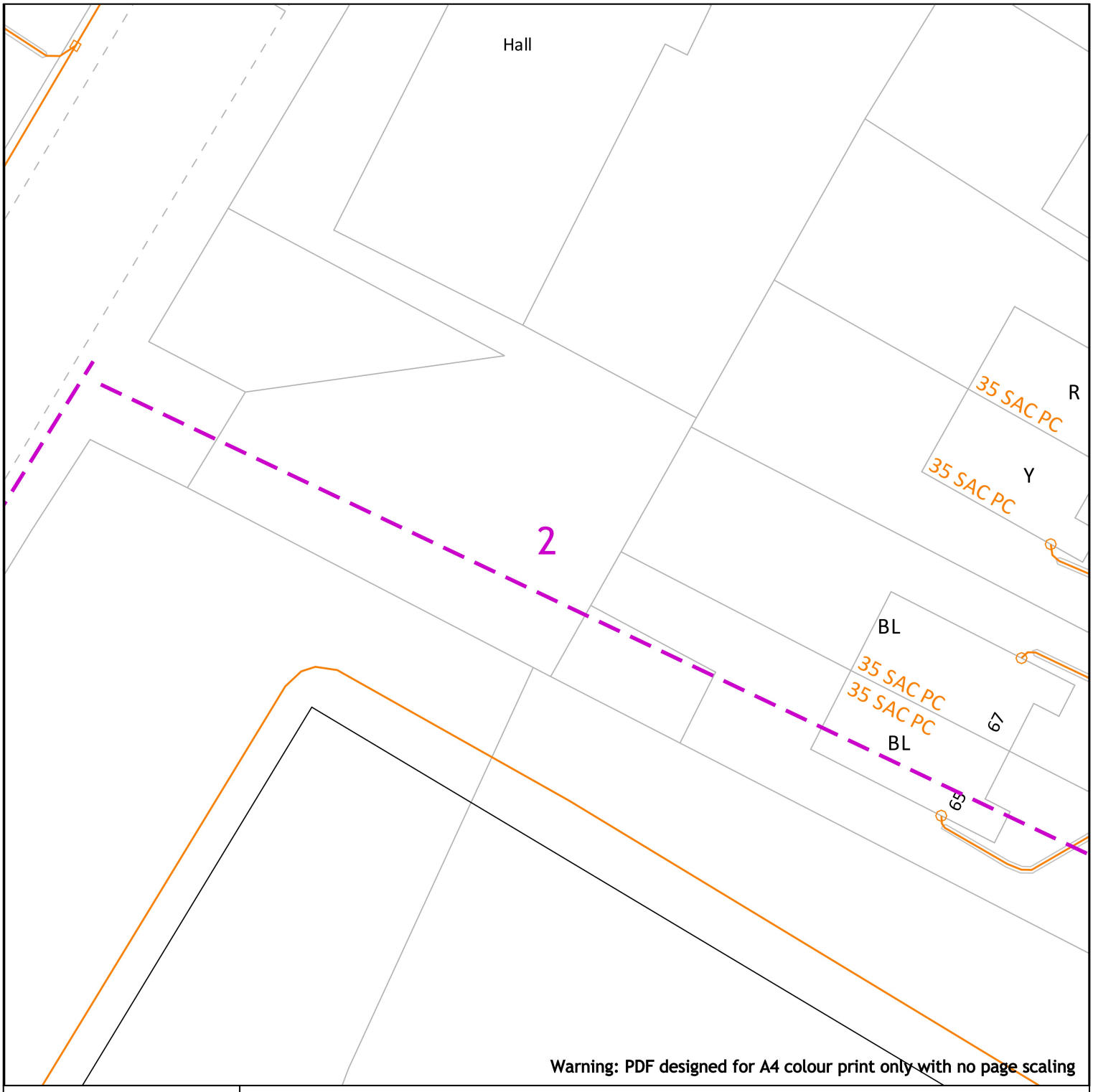
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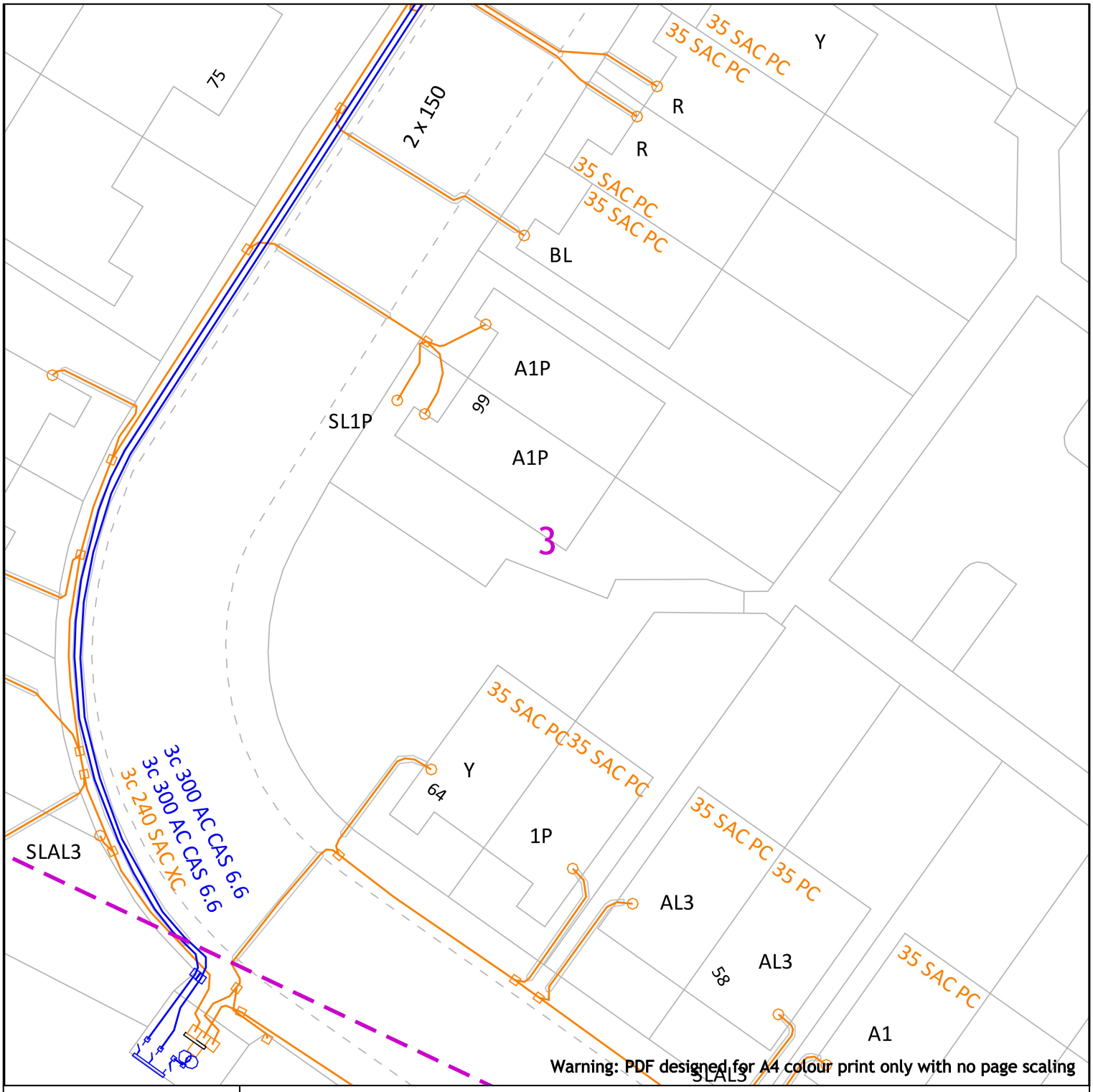
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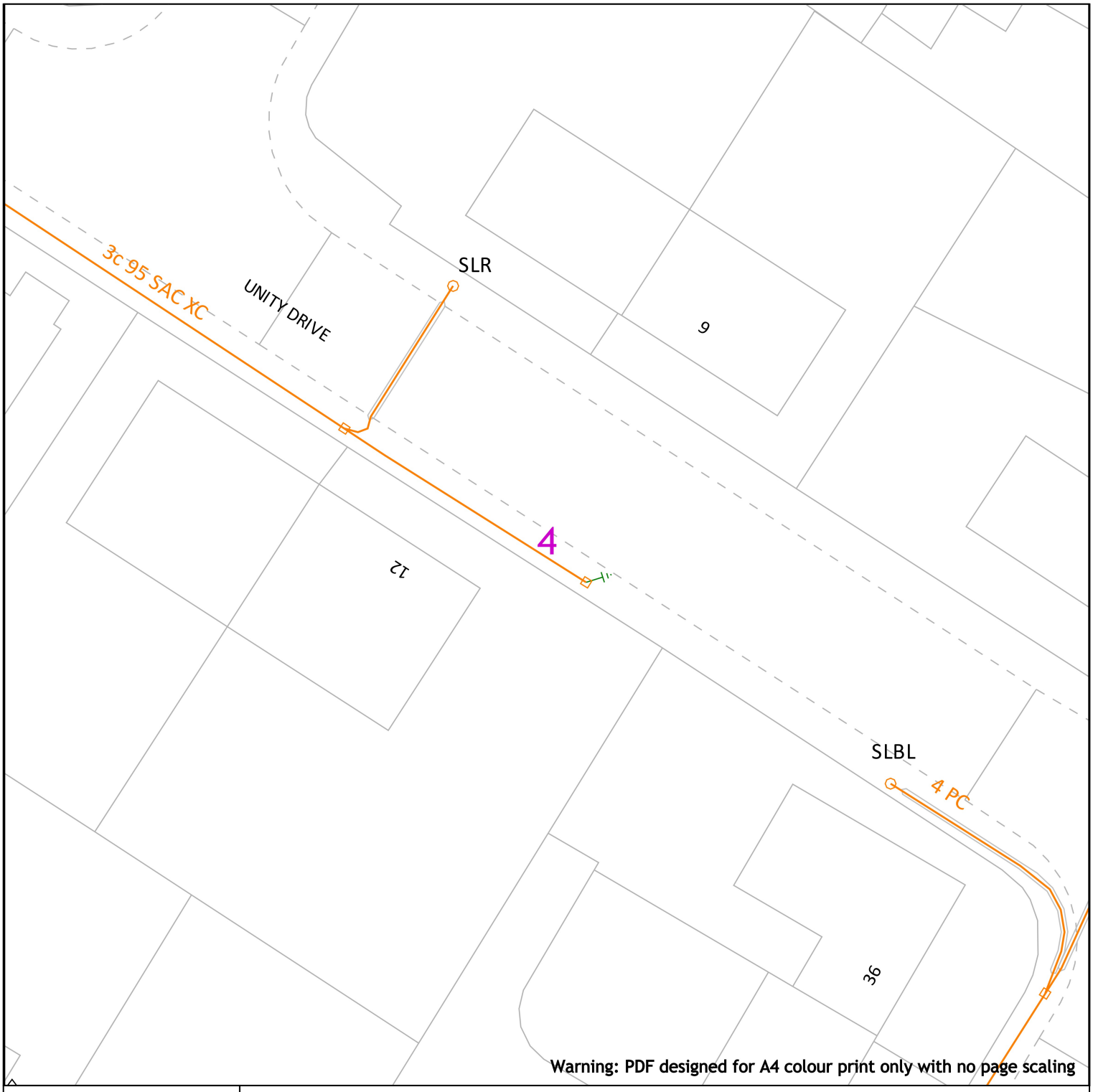
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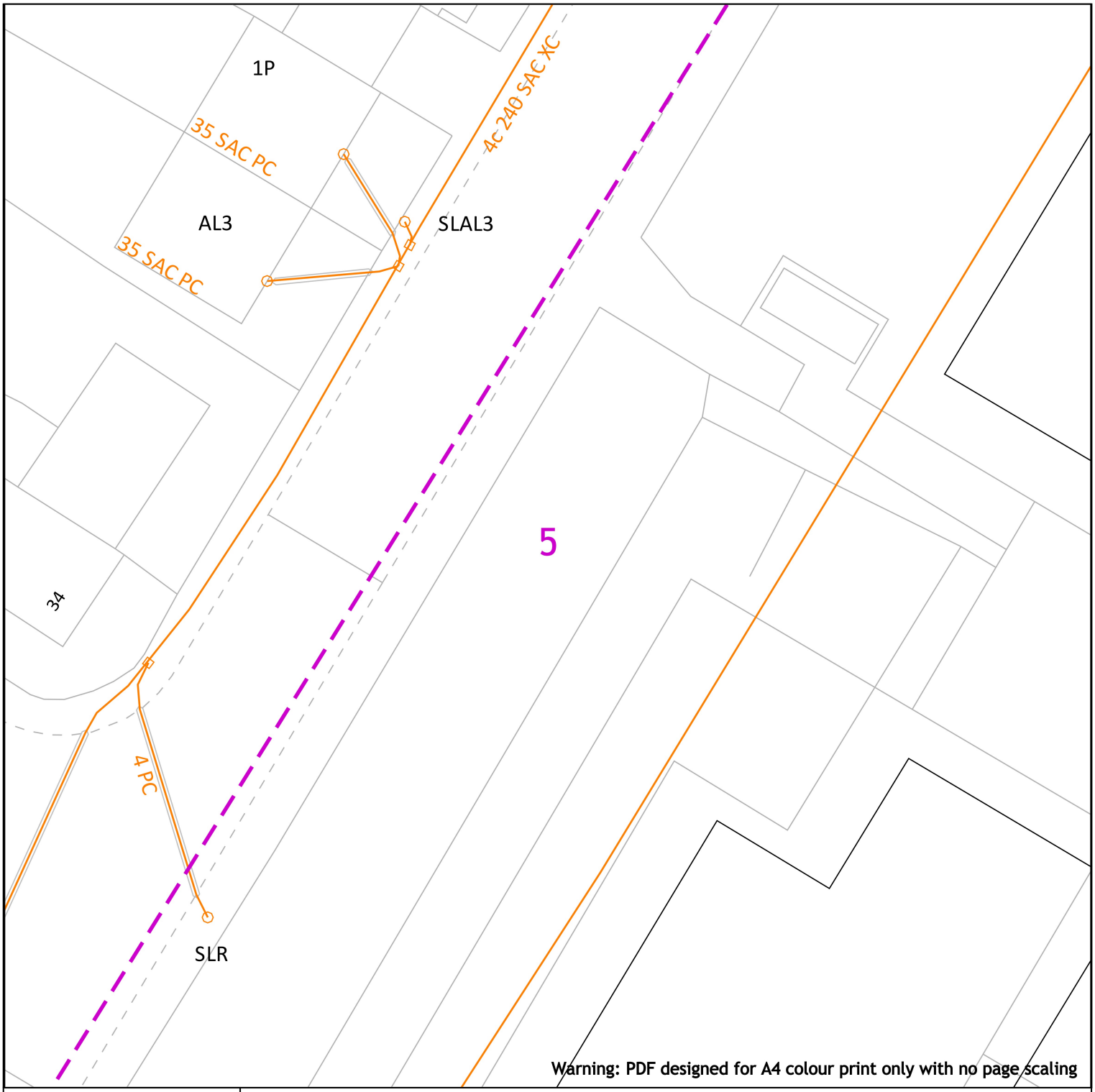
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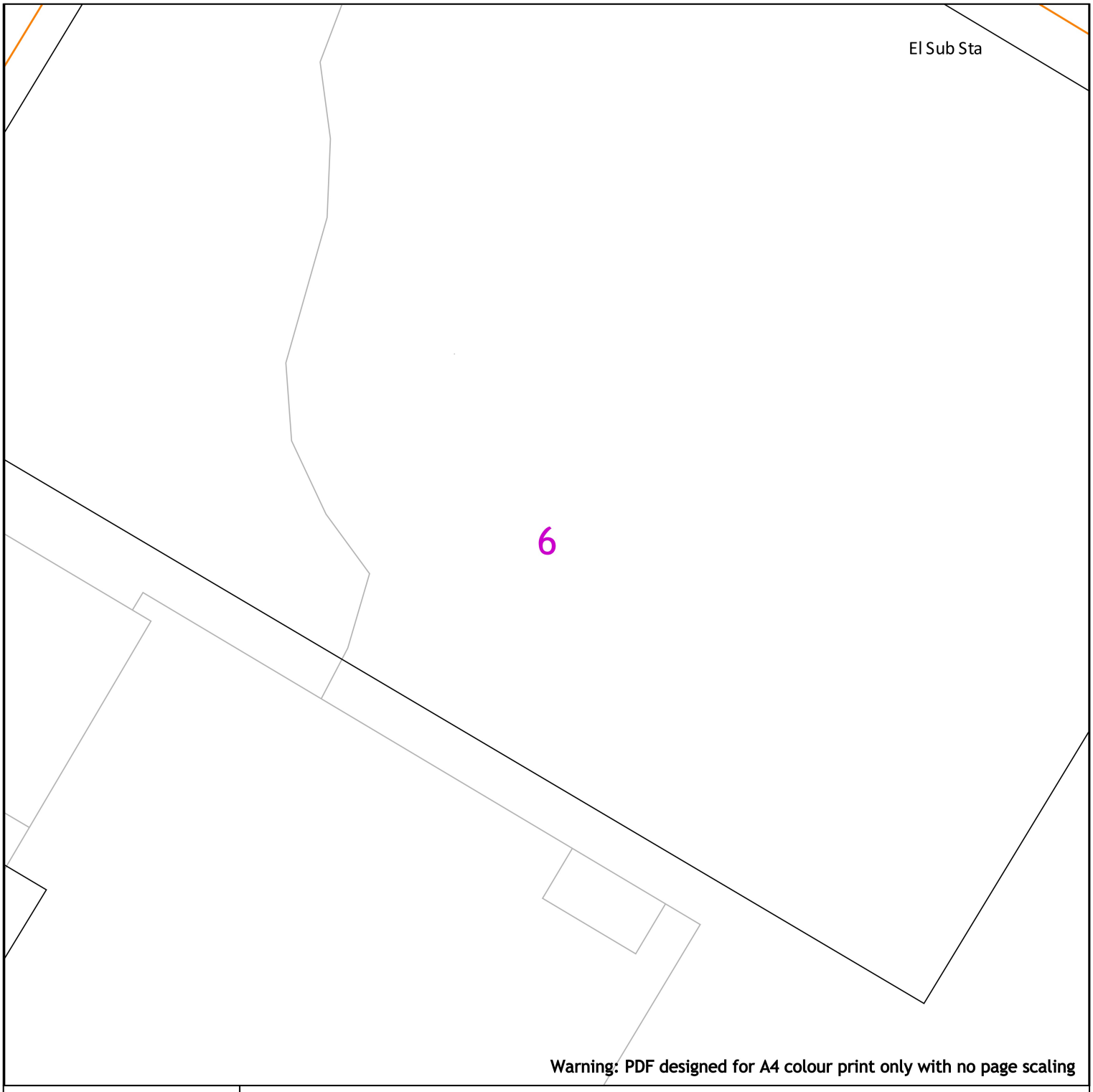
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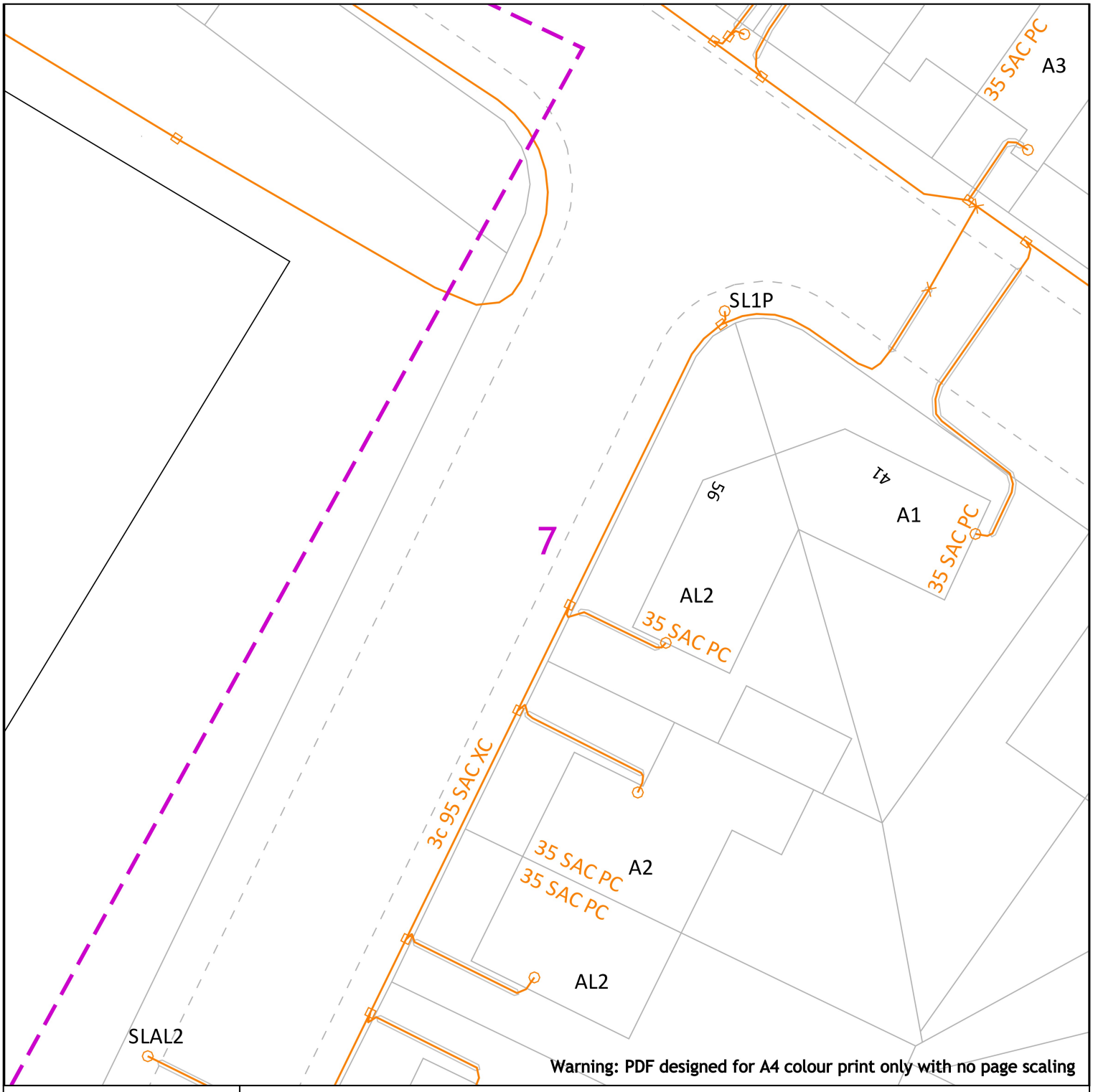
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Dig Sites

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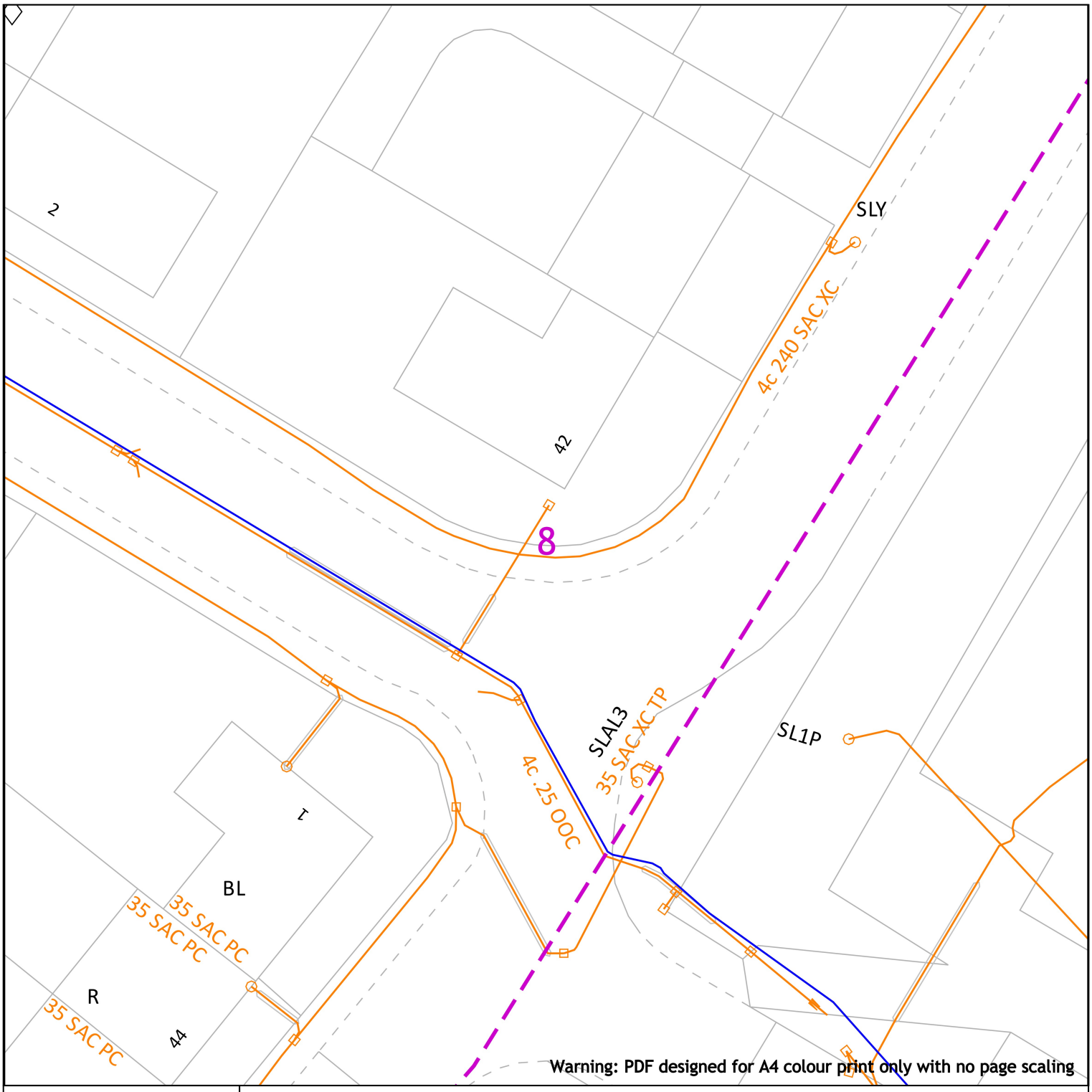
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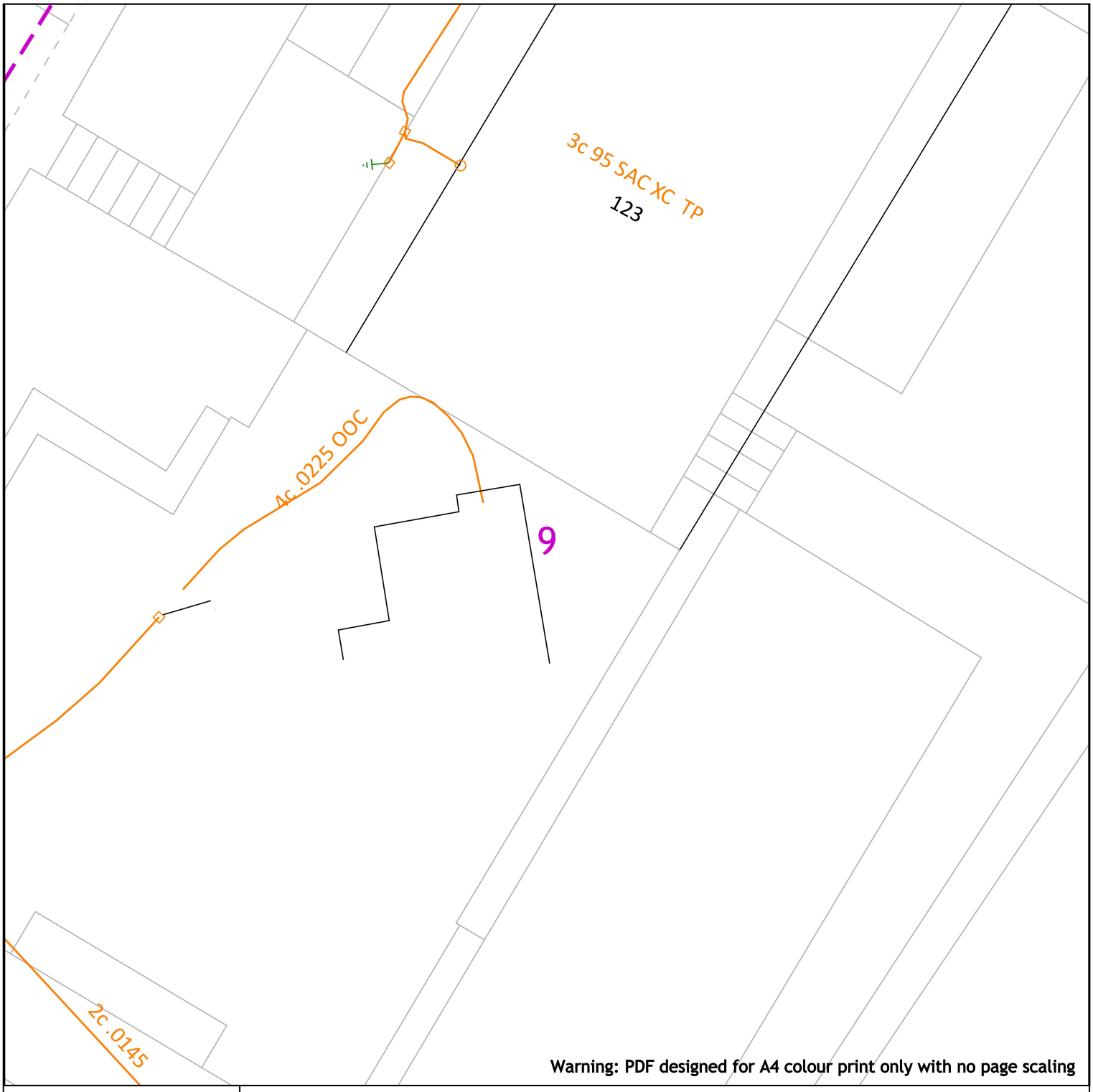
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Electricity North West
Linley House
Dickinson Street
Manchester, M1 4LF
Phone: 0800 195 4141
Email: planrequest@enwl.co.uk

Date Requested: 24/11/2023
Job Reference: 31658496
Site Location: 383607 400435
Requested by: Miss Lauren Wenham

Your Scheme/Reference: STV6309

Scale: 1:250 (When plotted at A4)

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11kV	Red	
6kV-6.6kV	Blue	
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LV	Orange	
Unknown Voltage	Brown	

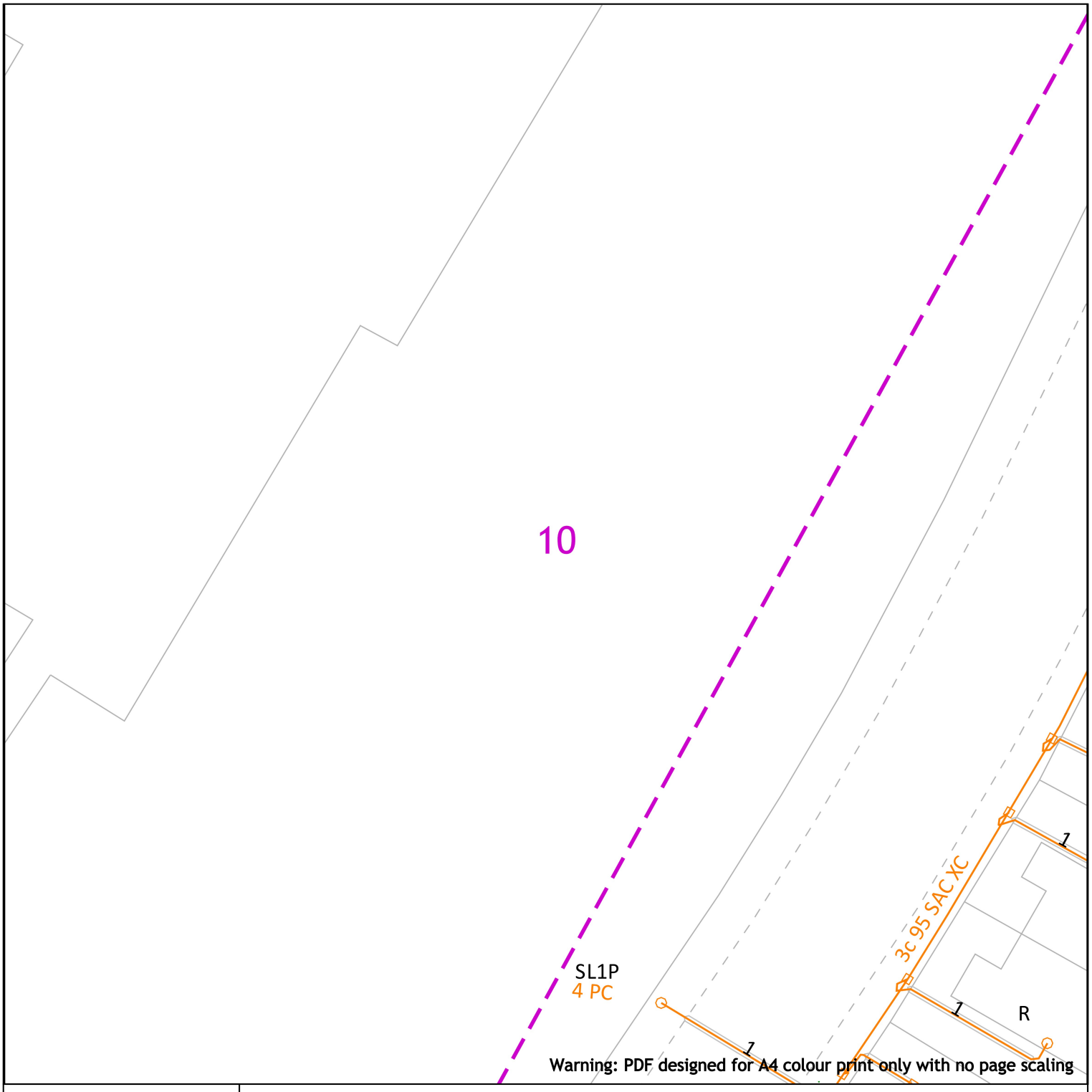
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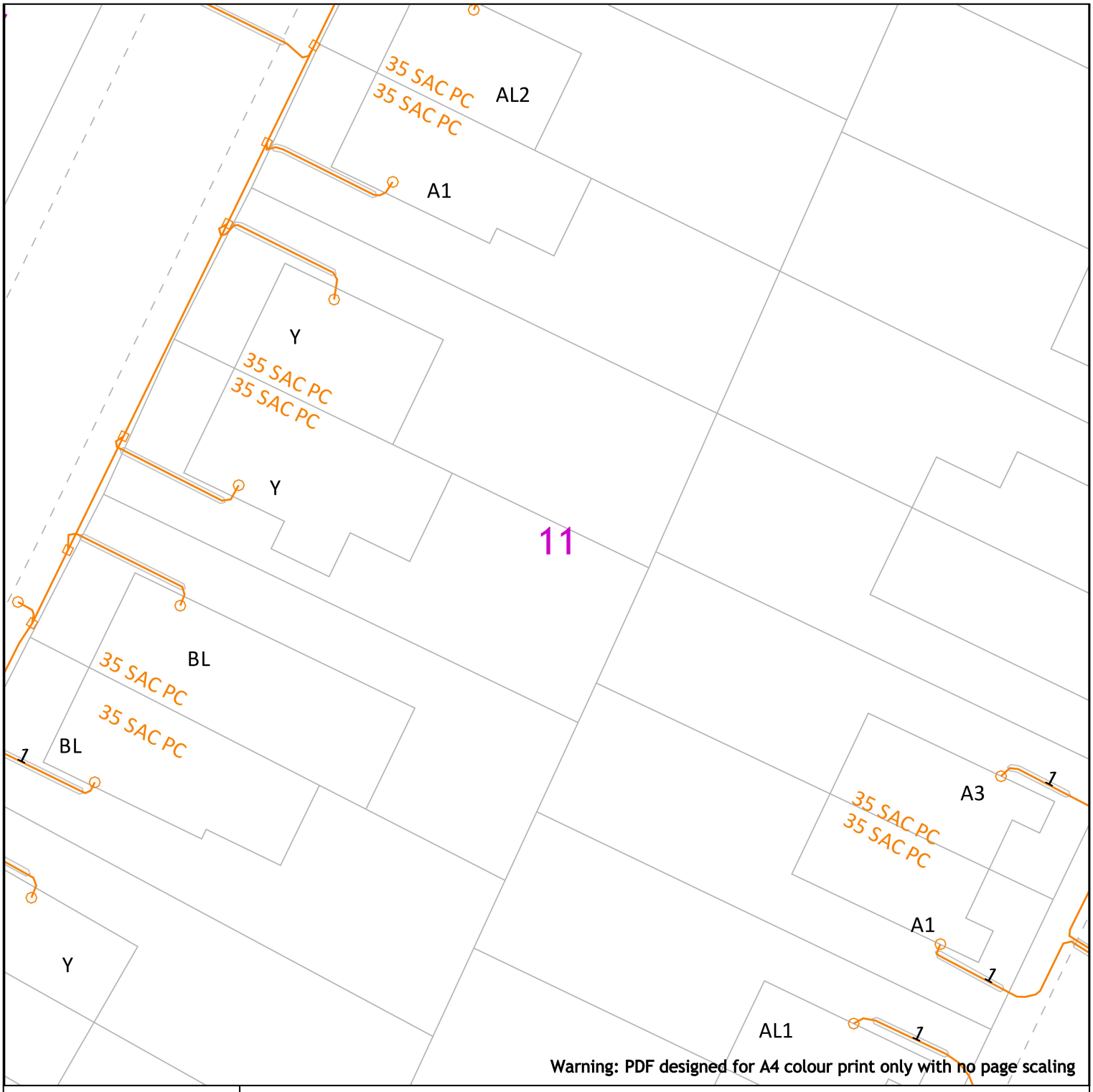
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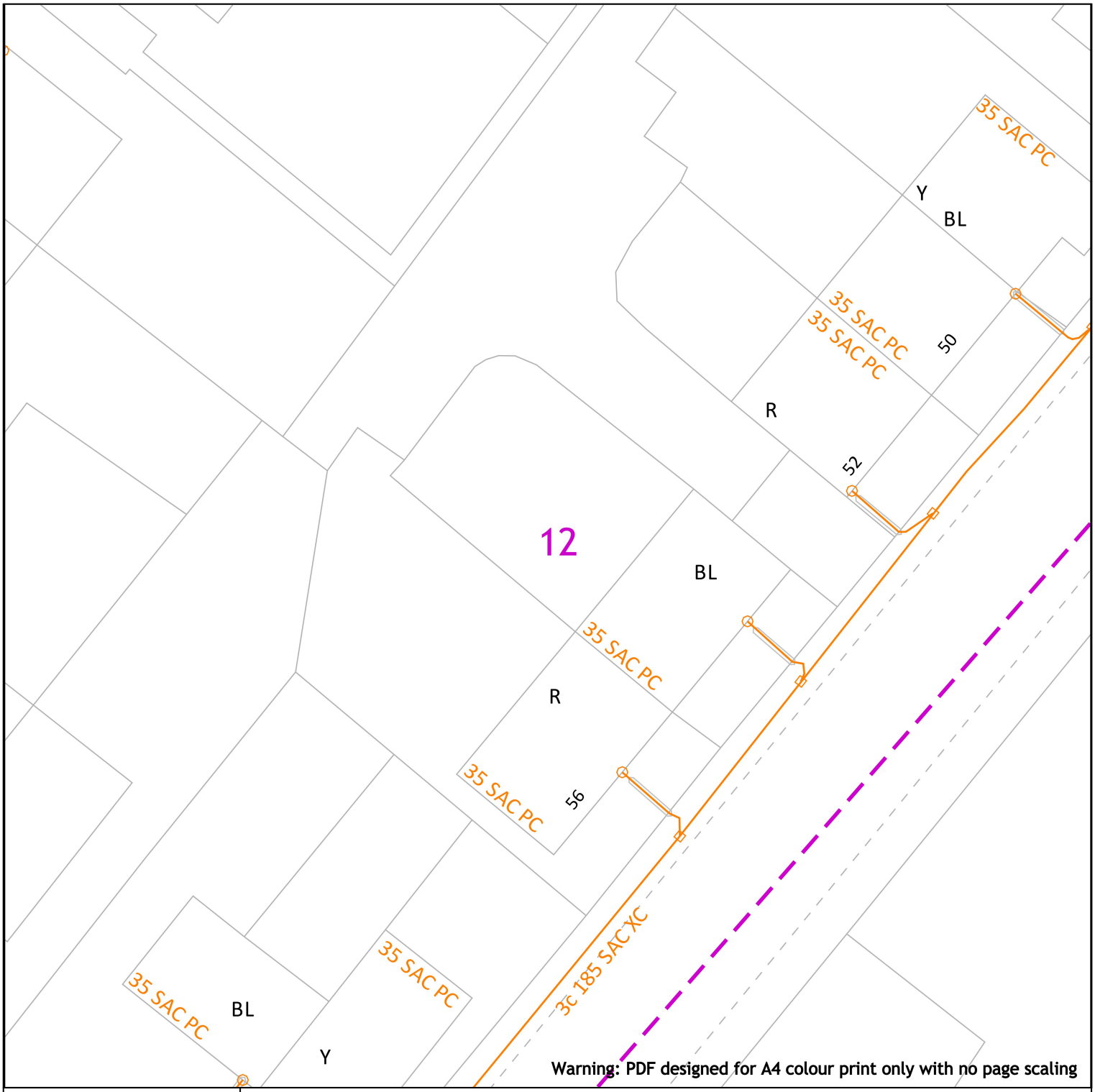
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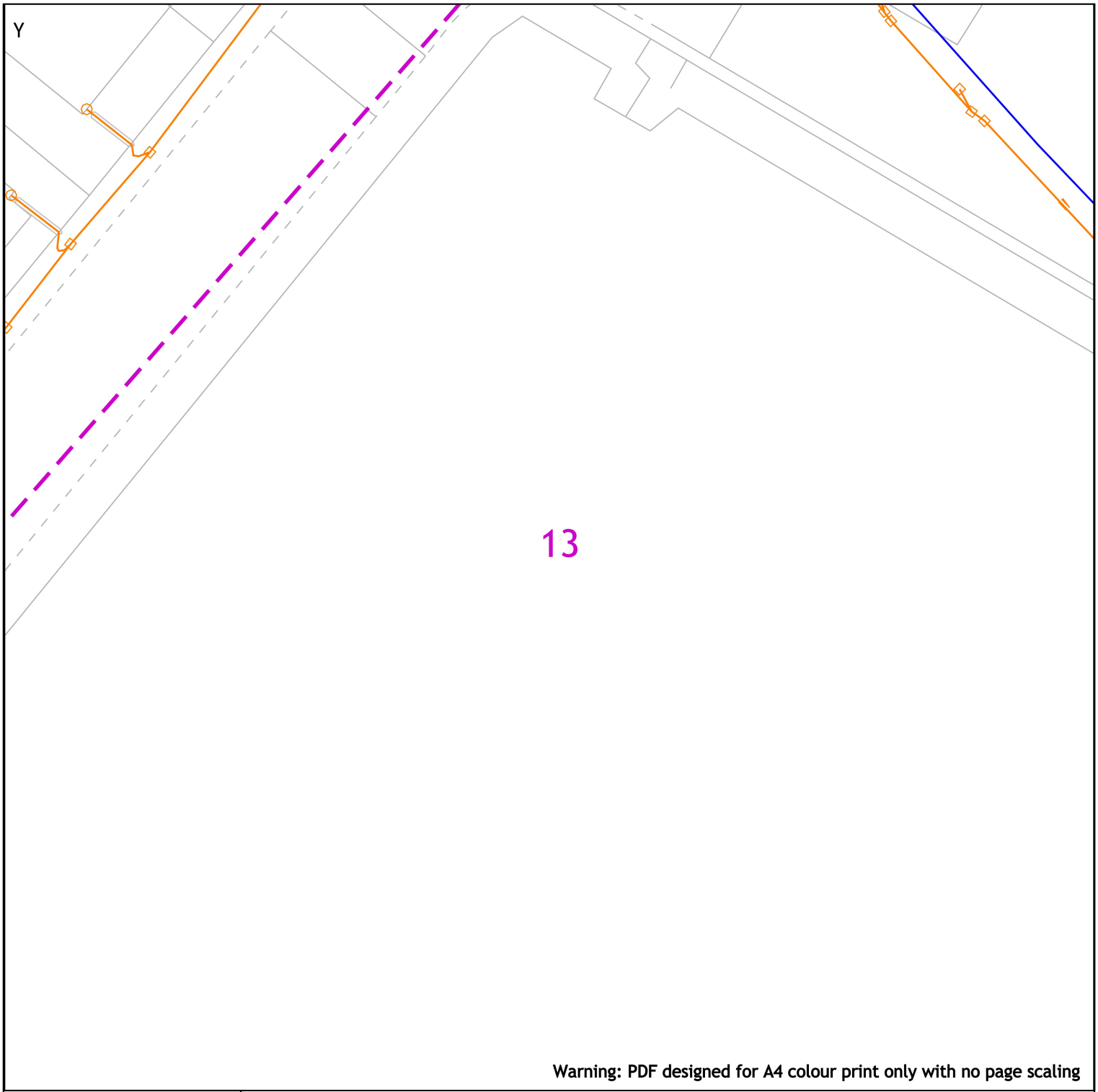
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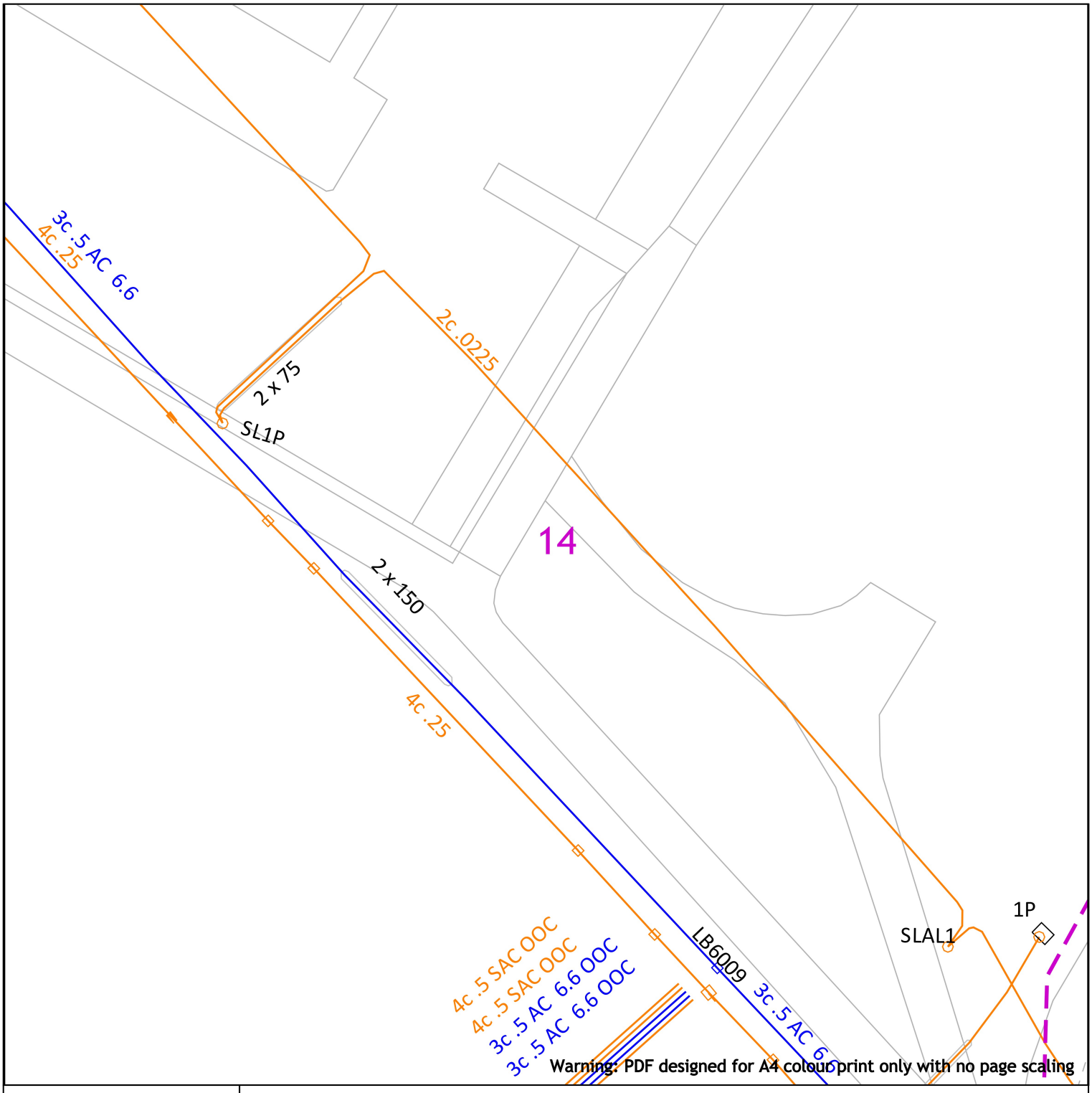
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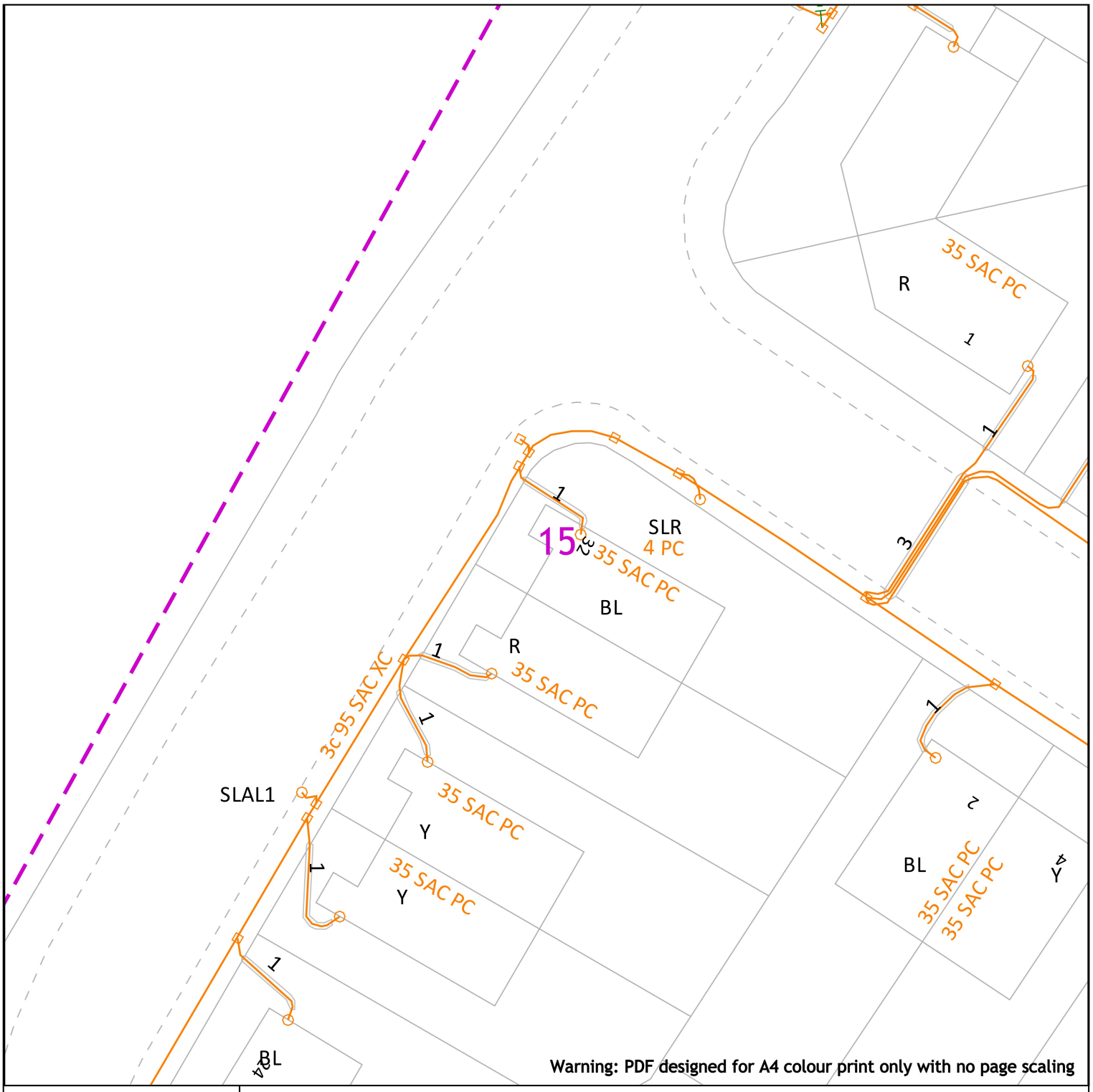
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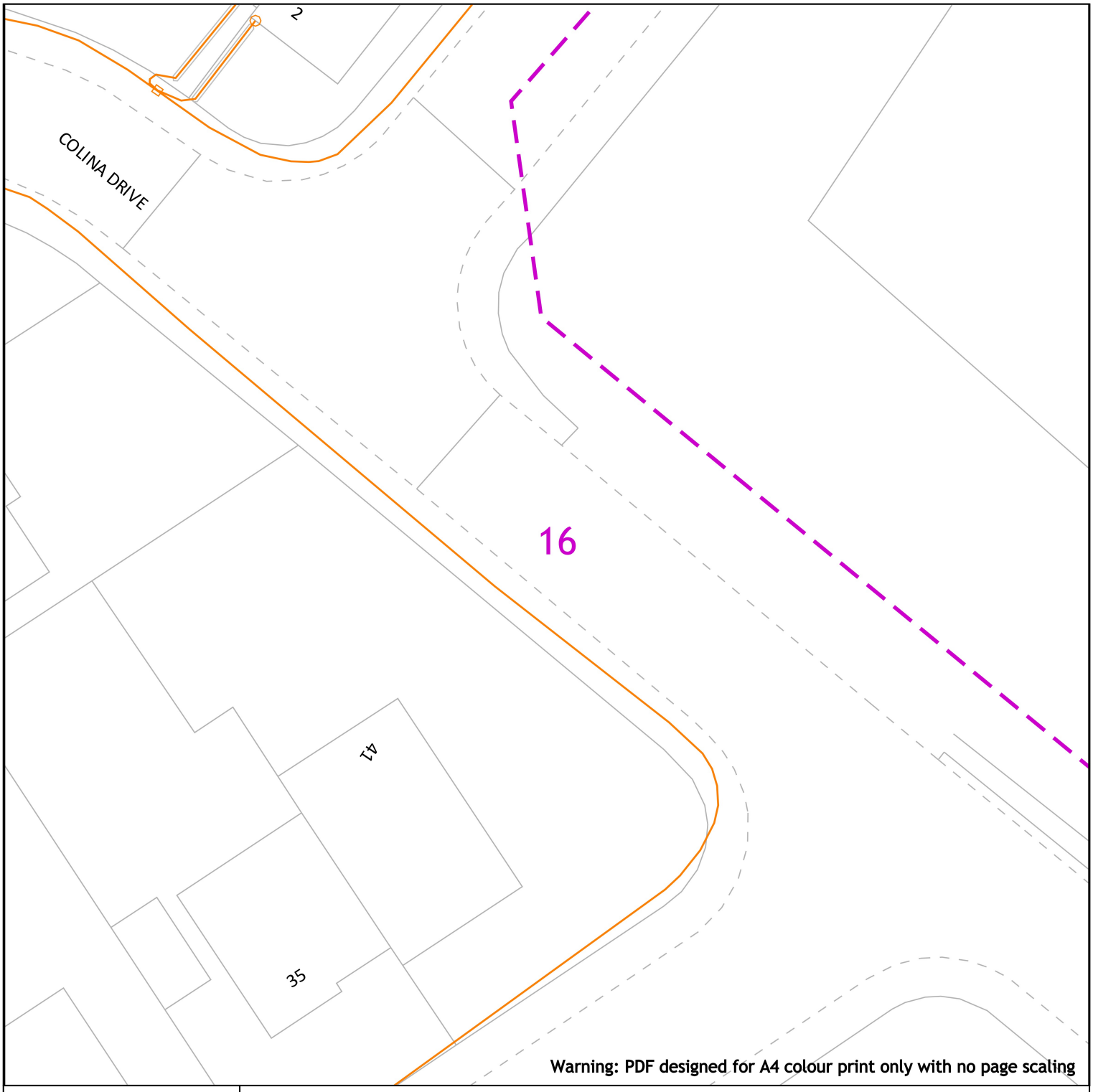
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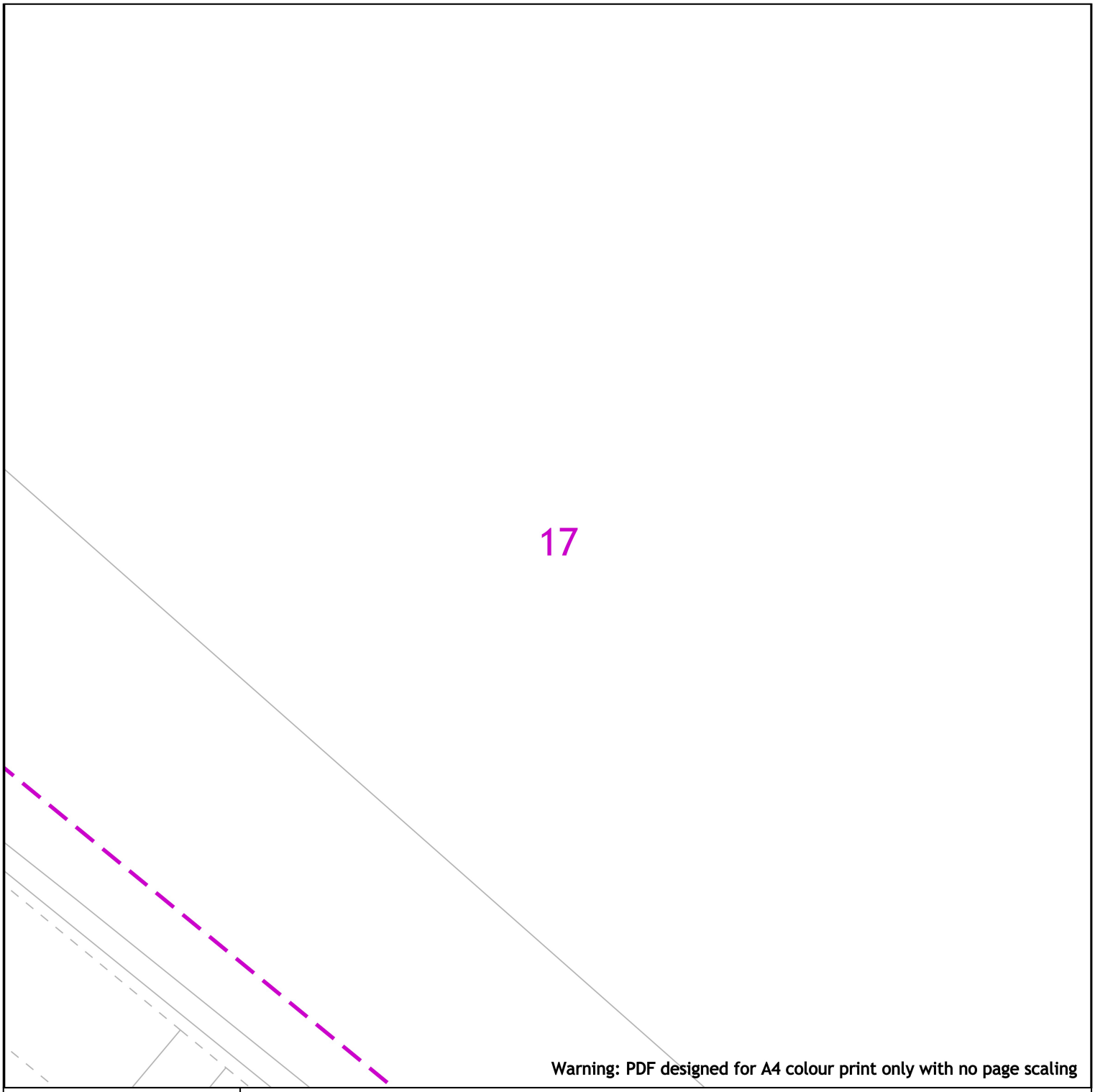
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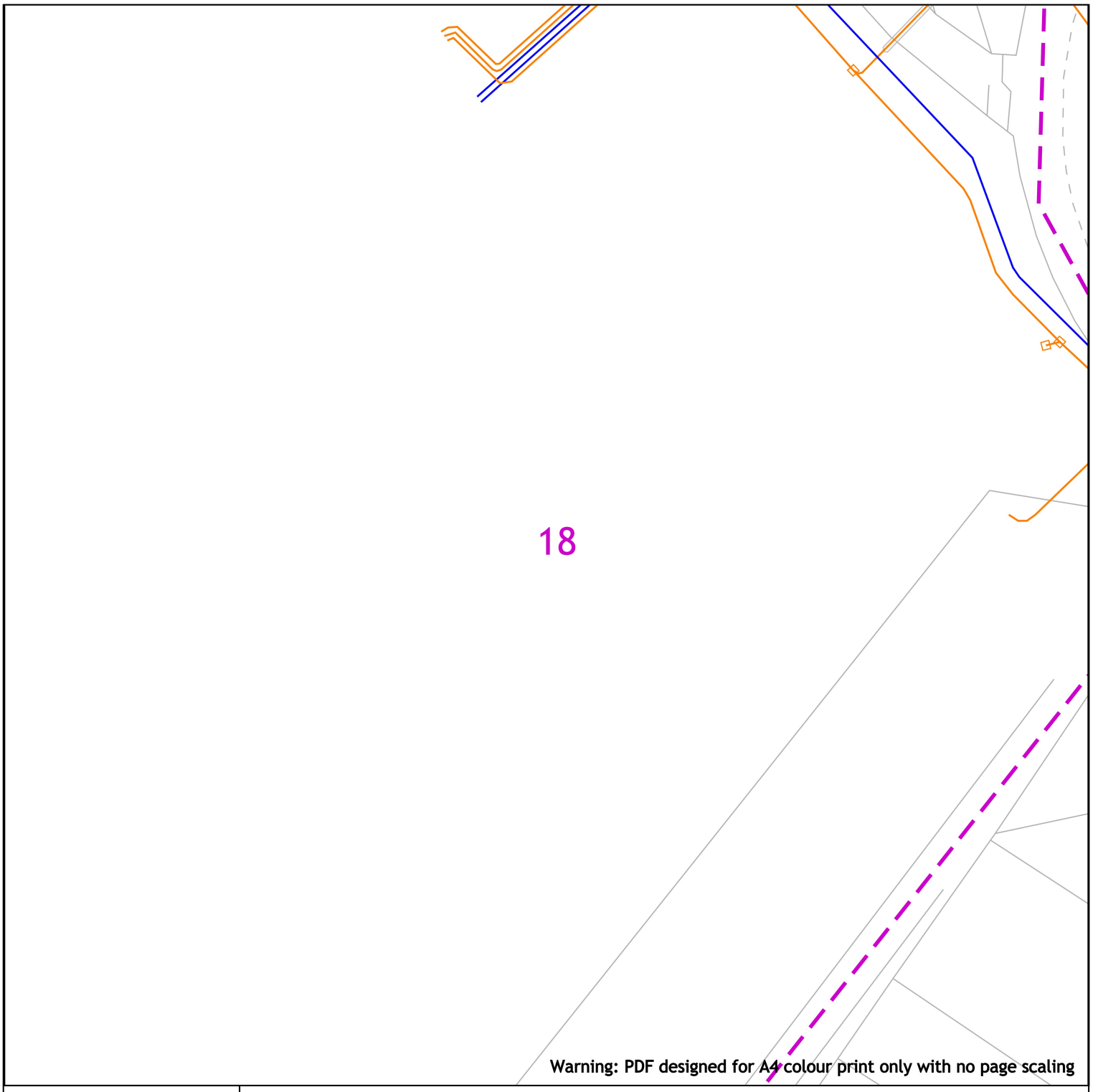
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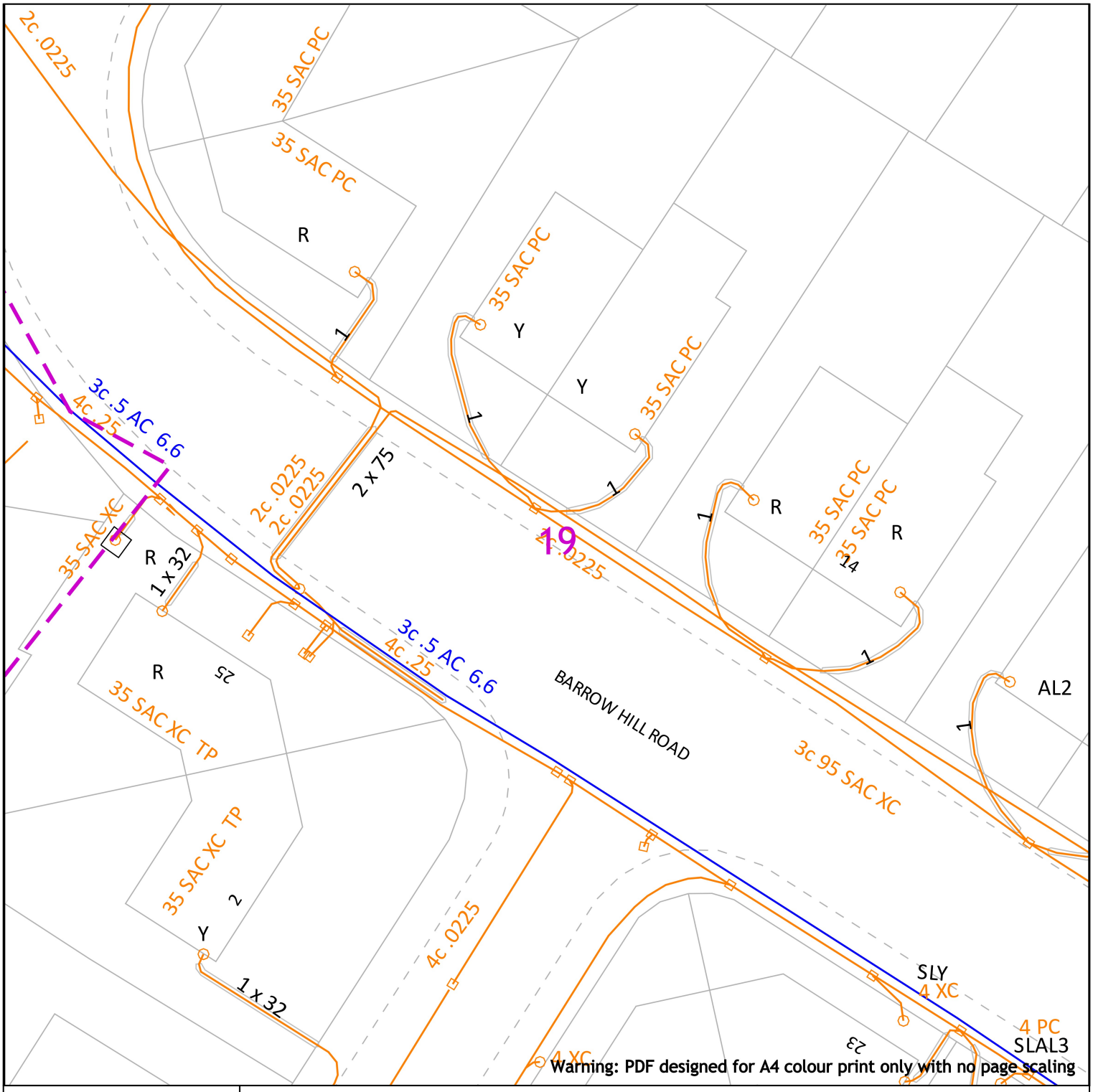
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Your Scheme/Reference: STV6309

Scale: 1:250 (When plotted at A4)

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	

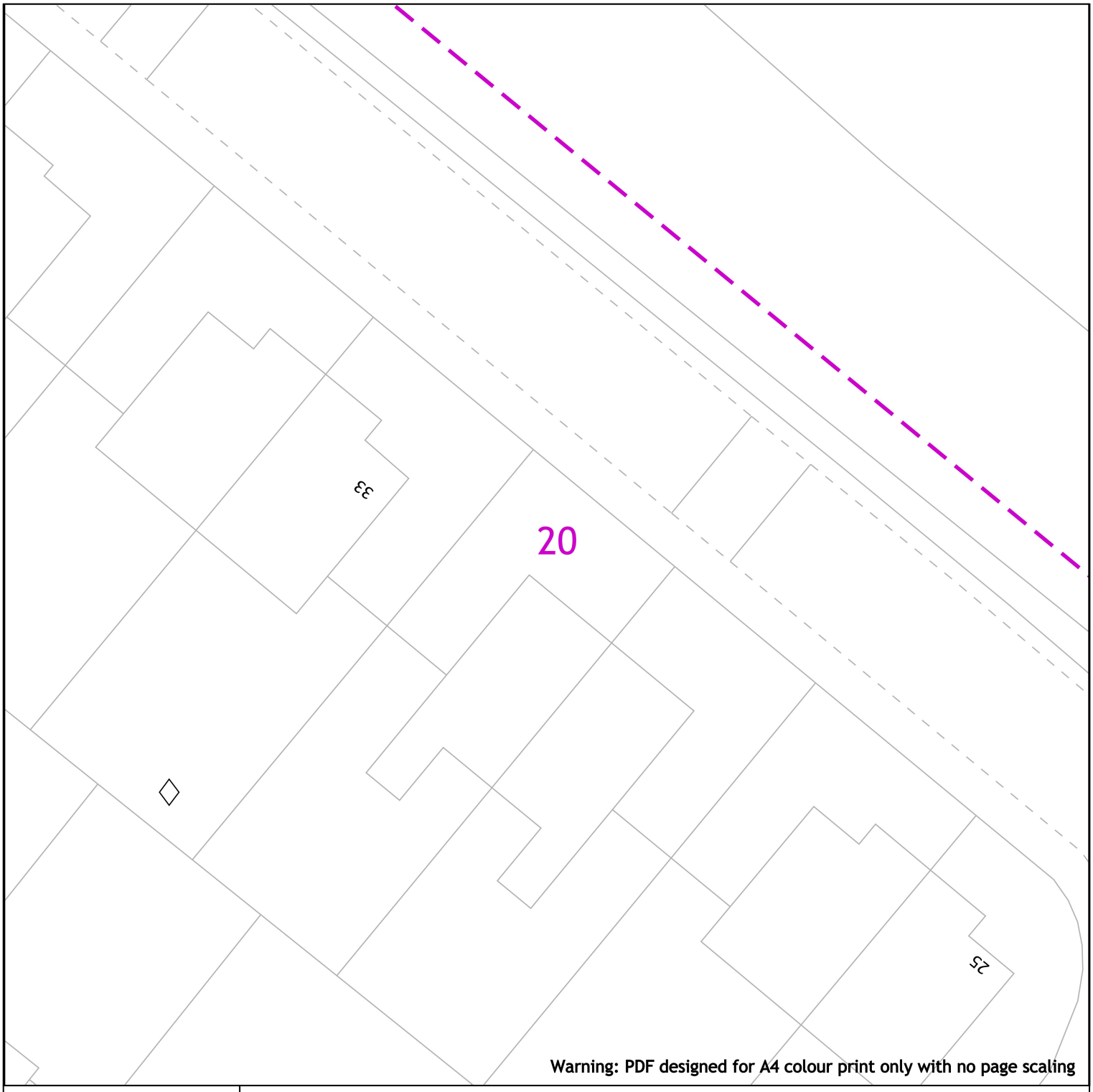
In an emergency call 105, 24 hours a day

Dig Sites
Line:
Area:

IMPORTANT INFO

Unless otherwise indicated the depth of Electricity North West Limited cables are in accordance with NJUG (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.
Reference should be made to HSE Guidance, HS(G)47 "Avoiding Danger from Underground Services" and GS6 "Avoidance of Danger from Overhead Power Lines".
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Data Management
Electricity North West
Linley House
Dickinson Street
Manchester, M1 4LF
Phone: 0800 195 4141
Email: planrequest@enwl.co.uk

Date Requested: 24/11/2023
Job Reference: 31658496
Site Location: 383607 400435
Requested by: Miss Lauren Wenham

Your Scheme/Reference: STV6309

Scale: 1:250 (When plotted at A4)

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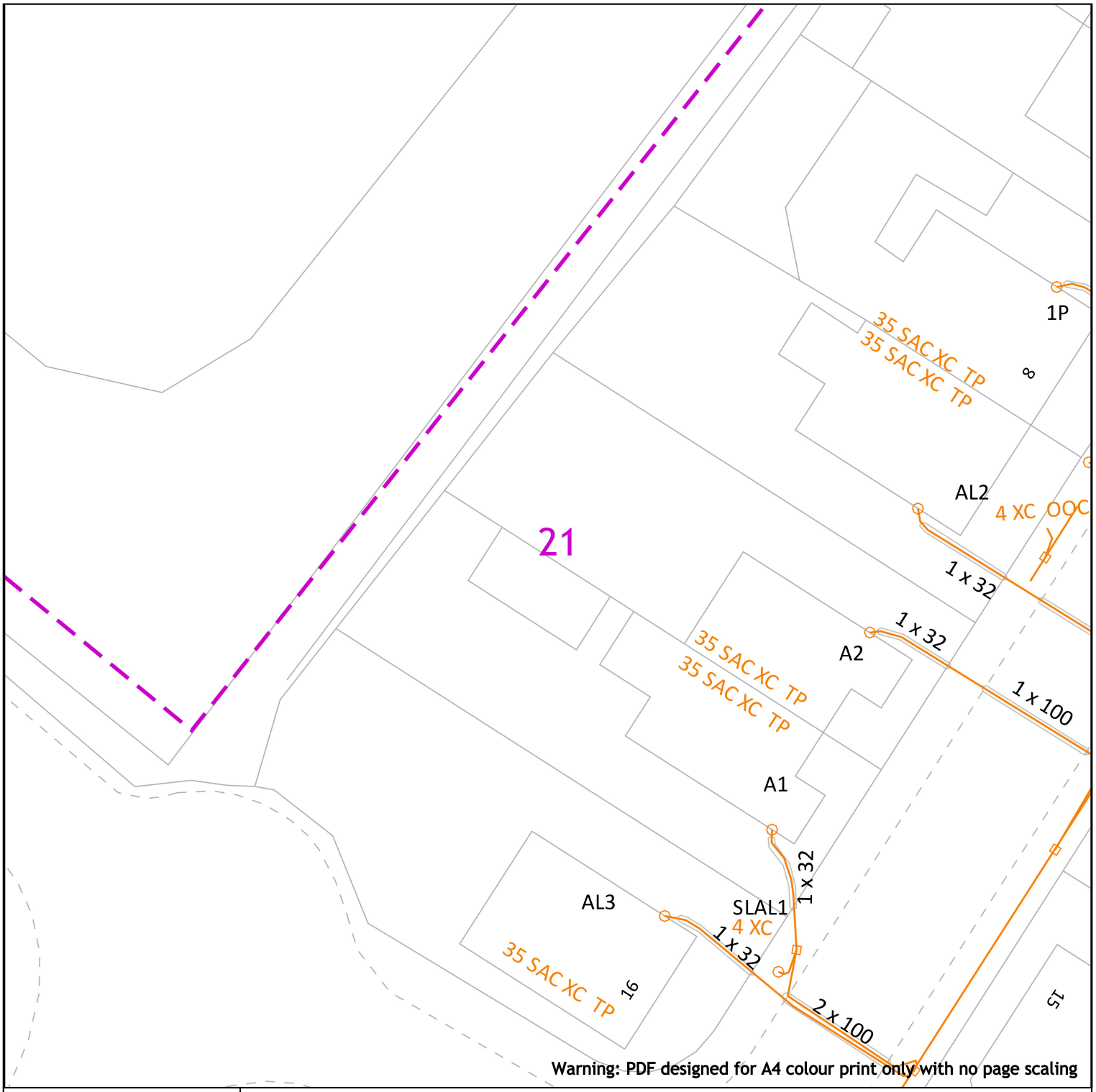
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Enquiry Confirmation

LSBUD Ref: 31658496

Date of enquiry: 24/11/2023
Time of enquiry: 14:44

Enquirer

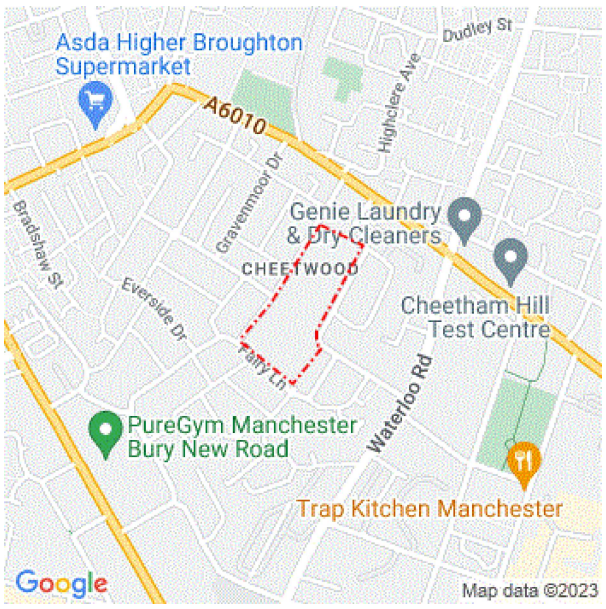
Name	Miss Lauren Wenham	Phone	01604 781877
Company	Soiltechnics Ltd	Mobile	Not Supplied
Address	Cedar Barn Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY		
Email	admin@soiltechnics.net		

Enquiry Details

Enquiry type	Planned Works
Work category	Development Projects
Work type	Commercial/industrial
Work type buffer*	75 metres
Start date	25/11/2023
End date	25/11/2023
Scheme/Reference	STV6309
Search location	M7 4ye
Confirmed location	383607 400435
Site size	0 metres square
Site Contact Name	Admin Soiltechnics
Site Phone No.	01604781877
Description of Works	NA

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

Site Map



Please note that the above map only displays the location of the proposed work site and will not display any of the Members' pipes and cables. It is imperative that this area accurately reflects the proposed work site.

Affected LSBUD members

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

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

Status explanation

Await Response means that the asset owner will contact you. This is typically by sending the plan response but they may ask for further information before being able to do so, particularly if any payments or authorisations are required.

Email Additional Info means that the asset owner needs further information about your works to assess your enquiry before providing a response. Please provide any details you have available including plans, method statements etc. if available.

Enquiry Confirmation
LSBUD Ref: 31658496

Date of enquiry: 24/11/2023
Time of enquiry: 14:44

Important notices

It is very important that you correctly understand what the service does and the procedures in order for you to work safely. Please refer to the LSBUD Support Page (www.lsbud.co.uk/linesearchbeforeudig-support) for further guidance.
This information includes how to provide additional information to the LSBUD Members who request it to provide a response to your enquiry.
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 and time of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig (LSBUD) 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.
Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lsbud.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.

List of not affected LSBUD members
(LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area.)

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	Cambridgeshire County Council Climate Change and Energy Services
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
ESB CCGT Power station (Carrington Gas Pipeline)	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	Kensa Utilities
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	National Grid Ventures
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	Spring Fibre Limited	Squire Energy Networks
SSE Generation Ltd	SSE Transmission	SSE Utility Solutions Limited

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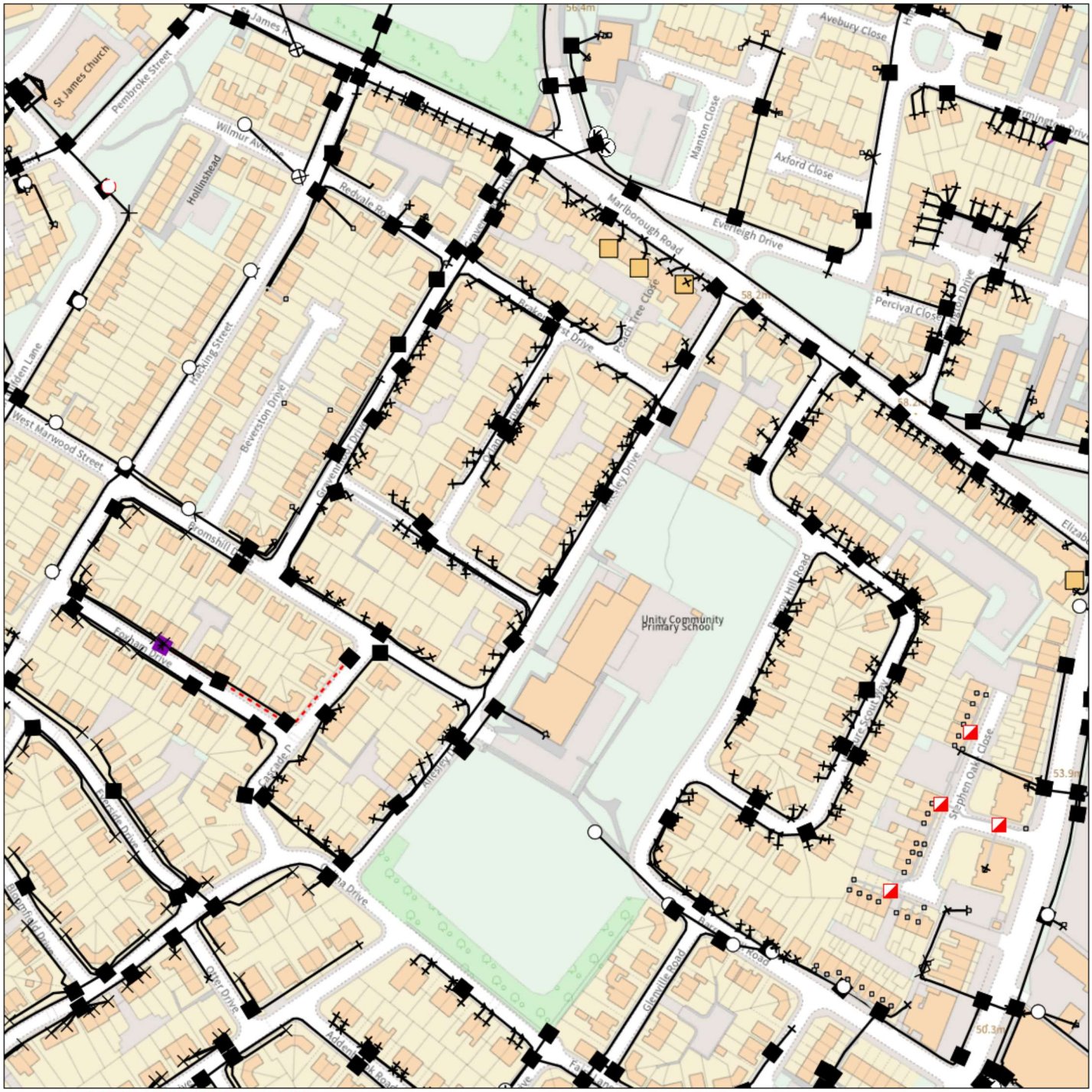
Storengy	Tata Communications (c/o JSM Construction Ltd)	TfL – London Underground HV Cables (Road Side Cables)
Total Colnbrook Pipelines	Total Finaline Pipelines	Transmission Capital
Trojan Energy Limited	UK Power Networks	Uniper UK Ltd
University of Cambridge Granta Backbone Network	Vattenfall	Veolia 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		

Non-LSBUD members (Asset owners not registered on LSBUD)
(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.)

Asset Owner	Preferred contact method	Phone	Status
Arelion UK Ltd	check-network@arelion.com		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	nrswa.uk@equans.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@ocugroup.com	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	nrswa@sky.uk	02070323234	Not Notified
Sota	sota.plantenquiries@ocugroup.com		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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The results of this Enquiry are personal to the Enquirer and shall not be shared with or relied upon by any other party. The asset information on which the Enquiry results are based has been provided by LSBUD Members, therefore LSBUD will provide no guarantee that such information is accurate or reliable nor does it monitor such asset information for accuracy and reliability going forward. There may also be asset owners which do not participate in the enquiry service operated by LSBUD, including but not exclusively those set out above. Therefore, LSBUD cannot make any representation or give any guarantee or warranty as to the completeness of the information contained in the enquiry results or accept any responsibility for the accuracy of the mapping images used. LSBUD and its employees, agents and consultants accept no liability (save that nothing in this Enquiry Confirmation excludes or limits our liability for death or personal injury arising from our negligence, or our fraud or fraudulent misrepresentation, or any other liability that cannot be excluded or limited by English law) arising in respect thereof or in any other way for errors or omissions including responsibility to any person by reason of negligence.

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

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KEY TO BT SYMBOLS

	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

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 : MWZ02519Y
Map Reference : (centre) SD8356600569
Easting/Northing : (centre) 383566,400569
Issued : 24/11/2023 14:52:17

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