



SUDS DRAINAGE SYSTEM PROPOSALS

Construction of a New 2G
Synthetic Pitch

for

St. Gregory's Catholic
Academy

December 2023



Sports Labs Ltd
1 Adam Square
Brucefield Industry Park,
Livingston
EH54 9DE

Contract Number: **3219**

Issued by: Sports Labs on behalf of
St Gregory's Catholic Academy

For the development of:
The construction of a new MUGA pitch with fencing system to replace the existing natural grass area.

Date of Issue:
December 2023

Version	Issue Date	Details
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Approvals		Signatures
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Checked by:	David Dickinson	
Client approval:	For and on behalf of St Gregory's Catholic Academy	
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1 SITE DETAILS

1.1 Site Address

St Gregory's Catholic Academy
Ragpath Lane
Roseworth
Stockton on Tees
TS19 9AD

1.2 Applicant Details

St Gregory's Catholic Academy
Ragpath Lane
Roseworth
Stockton on Tees
TS19 9AD

Project Contact:
Email:

1.3 Agent Details

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Project Contact: Calum Hirst
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2 INTRODUCTION

- 2.1 Sports Labs Ltd has been appointed on behalf of St Gregory's Catholic Academy develop an application for planning permission for a proposed redevelopment of existing natural grass football pitches, along with associated bowling green within the grounds of St. Gregory's Catholic Academy, Ragpath Ln, Roseworth, Stockton-on-Tees TS19 9AD.
- 2.2 In order to assist in the approval of planning permission and the development of the proposed project, this document shall outline the SUDS drainage system put forward for the new pitch.
- 2.3 This SUDS document is a statutory requirement on all major developments as defined in Town and Country Planning (General Permitted Development) (England) Order 2015. Local requirement on all new development, including dwellings, commercial units and basements.
- 2.4 This document shall include the following minimum requirements as set out within the Local Authority Validation Checklist;
- A plan of the existing site layout.
 - A topographical survey.
 - Plans & drawings of the proposed site layout identifying the footprint of the area being drained.
 - Information on proposed SUDS measures describing how the proposed measures manage surface water.
 - Geological information including infiltration test results.

3 SUDS PROPOSALS

3.1 Existing Site Layout Plan

3.1.1 Refer to APPENDIX A – 3219-010 ST GREGORY – LOCATION PLAN. This indicates the proposed location of the new 2G pitch within the context of the existing playing fields on the grounds of St Gregory's Catholic Academy.

3.2 Topographical Survey

3.2.1 Refer to APPENDIX B – 3219-050 ST GREGORY – TOPOGRAPHICAL SURVEY. This indicates the proposed footprint of the new 2G pitch. The survey provides a levels grid over the site area and identifies the location of main features within the existing site such as kerb-lines, utilities, trees, fencing etc.

3.2.2 Earthworks shall be undertaken over the site area. The new pitch shall have a pitch platform of 1:100 from the Northern goal line down to the Southern goal line of the pitch, in line with the existing levels on site. This is in-line with the minimum requirements of BS EN 15330. The proposed drainage network will run in the opposite direction due to the location of the near by surface water network.

3.3 Additional Supporting Drawings

3.3.1 Refer to APPENDIX C – 3219-100 & 200 ST GREGORY – GENERAL ARRANGEMENT & DRAINAGE DRAWINGS. This indicates the proposed footprint of the new 2G pitch within the existing natural grass playing fields, and identifies the location of main features within the existing site, such as kerb-lines, utilities, trees, fencing etc.

3.4 Pitch Drainage

3.4.1 The pitch itself shall consist of a 250mm thick sub-base layer of type 1 stone modified for drainage. Above this is an optional porous asphalt engineered layer of 40mm thick, and a free draining shockpad up to 20mm and synthetic turf system 20mm. Given that the existing soils on site are predominantly clay based, an attenuation crate system is to be installed, sized at 10.0m x 5.0m x 1.0m, prior to a flow control manhole discharging at a restricted rate of 2l/s to the existing surface water network in the area.

3.4.2 The pitch drainage system shall consist of lateral drainage pipes of 80mm diameter laid at 7.8m centres across the width of the pitch in line with the 1:100 maximum allowable gradient pitch platform created. The lateral pipes shall connect into a carrier drain of 150mm in diameter laid along the Western touchline of the new pitch flowing to the low Northern goal line of the site.

3.4.3 The drainage system shall then outfall to a new attenuation system, sized at 10.0m x 5.0m x 1.0m, via a silt trap manhole. The attenuation system will discharge via a flow control manhole set to 2l/s (greenfield runoff rate) to the existing surface water network, via a manhole located to the Northwest of the development.

3.5 Geological Information

3.5.1 Refer to APPENDIX D – SOAKAWAY TEST RESULTS (SOILTECHNICS GROUND INVESTIGATION REPORT). This comprised of two soakaway tests being undertaken on site which has indicated that the soils to infiltrate poorly, with minimal drop in the water level in either location. Due to this, we have produced a drainage strategy to allow for worst case scenario infiltration, with storage capacity allowed for within the new pitch subbase area, new attenuation tank and a flow control within the disconnecting manhole.

3.6 Proposed SUDS Measures Summary

- 3.6.1 The drainage system shall outfall to a new infiltration trench to the north of the pitch. This was agreed to be the most suitable solution following consultation with Scottish Water and Fife Council's consultee on this development. While the attached site investigation demonstrates via infiltration testing that the soils have limited capacity for this, there are no records of this site being at risk of flooding. This is backed up by the boreholes that detail there to be no groundwater within 3.4m of the surface.
- 3.6.2 Given that the new subbase layers to be constructed as part of the new pitch, along with the installation of a new infiltration trench, will massively increase the potential for surface water attenuation within the site, we believe this to be sufficient in order to control surface water runoff on site, per the attached drainage calculations provided in Appendix E.
- 3.6.3 Given that there are no records of flooding on this site, no new hardstanding surfaces are proposed to be introduced and the attenuation capacity of the site will be increased by the development, this design is believed to be sufficient.

3.7 Construction Phase – Key Stage Inspections

- 3.7.1 As a quality control measure, the pitch construction is to be controlled by Key Stage Inspections (KSI's) at each phase of construction. This will allow porosity testing to be carried out in line with BS EN standards to ensure that the pitch is draining correctly at key stages of the construction.

3.8 Proposed Adoption and Maintenance

- 3.8.1 Following completion of the works, the client will assume ownership and subsequent maintenance of the drainage system. There are no set adoption processes/criteria prior to ownership being transferred from the contractor.
- 3.8.2 The drainage design has been contained to on site attenuation of the surface water within the pitch base, with a new infiltration trench installed, the length of the proposed pitch. As per chapter 32 of the CIRIA SuDS Manual (2015), the maintenance of the drainage system consists of:

SuDS Element	Maintenance Required	Frequency of Visit
Silt Trap Manhole	Litter and debris removal	Regular Maintenance
	Sediment management	Occasional Maintenance
Rodding Eye	Sediment management	Occasional Maintenance
Lateral Drainage	Structure rehabilitation/repair	Occasional maintenance
Stone Base Construction	Structure rehabilitation/repair	Occasional maintenance
Attenuation Tank	Sediment management/repair	Occasional maintenance

Synthetic Pitch	Brushing and litter picking	Weekly maintenance
	Infill decompaction	Quarterly maintenance

Table 1 - SuDS Maintenance Schedule

3.8.3 The pitch maintenance will be carried out on a regular basis to ensure the pitch remains in suitable playing condition. This includes various measures from litter picking and brushing of the turf, to deep decompaction of the infill. The decompaction works will help to ensure that water is still able to freely pass through the pitch system and enter the drainage system to be installed.

3.8.4 As detailed above, various other means of maintenance are to be undertaken to ensure the drainage system remains clear of silting and blockages in order to keep the system operating effectively.

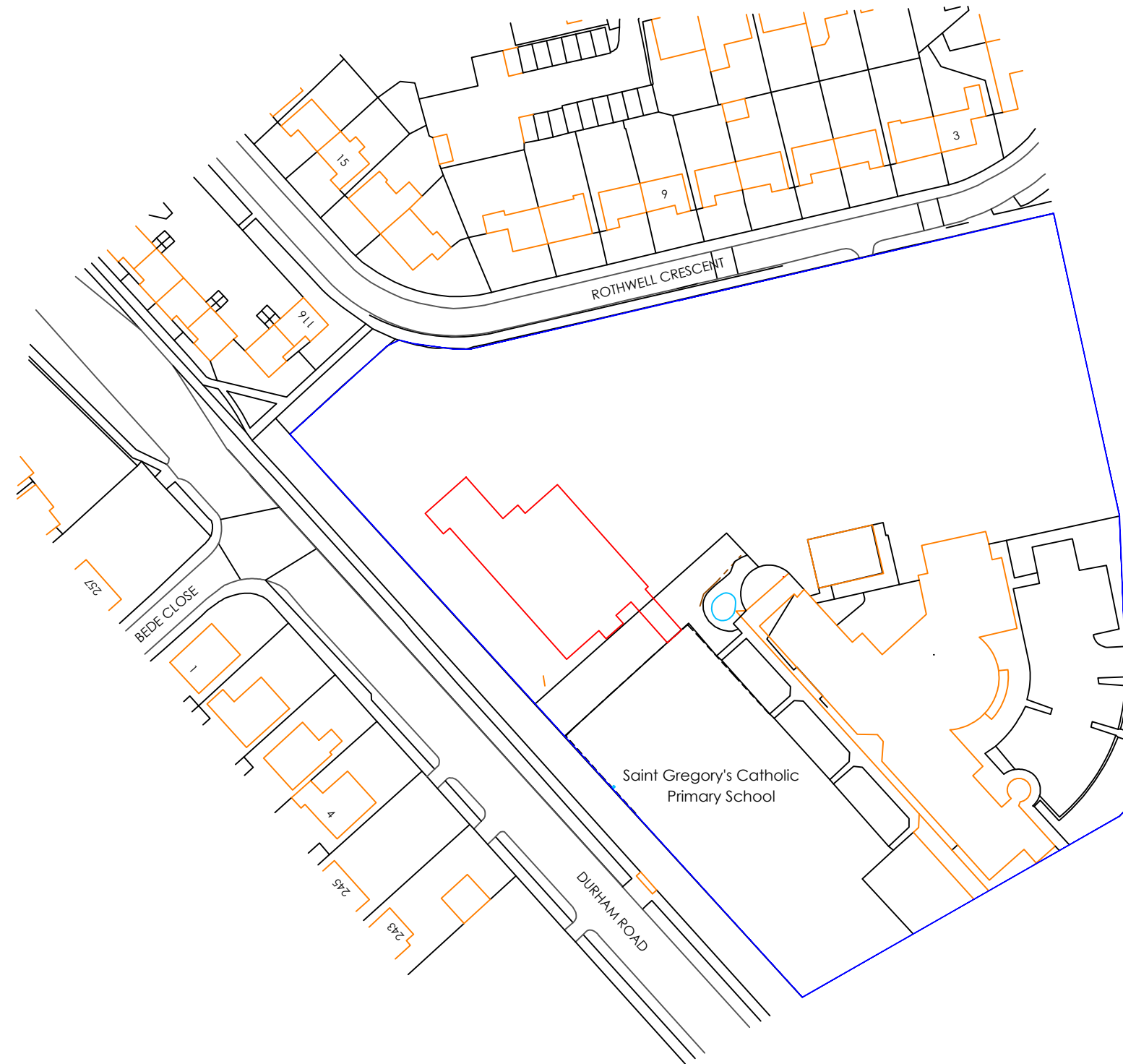
APPENDIX A – 3219-010 LOCATION PLAN



NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

KEY

- Ownership Boundary
- Development Area

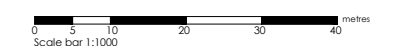


01 LOCATION PLAN
SCALE: 1:1000

REVISION	DETAILS	BY	DATE	CHECKED

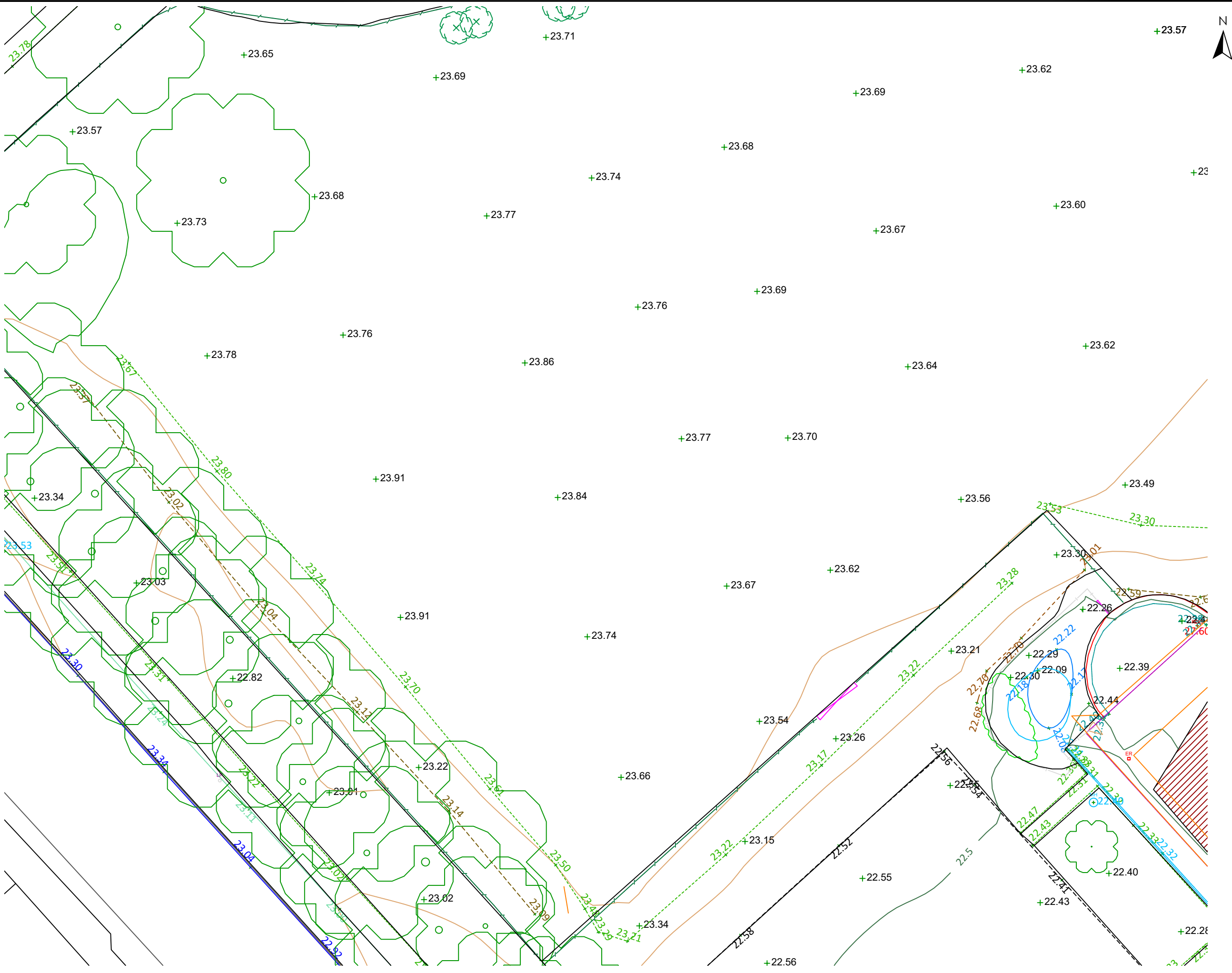


**ST GREGORY'S CATHOLIC ACADEMY
LOCATION PLAN
CONSTRUCTION OF A NEW 2G PITCH**



Date: 12/2023 Scale: 1:1000 @ A3	Job. No. 3219	Drawn by: CH Checked by: DD
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APPENDIX B – 3219-050 TOPOGRAPHICAL SURVEY

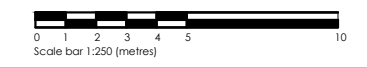


NOTES
 It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.
 Topographical Survey Undertaken to obtain existing levels and dimensions of the site.

REVISION	DETAILS	BY	DATE	CHECKED



**ST GREGORY'S CATHOLIC ACADEMY
 TOPOGRAPHICAL SURVEY
 CONSTRUCTION OF A NEW 2G PITCH**



Date: 10/2023 Scale: 1:250 @ A3	Job No. 3219	Drawn by: CH Checked by: DD
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APPENDIX C – 3219-100 GENERAL ARRANGEMENT, 200 DRAINAGE LAYOUT, 250 DRAINAGE DETAILS



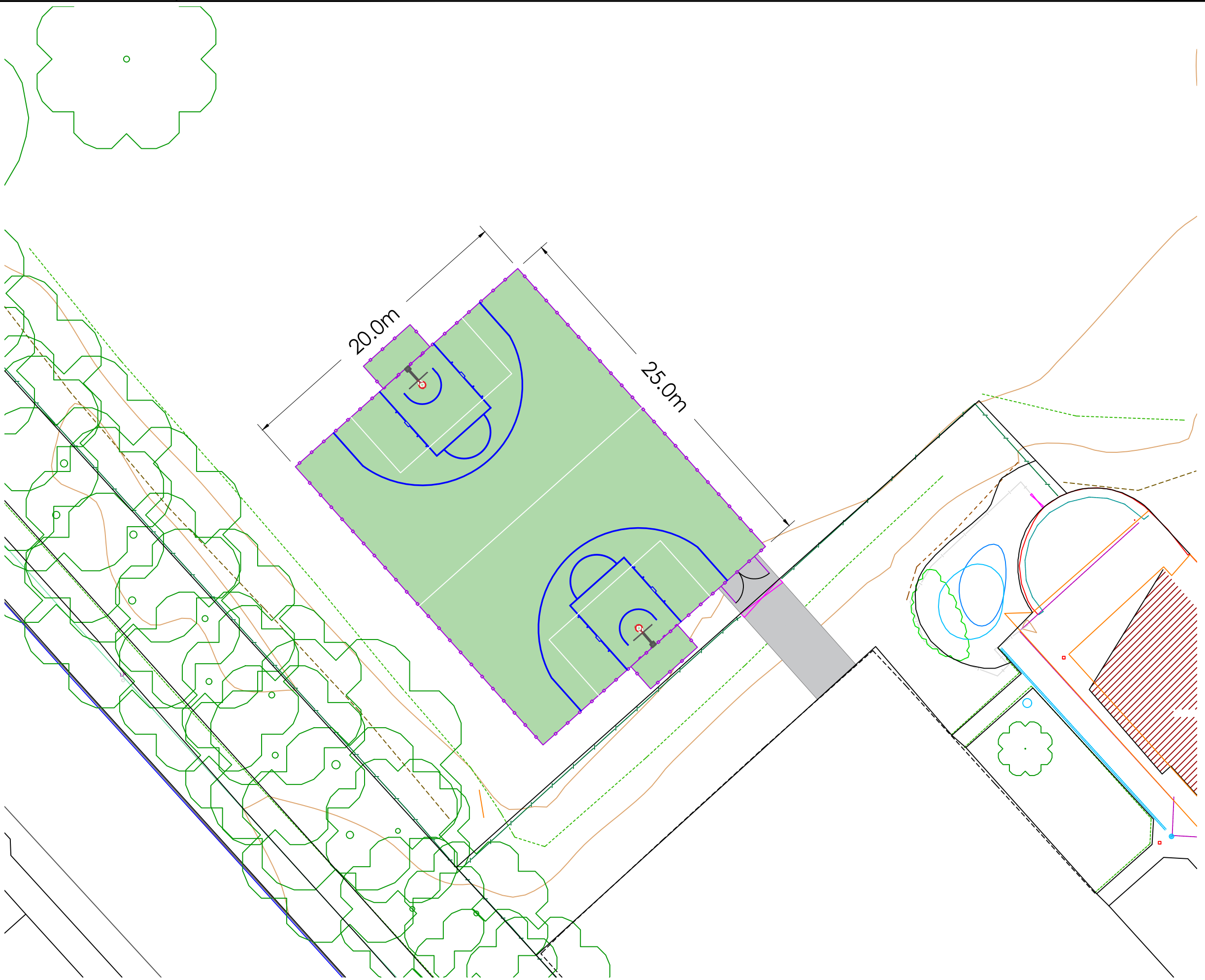
NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

Synthetic Pitch Area
Length - 25.0m
Width - 20.0m
Recesses - 2x 4.0m x 2.0m
Total - 516m²

Playing Lines
Football (White)
Length - 25.0m
Width - 20.0m

Basketball Shooting Areas (Blue)

- Key**
- 2G Synthetic Turf
 - New Access Path Hardstanding
 - 3.0m High Perimeter Fencing



01 GENERAL ARRANGEMENT
SCALE: 1:250

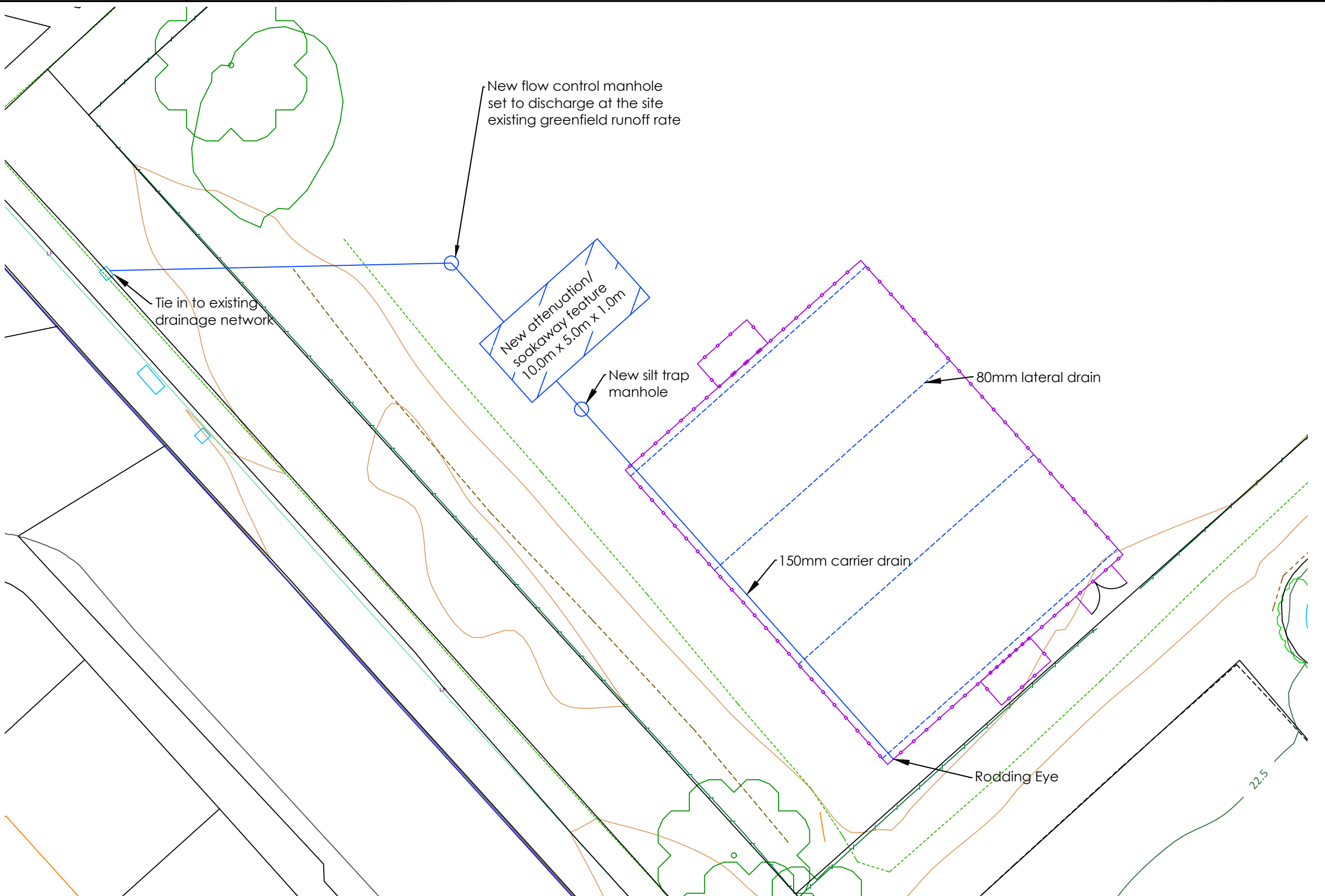
REVISION	DETAILS	BY	DATE	CHECKED



**ST GREGORY'S CATHOLIC ACADEMY
GENERAL ARRANGEMENT
CONSTRUCTION OF A NEW 2G PITCH**



Date: 10/2023 Scale: 1:250 @ A3	Job. No. 3219	Drawn by: CH Checked by: DD
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NOTES
 It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

New drainage system
 consisting of;

Lateral drainage - 80m diameter, location as shown

Carrier drainage - 150m diameter, location as shown

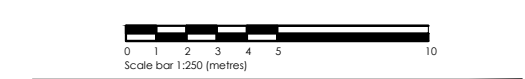
- KEY**
- New Perimeter Fencing
 - - - New 80mm Carrier Drain
 - New 150mm Carrier Drain
 - New Manhole
 - ▨ New Attenuation Tank

01 DRAINAGE LAYOUT PLAN
 SCALE: 1:250

REVISION	DETAILS	BY	DATE	CHECKED

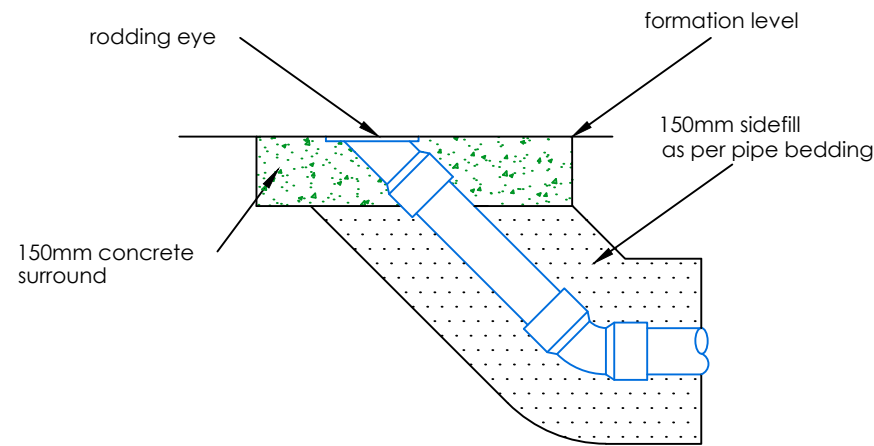
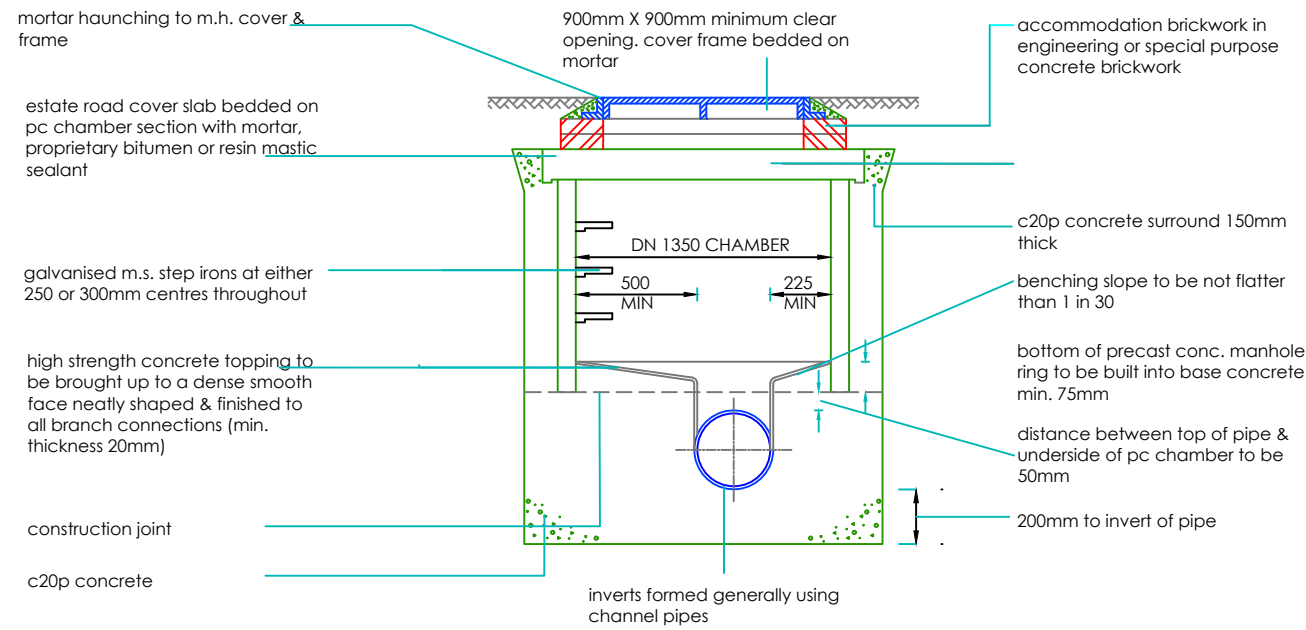
info@sportslabsconsult.com

ST GREGORY'S CATHOLIC ACADEMY
 DRAINAGE LAYOUT
 CONSTRUCTION OF NEW 2G PITCH



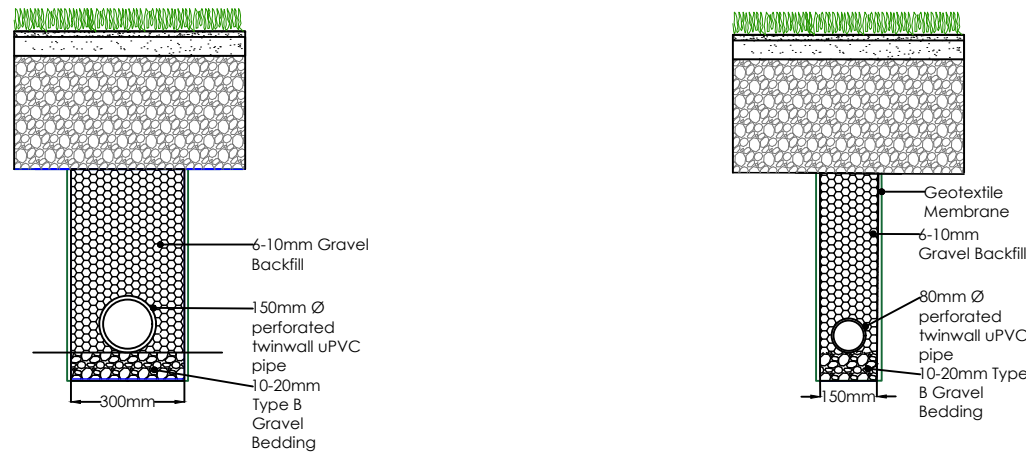
Date: 11/2023 Scale: 1:250 @ A3	Job No. 3219	Drawn by: CH Checked by: DD
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NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.



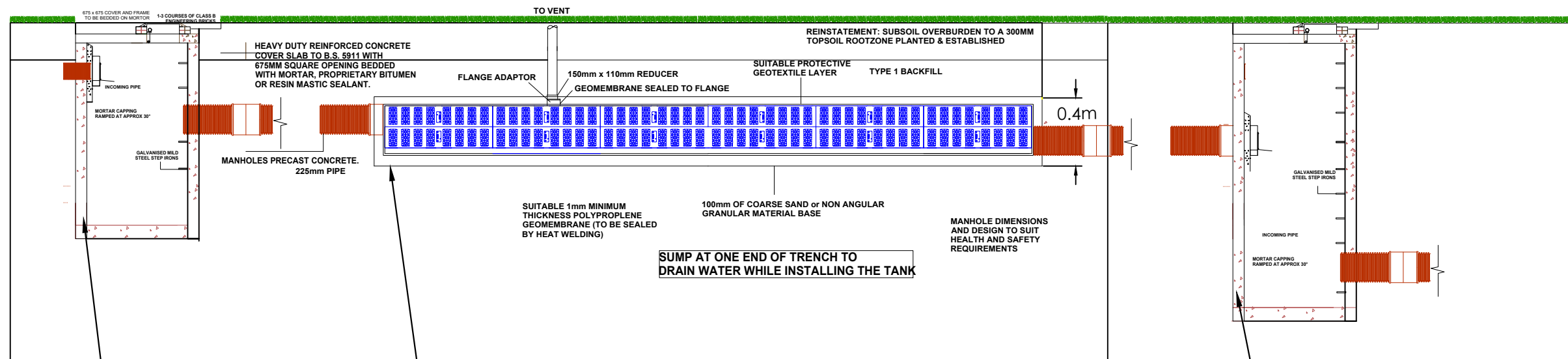
01 | STANDARD MANHOLE SECTION

02 | STANDARD RODDING EYE SECTION



03 | STANDARD CARRIER DRAIN SECTION

04 | STANDARD LATERAL DRAIN SECTION



05 | STANDARD ATTENUATION SYSTEM

New attenuation storage tank with dimensions of 15.5m x 8.0m x 1.0m

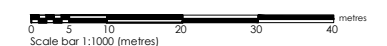
New flow control chamber restricted to a discharge of 2.0 l/s to tie into existing surface water drainage network

REVISION	DETAILS	BY	DATE	CHECKED
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info@sportslabsconsult.com

ST GREGORY'S CATHOLIC ACADEMY
DRAINAGE DETAILS
CONSTRUCTION OF A NEW 2G PITCH



Date: 10/2023	Job. No. 3219	Drawn by: CH
Scale: VARIES		Checked by: DD

APPENDIX D – SOIL INFILTRATION TEST RESULTS (SOILTECHNICS)

soiltechnics

environmental • geotechnical • building fabric

Ground Investigation Report

Proposed Multi-Use Games Area (MUGA)

St. Gregory's Catholic Academy, Stockton-on-Tees

October 2023



Project Details

Site: St. Gregory's Catholic Academy, Stockton-on-Tees

Document Title: Ground Investigation Report

Document no.: STV6189-R01 Rev A

Date: October 2023

Client: Sports Labs Limited

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Document history and status

Revision	Date	Description	Author	Checker	Reviewer
A	October 2023	First Issue	DH	SCD	SCD



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Drawing Register

Title	Produced by	Date	Reference
Exploratory hole location plan	Soiltechnics Limited	October 2023	D-STV5949-01_RevA

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1 Introduction

1.1 Scheme Outline

1.1.1 The proposed development is for construction of a Multi-Use Games Area (MUGA). The approximate footprint of the proposed MUGA 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, Sports Labs Limited.

1.2.2 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 MUGA and floodlight foundations. The report will also advise on abnormal ground conditions and provide recommendations for further investigation works where applicable.

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 manpower, 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 Site Setting

2.1 Site Location and Description

2.1.1 The proposed development lies within Stockton-on-Tees, approximately 2km northwest of the town centre, at the following postal address:

St. Gregory's Catholic Academy
 Ragpath Lane
 Stockton-on-Tees
 TS19 9AD

2.1.2 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 MUGA footprint (blue)

Theme	Feature
Current site use	The MUGA site currently forms part of grassed playing fields associated with St. Gregory's Catholic Academy.
Local area land use	Adjacent sites comprise further grassed playing fields to the north and east, the main school buildings and associated hardstanding to the south-east and off-site residential housing to the southwest and northwest.
Topography	The topography of the surrounding area generally falls gently to the southeast, towards the River Tees. On site, levels are relatively flat, falling by 40cm from northwest to southeast across the footprint of the MUGA.

Theme	Feature
Buildings, surfacing and other permanent features	School buildings are located off-site to the southeast. The MUGA site itself is comprised of grassed playing fields.
Boundary features	Steel fencing denotes the approximate south extent of the MUGA area. No other physical boundaries exist to define the MUGA area.
Vegetation	No significant vegetation is present within the site boundary. A bank of mature trees is present adjacent to the west of the proposed MUGA.
On-site / adjacent surface water features	None observed.
Injurious and invasive weeds	No invasive weeds were identified during the site reconnaissance.
Evidence for ground instability	There is a small surface depression in the southeast of the proposed MUGA area, covered in tyres at the time of the investigation.

Table 2-A: Site Description

- 2.1.3 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.
- 2.1.4 A selection of site photographs are presented below:



Figure 2-B: Looking southeast from the north-western boundary of the proposed MUGA



Figure 2-C: Small surface depression with tyres in the southeast of the proposed MUGA area



Figure 2-D: Looking northwest from the south-eastern boundary of the proposed MUGA

2.2 Site History

2.2.1 An attempt to trace the history of the site has been carried out by reviewing readily available ordnance survey maps. The area of the proposed MUGA has predominately remained an open field, however, the previous school building was recorded within close proximity to the area before it was demolished and replaced with the building to the south. During demolition and construction aerial imagery appears to show a large portion of the proposed development area to have been covered over with a stockpile and later completely regraded and returned.

2.3 Anticipated Geology

2.3.1 Based on a review of available records, the site is anticipated to be underlain by superficial deposits of Devensian Till. Given the presence of the previous stockpiled soils and subsequent regrading of the area, Made Ground/reworked soils could be present. Bedrock of the Sherwood Sandstone Group is present at depth.

2.4 Mining and Ground Stability

2.4.1 The site falls outside of a Coal Mining Reporting Area.

2.5 Landfill and infilled ground

2.5.1 The site does not lie within 250m of a permitted or historical landfill site and there are no records of infilled ground based on historical mapping.

2.6 Underground Infrastructure

2.6.1 Copies of all utility plans obtained are presented as Appendix E. 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.

2.6.2 The plans do not show any mains services to cross the site.

2.7 Unexploded Ordnance (UXO) Hazard Screen

2.7.1 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?	No	The site falls within a low bombing density area and no military sites or likely Luftwaffe targets have been identified in the surrounding area. A review of historical mapping records did not reveal any indicators of bombing in the area.

Table 2-B: UXO Hazard Screen

- 2.7.2 The risk review concluded that there was not 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 8th September 2023.

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 B	Windowless sampling boreholes	5	3.40 – 4.43	WS01 to WS05 Boreholes terminated due to SPT refusal.
Appendix C	Dynamic Cone Penetrometer Tests	7	0.76-0.86	DCP01 to DCP07 Terminated at scheduled depth.

Table 3-A: Summary of fieldwork undertaken

3.2.3 All soils encountered were described in accordance with BS EN ISO 14688 “Identification and Classification of soil”.

3.3 Sampling

3.3.1 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”.

3.3.2 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”.

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

3.3.4 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.

3.4 In-situ Testing

3.4.1 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)	19	BS EN ISO 22476-3	Included within logs Detailed in Appendix C
Pocket penetrometer	30	Manufacturer's instructions	Included within logs Detailed in Appendix C
Dynamic cone penetrometer (DCP) using TRL probe	7	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

3.5 Investigation Constraints

3.5.1 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	BRE SD1 Suite D	1
Devensian Till	Atterberg limits	3
	BRE SD1 Suite D	2

Table 4-A: Summary of geotechnical laboratory testing

5 Ground Investigation Findings

5.1 Ground Model

5.1.1 Ground conditions encountered were relatively consistent across the site.

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
Topsoil	Sandy gravelly clay	G.L.	G.L.	0.2 – 0.4	Dry
Made Ground	Sandy gravelly clay	0.2 - 0.4	0.30	0.2 – 0.8	Dry
Devensian Till	Firm brown sandy gravelly clay. Silty sand in WS01 and WS04 at 4.0m and 3.7m respectively.	0.5 – 1.0	0.80	>3.92	At 3.4m and 3.7m in WS02 and WS04 only

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. The base of the unit was between 0.2-0.4m bgl and comprising sandy gravelly clay with brick and frequent rootlets.

5.3 Made Ground

5.3.1 Made Ground was encountered in all exploratory holes directly underlying topsoil to depths between 0.5m (WS01) and 1.0m (WS02, WS04, WS05). In all cases Made Ground comprised sandy gravelly clay containing brick, concrete and coal and potentially represents reworked natural deposits.

5.3.2 A typical photograph of the Made Ground encountered is presented below.



Figure 5-A: Arisings of topsoil and Made Ground 0.0-1.0m depth from WS05

5.4 Devensian Till

5.4.1 Natural deposits of Devensian Till were encountered in every borehole underlying Made Ground, comprising firm to stiff sandy gravelly clay.

- 5.4.2 Silty fine to medium sand was encountered at the base of WS01 and WS04 from a top depth of 4.0m and 3.7m respectively.
- 5.4.3 SPT refusal was met at the base of every borehole within Devensian Till deposits up to a maximum exploratory depth of 4.43m in WS03.
- 5.4.4 A typical photograph of the Devensian Till encountered is presented below.



Figure 5-B: Arisings of Devensian Till 1.0-4.0m depth from WS01

5.5 Groundwater

- 5.5.1 Groundwater was observed in WS01 and WS04 within and overlying the layer of silty sand noted within these boreholes only.
- 5.5.2 A summary of the groundwater level data obtained during the fieldworks phase is presented below.

Exploratory hole ID	Groundwater observation
WS01	Groundwater encountered at 3.4m, insufficient to fill borehole.
WS04	Groundwater encountered at 3.7m, rising to 3.46m after 20 mins.

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

- 5.5.3 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 (brick, concrete).

5.7 Obstructions and Instability

- 5.7.1 The progress of the ground investigation works was not generally affected by below ground obstructions or instability.

6 Geotechnical Discussion

6.1 Scheme Overview

6.1.1 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.

6.1.2 The project will comprise construction of a Multi-Use Games Area (MUGA). In view of the scheme proposals, the geotechnical elements considered in this report are outlined below:

- a) Floodlight and pitch foundations
- b) Drainage

6.2 Key Geotechnical Issues

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

- Made Ground
- Groundwater
- Trees and other vegetation

6.3 Made Ground

6.3.1 The near surface Made Ground soils are unsuitable for supporting concentrated floodlight foundation loads due to their low strength and or variable/compressible nature. Accordingly, foundations should extend, as a minimum, through such deposits.

6.4 Groundwater

6.4.1 It is anticipated that groundwater will not be encountered during foundation excavations, with groundwater potentially present in more granular horizons at approximately 3-4m below ground level.

6.4.2 Groundwater levels are expected to vary seasonally and in response to weather events.

6.5 Trees and Vegetation

6.5.1 There are a number of trees within close proximity to the west of proposed MUGA, which may impact upon the foundation design depth given the presence of clay soils. It is recommended that a suitably qualified arboriculturist is appointed to undertake a survey such that building foundations can be designed appropriately. The survey should include the location, species, height (and mature height) and water demand of each tree and major vegetation.

6.6 Foundation Strategy

6.6.1 In view of the key geotechnical issues discussed above and anticipated loadings pad type foundations are considered suitable for the project;

6.7 Floodlight Foundations

6.7.1 The deposits of Devensian Till will adequately support the proposed floodlight bases and on pad type foundations. Excavations for foundations are likely to encounter clay deposits. The following assessments are therefore based on foundations located within cohesive soils.

6.7.2 Laboratory testing indicates that the soils are of medium volume change potential and thus, foundations should extend a minimum of 0.9m depth below the proposed ground level, subject to penetrating the naturally deposited soils by a minimum of 0.3m.

6.7.3 In all instances it is recommended Made Ground is penetrated with foundation excavations advanced to locate naturally deposited and more competent deposits at depth. It is, therefore, likely that foundations will locally require deepening to depths within the region of 1.3m below existing ground level.

6.7.4 The floodlight foundations will be eccentrically loaded thus stresses imparted to the ground will not be uniform. As a result of the long-term stresses, the settlement in turn may not be uniform in clay soils. Such stresses are likely to be from dead loads only and not from live loads (such as wind), which will be transient and not likely to contribute to settlement. Live loads will increase the eccentricity of loads and thus increase the concentration of stresses potentially to an edge of the foundation.

6.7.5 Based on ground conditions and in-situ pocket penetrometer testing, a conservative undrained shear strength of 75kN/m² has been adopted for design purposes. The presumed bearing capacity to limit the effects of eccentricity should not exceed 135kN/m².

6.7.6 The results of calculations undertaken to determine the bearing values for pad type foundations in cohesive Devensian Till are presented below;

Plan size of pad (m)	Ultimate bearing value (kN/m ²)	Presumed bearing value (kN/m ²)	Allowable bearing pressure (kN/m ²)
1.0 x 1.0	705	135	135
1.5 x 1.5	670	135	135
2.0 x 2.0	650	135	125

Table 6-A: Bearing values for floodlight foundations

6.7.7 The presumed bearing values have been derived from the ultimate bearing value by applying a factor of safety of 3 and adopting the lesser value when compared with the eccentricity value derived in paragraph 6.7.5 above for floodlights in a clay soil scenario. The presumed bearing capacities given above should not be exceeded in any loading cases.

6.7.8 The allowable bearing capacity is derived assuming a constant, uniformly applied load, with a settlement limit of 25mm, limited where necessary for floodlights in cohesive soils in line with paragraph 6.7.5 above.

6.8 Artificial Pitch Foundations

6.8.1 It is anticipated that the proposed MUGA will be located at or about existing ground levels, with the formation located on Made Ground following removal of any Topsoil type material.

- 6.8.2 CBR value has been determined for the proposed MUGA 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.
- 6.8.3 Based on the anticipated founding depth and DCP results, a CBR design value of 2.5% can be adopted for soils that are likely to be representative of those which remain at or near pitch formation levels.
- 6.8.4 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.
- 6.8.5 The Made Ground deposits soils are considered frost susceptible and this may override the CBR criteria for pavement foundation design purposes.
- 6.8.6 The silty nature of the Made Ground deposits will render them moisture susceptible with small increases in moisture content giving rise to a rapid loss of support to construction plant. It is therefore recommended that the sub-base is laid as soon as practicable following establishment of formation.

6.9 Drainage

- 6.9.1 In situ permeability testing has been undertaken at the site in accordance with BS EN ISO 22282 Geotechnical investigation and testing – Geohydraulic testing (2012).
- 6.9.2 The Devensian Till deposits were encountered as a cohesive material. Indicative testing was undertaken within WS01 and WS02, however only one cycle could be undertaken during the fieldwork due to the very slow dissipation of water added.
- 6.9.3 The results are presented in Appendix C and summarised below:

Exploratory hole ID	Stratum tested	Cycle	Infiltration rate (m/s)
WS01	Devensian Till	1	1.68 x 10 ⁻⁷
WS02		1	1.42 x 10 ⁻⁷

Table 6-B: Summary of infiltration test results undertaken in accordance with BRE 365

- 6.9.4 It should be noted that infiltration testing in boreholes uses notably less water than tests undertaken within soakaway trial pits. Accordingly, results should be considered as an indication of the potential viability of soakaways. However, based on ground conditions, the near surface soils are unlikely to be amenable to the use of soakaway type systems.
- 6.9.5 As an alternative, it is possible that the MUGA drainage could key into the existing surface water drainage system currently used by the academy. 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 MUGA area.

6.10 Aggressiveness Of The Ground To Buried Concrete

6.10.1 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).

6.10.2 The site is interpreted to be a brownfield site where pyrite is unlikely to be present.

6.10.3 The classification of the strata is tabulated below:

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

Table 6-C: Summary of the aggressiveness of the ground to buried concrete






7 Recommendations for further works

7.1.1 At this stage further investigations are not considered to be necessary.

Appendix A Drawings



Key:

-  Site Boundary
-  Pitch Boundary
-  Windowless Sampler Borehole
-  Dynamic Cone Penetrometer Test
-  Soakaways



Notes

- 1) Base image provided by Google.
- 2) All drawn features are approximate.

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Map data © 2023 Google

A	Oct 2023	First issue
REV	DATE	COMMENT ON VARIATION

soiltechnics
environmental • geotechnical • building fabric

PROJECT
St Gregorys Academy, Stockton-on-Tees

















TITLE
Exploratory Hole Location Plan

PROJECT No. STV6189	DRAWING 01	REVISION A
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Appendix B Exploratory Hole Logs

Key to legends

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

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		Sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)	From (m) To (m)	Records depth of sampling
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m ²) by applying a factor of 50.	Type	D Disturbed sample
	SV – Hand held shear vane result reported as an undrained shear strength (kN/m ²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.		B Bulk disturbed sample
	SPT – Standard Penetration Test result (N value) (uncorrected) ^{1,2,3}		ES Environmental sample
	SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected) ^{1,2,3}		W Water sample
	UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample		U Undisturbed thick-walled sample 100mm diameter sampler
			UT Undisturbed thin walled sample 100mm diameter sampler
			UTF Failed undisturbed sample


Note 1: Seating blows recorded in brackets.

Note 2: Casing depth records depth of casing when SPT or SPT(c) was carried out.

Note 3: Water depth records depth of water when SPT or SPT(c) was carried out.









Water observations

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

 Water level observed after specified delay in drilling





























 Water strike

Installation details

	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

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]).

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 firm brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine subangular brick. (TOPSOIL - MADE GROUND) Firm brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular brick and concrete. (MADE GROUND) Firm brown mottled reddish / light grey slightly gravelly slightly sandy CLAY. Gravel is fine subangular mudstone and coal. (DEVANSIAN TILL) ...from 1m depth, becoming stiff. ...from 2m depth, becoming very stiff. ...at 3.4m depth, band of fine SAND. ...at 3.6m depth, band of fine SAND. Very dense brown slightly silty fine SAND. (DEVANSIAN TILL)		0.30									0.10		D	
		0.50									0.40		D	
											0.70		D	
						S 1.00 - 1.45	(2) 8				PP 0.60	PP=79		
											PP 0.90	PP=83		
											PP 1.20	PP=146		
											PP 1.50	PP=92		
											PP 1.80	PP=108		
						S 2.00 - 2.45	(6) 17				PP 2.10	PP=208	2.10	D
											PP 2.40	PP=225		
										PP 2.70	PP=200			
										PP 3.10	PP=225			
										PP 3.40	PP=225			
										PP 3.70	PP=225			
					S 3.00 - 3.45	(10) 34								
														
														
														
					S 4.00 - 4.42	(22) 50/275mm								
														
														
														
														
														
														
														
														

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
INSTALL	Grass onto brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine subangular brick. (TOPSOIL - MADE GROUND)	0.20									0.10		D	
	Firm friable slightly gravelly sandy CLAY with occasional rootlets. Gravel is fine angular to subangular coal and brick. (MADE GROUND)										0.50		D	
	Firm brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is fine subangular mudstone and coal. (DEVENSIAN TILL)	1.00				S 1.00 - 1.45	(4) 8			PP 1.30	PP=88	1.20	D	
	...from 2m depth, becoming stiff to very stiff.					S 2.00 - 2.45	(6) 15			PP 1.60	PP=96			
	...between 3.2m and 3.4m depth, band of fine SAND.					S 3.00 - 3.45	(8) 27			PP 1.90	PP=100			
					S 4.00 - 4.42	(18) 50/275mm			PP 2.20	PP=113				
									PP 2.50	PP=125				
									PP 2.80	PP=113				
									PP 3.10	PP=163				
									PP 3.50	PP=150	3.50		D	
	BOREHOLE TERMINATED AT 4.42m													

Notes Terminated due to SPT refusal. Infiltration testing performed.	Title Dynamic Windowless Sampling record			Date(s) 08/09/2023	
	Recovery details		Method Windowless sampler	Logged by JT	
Groundwater observations No groundwater encountered.	Range (m)	Recovery (%)		Sheet number Sheet 1 of 1	
	0.00 - 1.00	60	Revision		
	1.00 - 2.00	80	WS02		
	2.00 - 3.00	85			
3.00 - 4.00	80	Level (m OD) -	Compiled by AM		
		Co-ordinates -	Checked by DH		

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
INSTALL	Grass onto firm brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine subangular brick. (TOPSOIL - MADE GROUND)	0.25									0.10		D	
	Firm brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular brick and concrete. (MADE GROUND)	0.80									0.50		D	
	Stiff brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is fine subangular mudstone. (DEVENSIAN TILL)					S 1.00 - 1.45	(4) 11			PP 1.10	PP=108			
						S 2.00 - 2.45	(6) 17			PP 1.60	PP=133	1.70	D	
						S 3.00 - 3.45	(6) 23			PP 2.10	PP=146			
	...from 2.5m depth, becoming stiff to very stiff.				S 3.00 - 3.45	(6) 23			PP 2.60	PP=208				
					S 4.00 - 4.43	(25/135mm) 50			PP 3.10	PP=200				
									PP 3.60	PP=213				
	BOREHOLE TERMINATED AT 4.43m	4.43												

Notes Terminated due to SPT refusal.	Title Dynamic Windowless Sampling record			Date(s) 08/09/2023	
	Recovery details		Method	Logged by	Sheet number
Groundwater observations No groundwater encountered.	Range (m)	Recovery (%)	Windowless sampler	JT	Sheet 1 of 1
	0.00 - 1.00	100	Level (m OD)	Compiled by	Revision
	1.00 - 2.00	100	-	AM	A
	2.00 - 3.00	100	Co-ordinates	Checked by	WS03
3.00 - 4.00	100	-	DH		

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
INSTALL	Grass onto firm brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular brick. (TOPSOIL - MADE GROUND)	0.25									0.10		D	
	Firm brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular brick and coal. (MADE GROUND)										0.50		D	
	Stiff brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is fine subangular coal and mudstone. (DEVANSIAN TILL)	1.00				S 1.00 - 1.45	(3) 8			PP 1.20	PP=79	1.20	D	
	...from 2m depth, becoming very stiff.					S 2.00 - 2.45	(6) 17			PP 1.80 PP 2.10	PP=75 PP=158			
						S 3.00 - 3.45	(7) 26			PP 2.80 PP 3.10	PP=175 PP=171			
	Very dense brown slightly silty fine to medium SAND. (DEVANSIAN TILL)	3.70			▼ ▼						3.70	4.00	B	
	BOREHOLE TERMINATED AT 4.36m	4.36				S 4.00 - 4.36	(25/125mm) 50/235mm							

Notes Terminated due to refusal.	Title Dynamic Windowless Sampling record			Date(s) 08/09/2023	
	Recovery details		Method	Logged by	Sheet number
Groundwater observations Groundwater encountered at 3.7m depth, rising to 3.46m.	Range (m)	Recovery (%)	Windowless sampler	JT	Sheet 1 of 1
	0.00 - 1.00	80	Level (m OD)	Compiled by	Revision
	1.00 - 2.00	90	-	AM	A
	2.00 - 3.00	70	Co-ordinates	Checked by	WS04
3.00 - 4.00	60	-	DH		

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	
INSTALL	Grass onto firm brown slightly gravelly slightly sandy CLAY with frequent rootlets. Gravel is fine subangular brick. (MADE GROUND)	0.40				S 1.00 - 1.45	(3) 14				0.10		D		
	Firm brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium subangular brick and concrete. (MADE GROUND)			0.50								D			
	Stiff brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is fine subangular coal and mudstone. (DEVENSIAN TILL)	1.00									D				
	...from 2m depth, becoming stiff to very stiff.	2.00									D				
		3.40				S 3.00 - 3.40	(18) 50/255mm								
BOREHOLE TERMINATED AT 3.40m															

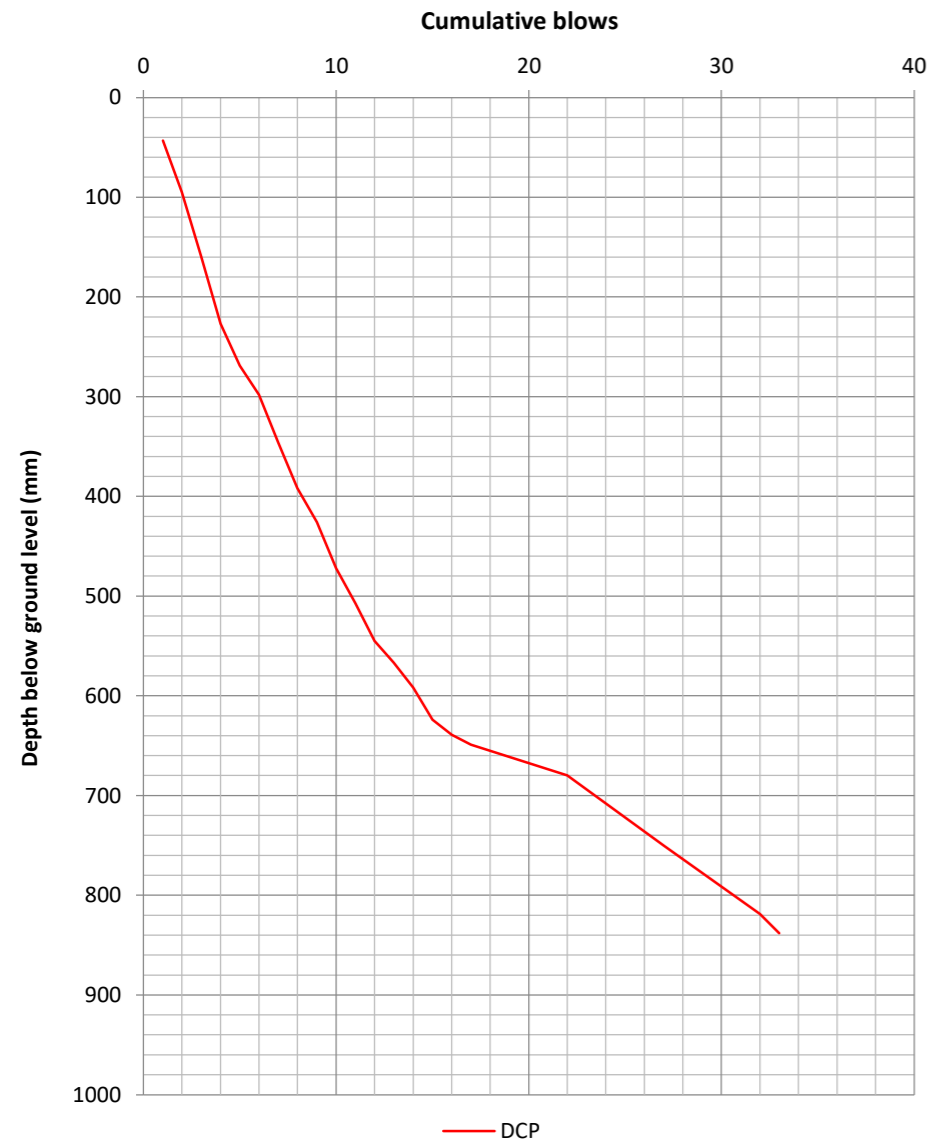
Notes Terminated due to refusal.	Title Dynamic Windowless Sampling record				Date(s) 08/09/2023	
	Recovery details		Method	Logged by	Sheet number	
Groundwater observations No groundwater encountered.	Range (m)	Recovery (%)	Windowless sampler	JT	Sheet 1 of 1	
	0.00 - 1.00	90	Level (m OD)	Compiled by	Revision	
	1.00 - 2.00	90	-	AM	A	
	2.00 - 3.00	100	Co-ordinates	Checked by	WS05	
			-	DH		

Appendix C In Situ Test Results

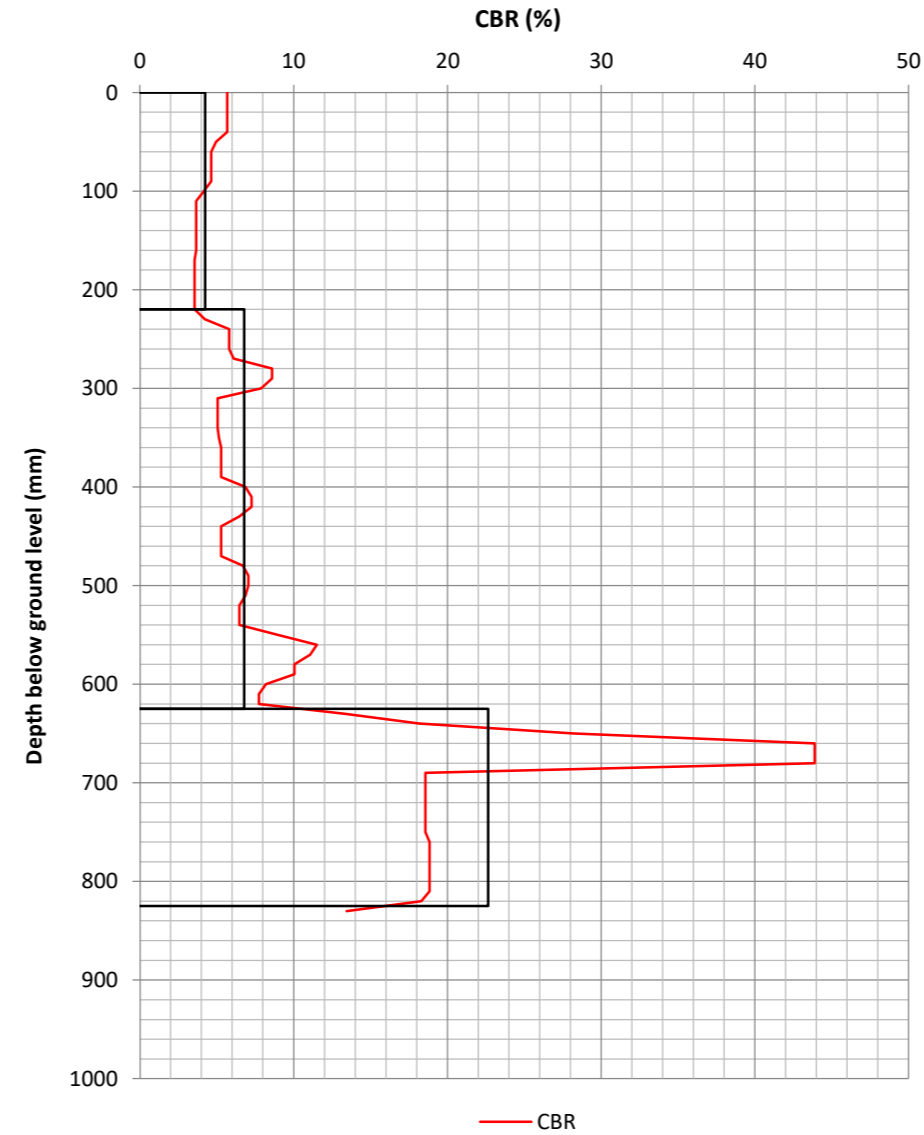
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP01	08/09/2023	0	65	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	4.2	220	0	220
2	6.8	405	220	625
3	22.7	200	625	825

Notes

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

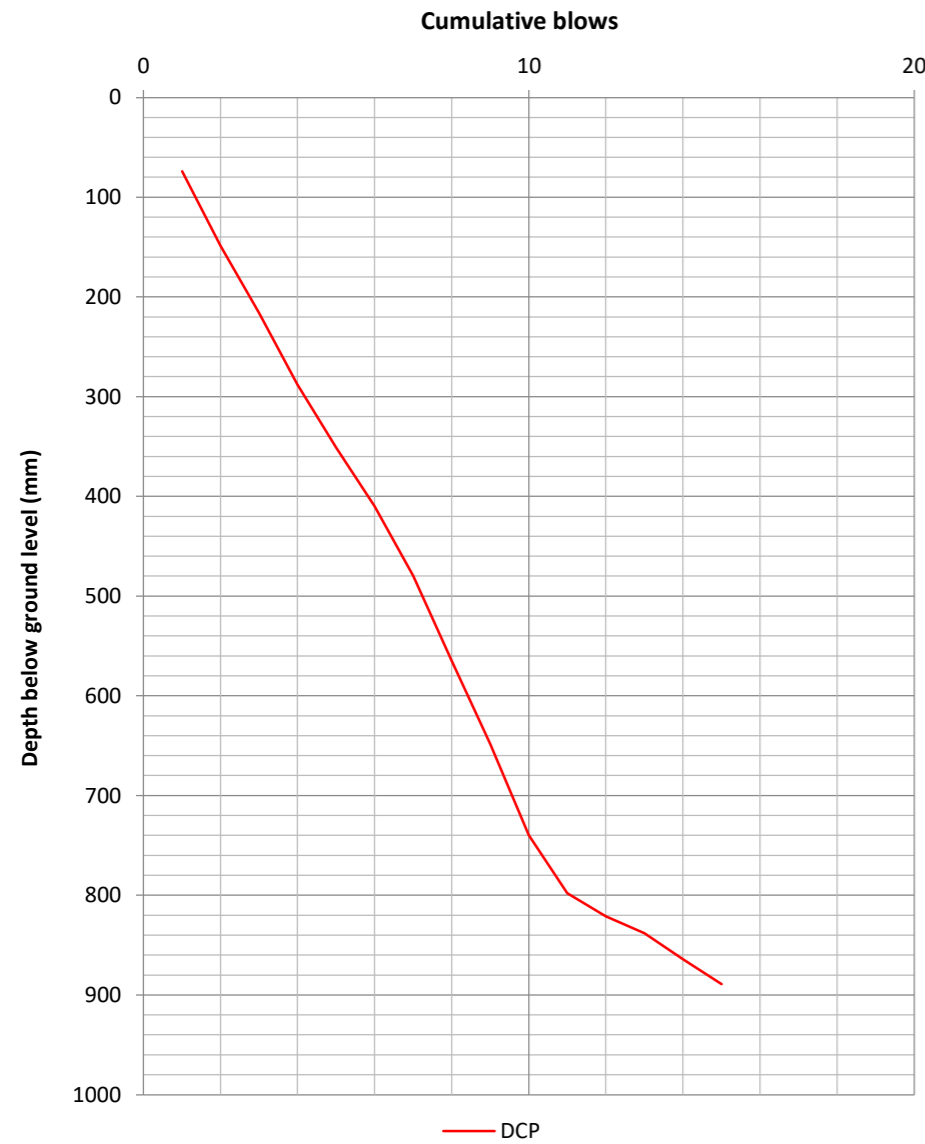
Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

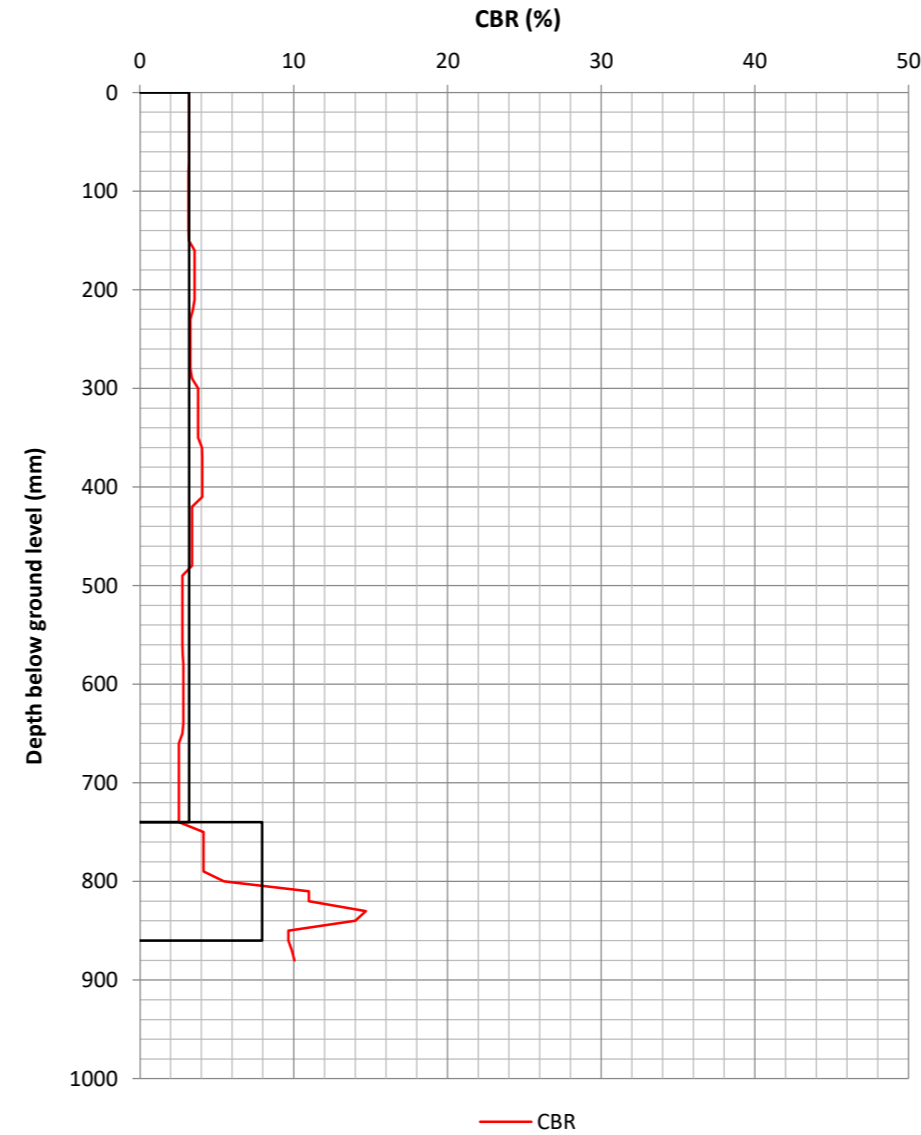
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP02	08/09/2023	0	58	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	3.2	740	0	740
2	8.0	120	740	860

Notes

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

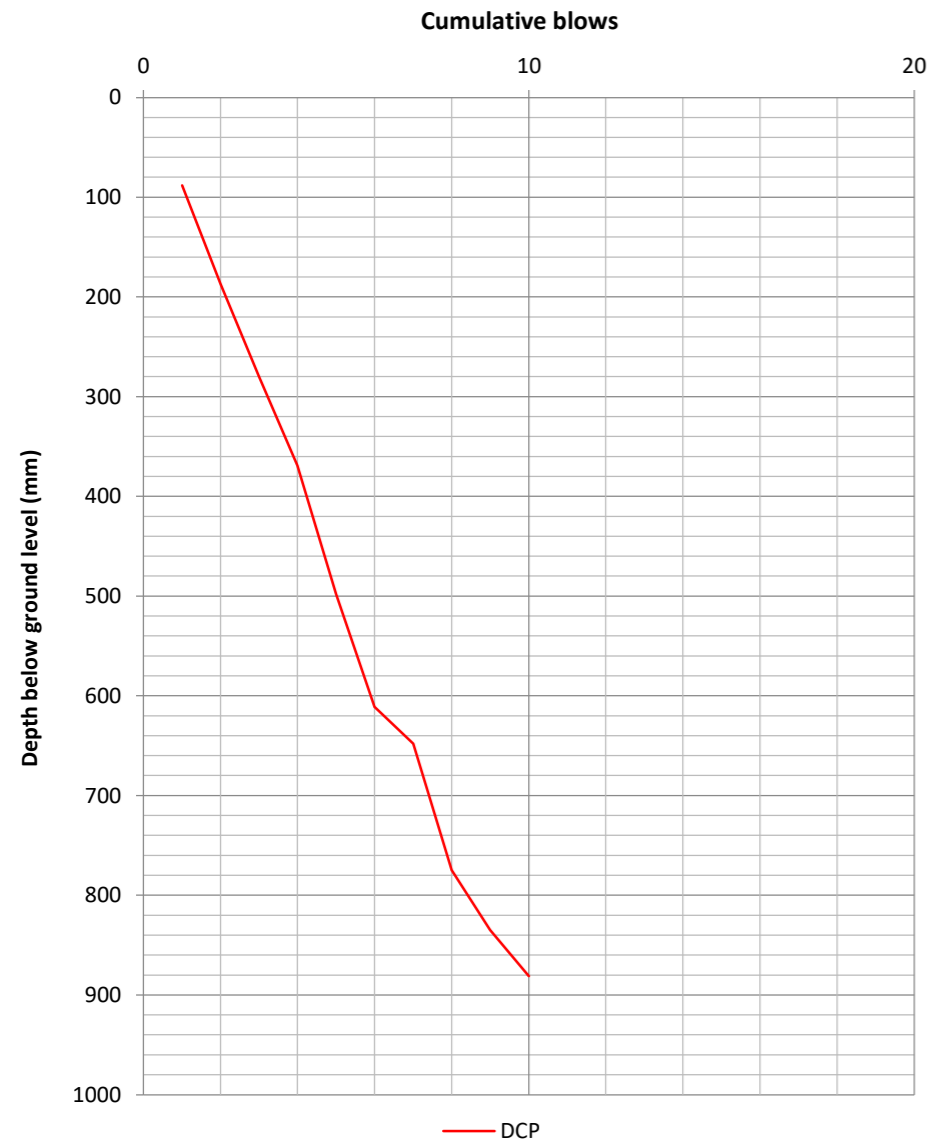
Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

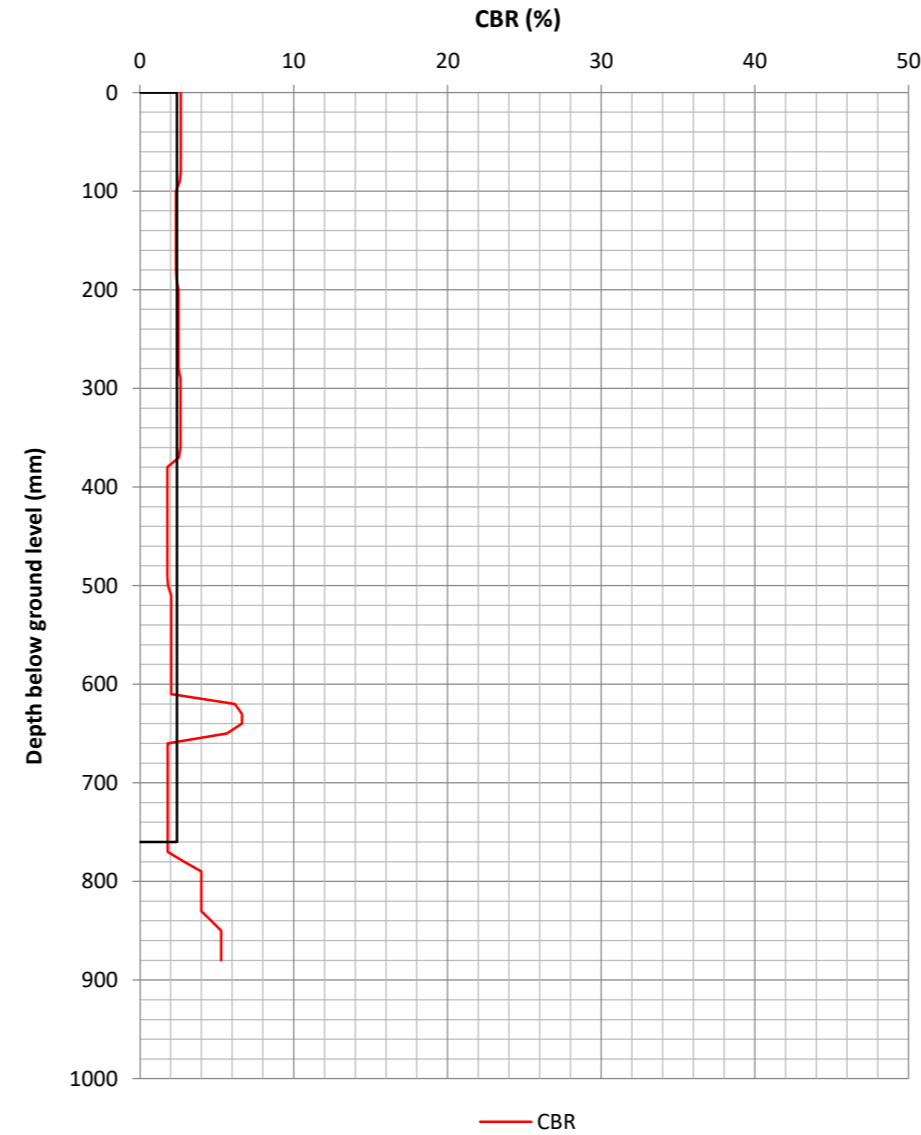
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP03	08/09/2023	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	2.4	760	0	760

Notes

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

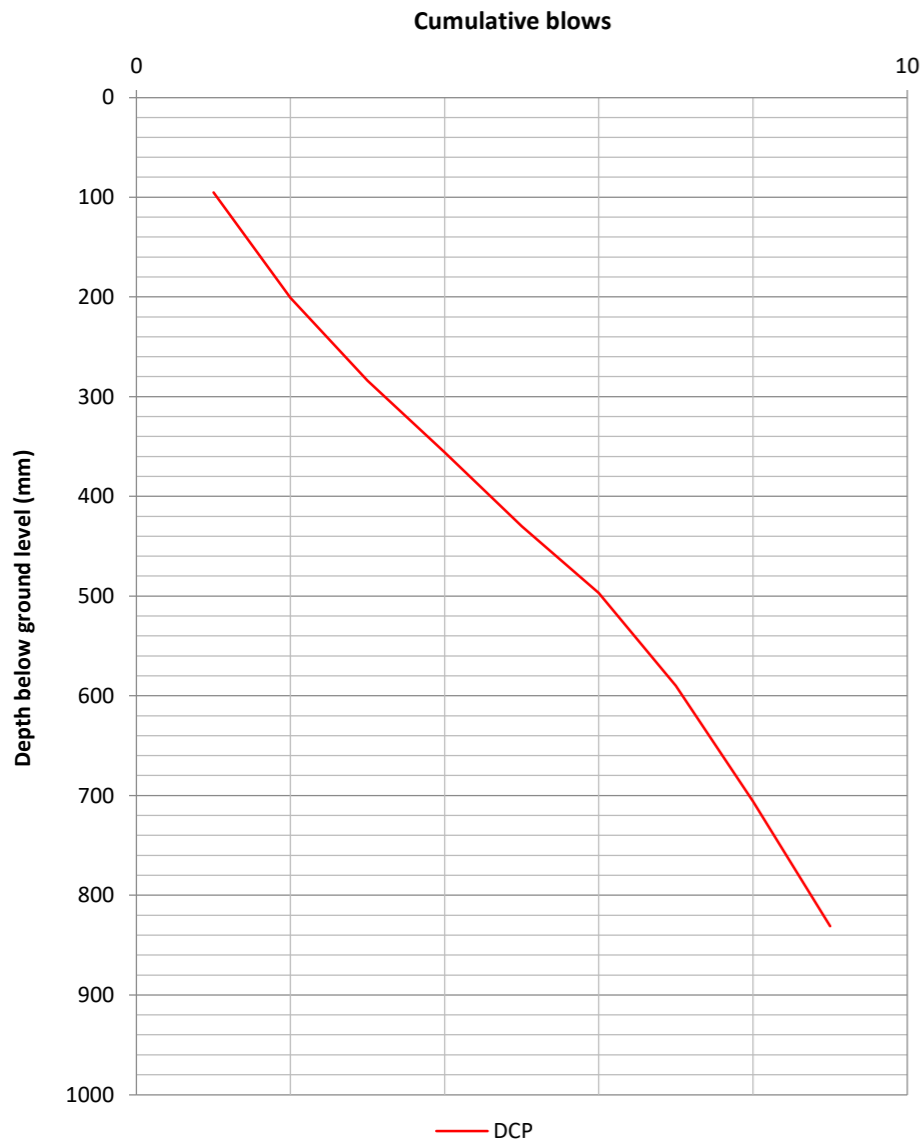
Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

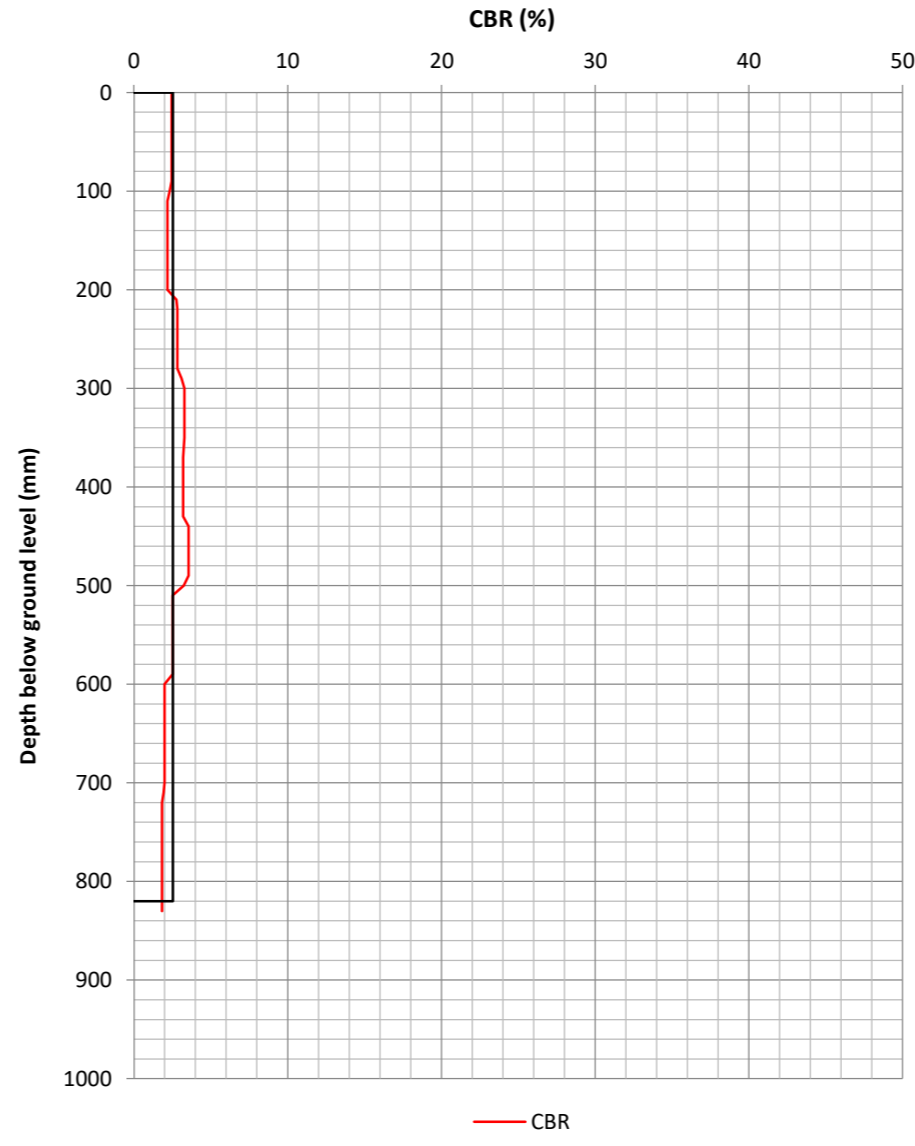
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP04	08/09/2023	0	60	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	2.5	820	0	820

Notes

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

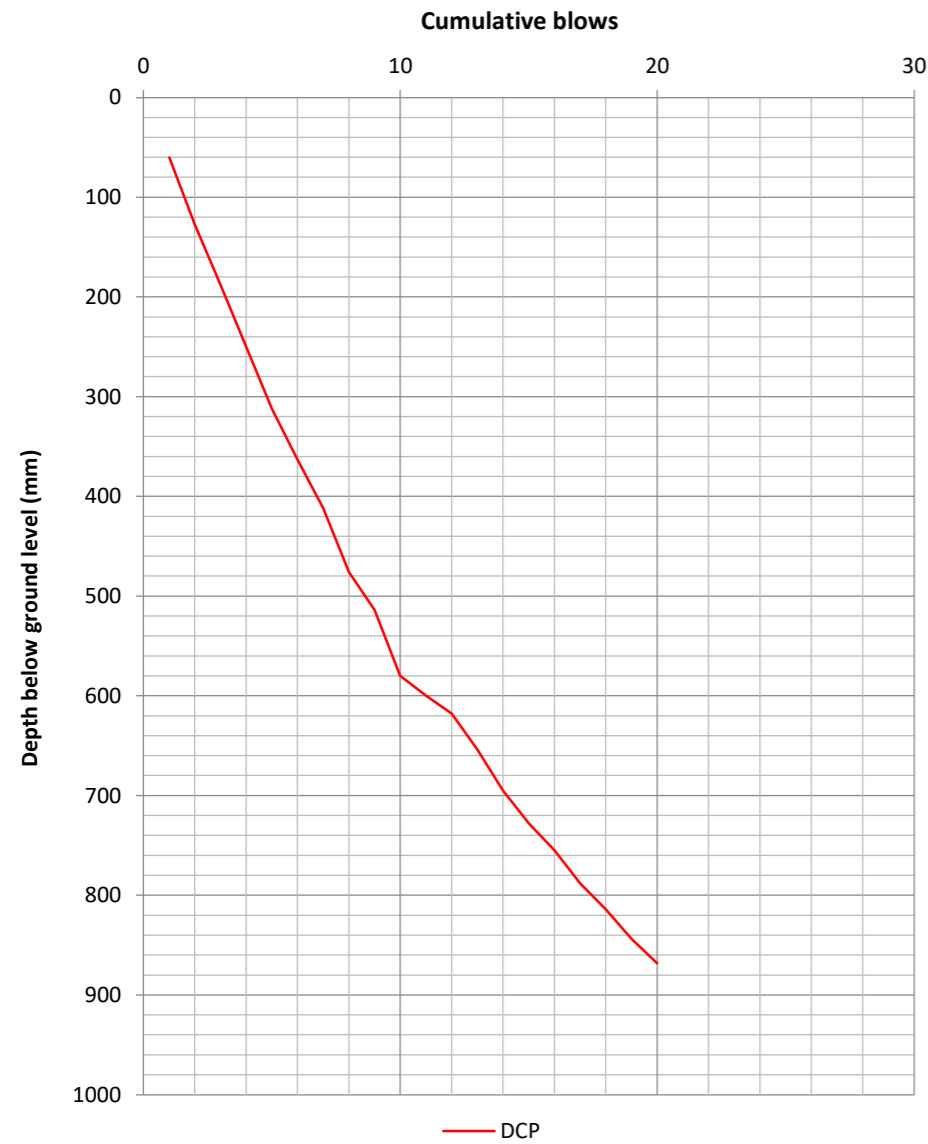
Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

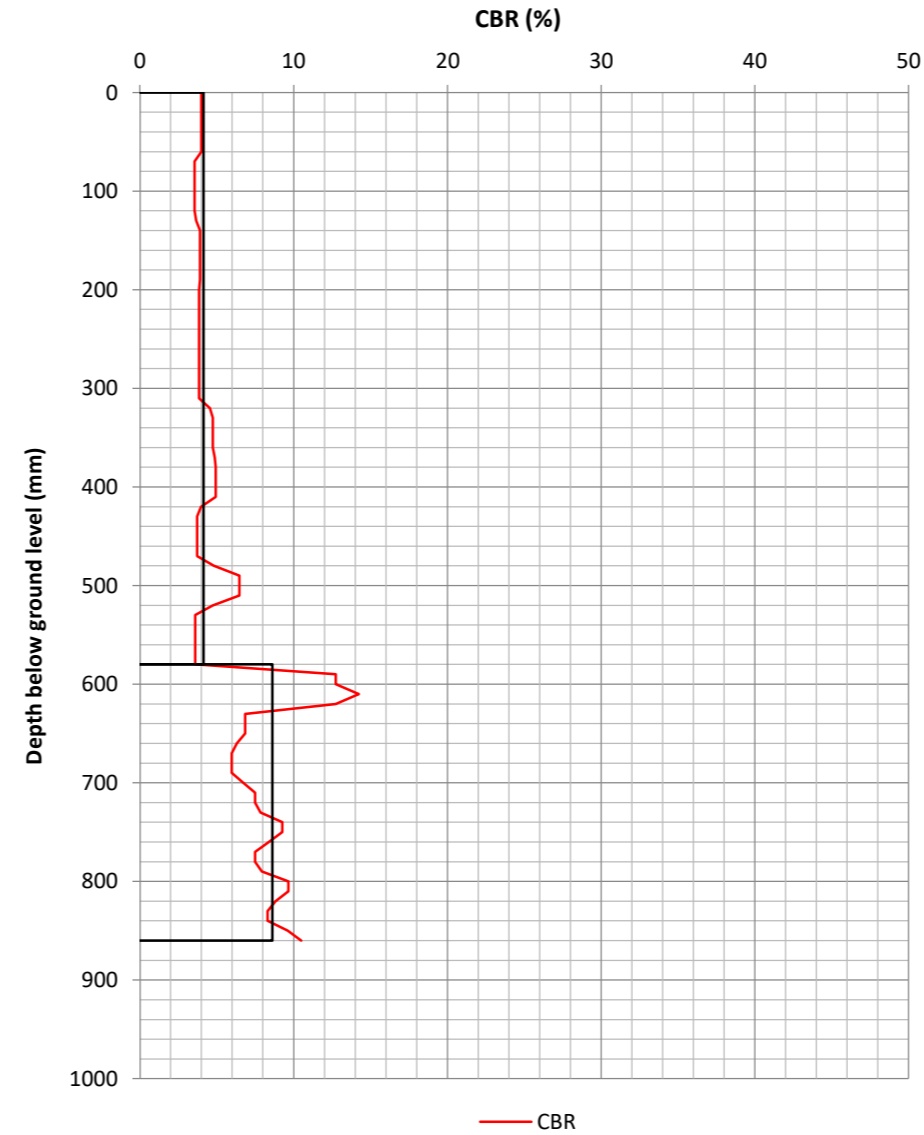
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP05	08/09/2023	0	66	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	4.1	580	0	580
2	8.6	280	580	860

Notes

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

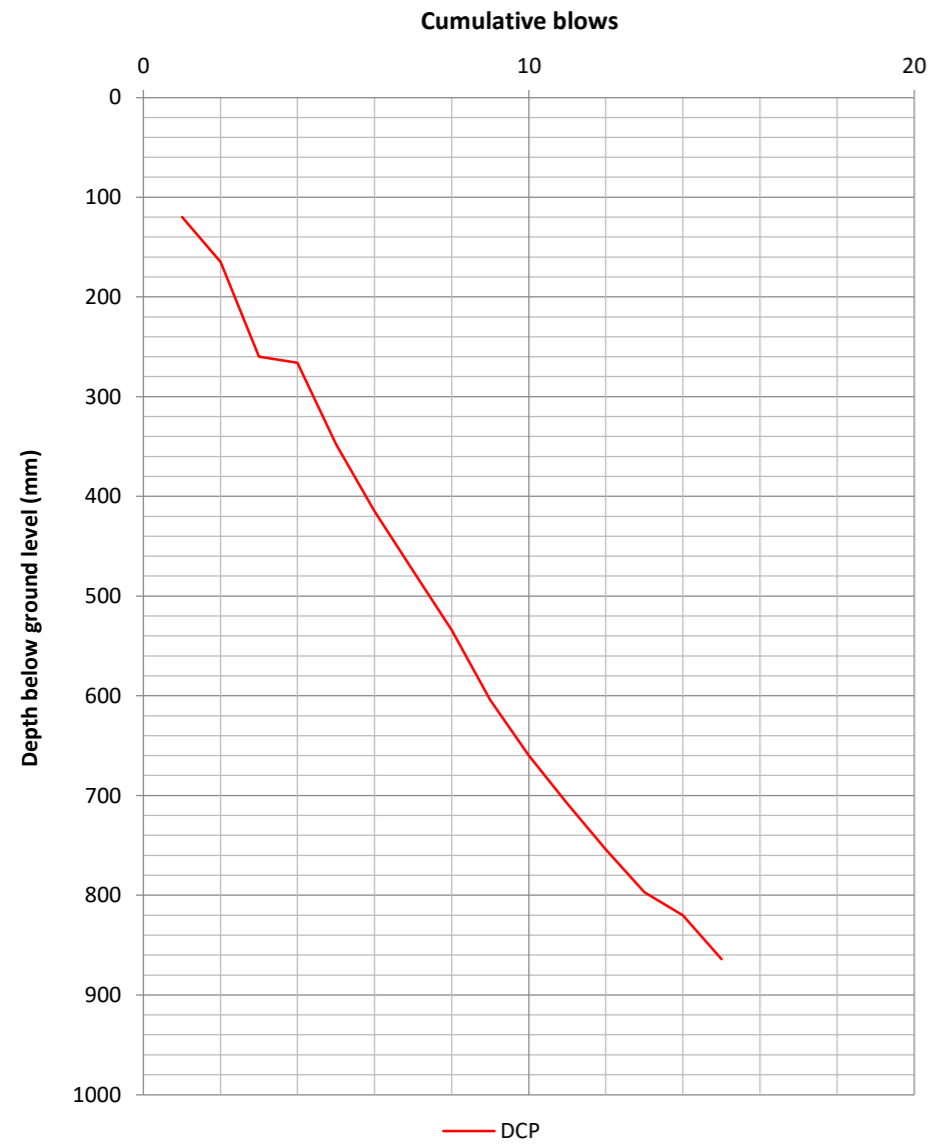
Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

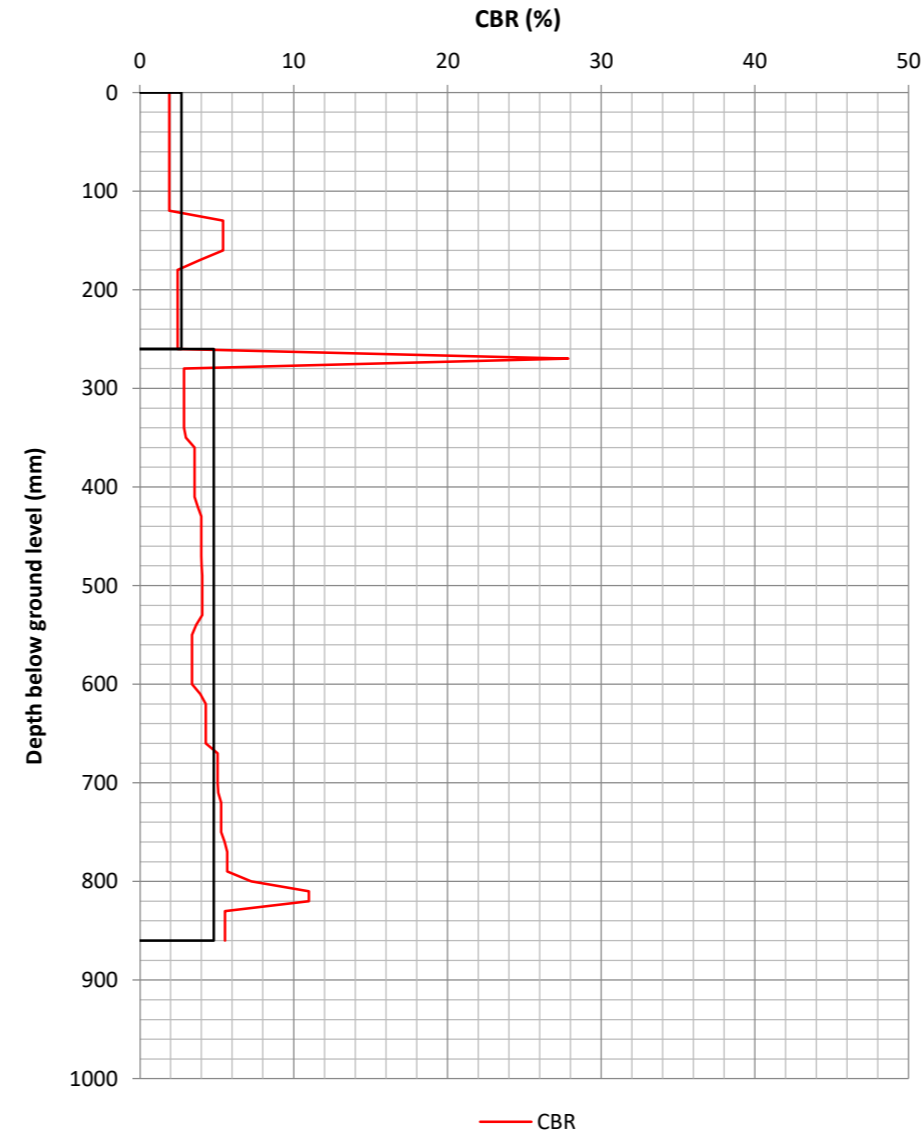
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP06	08/09/2023	0	72	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	2.7	260	0	260
2	4.8	600	260	860

Notes

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

Calculations

$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

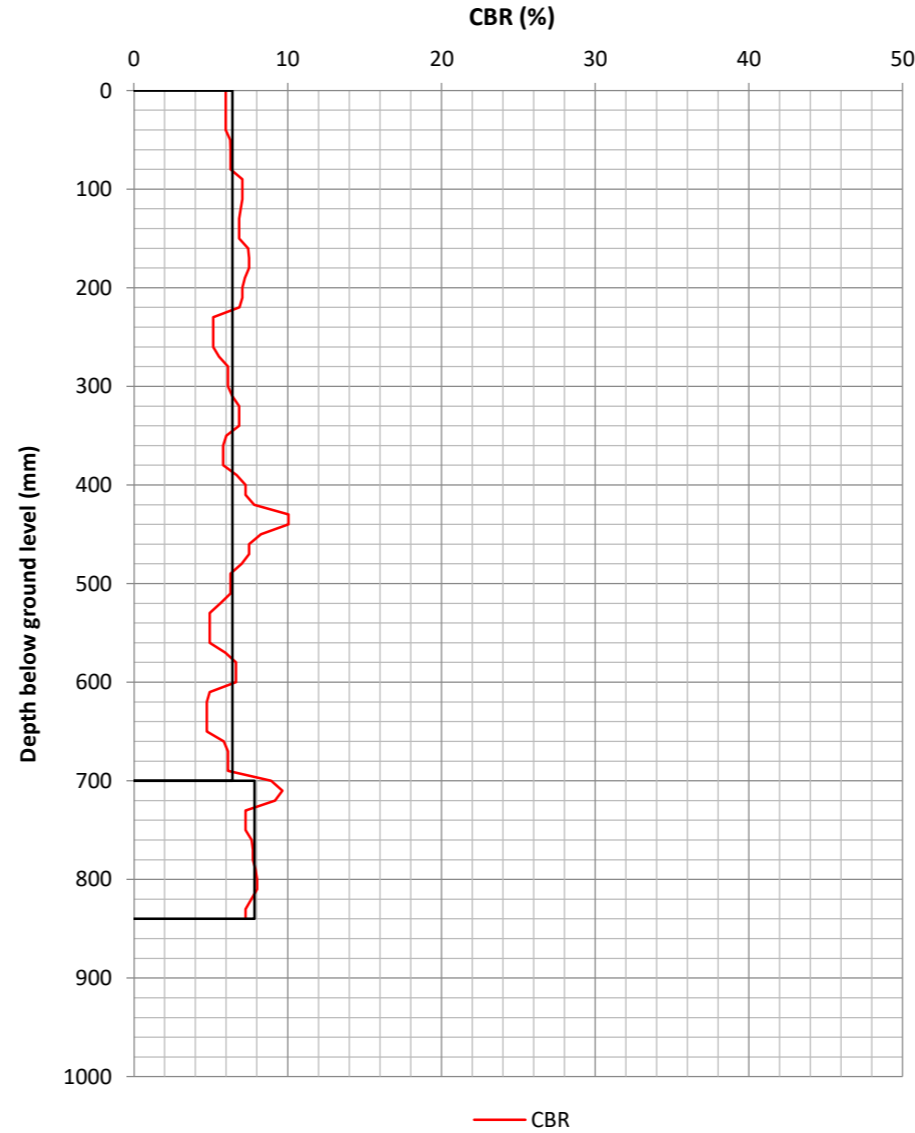
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP07	08/09/2023	0	72	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	6.4	700	0	700
2	7.8	140	700	840

Notes

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

Calculations

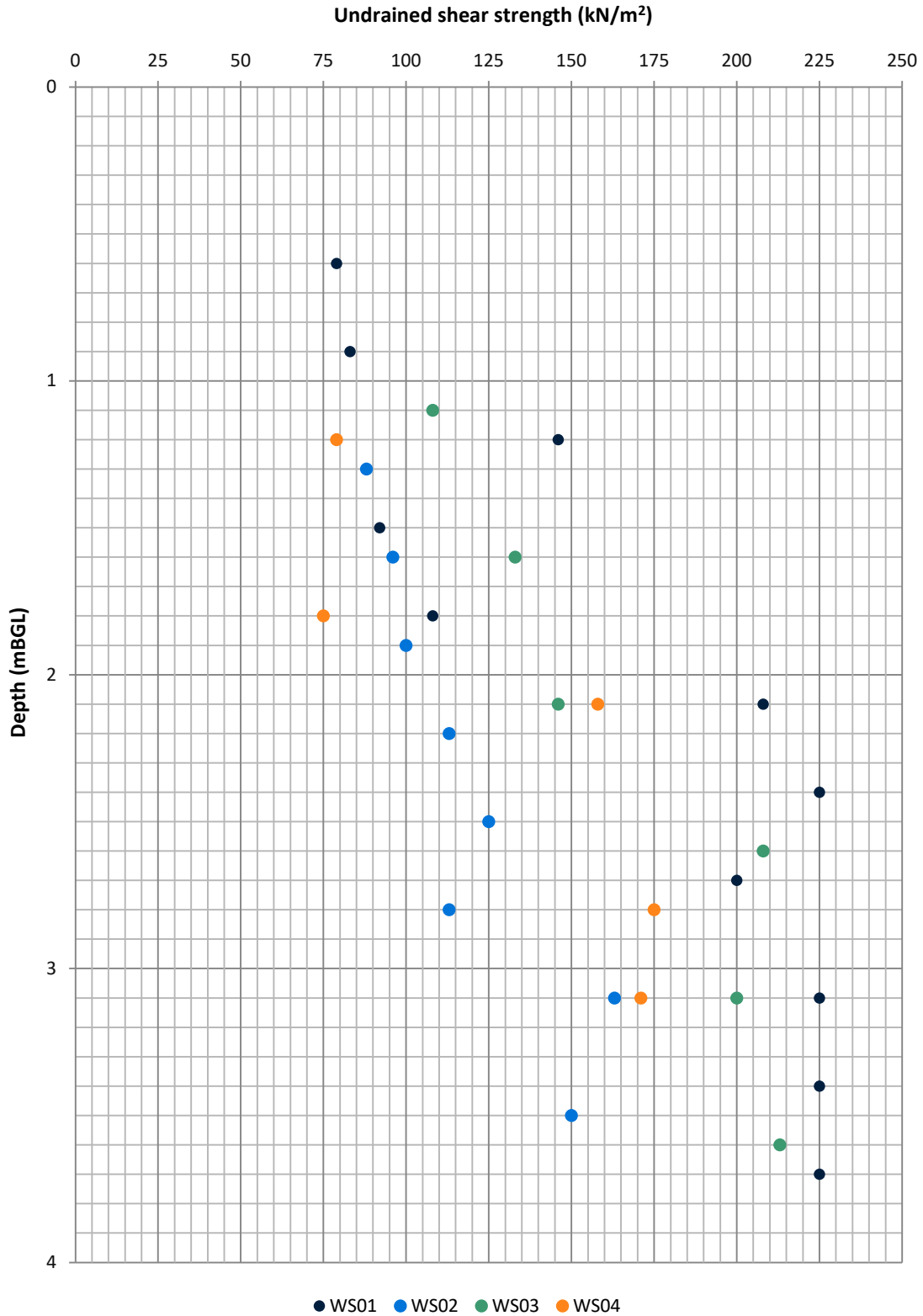
$$\text{Log}_{10}(\text{Uncorrected (UC) CBR}) = 2.48 - 1.057\text{Log}_{10}(\text{mm/blow})$$

Table summarising Pocket Penetrometer results

* Instrument limit reached.

Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m ²)
WS01	0.60	1.5/1.5/1.75	1.58	79
WS01	0.90	1.5/1.75/1.75	1.67	83
WS01	1.20	3/3/2.75	2.92	146
WS01	1.50	1.5/2/2	1.83	92
WS01	1.80	2.5/2/2	2.17	108
WS01	2.10	4/4.5/4	4.17	208
WS01	2.40	4.5/4.5/4.5	4.50	225
WS01	2.70	4/4/4	4.00	200
WS01	3.10	4.5/4.5/4.5	4.50	225
WS01	3.40	4.5/4.5/4.5	4.50	225
WS01	3.70	4.5/4.5/4.5	4.50	225
WS02	1.30	1.75/1.75/1.75	1.75	88
WS02	1.60	1.75/2/2	1.92	96
WS02	1.90	2/2/2	2.00	100
WS02	2.20	2/2.5/2.25	2.25	113
WS02	2.50	2.5/2.5/2.5	2.50	125
WS02	2.80	2.75/2/2	2.25	113
WS02	3.10	3.75/3/3	3.25	163
WS02	3.50	3/3/3	3.00	150
WS03	1.10	2/2.5/2	2.17	108
WS03	1.60	3/2.5/2.5	2.67	133
WS03	2.10	2.75/3/3	2.92	146
WS03	2.60	4/4.5/4	4.17	208
WS03	3.10	4/4/4	4.00	200
WS03	3.60	4.5/4.25/4	4.25	213
WS04	1.20	1.5/1.75/1.5	1.58	79
WS04	1.80	1.5/1.5/1.5	1.50	75
WS04	2.10	3/3.5/3	3.17	158
WS04	2.80	3.5/3.5/3.5	3.50	175
WS04	3.10	3.5/3/3.75	3.42	171

Plot summarising Pocket Penetrometer results versus depth filtered by location



Plot summarising Pocket Penetrometer results versus depth filtered by geology

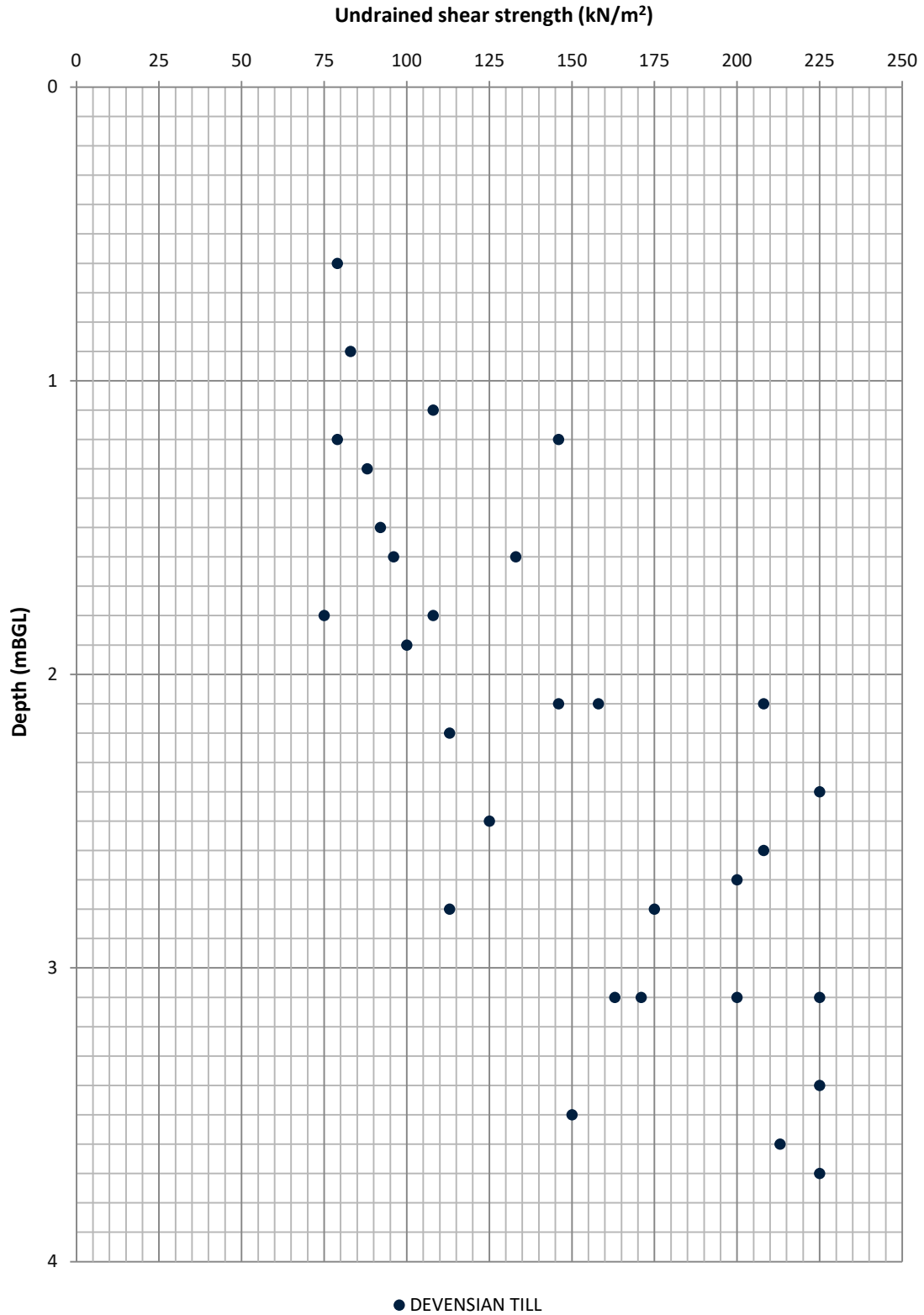
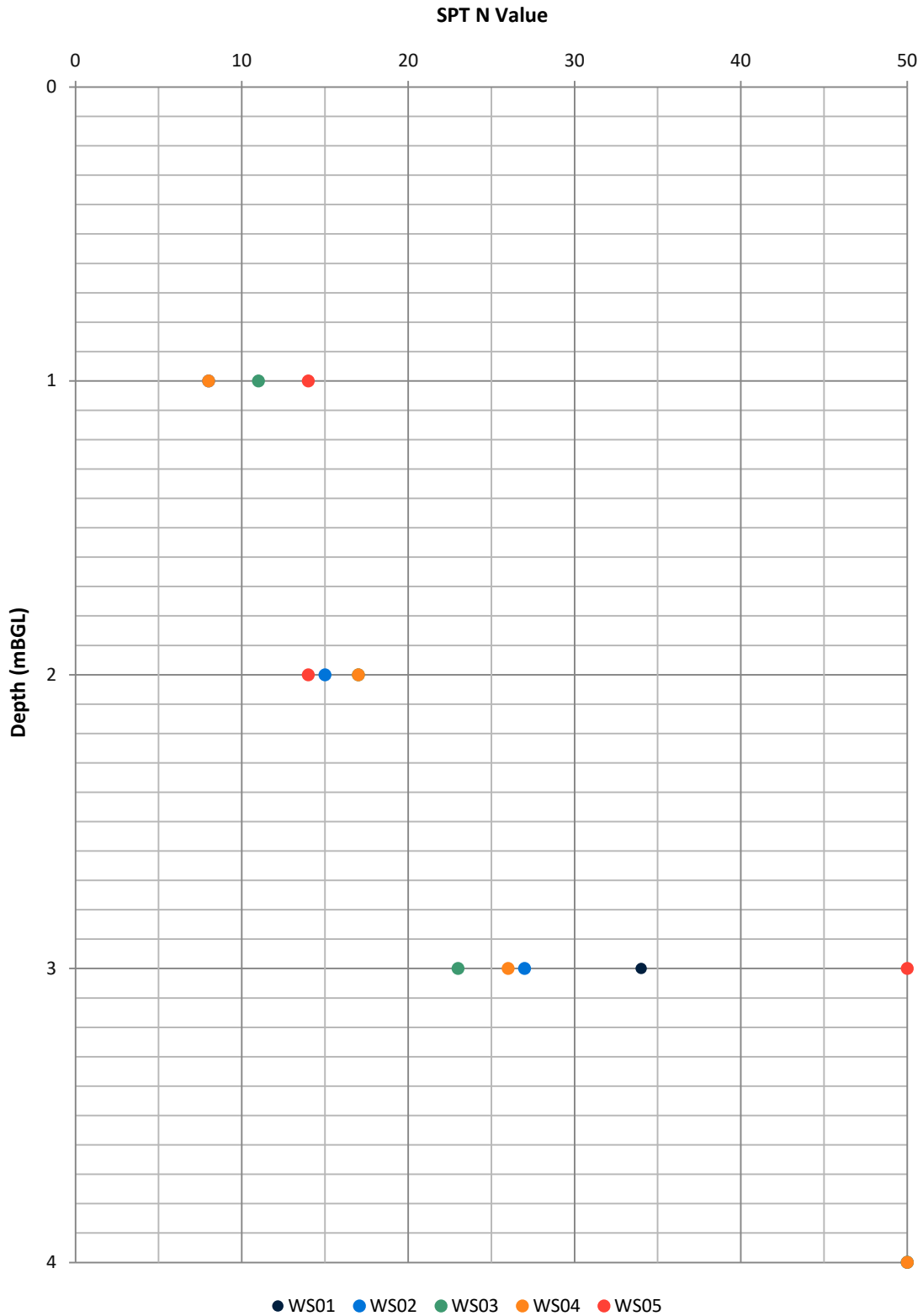


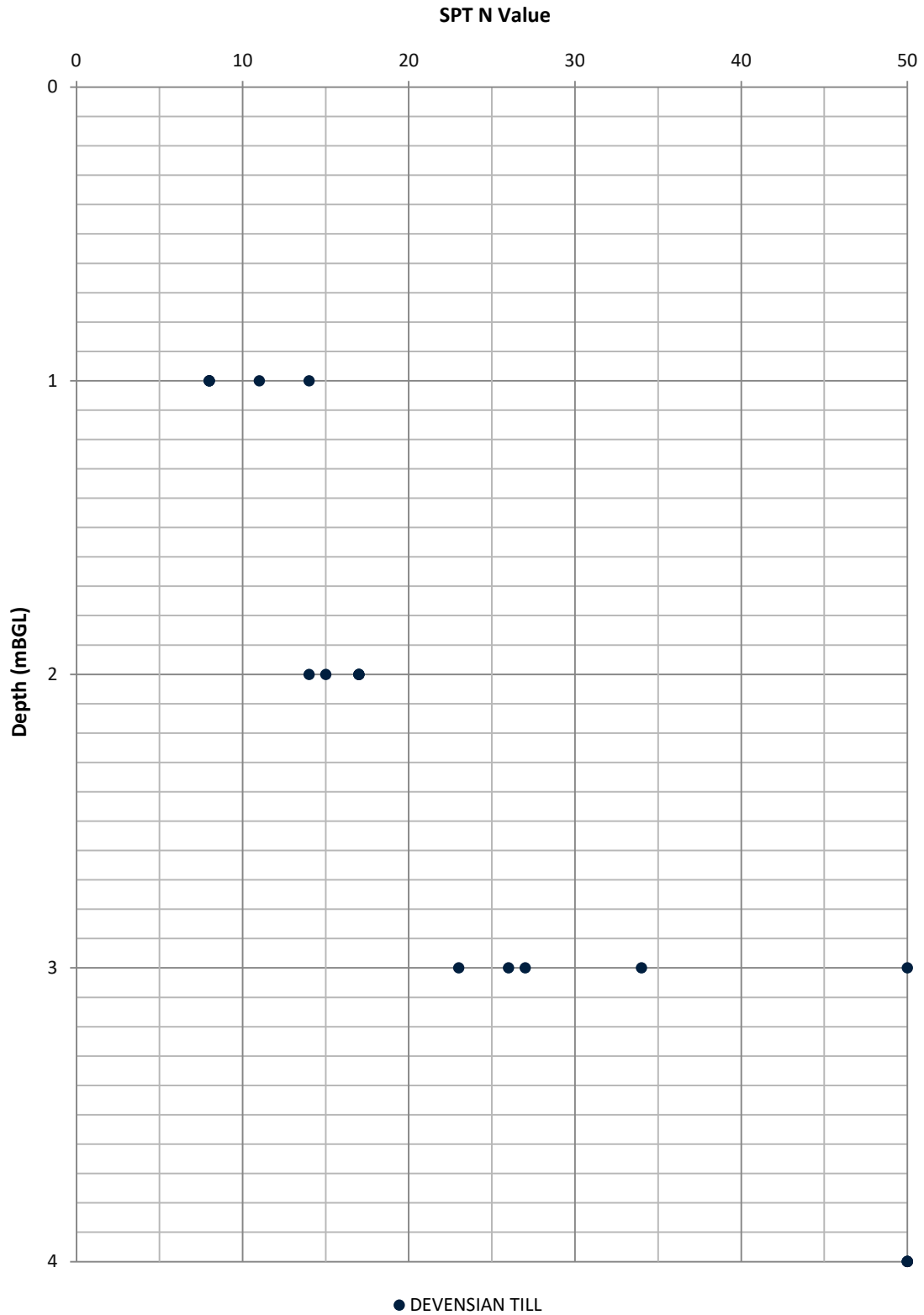
Table summarising Standard Penetration Test (SPT) results

Location	Start Depth (m)	Penetration (mm)					
		Seating 1-2	Main 1-4	Total Seating	Total Main	Total Seating	Total Main
WS01	1.00	1/1	1/2/2/3	2	8	150	300
WS01	2.00	3/3	4/4/5/4	6	17	150	300
WS01	3.00	3/7	8/8/8/10	10	34	150	300
WS01	4.00	10/12	13/13/13/11	22	50	150	275
WS02	1.00	2/2	2/2/2/2	4	8	150	300
WS02	2.00	3/3	3/4/4/4	6	15	150	300
WS02	3.00	3/5	5/7/7/8	8	27	150	300
WS02	4.00	8/10	12/14/13/11	18	50	150	275
WS03	1.00	2/2	2/3/3/3	4	11	150	300
WS03	2.00	3/3	3/4/5/5	6	17	150	300
WS03	3.00	3/3	4/5/7/7	6	23	150	300
WS03	4.00	13/12	15/17/17/1	25	50	135	300
WS04	1.00	1/2	2/2/2/2	3	8	150	300
WS04	2.00	3/3	4/5/4/4	6	17	150	300
WS04	3.00	3/4	5/7/7/7	7	26	150	300
WS04	4.00	13/12	14/16/16/4	25	50	125	235
WS05	1.00	1/2	3/3/4/4	3	14	150	300
WS05	2.00	2/2	2/3/4/5	4	14	150	300
WS05	3.00	7/11	12/13/12/13	18	50	150	255

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



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



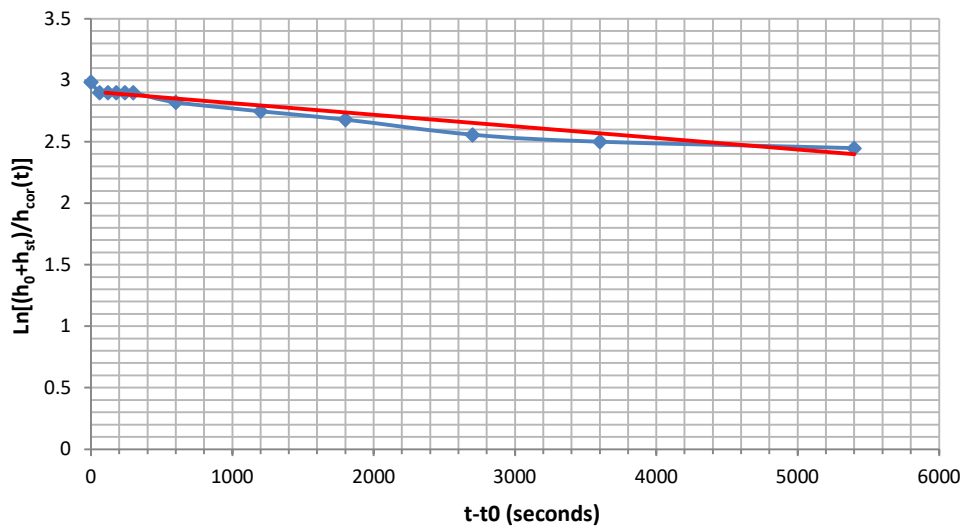
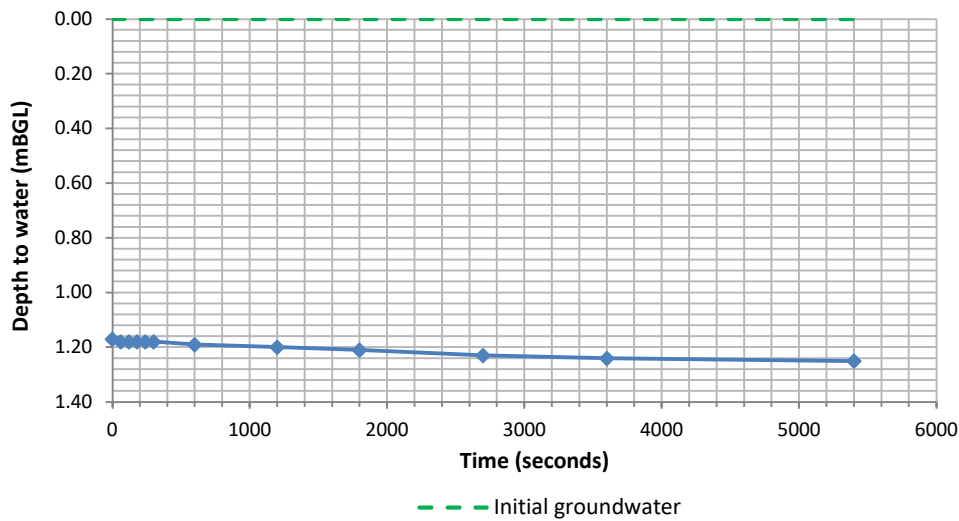
Permeability test in a borehole using open systems (BS EN ISO 22282-2:2012)

Location	Test number	Test method	Test system	Test date
WS01	1	Falling head	Open borehole	08/09/2023

Top of test section (m)	Bottom of test section (m)	Test section length (m)	Test diameter (m)	
1.17	4.00	2.83	0.1	0.1

Variables at start of test

Groundwater (mBGL)	Water after injection (mBGL)	Change in head (m)
Dry	1.17	1.17



F	Shape factor according BS EN ISO 22282-1:2012	4.406 m
S	Cross sectional area of measurement tube	0.0079 m ²
h_{st}	Corrective term to initial static level	1.06E+00 m
α	Gradient of line alpha	-9.43E-05 s ⁻¹
k	Permeability (α S / F)	1.68E-07 m/s

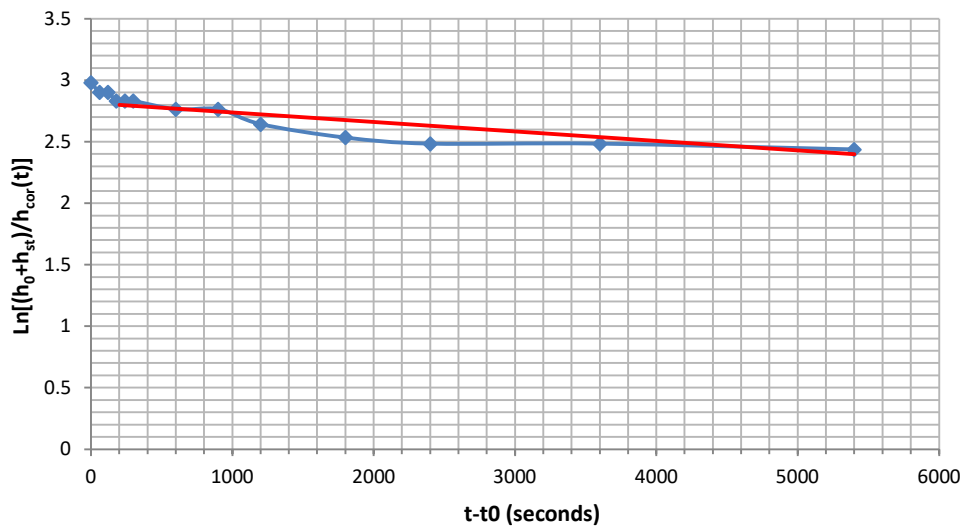
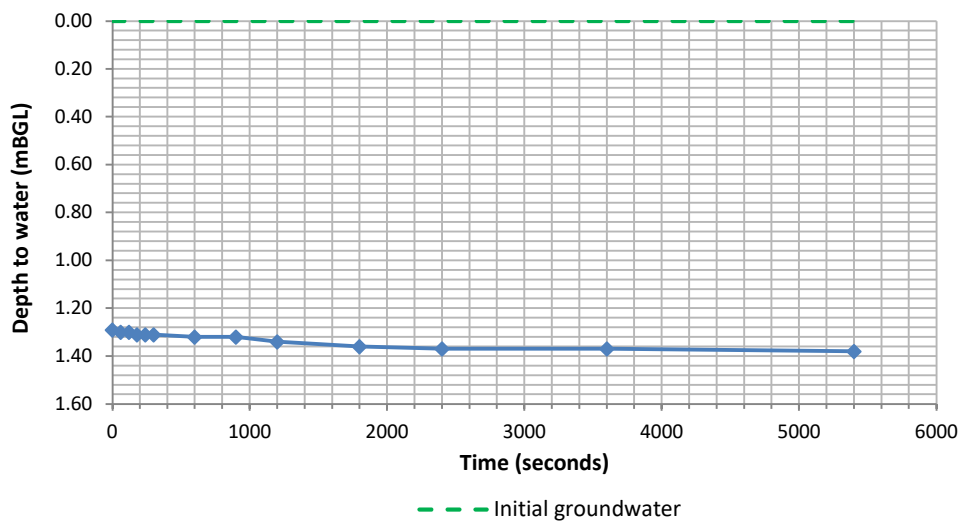
Permeability test in a borehole using open systems (BS EN ISO 22282-2:2012)

Location	Test number	Test method	Test system	Test date
WS02	1	Falling head	Open borehole	08/09/2023

Top of test section (m)	Bottom of test section (m)	Test section length (m)	Test diameter (m)	
1.29	4.00	2.71	0.1	0.1

Variables at start of test

Groundwater (mBGL)	Water after injection (mBGL)	Change in head (m)
Dry	1.29	1.29



F	Shape factor according BS EN ISO 22282-1:2012	4.265 m
S	Cross sectional area of measurement tube	0.0079 m ²
h_{st}	Corrective term to initial static level	1.17E+00 m
α	Gradient of line alpha	-7.69E-05 s ⁻¹
k	Permeability (α S / F)	1.42E-07 m/s

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 Address: Cedar Barn, White Lodge,
 Walgrave, Northampton,
 NN6 9PY
 Contact: Admin
 Site Address: St Gregor's Academy, Stockton-On-Tees

Client Reference: STV6189
 Job Number: 23-58383-1
 Date Sampled: 08/09/2023
 Date Received: 25/09/2023
 Date Tested: 02/10/2023
 Sampled By: Not Given

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

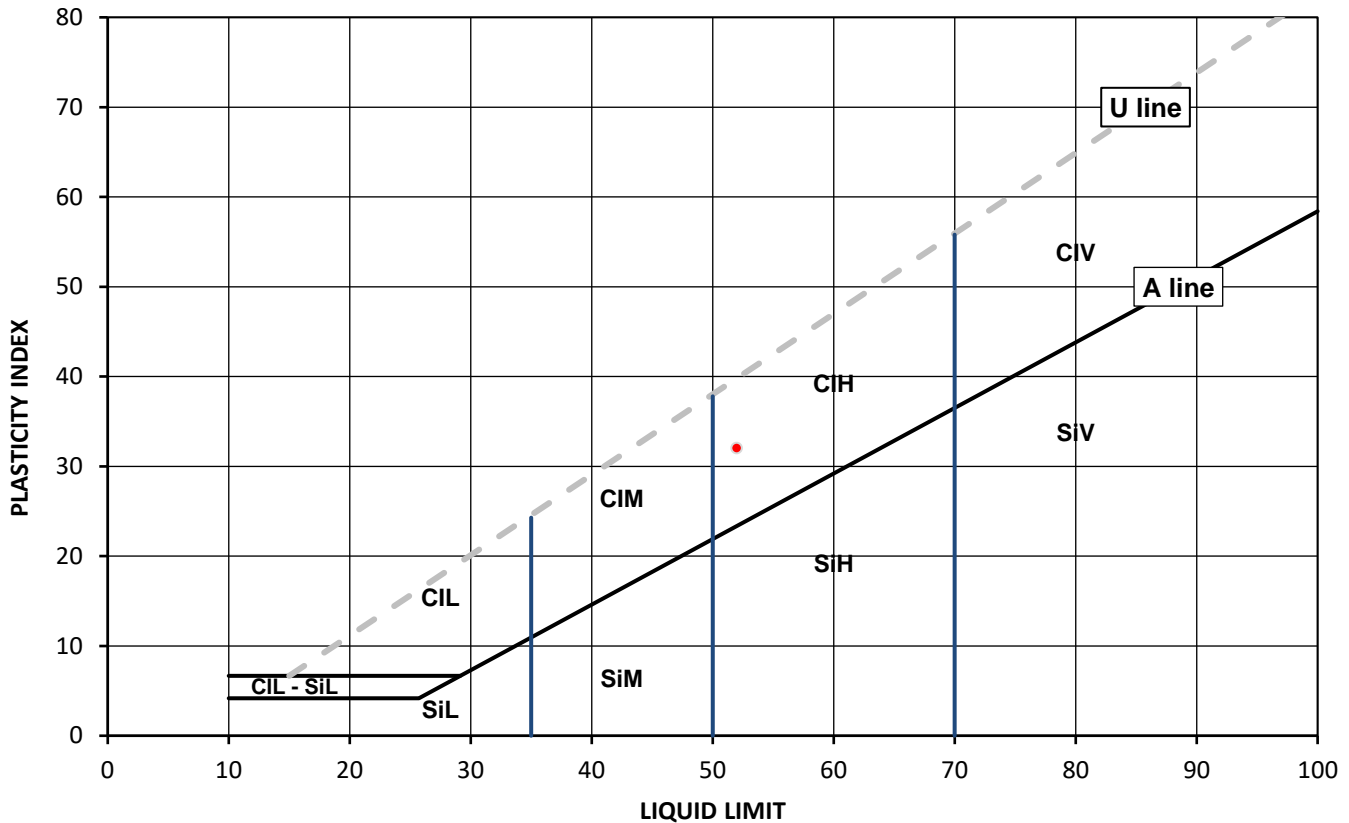
Test Results:

Laboratory Reference: 2822354
 Hole No.: WS01
 Sample Reference: WS010.703
 Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 0.70
 Depth Base [m]: Not Given
 Sample Type: D

Sample Preparation: Tested after >425 µm removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	52	20	32	98



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

Cl	Clay	Plasticity	Liquid Limit
Si	Silt	L	below 35
		M	35 to 50
		H	50 to 70
		V	exceeding 70
		O	append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

Monika Janoszek
 PL Environmental & Geotechnical Lab Production 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.



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 Address: Cedar Barn, White Lodge,
 Walgrave, Northampton,
 NN6 9PY
 Contact: Admin
 Site Address: St Gregor's Academy, Stockton-On-Tees

Client Reference: STV6189
 Job Number: 23-58383-1
 Date Sampled: 08/09/2023
 Date Received: 25/09/2023
 Date Tested: 02/10/2023
 Sampled By: Not Given

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

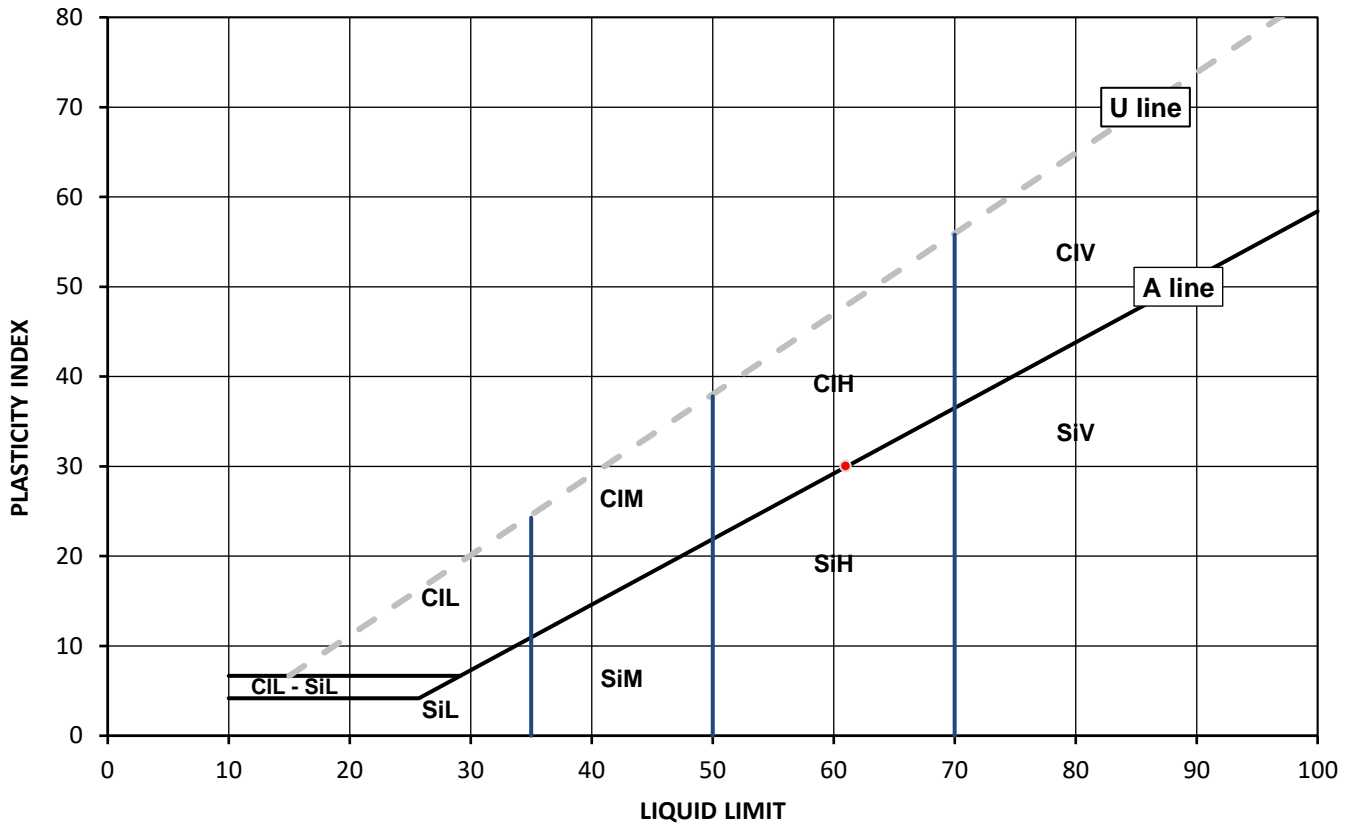
Test Results:

Laboratory Reference: 2822355
 Hole No.: WS02
 Sample Reference: WS021.203
 Sample Description: Brown silty CLAY

Depth Top [m]: 1.20
 Depth Base [m]: Not Given
 Sample Type: D

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
30	61	31	30	100



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

Cl	Clay	Plasticity	Liquid Limit
Si	Silt	L	below 35
		M	35 to 50
		H	50 to 70
		V	exceeding 70
		O	append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

Monika Janoszek
 PL Environmental & Geotechnical Lab Production Specialist
 for and on behalf of i2 Analytical Ltd

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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 Address: Cedar Barn, White Lodge,
 Walgrave, Northampton,
 NN6 9PY
 Contact: Admin
 Site Address: St Gregor's Academy, Stockton-On-Tees

Client Reference: STV6189
 Job Number: 23-58383-1
 Date Sampled: 08/09/2023
 Date Received: 25/09/2023
 Date Tested: 02/10/2023
 Sampled By: Not Given

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

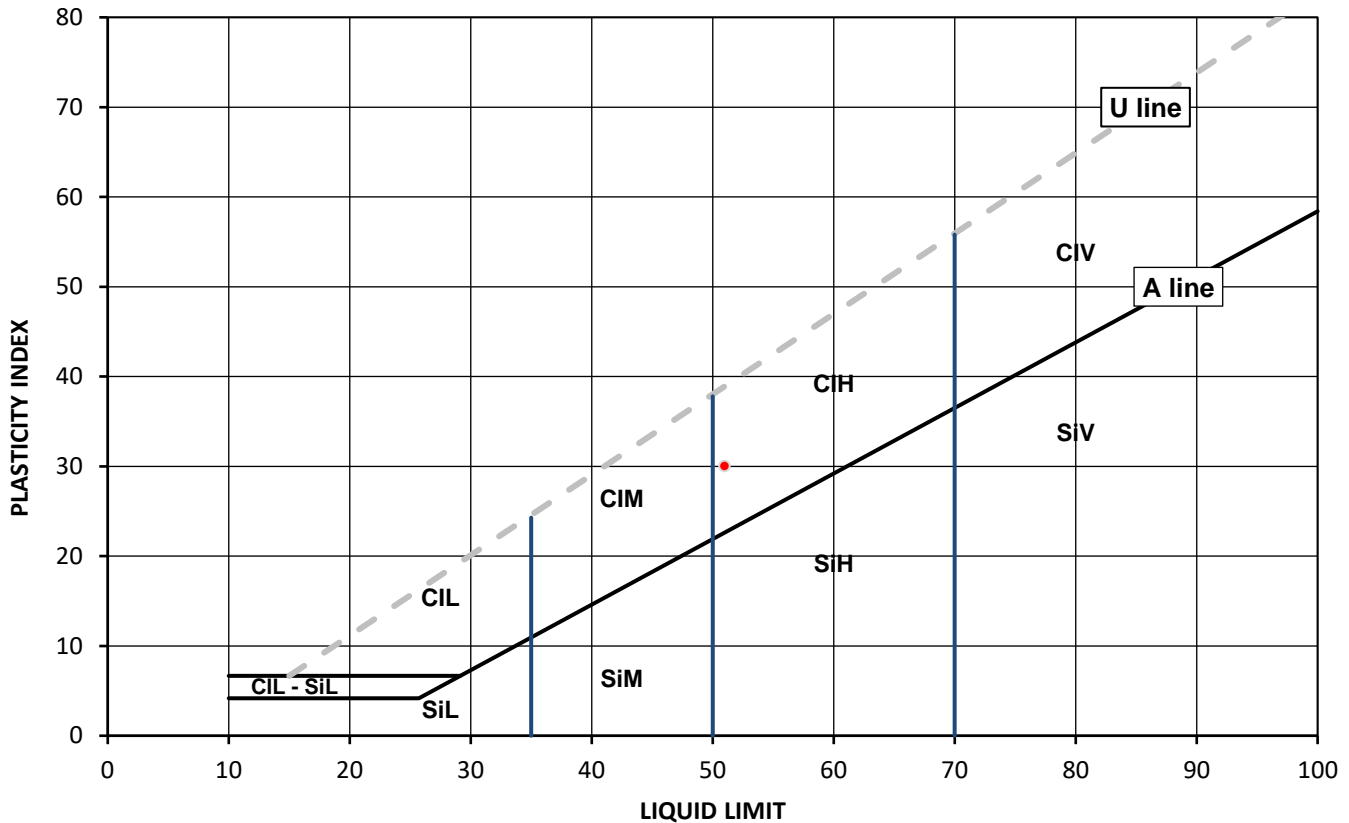
Test Results:

Laboratory Reference: 2822356
 Hole No.: WS03
 Sample Reference: WS031.703
 Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 1.70
 Depth Base [m]: Not Given
 Sample Type: D

Sample Preparation: Tested after >425 µm removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	51	21	30	99



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

Cl	Clay	Plasticity	Liquid Limit
Si	Silt	L	below 35
		M	35 to 50
		H	50 to 70
		V	exceeding 70
		O	append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

Monika Janoszek
 PL Environmental & Geotechnical Lab Production Specialist
 for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

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

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

Client Reference: STV6189
Job Number: 23-58383-1
Date Sampled: 08/09/2023
Date Received: 25/09/2023
Date Tested: 02/10/2023
Sampled By: Not Given

Contact: Admin
Site Address: St Gregorys Academy, Stockton-On-Tees

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 m	Depth Base m	Type					% Passing 425um	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3		
2822354	WS01	WS010.703	0.70	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	24		98	52	20	32					
2822355	WS02	WS021.203	1.20	Not Given	D	Brown silty CLAY	Atterberg 1 Point	30		100	61	31	30					
2822356	WS03	WS031.703	1.70	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	25		99	51	21	30					

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production 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.



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



Environmental Science

4041

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

Contact: Admin
Site Address: St Gregorys Academy, Stockton-On-Tees

Client Reference: STV6189
Job Number: 23-58383-1
Date Sampled: 08/09/2023
Date Received: 25/09/2023
Date Tested: 02/10/2023
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							
2822354	WS01	WS010.703	0.70	Not Given	D	Brown slightly gravelly slightly sandy CLAY		24	Sample was quartered, oven dried at 109 °C			
2822355	WS02	WS021.203	1.20	Not Given	D	Brown silty CLAY		30	Sample was quartered, oven dried at 109 °C			
2822356	WS03	WS031.703	1.70	Not Given	D	Brown slightly gravelly slightly sandy CLAY		25	Sample was quartered, oven dried at 109 °C			

Comments:

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Admin

Soiltechnics Limited
Cedar Barn
White Lodge
Walgrave
Northampton
NN6 9PY

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

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

e: admin@soiltechnics.net

Analytical Report Number : 23-58384

Project / Site name:	St Gregorys Academy, Stockton-On-Tees	Samples received on:	25/09/2023
Your job number:	STV6189	Samples instructed on/ Analysis started on:	25/09/2023
Your order number:	POR016526	Analysis completed by:	09/10/2023
Report Issue Number:	1	Report issued on:	09/10/2023
Samples Analysed:	3 soil samples		

Signed:

Izabela Wójcik

Izabela Wójcik
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

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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.

Analytical Report Number: 23-58384
 Project / Site name: St Gregorys Academy, Stockton-On-Tees
 Your Order No: POR016526

Lab Sample Number				2822357	2822358	2822359
Sample Reference				WS01	WS02	WS03
Sample Number				WS010.703	WS020.502	WS031.703
Depth (m)				0.70	0.50	1.70
Date Sampled				08/09/2023	08/09/2023	08/09/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
				Stone Content	%	0.1
Moisture Content	%	0.01	NONE	18	14	14
Total mass of sample received	kg	0.001	NONE	0.4	1.1	0.4

General Inorganics

	pH Units	N/A	MCERTS	7.2	7.3	8.4
pH - Automated						
Total Sulphate as SO ₄	%	0.005	MCERTS	0.029	0.072	0.027
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0313	0.0339	0.0378
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	31.3	33.9	37.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.7	6.3	2.3
Total Sulphur	%	0.005	MCERTS	0.016	0.034	0.012
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	9.7	< 2.0

Heavy Metals / Metalloids

	mg/kg	5	NONE	15	14	17
Magnesium (water soluble)	mg/kg	5	NONE	15	14	17
Magnesium (leachate equivalent)	mg/l	2.5	NONE	7.5	6.8	8.7

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

Analytical Report Number : 23-58384

Project / Site name: St Gregorys Academy, Stockton-On-Tees

* 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 *
2822357	WS01	WS010.703	0.7	Brown clay with gravel.
2822358	WS02	WS020.502	0.5	Brown clay and sand with gravel.
2822359	WS03	WS031.703	1.7	Brown clay.

Analytical Report Number : 23-58384

Project / Site name: St Gregorys Academy, Stockton-On-Tees

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
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	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	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 Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

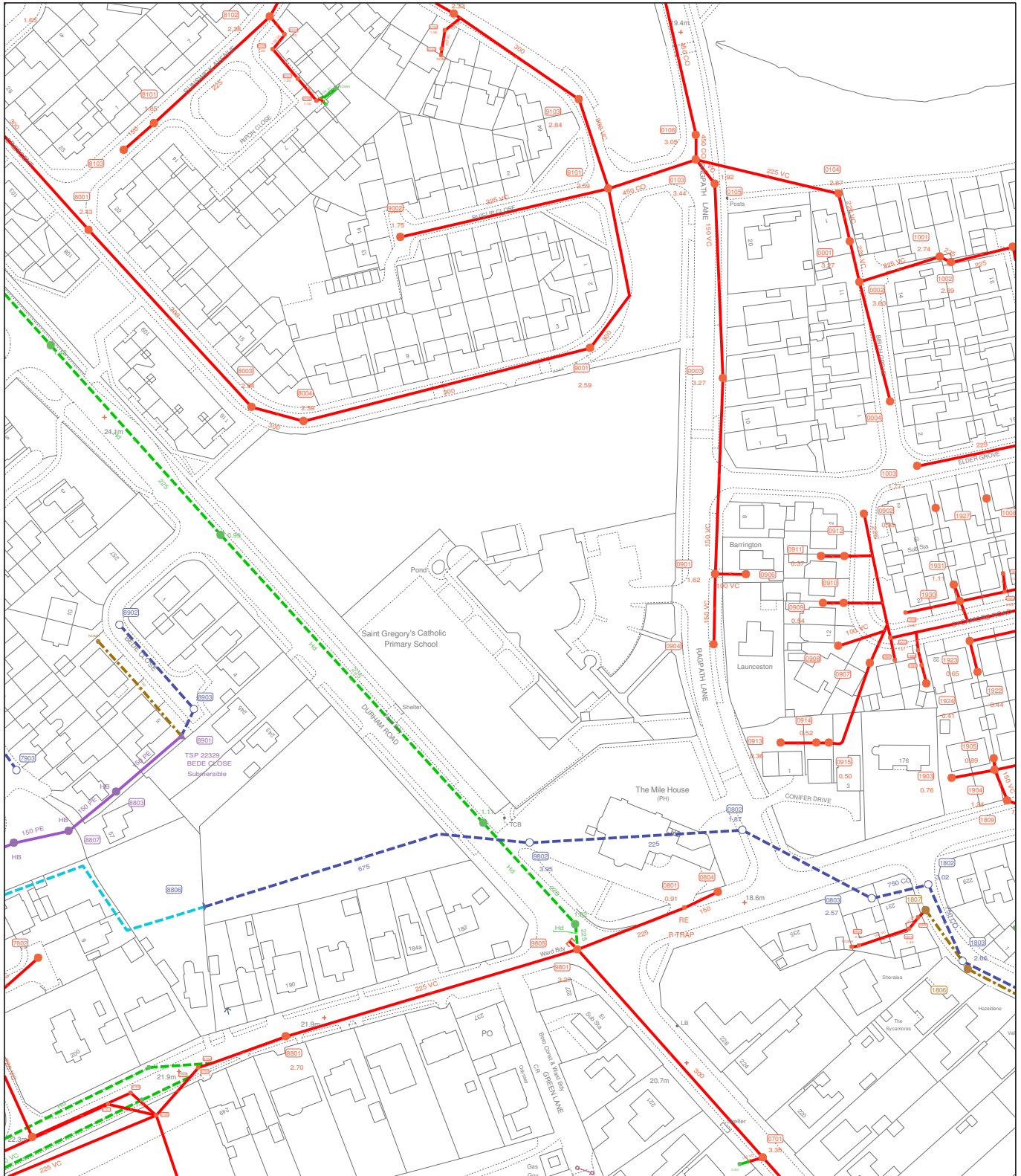
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

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.

Appendix E Statutory Undertakers Responses



NWL Responsibility		Private/Non NWL		Proposed		Annotations		Symbols	
Combined Foul	Red solid line	Combined Foul	Green solid line	Combined Foul	Purple solid line	Direction of flow	Arrow	Chambers	Black square
Surface	Blue dashed line	Surface	Green dashed line	Surface	Purple dashed line	Backdrop	Black circle	Capped End	Black square with dot
Treated Eff	Blue solid line	Treated Eff	Green solid line	Surface	Purple solid line	Abandoned	Black circle with cross	Balancing Pond	Black square with dot
Untreated Eff	Red dashed line	Trade Eff	Yellow solid line	Surface	Purple solid line	Rising Main	Black circle with cross	Termination Node	Black square with dot
Overflow	Red dashed line	Watercourse	Cyan dashed line	Surface	Purple solid line			Air Valve	Black diamond
								Property Connection	Black circle with dot
								Lamp Hole	Black square
								Hatchbox	Black circle
								Dual Usage Chamber	Black circle with dot



User : DAWSJ1

Date : 04/09/2023

Title : 0000

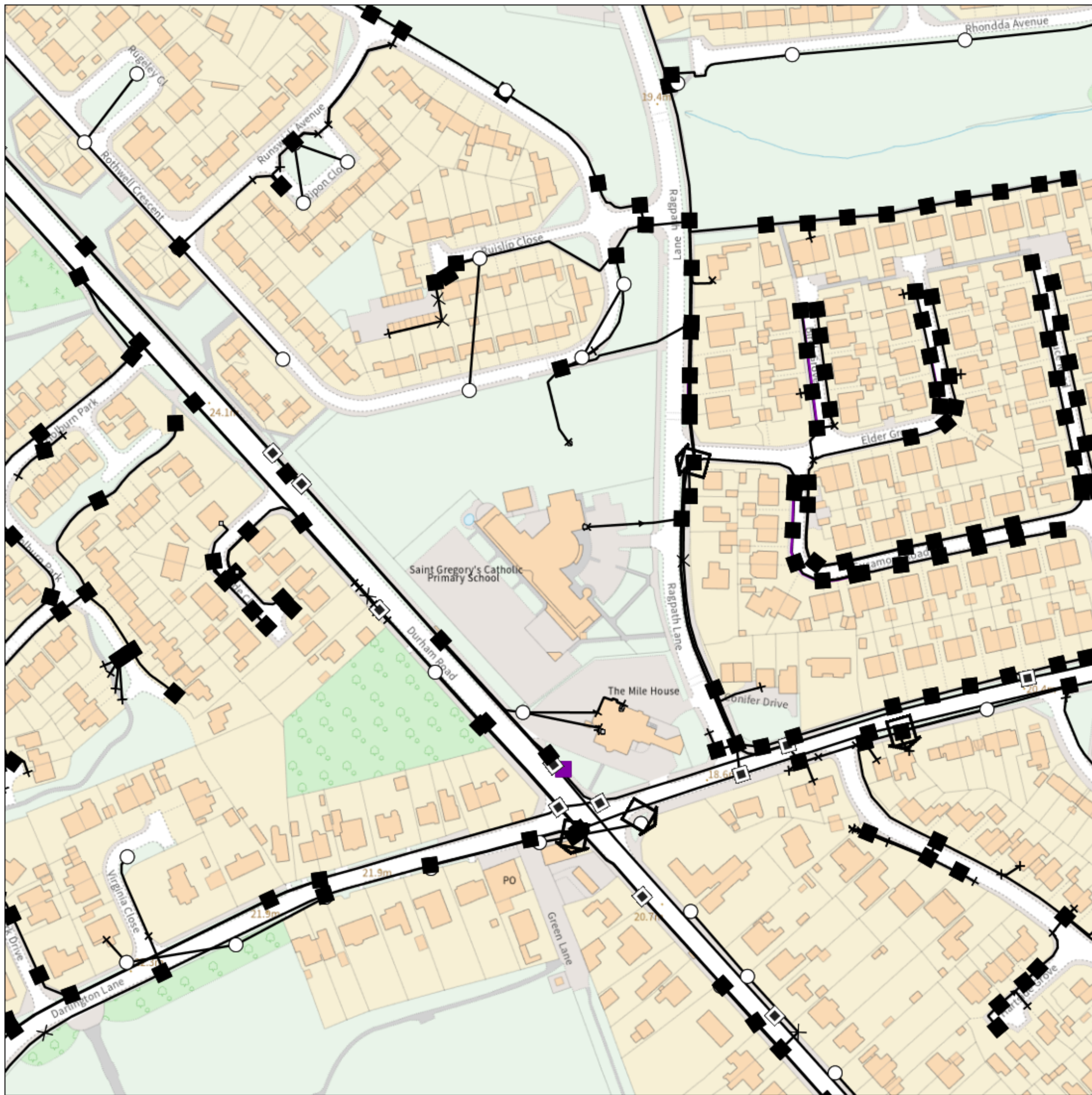
Centre Point : 442962,520968

Map Sheet : NZ4220NE

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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.



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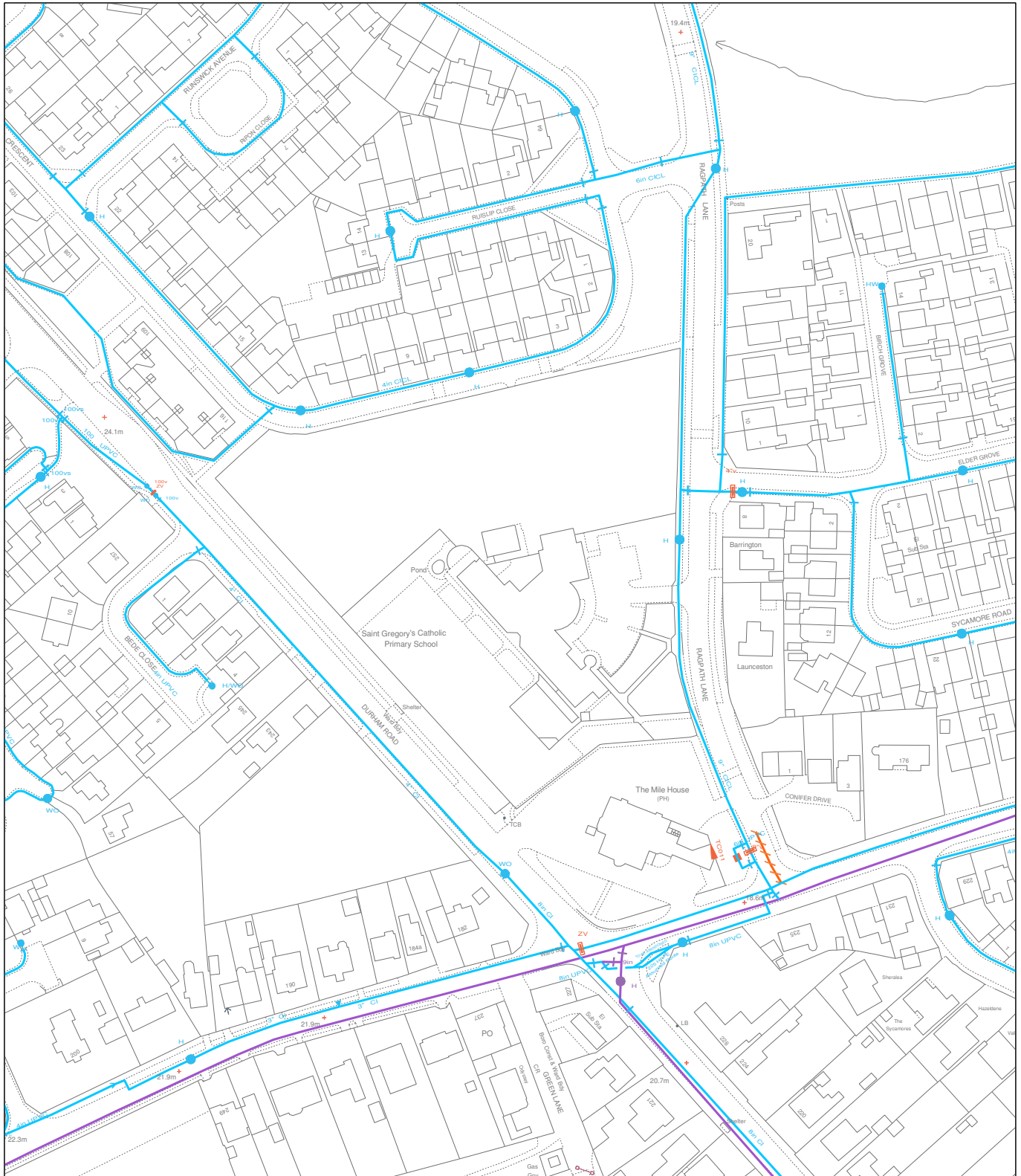
KEY TO BT SYMBOLS

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

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BT Ref : GWB01037T
Map Reference : (centre) NZ4297320962
Easting/Northing : (centre) 442973,520962
Issued : 31/08/2023 13:04:05

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



Valves/Regulators	Fittings/Symbols	Storage/Operations	Network Types	Specific Main Types	Area Types
P1 P2 P3 P4			Distribution Treated Raw Fire Supply	Abandoned Asbestos Abandoned Out of Commission Private Proposed	Water Quality District Metering Easement

User : DAWSJ1

Date : 04/09/2023

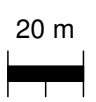


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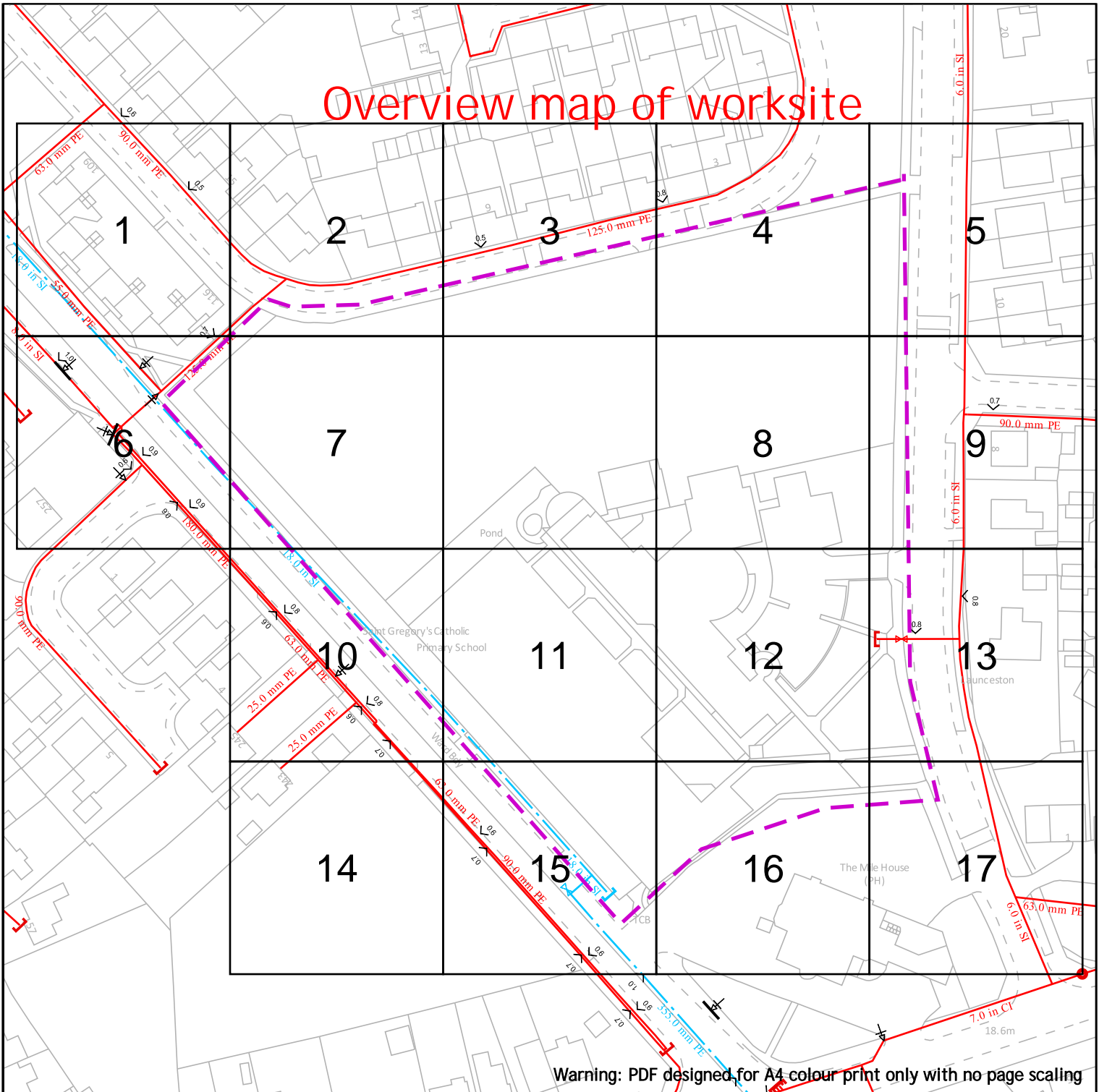
Centre Point : 442962,520968

Map Sheet : NZ4220NE

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Overview map of worksite



Contact Us

General Enquiries: 0800 040 7766

Date Requested: 31/08/2023
 Job Reference: 30689529
 Site Location: 442976 520900
 Requested by: Miss Lauren Wenham
 Your Scheme/Reference: STV6189

Pipes	Network Plant	Network Asset	Network Asset (continued)	Non-Network Asset	Environment
Intermediate Pressure	Flow Stop - Open	CP Point	Pig Trap	Outlet	NTS
Medium Pressure	Flow Stop - Closed	Dip Point	Pipe Joint	Inlet	IGT Area
Low Pressure	Valve - Open	Drain Point	Pressure Measurement	Depth of Cover	IGT Site
Transmission Pipe	Valve - Closed	End Closure	Purge Point	Crossover Connection	Infill Site
Regional High Pressure	Transmission Valve - Open	Flow Measure	Reducer	Change in Material	LPG Site
Asset Protection	Transmission Valve - Closed	Gas Conditioner	Stand Pipe	Change in Diameter	OMR's
Cathodic		Governor	Syphon		Pipeline
Slabbed		MEG Point	Tee		Contact Zone
Sleeved		Meter	Test Point		SAM
		OMR			SSSI
		Oiling Point			

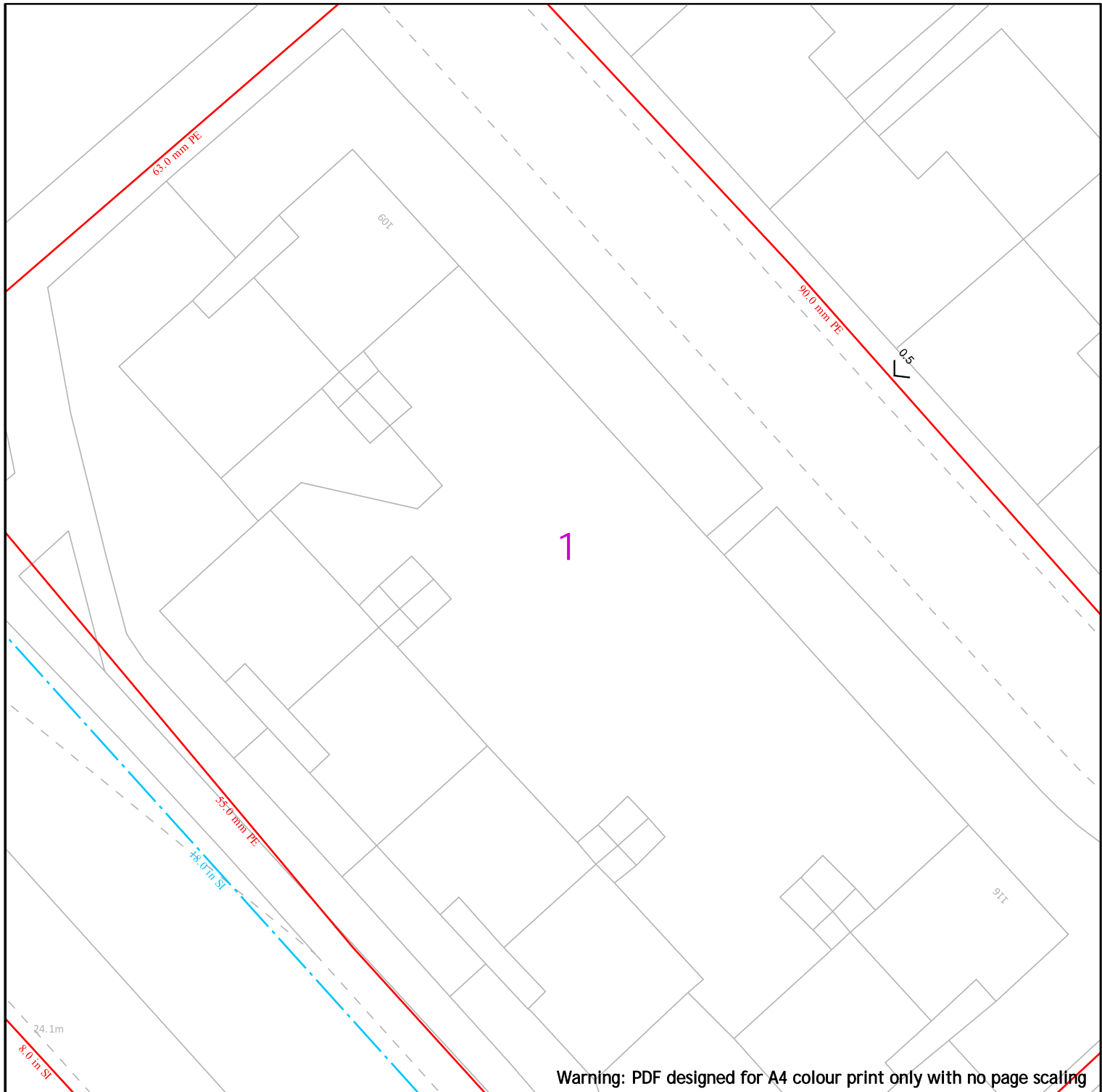
IMPORTANT NOTICES

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Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
 0800 111 999

Scale: 1:1281 (When plotted at A4)

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 General Enquiries: 0800 040 7766

Pipes		Network Plant		Network Asset		Network Asset (continued)		Non-Network Asset		Dig Sites																																					
Intermediate Pressure	Medium Pressure	Low Pressure	Transmission Pipe	Asset Protection	Flow Stop - Open	Flow Stop - Closed	Valve - Open	Valve - Closed	Transmission Valve - Open	Transmission Valve - Closed	CP Point	Dip Point	Drain Point	End Closure	Flow Measure	Gas Conditioner	Governor	MEG Point	Meter	OMR	Oiling Point	Pig Trap	Pipe Joint	Pressure Measurement	Purge Point	Reducer	Stand Pipe	Syphon	Tee	Test Point	Outlet	Inlet	Depth of Cover	Crossover Connection	Change in Material	Change in Diameter	NTS	IGT Area	IGT Site	Infill Site	LPG Site	OMR's	Pipeline	Contact Zone	Environment	SAM	SSSI

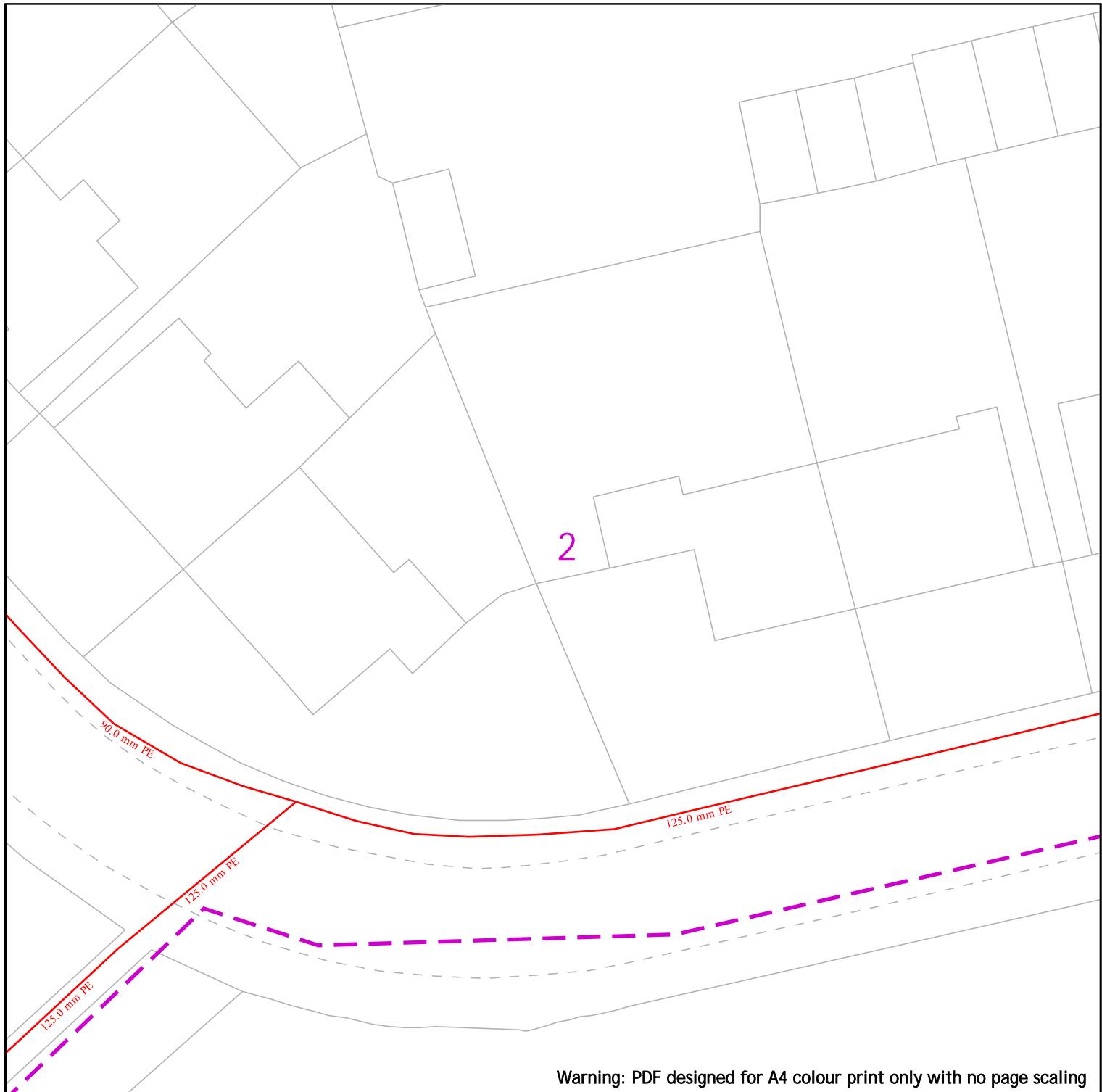
Date Requested: 31/08/2023
 Job Reference: 30689529
 Site Location: 442976 520900
 Requested by: Miss Lauren Wenham
 Your Scheme/Reference: STV6189

Scale: 1:250 (When plotted at A4)

IMPORTANT NOTICES
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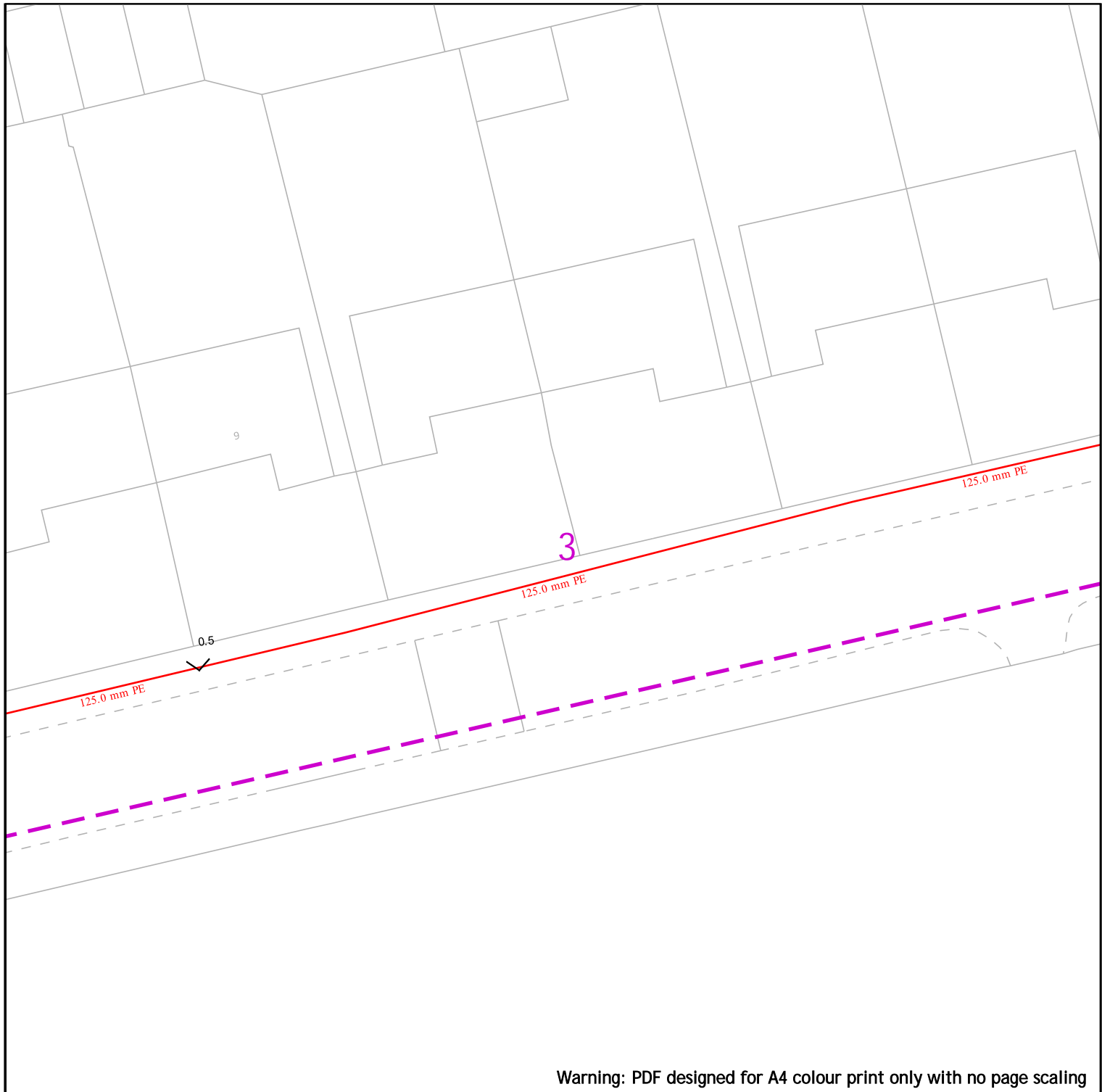
<p>Pipes</p> <ul style="list-style-type: none"> Intermediate Pressure Medium Pressure Low Pressure <p>Transmission Pipe</p> <ul style="list-style-type: none"> Regional High Pressure <p>Asset Protection</p> <ul style="list-style-type: none"> Cathodic Slabbed Sleeved 		<p>Network Plant</p> <ul style="list-style-type: none"> Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed 	<p>Network Asset</p> <ul style="list-style-type: none"> CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point 	<p>Network Asset (continued)</p> <ul style="list-style-type: none"> Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point 	<p>Non-Network Asset</p> <ul style="list-style-type: none"> Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter 	<p>Dig Sites Area: [Dashed Purple Line] Line: [Dashed Purple Line]</p> <ul style="list-style-type: none"> NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone Environment SAM SSSI
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Scale: 1:250 (When plotted at A4)



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		Dig Sites Area: Line:			
Pipes Intermediate Pressure Medium Pressure Low Pressure Transmission Pipe Regional High Pressure	Network Plant Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed	Network Asset CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point	Network Asset (continued) Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point	Non-Network Asset Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter	Environment NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone SAM SSSI

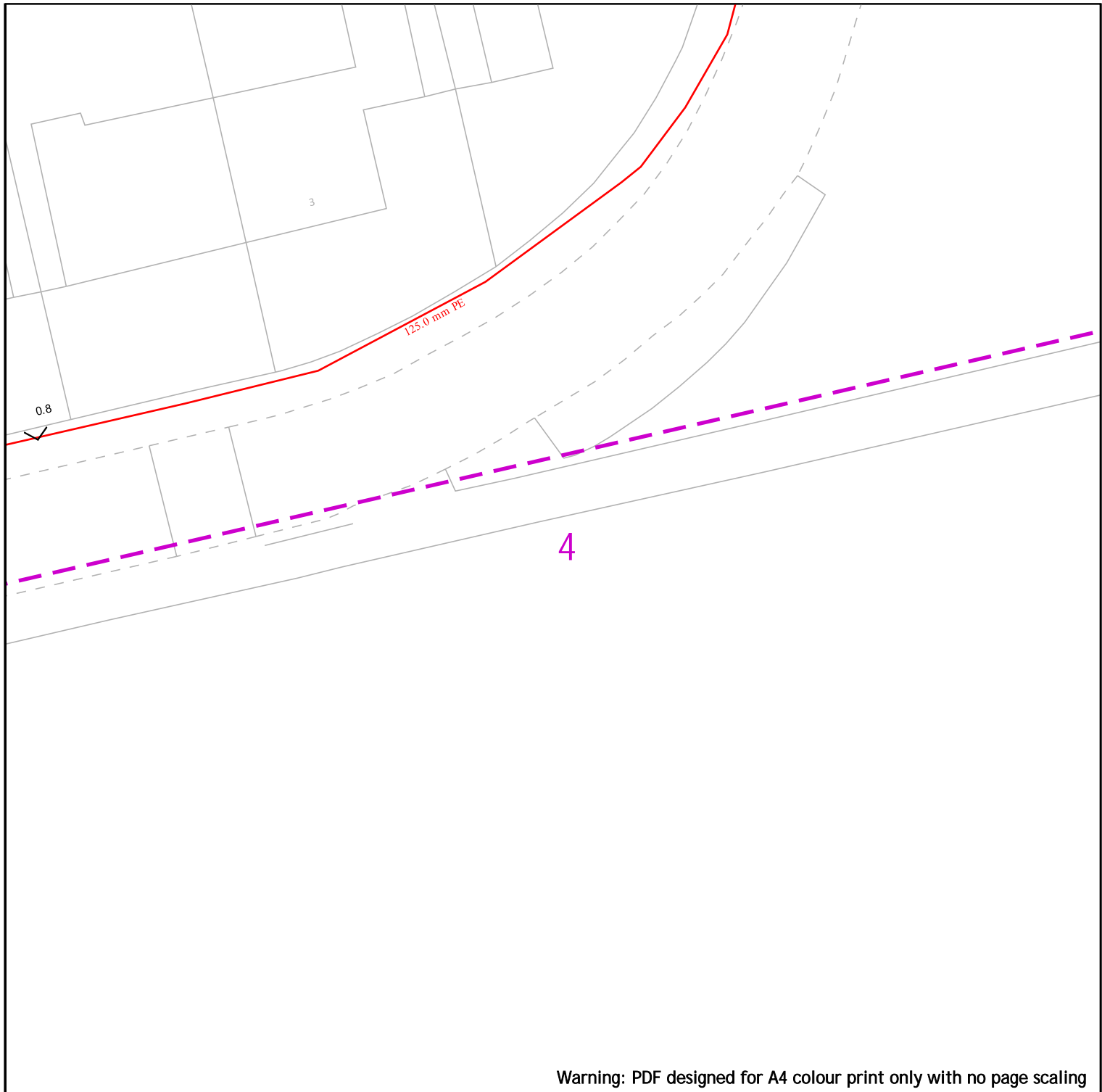
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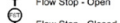
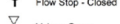
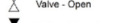
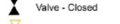
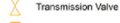




































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						Dig Sites Area:  Line: 
Pipes  Intermediate Pressure  Medium Pressure  Low Pressure Transmission Pipe  Regional High Pressure	Network Plant  Flow Stop - Open  Flow Stop - Closed  Valve - Open  Valve - Closed  Transmission Valve - Open  Transmission Valve - Closed	Network Asset  CP Point  Dip Point  Drain Point  End Closure  Flow Measure  Gas Conditioner  Governor  MEG Point  Meter  OMR  Oiling Point	Network Asset (continued)  Pig Trap  Pipe Joint  Pressure Measurement  Purge Point  Reducer  Stand Pipe  Syphon  Tee  Test Point	Non-Network Asset  Outlet  Inlet  Depth of Cover  Crossover Connection  Change in Material  Change in Diameter	Environment  NTS IGT Area  IGT Site  Infill Site  LPG Site  OMR's Pipeline  Contact Zone  SAM  SSSI	

Date Requested: 31/08/2023
 Job Reference: 30689529
 Site Location: 442976 520900
 Requested by: Miss Lauren Wenham
 Your Scheme/Reference: STV6189

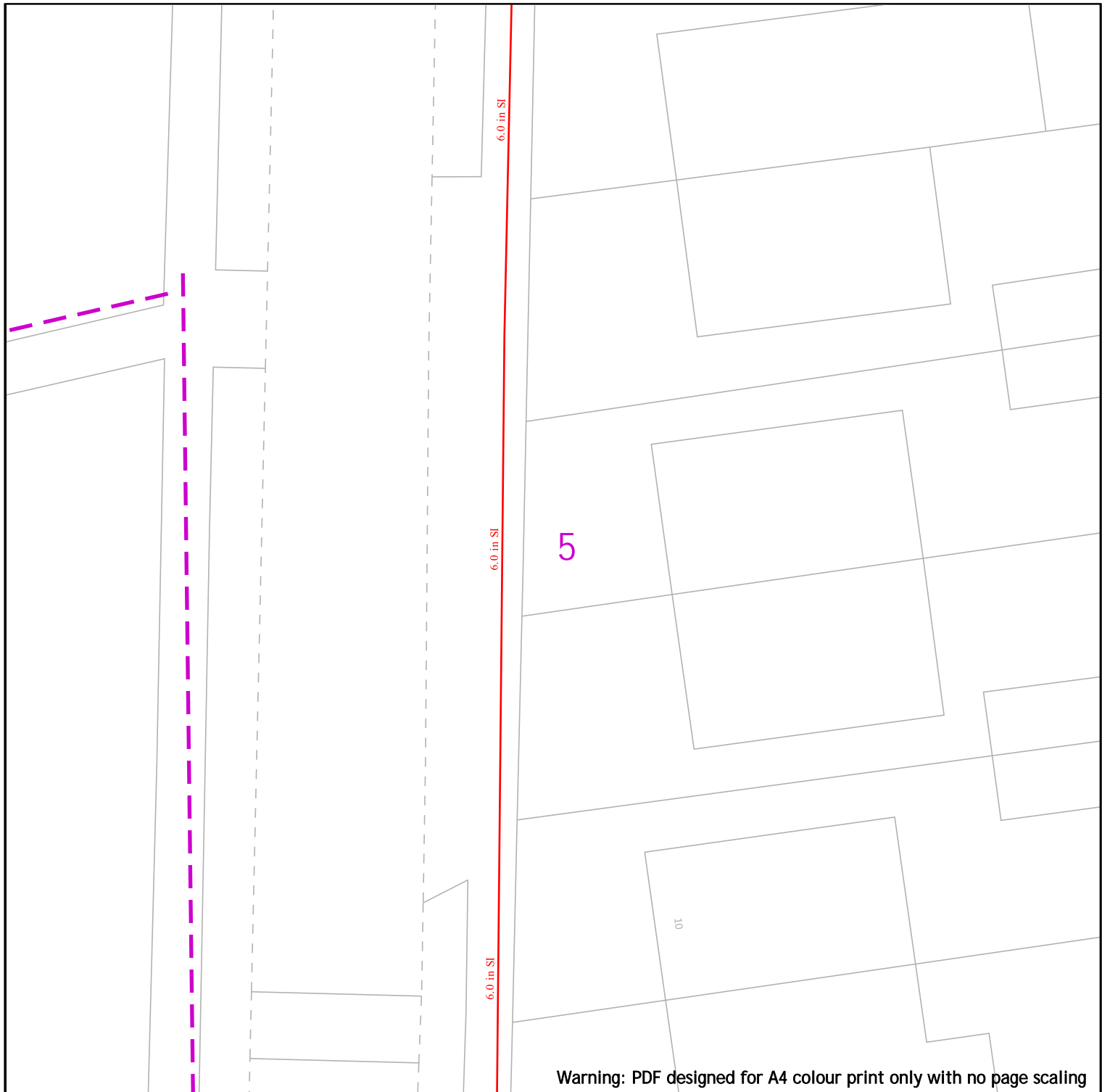
Scale: 1:250 (When plotted at A4)

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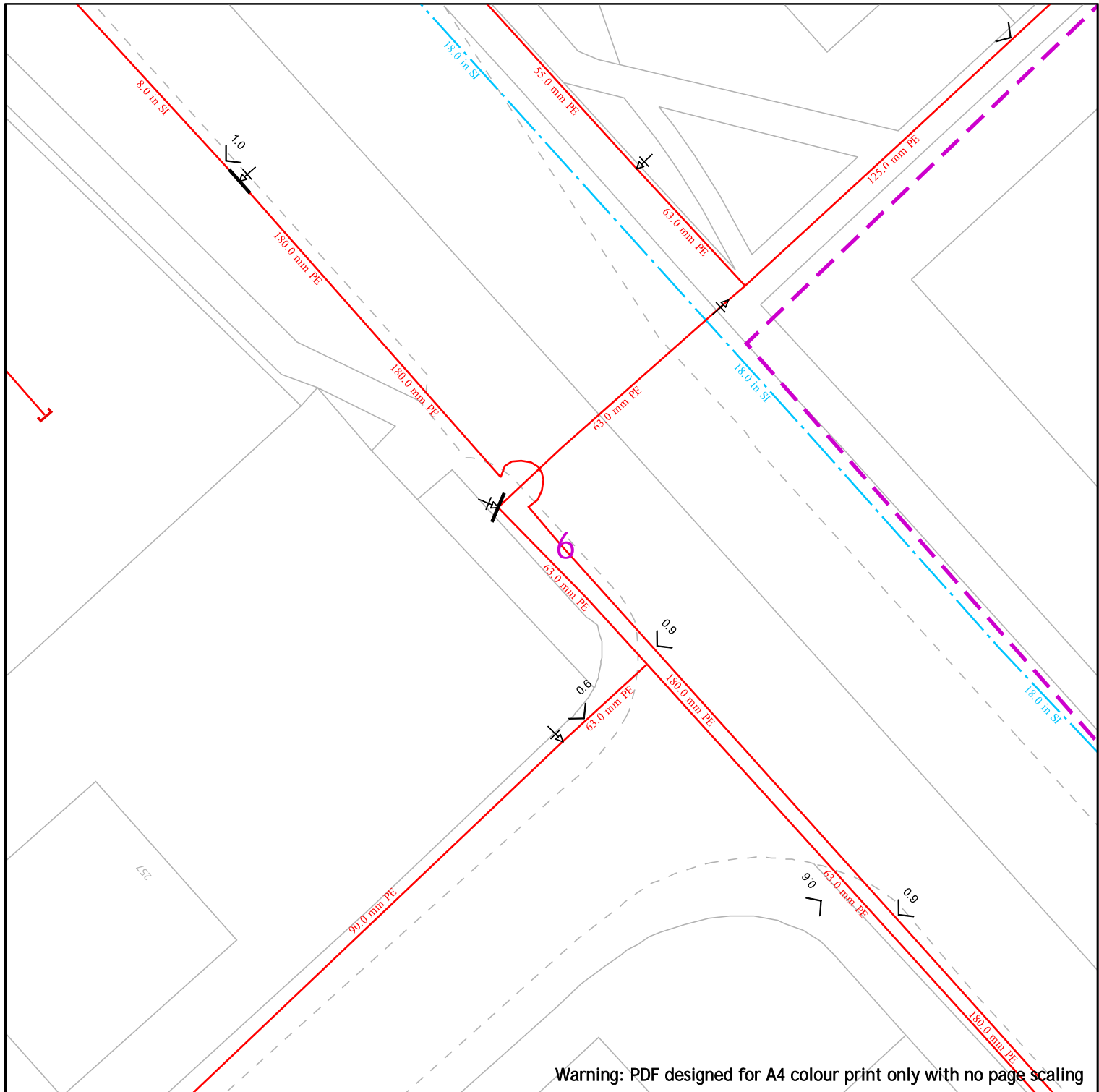
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		Dig Sites Area: Line:			
Pipes Intermediate Pressure Medium Pressure Low Pressure Transmission Pipe Regional High Pressure	Network Plant Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed	Network Asset CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point	Network Asset (continued) Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point	Non-Network Asset Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter	Environment NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone SAM SSSI

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<p>Pipes</p> <ul style="list-style-type: none"> Intermediate Pressure Medium Pressure Low Pressure <p>Transmission Pipe</p> <ul style="list-style-type: none"> Regional High Pressure <p>Asset Protection</p> <ul style="list-style-type: none"> Cathodic Slabbed Sleeved 		<p>Network Plant</p> <ul style="list-style-type: none"> Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed 	<p>Network Asset</p> <ul style="list-style-type: none"> CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point 	<p>Network Asset (continued)</p> <ul style="list-style-type: none"> Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point 	<p>Non-Network Asset</p> <ul style="list-style-type: none"> Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter 	<p>Dig Sites Area: [Dashed Box] Line: [Dashed Line]</p> <ul style="list-style-type: none"> NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone Environment SAM SSSI
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Date Requested: 31/08/2023
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 Site Location: 442976 520900
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 Your Scheme/Reference: STV6189

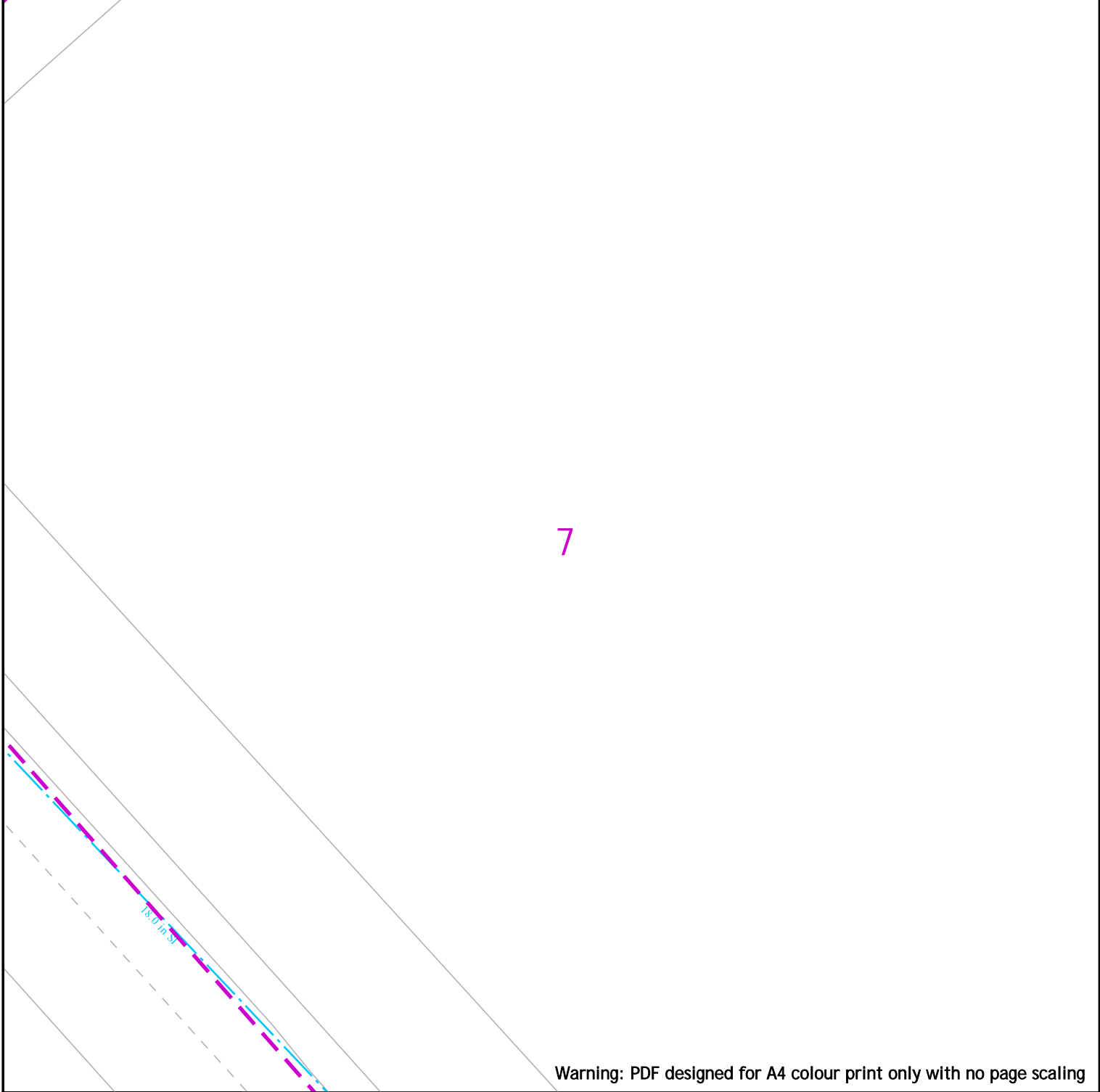
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Pipes	Network Plant	Network Asset	Network Asset (continued)	Non-Network Asset	Environment
<ul style="list-style-type: none"> Intermediate Pressure Medium Pressure Low Pressure 	<ul style="list-style-type: none"> Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed 	<ul style="list-style-type: none"> CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point 	<ul style="list-style-type: none"> Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point 	<ul style="list-style-type: none"> Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter 	<ul style="list-style-type: none"> NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone SAM SSSI

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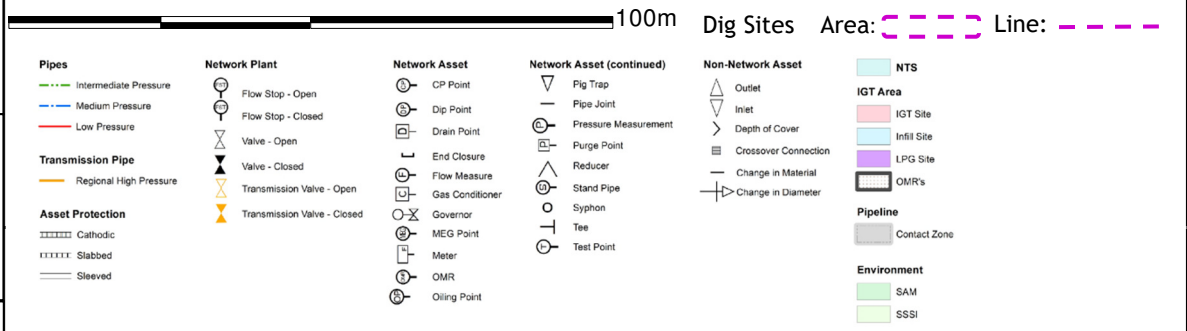
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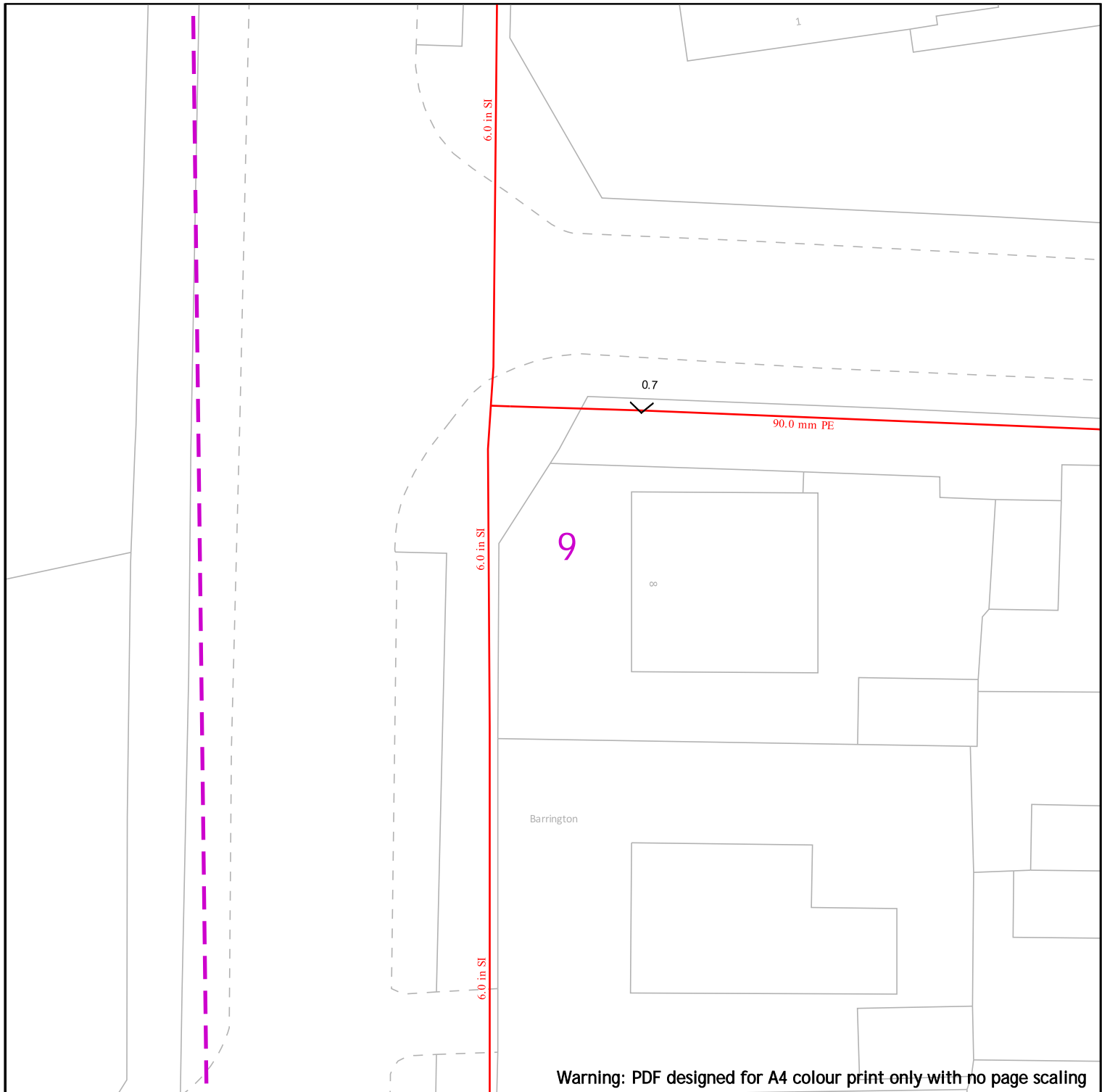


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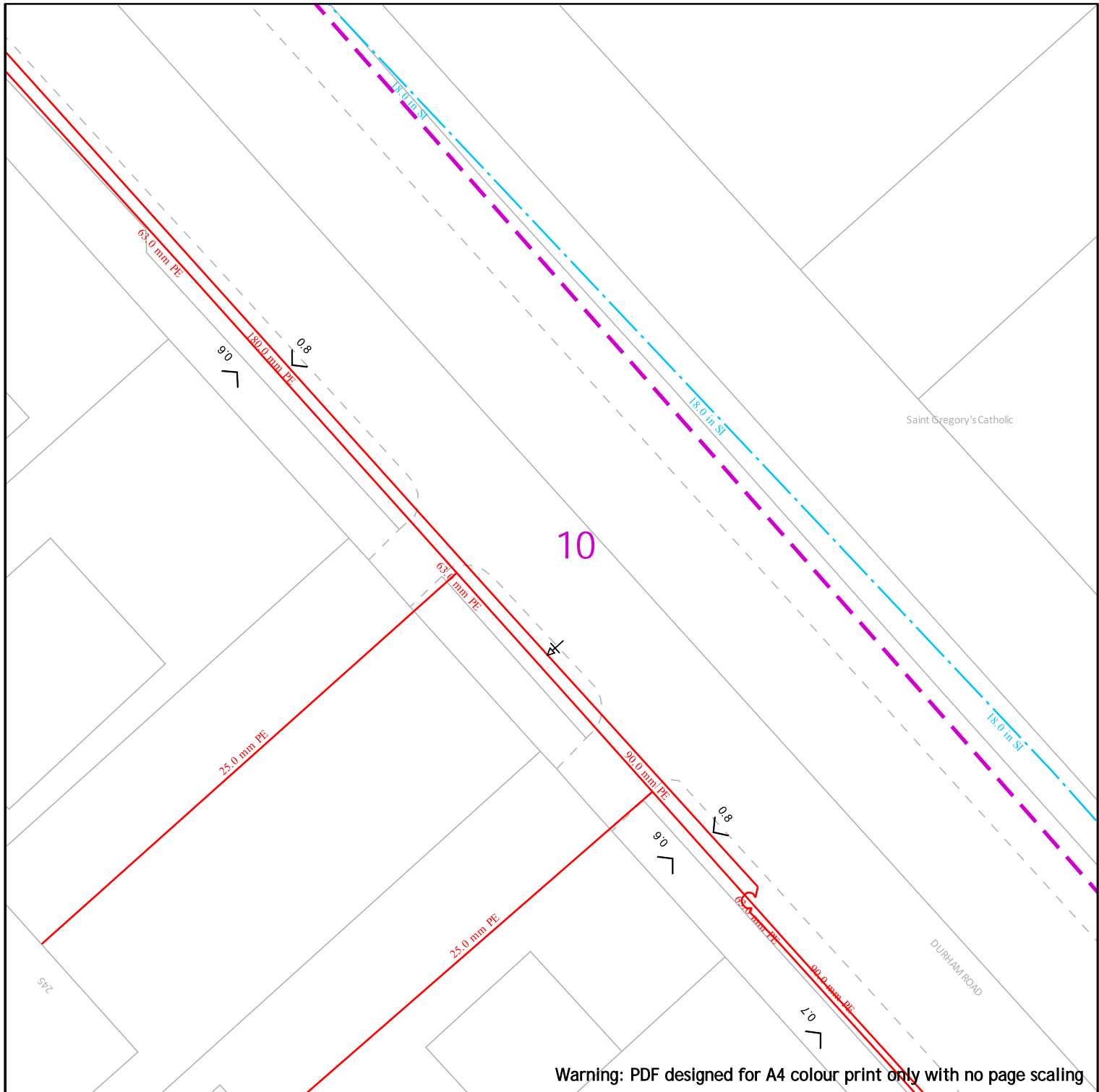
Pipes Intermediate Pressure Medium Pressure Low Pressure Transmission Pipe Regional High Pressure		Network Plant Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed		Network Asset CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point		Network Asset (continued) Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point		Non-Network Asset Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter		NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone Environment SAM SSSI	
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Pipes	Network Plant	Network Asset	Network Asset (continued)	Non-Network Asset	Environment
Intermediate Pressure	Flow Stop - Open	CP Point	Pig Trap	Outlet	NTS
Medium Pressure	Flow Stop - Closed	Dip Point	Pipe Joint	Inlet	IGT Area
Low Pressure	Valve - Open	Drain Point	Pressure Measurement	Depth of Cover	IGT Site
Transmission Pipe	Valve - Closed	End Closure	Purge Point	Crossover Connection	Infill Site
Regional High Pressure	Transmission Valve - Open	Flow Measure	Reducer	Change in Material	LPG Site
Asset Protection	Transmission Valve - Closed	Gas Conditioner	Stand Pipe	Change in Diameter	OMR's
Cathodic		Governor	Syphon		Pipeline
Slabbed		MEG Point	Tee		Contact Zone
Sleeved		Meter	Test Point		SAM
		OMR			SSSI
		Oiling Point			

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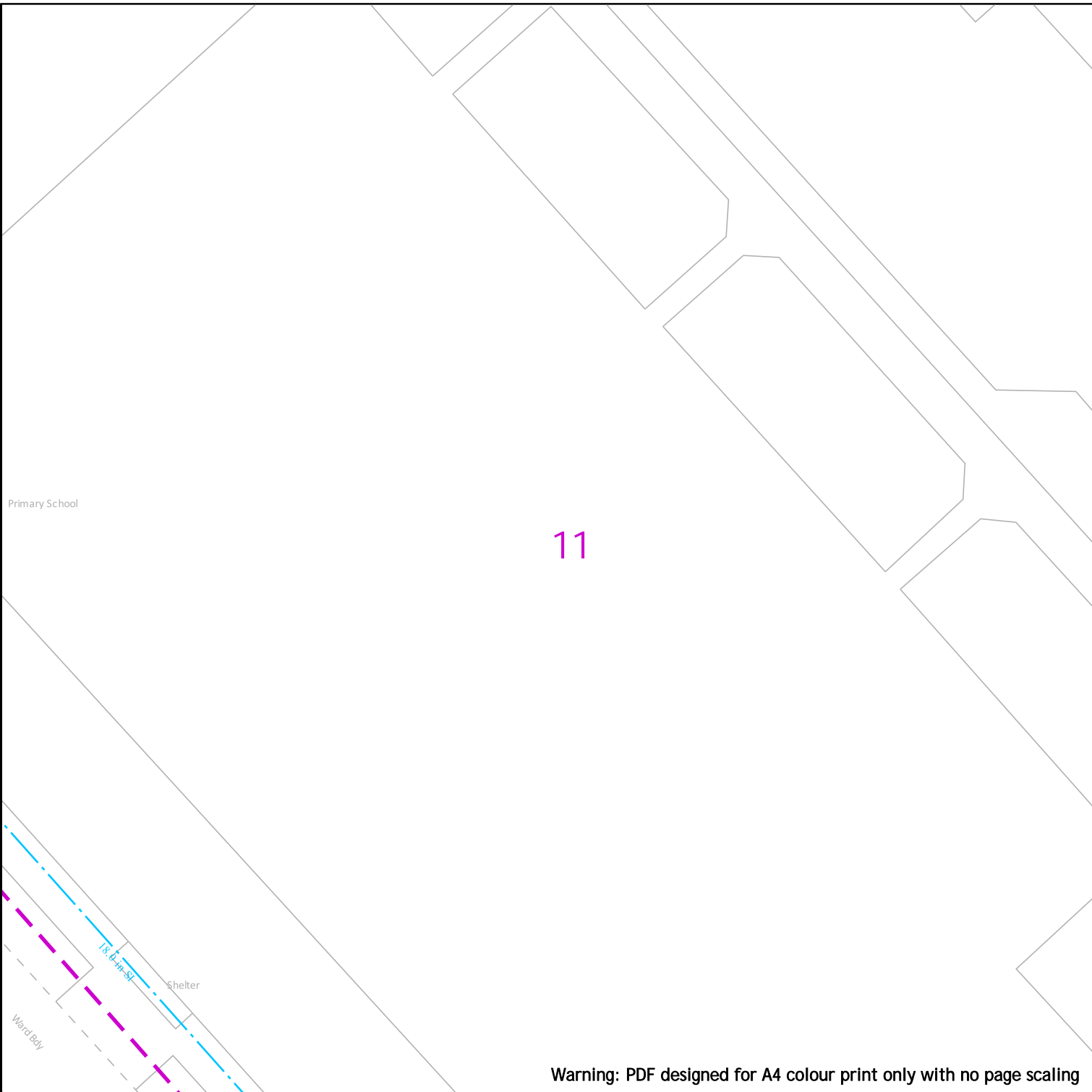
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Pipes		Network Plant		Network Asset		Network Asset (continued)		Non-Network Asset		Dig Sites	
	Intermediate Pressure		Flow Stop - Open		CP Point		Pig Trap		Outlet		Area:
	Medium Pressure		Flow Stop - Closed		Dip Point		Pipe Joint		Inlet		Line:
	Low Pressure		Valve - Open		Drain Point		Pressure Measurement		Depth of Cover		IGT Area
	Transmission Pipe		Valve - Closed		End Closure		Purge Point		Crossover Connection		Infill Site
	Regional High Pressure		Transmission Valve - Open		Flow Measure		Reducer		Change in Material		LPG Site
	Asset Protection		Transmission Valve - Closed		Gas Conditioner		Stand Pipe		Change in Diameter		OMR's
	Cathodic				Governor		Syphon				Contact Zone
	Slabbed				MEG Point		Tee				SAM
	Sleeved				Meter		Test Point				SSSI

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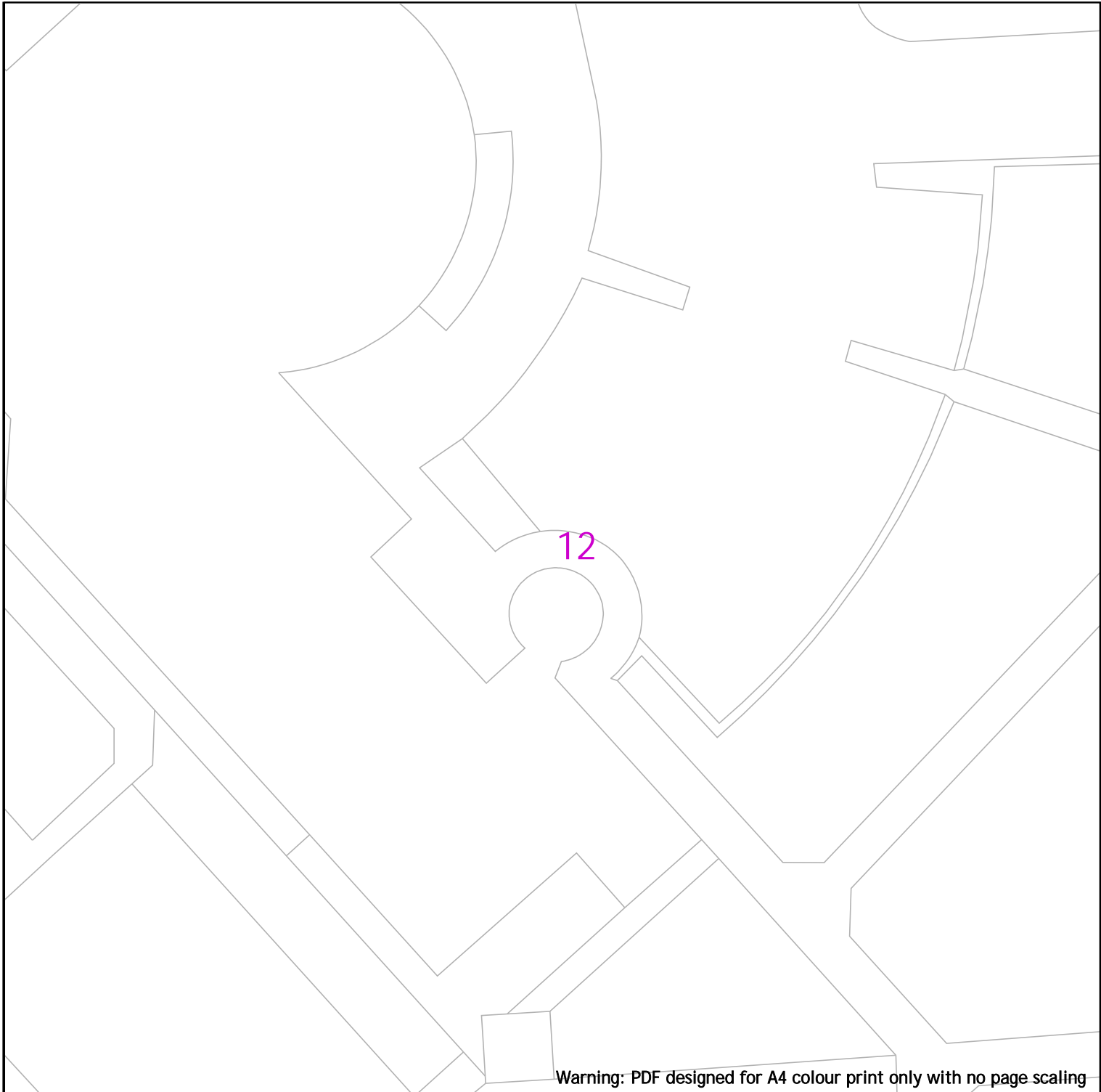
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100m Dig Sites Area: Line:

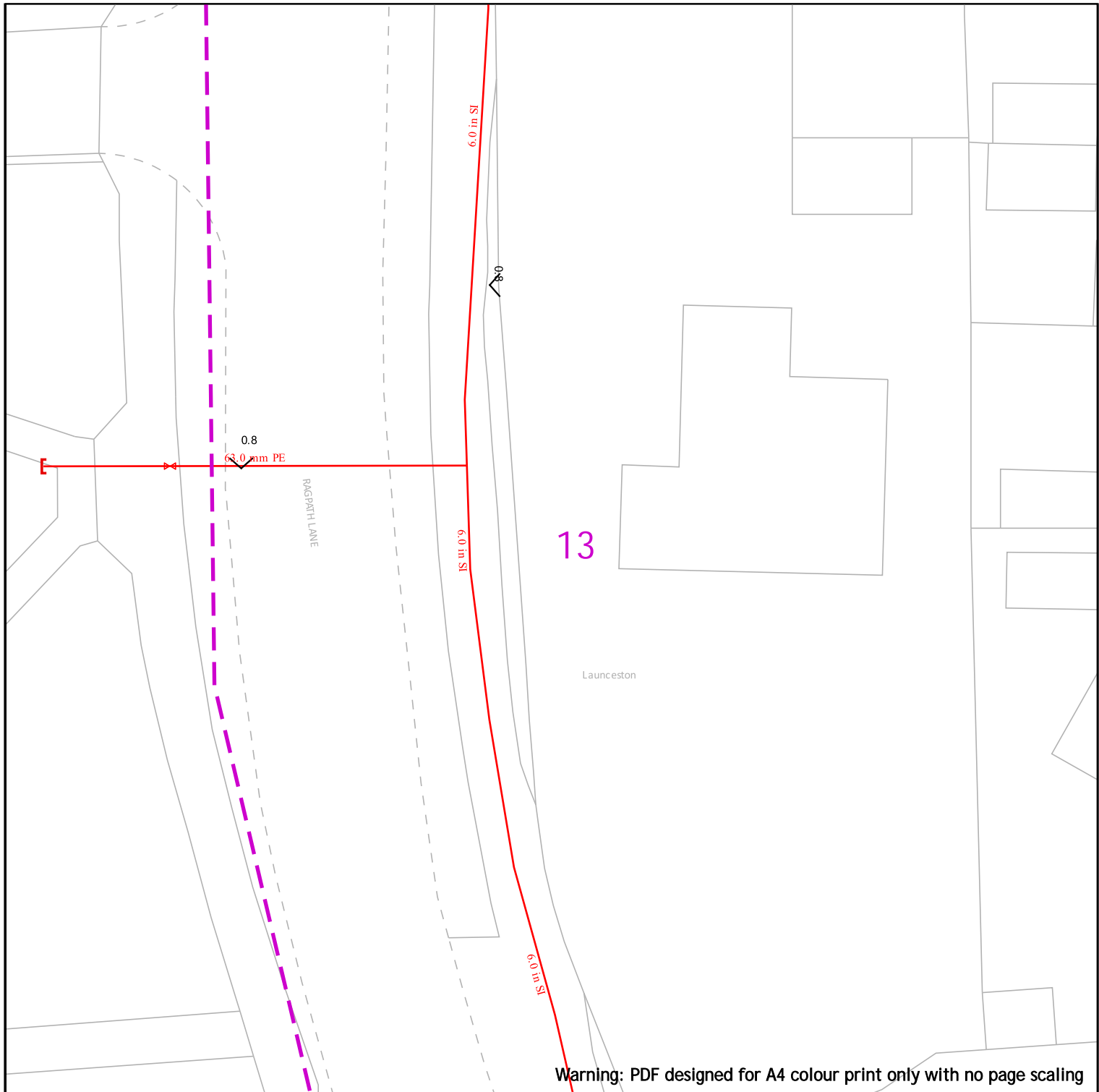
<p>Pipes</p> <ul style="list-style-type: none"> --- Intermediate Pressure --- Medium Pressure --- Low Pressure <p>Transmission Pipe</p> <ul style="list-style-type: none"> --- Regional High Pressure <p>Asset Protection</p> <ul style="list-style-type: none"> Cathodic Slabbed Sleeved 	<p>Network Plant</p> <ul style="list-style-type: none"> Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed 	<p>Network Asset</p> <ul style="list-style-type: none"> CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point 	<p>Network Asset (continued)</p> <ul style="list-style-type: none"> Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point 	<p>Non-Network Asset</p> <ul style="list-style-type: none"> Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter 	<p>Environment</p> <ul style="list-style-type: none"> NTS IGT Area IGT Site Infill Site LPG Site OMR's Pipeline Contact Zone SAM SSSI
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<p>Pipes</p> <ul style="list-style-type: none"> Intermediate Pressure Medium Pressure Low Pressure <p>Transmission Pipe</p> <ul style="list-style-type: none"> Regional High Pressure <p>Asset Protection</p> <ul style="list-style-type: none"> Cathodic Slabbed Sleeved 		<p>Network Plant</p> <ul style="list-style-type: none"> Flow Stop - Open Flow Stop - Closed Valve - Open Valve - Closed Transmission Valve - Open Transmission Valve - Closed 	<p>Network Asset</p> <ul style="list-style-type: none"> CP Point Dip Point Drain Point End Closure Flow Measure Gas Conditioner Governor MEG Point Meter OMR Oiling Point 	<p>Network Asset (continued)</p> <ul style="list-style-type: none"> Pig Trap Pipe Joint Pressure Measurement Purge Point Reducer Stand Pipe Syphon Tee Test Point 	<p>Non-Network Asset</p> <ul style="list-style-type: none"> Outlet Inlet Depth of Cover Crossover Connection Change in Material Change in Diameter 	<p>NTS</p> <p>IGT Area</p> <ul style="list-style-type: none"> IGT Site Infill Site LPG Site <p>OMR's</p> <p>Pipeline</p> <ul style="list-style-type: none"> Contact Zone <p>Environment</p> <ul style="list-style-type: none"> SAM SSSI
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IMPORTANT NOTICES

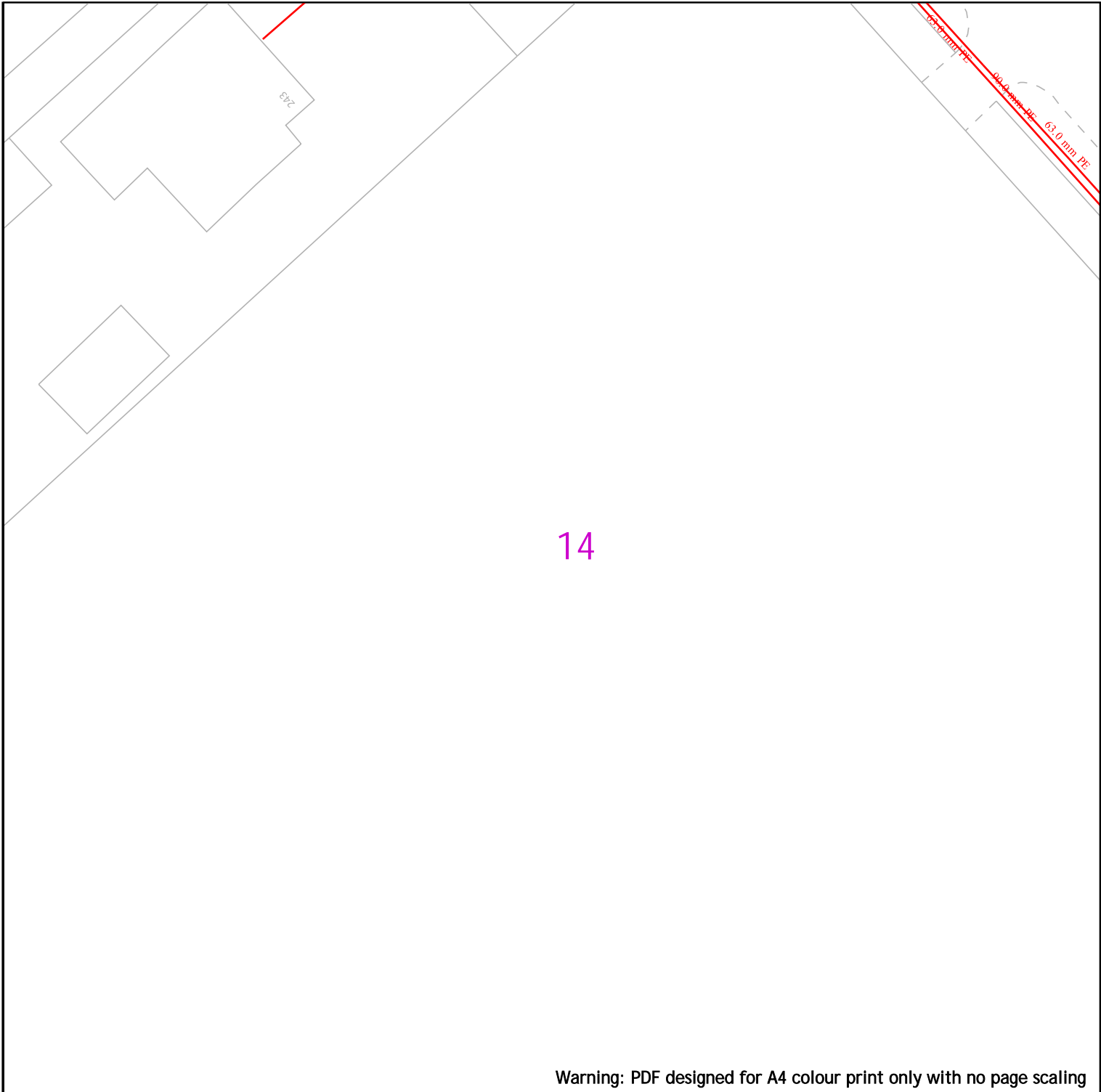
This plan shows those pipes owned by Northern Gas Networks or the relevant Gas Distribution Network in their roles as Licensed Gas Transporters (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from 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 Northern Gas Networks, the relevant Gas Distribution Network, or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with H5(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.

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0800 111 999

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Date Requested: 31/08/2023
 Job Reference: 30689529
 Site Location: 442976 520900
 Requested by: Miss Lauren Wenham
 Your Scheme/Reference: STV6189

Scale: 1:250 (When plotted at A4)



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







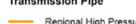










































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 Job Reference: 30689529
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 Requested by: Miss Lauren Wenham
 Your Scheme/Reference: STV6189

Scale: 1:250 (When plotted at A4)

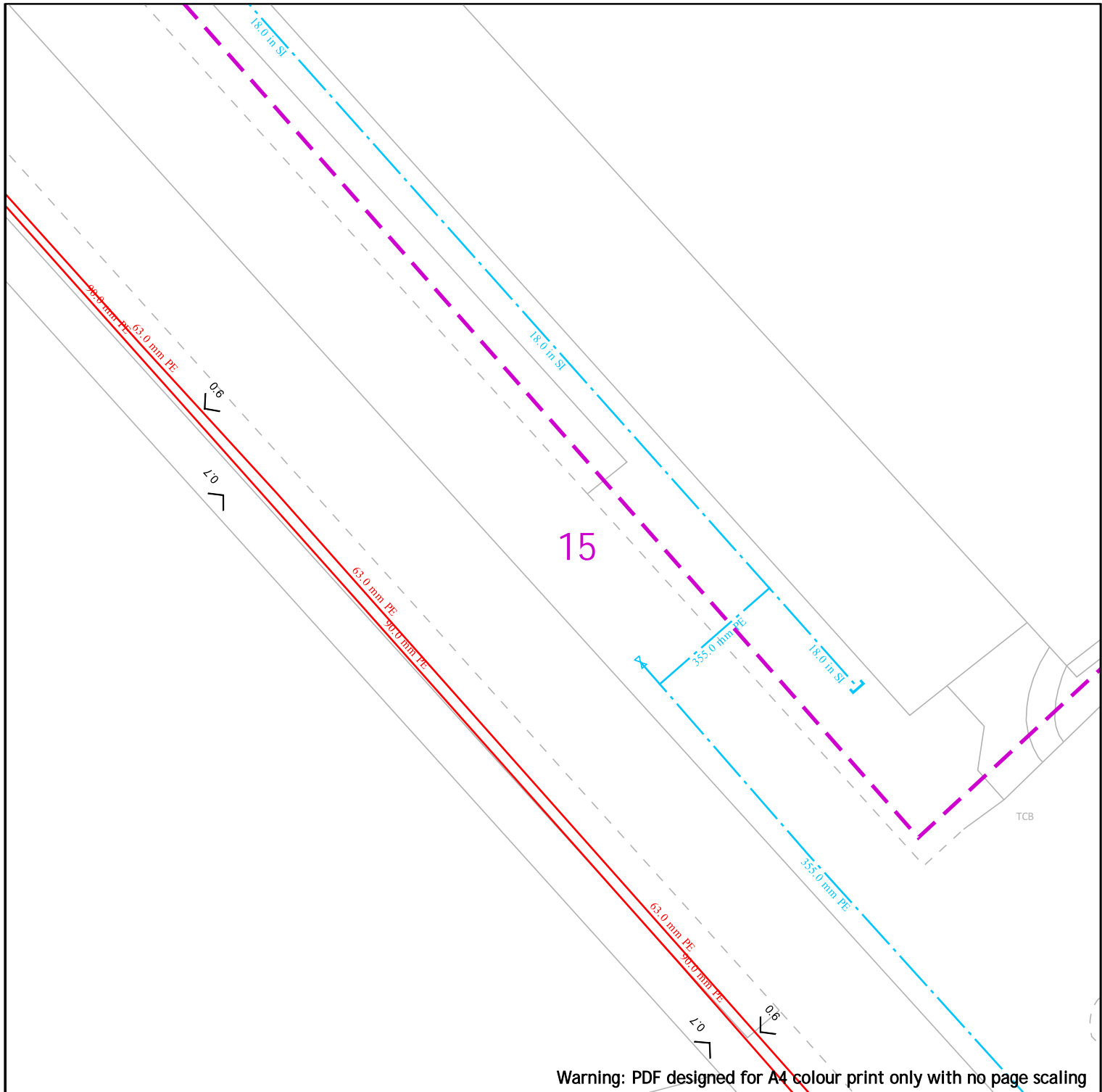
		Dig Sites Area:  Line: 			
Pipes  Intermediate Pressure  Medium Pressure  Low Pressure Transmission Pipe  Regional High Pressure	Network Plant  Flow Stop - Open  Flow Stop - Closed  Valve - Open  Valve - Closed  Transmission Valve - Open  Transmission Valve - Closed	Network Asset  CP Point  Dip Point  Drain Point  End Closure  Flow Measure  Gas Conditioner  Governor  MEG Point  Meter  OMR  Oiling Point	Network Asset (continued)  Pig Trap  Pipe Joint  Pressure Measurement  Purge Point  Reducer  Stand Pipe  Syphon  Tee  Test Point	Non-Network Asset  Outlet  Inlet  Depth of Cover  Crossover Connection  Change in Material  Change in Diameter	Environment  NTS IGT Area  IGT Site  Infill Site  LPG Site  OMR's Pipeline  Contact Zone Environment  SAM  SSSI

IMPORTANT NOTICES

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





























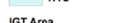
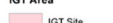
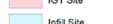
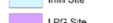
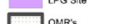
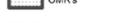

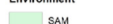
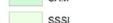


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		Dig Sites Area:  Line: 			
Pipes  Intermediate Pressure  Medium Pressure  Low Pressure Transmission Pipe  Regional High Pressure	Network Plant  Flow Stop - Open  Flow Stop - Closed  Valve - Open  Valve - Closed  Transmission Valve - Open  Transmission Valve - Closed	Network Asset  CP Point  Dip Point  Drain Point  End Closure  Flow Measure  Gas Conditioner  Governor  MEG Point  Meter  OMR  Oiling Point	Network Asset (continued)  Pig Trap  Pipe Joint  Pressure Measurement  Purge Point  Reducer  Stand Pipe  Syphon  Tee  Test Point	Non-Network Asset  Outlet  Inlet  Depth of Cover  Crossover Connection  Change in Material  Change in Diameter	Environment  NTS  IGT Area  IGT Site  Infill Site  LPG Site  OMR's Pipeline  Contact Zone  SAM  SSSI

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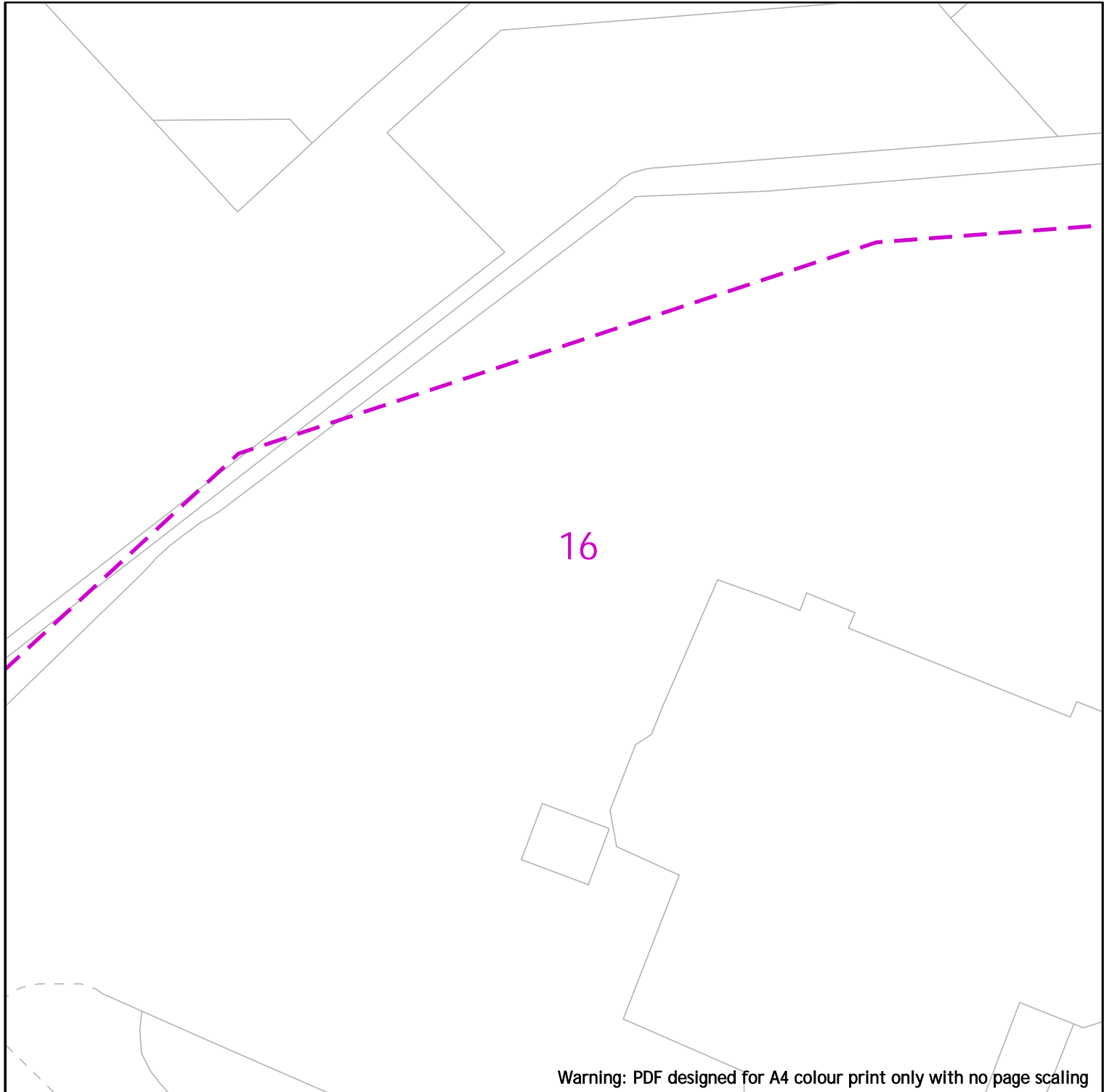
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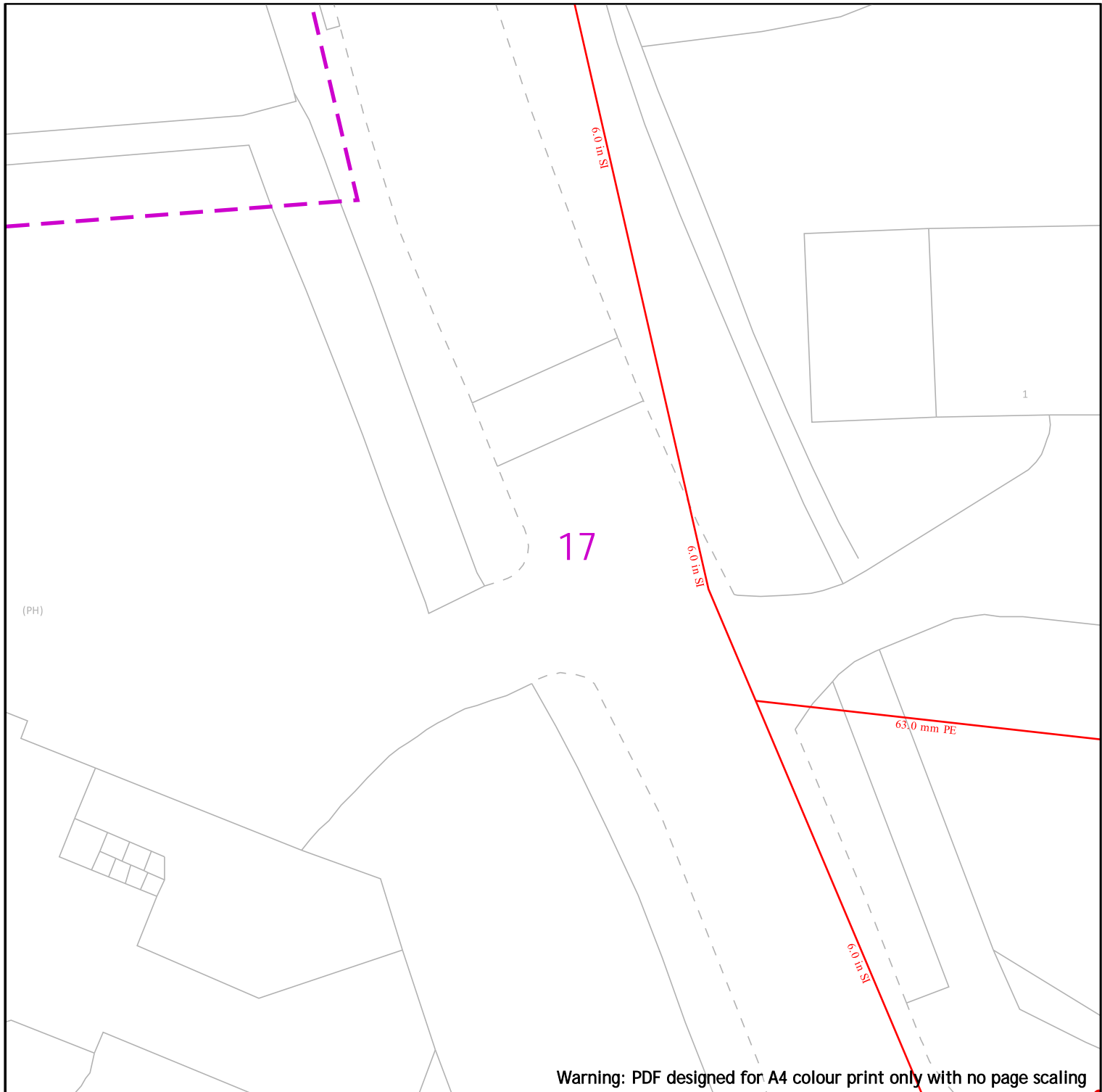
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		Dig Sites Area: Line:			
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IMPORTANT NOTICES

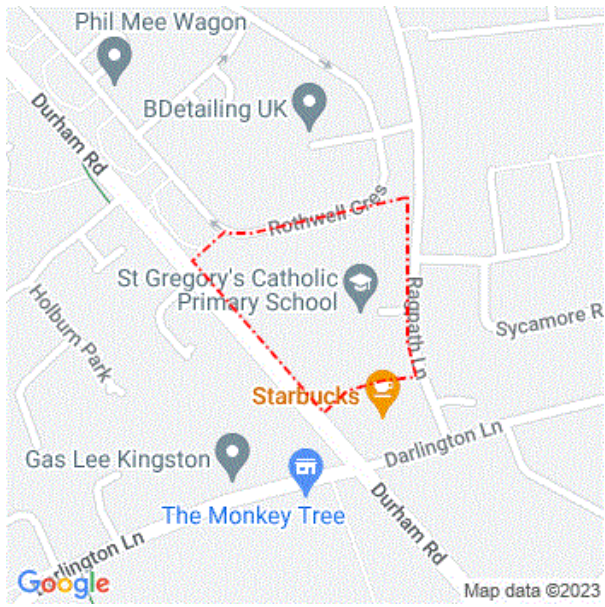
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Scale: 1:250 (When plotted at A4)

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	Site Map
Enquiry type	Planned Works
Work category	Development Projects
Work type	Piling
Work type buffer*	150 metres
Start date	01/09/2023
End date	01/09/2023
Scheme/Reference	STV6189
Search location	TS19 9AD
Confirmed location	442976 520900
Site size	0 metres square
Site Contact Name	Admin Soiltechnics
Site Phone No.	01604781877
Description of Works	Boreholes



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.

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

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
ESP Utilities Group	01372227560	01372227560	Await response
Northern Gas Networks Limited	08000407766 (opt 5)	0800111999	Await response
Northumbrian Water Limited	03702417408	03457171100	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.

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/lineasearchbeforeudig-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 LineasearchbeforeUdig (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	Cadent Gas
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
Electricity North West Limited	Energy Assets Networks	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESB CCGT Power station (Carrington Gas Pipeline)
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
Neos Networks	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



Enquiry Confirmation

LSBUD Ref: 30689529

Date of enquiry: 31/08/2023

Time of enquiry: 12:31

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

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.

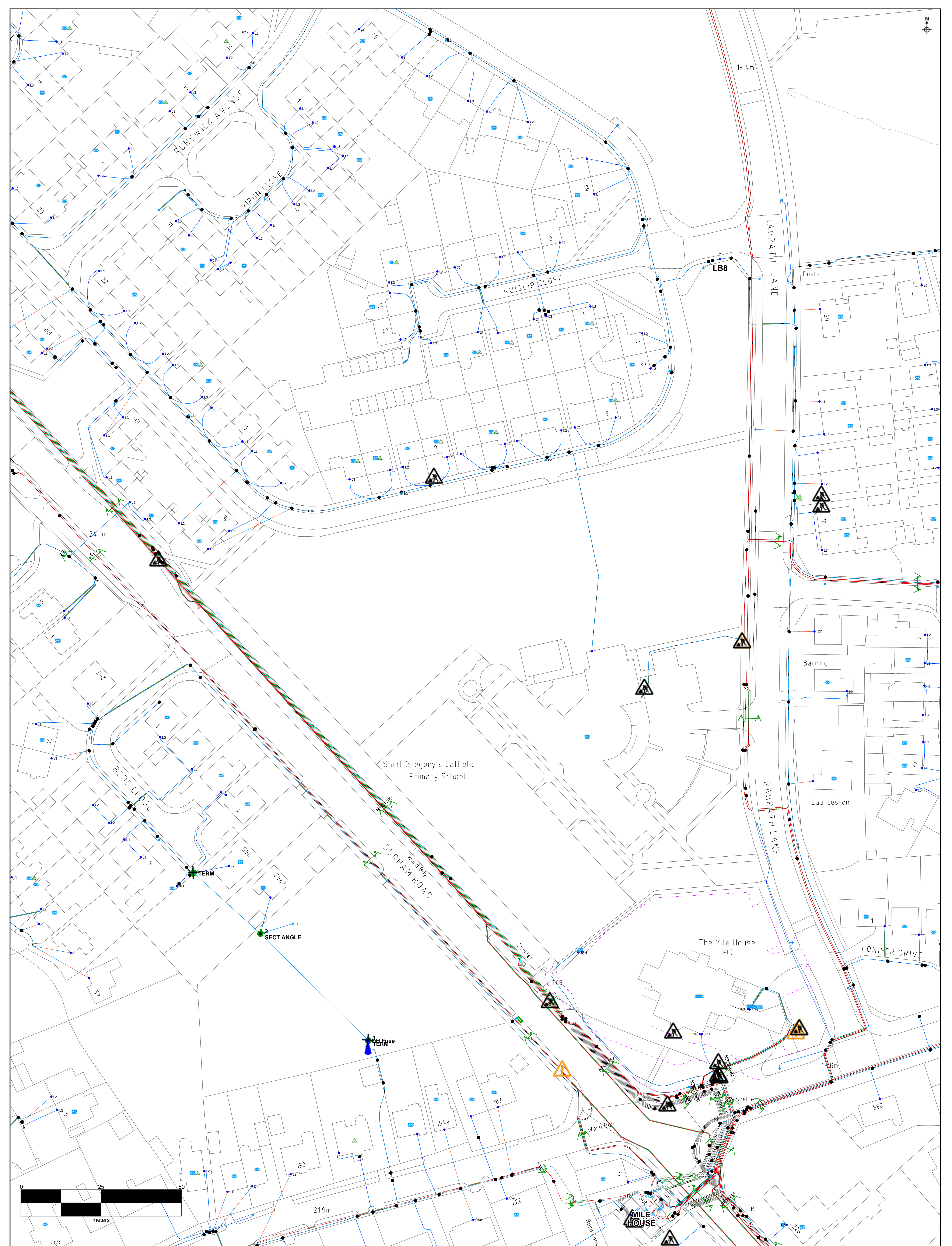
Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.)

Asset Owner	Preferred contact method	Phone	Status
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
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Northern Powergrid	Safediggingplans@northernpowergrid.com	01912294294	Not Notified
Sky UK Limited	nrswa@sky.uk	02070323234	Not Notified
Sota	sota.plantenquiries@ocugroup.com		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@atkingglobal.com	01454662881	Not Notified

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Underground Cables:		Overhead Conductors:	
120kV	220kV	120kV	LV Mains
66kV	11kV	66kV	LV Service
33kV	6kV	33kV	LV Service Assumed Route
20kV	3kV	20kV	LV Service Logical Connection
11kV	Aux	11kV	Duct
6kV	Left In Situ	6kV	
3kV		3kV	
Aux		Aux	

OS Grid Reference: NZ4293820995
 Printed By: peter.liddle
 Title: St Gregory's Academy
 Date Printed: 07-Sep-2023
 Scale: 1:500
NORTHERN POWERGRID
 MAINS RECORD

Version 1.10 15th June 2023 Call Centre Phone Numbers: If the area is located in: North East call 0800 666877, Yorkshire or North Lincs call 0800 375675.

APPENDIX E – DRAINAGE CALCULATIONS

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Inflows Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



MUGA

Type : Catchment Area

Area (ha)	0.052
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	16.07
Percentage Impervious (%)	100

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023		
Report Details: Type: Junctions Storm Phase: Porous Paving		Designed by: JA	Checked by: CH	
		Approved By: CH		
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
MH2	Manhole	214840.301	894702.666	23.769	0.889	22.880	Circular	1.200

Name	Lock
MH2	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH2	Inlet	P2	(None)	No Restriction

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Controls Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



MUGA Sub base

Type : Porous Paving

Dimensions

Exceedance Level (m)	23.592
Depth (m)	0.340
Base Level (m)	23.252
Paving Layer Depth (mm)	40
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	32.016
Long. Slope (%)	1
Width (m)	16.142
Total Volume (m³)	46.512

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	MUGA
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P1
Outlet Type	Free Discharge

Advanced

Base Infiltration Rate (m/hr)	0.0005
Side Infiltration Rate (m/hr)	0.0005
Safety Factor	2.0
Conductivity (m/hr)	500.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Controls Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	23.721
Depth (m)	0.400
Base Level (m)	23.000
Number of Crates Long	10
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	19.321

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	P1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P2
Outlet Type	Orifice
Diameter (m)	0.039
Coefficient of Discharge	0.600
Invert Level (m)	23.000

Advanced

Base Infiltration Rate (m/hr)	0.0005
Side Infiltration Rate (m/hr)	0.0005
Safety Factor	2.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023			
Report Details: Type: Connections Storm Phase: Porous Paving		Designed by: JA	Checked by:	Approved By: CH	
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE			

Name	Length (m)	Connection Type	Slope (%)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
P1	39.415	Pipe	0.64		0.6	150	23.597	23.252
P2	22.335	Pipe	0.54		0.6	150	23.784	23.000

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)
P1	23.784	23.000	None	
P2	23.769	22.880	None	2.7

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Title: Rainfall Analysis Criteria	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Rainfall

FSR Type: FSR

Region	England And Wales
M5-60 (mm)	26.25
Ratio R	0.350
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	35.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Inflows Summary Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
MUGA	FSR: 1 years: +0 %: 30 mins: Summer	0.05	5.4	6.210

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Inflows Summary Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
MUGA	FSR: 30 years: +35 %: 30 mins: Summer	0.05	17.6	20.101

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Inflows Summary Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
MUGA	FSR: 100 years: +40 %: 30 mins: Summer	0.05	23.9	27.398

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Porous Paving		Designed by: JA	Checked by: CH	
		Approved By: CH		
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
MUGA Sub base	FSR: 1 years: +0 %: 480 mins: Summer	0.153	0.022	2.1	12.802	0.000	1.673	0.7	14.086	72.476	OK
Cellular Storage	FSR: 1 years: +0 %: 480 mins: Summer	0.053	0.053	0.7	2.503	0.000	0.145	0.6	13.124	87.046	OK

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Porous Paving		Designed by: JA	Checked by: CH	
		Approved By: CH		
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
MUGA Sub base	FSR: 30 years: +35 %: 60 mins: Summer	0.361	0.033	16.5	25.132	2.173	0.218	1.5	2.034	45.966	Flood
Cellular Storage	FSR: 30 years: +35 %: 480 mins: Summer	0.221	0.221	2.2	10.518	0.000	0.160	1.4	39.116	45.561	OK

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Porous Paving		Designed by: JA	Checked by: CH	
		Approved By: CH		
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
MUGA Sub base	FSR: 100 years: +40 %: 60 mins: Summer	0.370	0.043	22.4	33.932	4.418	0.221	2.5	6.564	27.047	Flood
Cellular Storage	FSR: 100 years: +40 %: 480 mins: Summer	0.315	0.315	3.5	14.957	0.000	0.164	1.7	51.915	22.586	OK

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Phase Management Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Porous Paving
FSR: 1 years: Increase Rainfall (%): +0: 480 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
MH2			0.6	13.109
TOTAL	2.1	16.122	0.6	13.109

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Phase Management Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Porous Paving
FSR: 30 years: Increase Rainfall (%): +35: 480 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
MH2			1.4	39.091
TOTAL	5.8	43.866	1.4	39.091

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Phase Management Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Porous Paving
FSR: 100 years: Increase Rainfall (%): +40: 480 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
MH2			1.7	51.882
TOTAL	7.6	57.438	1.7	51.882

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



MUGA Sub base
Critical by Return Period: FSR: 1 years: Increase Rainfall (%): +0: 480 mins: Summer

Type : Porous Paving

Tables

Half Drain Down Time (mins)	306
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	0.1	0.000	0.000	0.005	0.000	0.0
10	0.1	0.001	0.000	0.028	0.000	0.0
15	0.2	0.002	0.000	0.068	0.000	0.0
20	0.2	0.004	0.000	0.118	0.000	0.0
25	0.2	0.005	0.000	0.171	0.000	0.0
30	0.2	0.007	0.000	0.223	0.000	0.0
35	0.2	0.009	0.000	0.277	0.000	0.0
40	0.2	0.010	0.000	0.332	0.000	0.0
45	0.2	0.011	0.000	0.387	0.000	0.0
50	0.2	0.013	0.000	0.441	0.000	0.0
55	0.2	0.014	0.000	0.496	0.000	0.0
60	0.2	0.016	0.000	0.553	0.000	0.0
65	0.2	0.017	0.000	0.610	0.000	0.0
70	0.2	0.018	0.000	0.667	0.000	0.0
75	0.2	0.019	0.000	0.727	0.000	0.0
80	0.2	0.020	0.000	0.787	0.000	0.0
85	0.2	0.021	0.000	0.850	0.000	0.0
90	0.2	0.023	0.000	0.913	0.000	0.0
95	0.2	0.024	0.000	0.978	0.000	0.0
100	0.2	0.025	0.000	1.044	0.000	0.0
105	0.3	0.026	0.000	1.113	0.000	0.0
110	0.3	0.027	0.000	1.184	0.000	0.0
115	0.3	0.028	0.000	1.258	0.000	0.0
120	0.3	0.029	0.000	1.334	0.000	0.0
125	0.3	0.030	0.000	1.411	0.000	0.0
130	0.3	0.031	0.000	1.490	0.000	0.0
135	0.3	0.032	0.000	1.573	0.000	0.0
140	0.3	0.033	0.000	1.659	0.000	0.0
145	0.3	0.034	0.000	1.751	0.000	0.0
150	0.4	0.036	0.000	1.846	0.000	0.0
155	0.4	0.037	0.000	1.949	0.000	0.0
160	0.4	0.039	0.000	2.061	0.000	0.0
165	0.4	0.040	0.000	2.181	0.000	0.0
170	0.5	0.042	0.000	2.311	0.000	0.0
175	0.5	0.044	0.000	2.453	0.000	0.0
180	0.6	0.047	0.000	2.610	0.000	0.0
185	0.6	0.049	0.000	2.784	0.000	0.0
190	0.7	0.053	0.000	2.978	0.000	0.0
195	0.8	0.057	0.000	3.197	0.000	0.0
200	0.9	0.061	0.000	3.443	0.000	0.0
205	1.0	0.066	0.000	3.718	0.000	0.0
210	1.1	0.071	0.000	4.027	0.000	0.0
215	1.2	0.077	0.000	4.369	0.000	0.0
220	1.4	0.084	0.000	4.748	0.000	0.0
225	1.5	0.091	0.000	5.165	0.000	0.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
230	1.7	0.099	0.001	5.625	0.000	0.0
235	1.8	0.107	0.001	6.132	0.000	0.0
240	2.0	0.117	0.001	6.689	0.000	0.0
245	2.1	0.126	0.001	7.292	0.000	0.0
250	2.1	0.135	0.002	7.917	0.000	0.0
255	2.0	0.143	0.002	8.528	0.000	0.0
260	1.8	0.148	0.003	9.095	0.000	0.0
265	1.7	0.151	0.003	9.611	0.000	0.0
270	1.5	0.153	0.004	10.079	0.000	0.0
275	1.4	0.153	0.005	10.501	0.000	0.1
280	1.3	0.153	0.006	10.881	0.000	0.1
285	1.1	0.151	0.006	11.224	0.000	0.1
290	1.0	0.149	0.007	11.529	0.000	0.1
295	0.9	0.147	0.009	11.797	0.000	0.1
300	0.8	0.144	0.010	12.029	0.000	0.1
305	0.7	0.140	0.011	12.228	0.000	0.1
310	0.7	0.137	0.012	12.393	0.000	0.2
315	0.6	0.133	0.013	12.527	0.000	0.2
320	0.5	0.129	0.014	12.633	0.000	0.2
325	0.5	0.125	0.016	12.711	0.000	0.3
330	0.5	0.121	0.017	12.765	0.000	0.3
335	0.4	0.118	0.017	12.794	0.000	0.4
340	0.4	0.114	0.018	12.802	0.000	0.4
345	0.4	0.111	0.019	12.788	0.000	0.4
350	0.3	0.107	0.019	12.754	0.000	0.5
355	0.3	0.104	0.020	12.704	0.000	0.5
360	0.3	0.101	0.020	12.640	0.000	0.6
365	0.3	0.098	0.020	12.563	0.000	0.6
370	0.3	0.095	0.020	12.478	0.000	0.6
375	0.3	0.092	0.021	12.386	0.000	0.6
380	0.3	0.089	0.021	12.287	0.000	0.6
385	0.3	0.087	0.021	12.181	0.000	0.6
390	0.3	0.084	0.021	12.069	0.000	0.6
395	0.3	0.082	0.021	11.949	0.000	0.7
400	0.2	0.080	0.022	11.823	0.000	0.7
405	0.2	0.078	0.022	11.693	0.000	0.7
410	0.2	0.075	0.022	11.560	0.000	0.7
415	0.2	0.073	0.022	11.423	0.000	0.7
420	0.2	0.071	0.022	11.284	0.000	0.7
425	0.2	0.069	0.022	11.143	0.000	0.7
430	0.2	0.068	0.022	11.001	0.000	0.7
435	0.2	0.066	0.022	10.857	0.000	0.7
440	0.2	0.064	0.022	10.714	0.000	0.7
445	0.2	0.062	0.022	10.570	0.000	0.7
450	0.2	0.061	0.021	10.425	0.000	0.7
455	0.2	0.059	0.021	10.282	0.000	0.7
460	0.2	0.058	0.021	10.139	0.000	0.7
465	0.2	0.056	0.021	9.997	0.000	0.7
470	0.2	0.055	0.021	9.855	0.000	0.7
475	0.2	0.053	0.021	9.714	0.000	0.7
480	0.2	0.052	0.021	9.574	0.000	0.6
485	0.1	0.050	0.021	9.426	0.000	0.6
490	0.1	0.048	0.021	9.263	0.000	0.6
495	0.0	0.046	0.021	9.083	0.000	0.6
500	0.0	0.043	0.020	8.895	0.000	0.6
505	0.0	0.041	0.020	8.709	0.000	0.6
510	0.0	0.038	0.020	8.525	0.000	0.6

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m		Date: 08/12/2023		
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving		Designed by: JA	Checked by: CH	
		Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	0.0	0.036	0.020	8.343	0.000	0.6
520	0.0	0.034	0.020	8.163	0.000	0.6
525	0.0	0.032	0.020	7.986	0.000	0.6
530	0.0	0.030	0.020	7.810	0.000	0.6
535	0.0	0.028	0.020	7.637	0.000	0.6
540	0.0	0.026	0.019	7.467	0.000	0.6
545	0.0	0.024	0.019	7.298	0.000	0.6
550	0.0	0.023	0.019	7.132	0.000	0.5
555	0.0	0.021	0.019	6.968	0.000	0.5
560	0.0	0.019	0.019	6.806	0.000	0.5
565	0.0	0.018	0.019	6.647	0.000	0.5
570	0.0	0.017	0.019	6.490	0.000	0.5
575	0.0	0.015	0.018	6.336	0.000	0.5
580	0.0	0.014	0.018	6.184	0.000	0.5
585	0.0	0.013	0.018	6.034	0.000	0.5
590	0.0	0.012	0.018	5.886	0.000	0.5
595	0.0	0.010	0.018	5.741	0.000	0.5
600	0.0	0.009	0.018	5.598	0.000	0.5
605	0.0	0.008	0.018	5.457	0.000	0.5
610	0.0	0.007	0.017	5.318	0.000	0.5
615	0.0	0.006	0.017	5.182	0.000	0.5
620	0.0	0.006	0.017	5.048	0.000	0.4
625	0.0	0.005	0.017	4.916	0.000	0.4
630	0.0	0.004	0.017	4.787	0.000	0.4
635	0.0	0.003	0.017	4.659	0.000	0.4
640	0.0	0.002	0.017	4.534	0.000	0.4
645	0.0	0.002	0.016	4.411	0.000	0.4
650	0.0	0.001	0.016	4.290	0.000	0.4
655	0.0	0.000	0.016	4.171	0.000	0.4
660	0.0	0.000	0.016	4.055	0.000	0.4
665	0.0	0.000	0.016	3.943	0.000	0.4
670	0.0	0.000	0.016	3.832	0.000	0.4
675	0.0	0.000	0.016	3.724	0.000	0.4
680	0.0	0.000	0.015	3.617	0.000	0.4
685	0.0	0.000	0.015	3.513	0.000	0.3
690	0.0	0.000	0.015	3.410	0.000	0.3
695	0.0	0.000	0.015	3.309	0.000	0.3
700	0.0	0.000	0.015	3.210	0.000	0.3
705	0.0	0.000	0.015	3.113	0.000	0.3
710	0.0	0.000	0.015	3.018	0.000	0.3
715	0.0	0.000	0.014	2.925	0.000	0.3
720	0.0	0.000	0.014	2.833	0.000	0.3
725	0.0	0.000	0.014	2.744	0.000	0.3
730	0.0	0.000	0.014	2.656	0.000	0.3
735	0.0	0.000	0.014	2.570	0.000	0.3
740	0.0	0.000	0.014	2.485	0.000	0.3
745	0.0	0.000	0.014	2.403	0.000	0.3
750	0.0	0.000	0.013	2.322	0.000	0.3
755	0.0	0.000	0.013	2.242	0.000	0.3
760	0.0	0.000	0.013	2.165	0.000	0.3
765	0.0	0.000	0.013	2.089	0.000	0.2
770	0.0	0.000	0.013	2.016	0.000	0.2
775	0.0	0.000	0.013	1.945	0.000	0.2
780	0.0	0.000	0.013	1.876	0.000	0.2
785	0.0	0.000	0.012	1.809	0.000	0.2
790	0.0	0.000	0.012	1.743	0.000	0.2
795	0.0	0.000	0.012	1.679	0.000	0.2

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
800	0.0	0.000	0.012	1.617	0.000	0.2
805	0.0	0.000	0.012	1.555	0.000	0.2
810	0.0	0.000	0.012	1.496	0.000	0.2
815	0.0	0.000	0.011	1.437	0.000	0.2
820	0.0	0.000	0.011	1.381	0.000	0.2
825	0.0	0.000	0.011	1.325	0.000	0.2
830	0.0	0.000	0.011	1.271	0.000	0.2
835	0.0	0.000	0.011	1.219	0.000	0.2
840	0.0	0.000	0.011	1.168	0.000	0.2
845	0.0	0.000	0.011	1.118	0.000	0.2
850	0.0	0.000	0.010	1.070	0.000	0.2
855	0.0	0.000	0.010	1.023	0.000	0.2
860	0.0	0.000	0.010	0.977	0.000	0.2
865	0.0	0.000	0.010	0.934	0.000	0.1
870	0.0	0.000	0.010	0.894	0.000	0.1
875	0.0	0.000	0.010	0.854	0.000	0.1
880	0.0	0.000	0.009	0.816	0.000	0.1
885	0.0	0.000	0.009	0.780	0.000	0.1
890	0.0	0.000	0.009	0.745	0.000	0.1
895	0.0	0.000	0.009	0.711	0.000	0.1
900	0.0	0.000	0.009	0.678	0.000	0.1
905	0.0	0.000	0.008	0.646	0.000	0.1
910	0.0	0.000	0.008	0.616	0.000	0.1
915	0.0	0.000	0.008	0.586	0.000	0.1
920	0.0	0.000	0.008	0.558	0.000	0.1
925	0.0	0.000	0.007	0.530	0.000	0.1
930	0.0	0.000	0.007	0.504	0.000	0.1
935	0.0	0.000	0.007	0.478	0.000	0.1
940	0.0	0.000	0.007	0.454	0.000	0.1
945	0.0	0.000	0.007	0.431	0.000	0.1
950	0.0	0.000	0.006	0.408	0.000	0.1
955	0.0	0.000	0.006	0.387	0.000	0.1
960	0.0	0.000	0.006	0.366	0.000	0.1

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Cellular Storage
Critical by Return Period: FSR: 1 years: Increase Rainfall (%): +0: 480 mins: Summer

Type : Cellular Storage

Tables

Half Drain Down Time (mins)	59
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Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.000	0.000	0.000	0.0
40	0.0	0.000	0.000	0.000	0.0
45	0.0	0.000	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0
65	0.0	0.000	0.000	0.000	0.0
70	0.0	0.000	0.000	0.000	0.0
75	0.0	0.000	0.000	0.000	0.0
80	0.0	0.000	0.000	0.000	0.0
85	0.0	0.000	0.000	0.000	0.0
90	0.0	0.000	0.000	0.000	0.0
95	0.0	0.000	0.000	0.000	0.0
100	0.0	0.000	0.000	0.000	0.0
105	0.0	0.000	0.000	0.000	0.0
110	0.0	0.000	0.000	0.000	0.0
115	0.0	0.000	0.000	0.000	0.0
120	0.0	0.000	0.000	0.000	0.0
125	0.0	0.000	0.000	0.000	0.0
130	0.0	0.000	0.000	0.000	0.0
135	0.0	0.000	0.000	0.000	0.0
140	0.0	0.000	0.000	0.000	0.0
145	0.0	0.000	0.000	0.000	0.0
150	0.0	0.000	0.000	0.000	0.0
155	0.0	0.000	0.000	0.000	0.0
160	0.0	0.000	0.000	0.000	0.0
165	0.0	0.000	0.000	0.000	0.0
170	0.0	0.000	0.000	0.000	0.0
175	0.0	0.000	0.000	0.000	0.0
180	0.0	0.000	0.000	0.000	0.0
185	0.0	0.000	0.000	0.000	0.0
190	0.0	0.000	0.000	0.000	0.0
195	0.0	0.000	0.000	0.000	0.0
200	0.0	0.000	0.000	0.000	0.0
205	0.0	0.000	0.000	0.000	0.0
210	0.0	0.000	0.000	0.000	0.0
215	0.0	0.000	0.000	0.000	0.0
220	0.0	0.000	0.000	0.000	0.0
225	0.0	0.000	0.000	0.000	0.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
230	0.0	0.000	0.000	0.000	0.0
235	0.0	0.000	0.000	0.000	0.0
240	0.0	0.000	0.000	0.000	0.0
245	0.0	0.000	0.000	0.000	0.0
250	0.0	0.000	0.000	0.000	0.0
255	0.0	0.000	0.000	0.000	0.0
260	0.0	0.000	0.000	0.000	0.0
265	0.0	0.000	0.000	0.000	0.0
270	0.0	0.000	0.000	0.000	0.0
275	0.0	0.000	0.003	0.000	0.0
280	0.0	0.000	0.007	0.000	0.0
285	0.0	0.000	0.013	0.000	0.0
290	0.0	0.000	0.022	0.000	0.0
295	0.1	0.001	0.035	0.000	0.0
300	0.1	0.001	0.053	0.000	0.0
305	0.1	0.002	0.076	0.000	0.0
310	0.1	0.002	0.108	0.000	0.0
315	0.2	0.003	0.149	0.000	0.0
320	0.2	0.004	0.199	0.000	0.0
325	0.2	0.006	0.259	0.000	0.0
330	0.3	0.007	0.329	0.000	0.0
335	0.3	0.009	0.410	0.000	0.0
340	0.4	0.011	0.499	0.000	0.1
345	0.4	0.013	0.598	0.000	0.1
350	0.5	0.015	0.703	0.000	0.1
355	0.5	0.017	0.814	0.000	0.1
360	0.5	0.020	0.929	0.000	0.1
365	0.5	0.022	1.043	0.000	0.2
370	0.6	0.024	1.154	0.000	0.2
375	0.6	0.027	1.262	0.000	0.2
380	0.6	0.029	1.366	0.000	0.2
385	0.6	0.031	1.467	0.000	0.3
390	0.6	0.033	1.564	0.000	0.3
395	0.6	0.035	1.656	0.000	0.3
400	0.6	0.037	1.743	0.000	0.4
405	0.6	0.039	1.825	0.000	0.4
410	0.6	0.040	1.891	0.000	0.5
415	0.7	0.041	1.947	0.000	0.5
420	0.7	0.042	2.002	0.000	0.5
425	0.7	0.043	2.054	0.000	0.5
430	0.7	0.044	2.103	0.000	0.5
435	0.7	0.045	2.149	0.000	0.5
440	0.7	0.046	2.193	0.000	0.5
445	0.6	0.047	2.233	0.000	0.5
450	0.6	0.048	2.271	0.000	0.5
455	0.6	0.049	2.306	0.000	0.5
460	0.6	0.049	2.338	0.000	0.5
465	0.6	0.050	2.366	0.000	0.5
470	0.6	0.050	2.392	0.000	0.5
475	0.6	0.051	2.415	0.000	0.5
480	0.6	0.051	2.435	0.000	0.6
485	0.6	0.052	2.453	0.000	0.6
490	0.6	0.052	2.467	0.000	0.6
495	0.6	0.052	2.479	0.000	0.6
500	0.6	0.052	2.489	0.000	0.6
505	0.6	0.053	2.496	0.000	0.6
510	0.6	0.053	2.501	0.000	0.6

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	0.6	0.053	2.503	0.000	0.6
520	0.6	0.053	2.503	0.000	0.6
525	0.6	0.053	2.501	0.000	0.6
530	0.5	0.053	2.497	0.000	0.6
535	0.5	0.052	2.490	0.000	0.6
540	0.5	0.052	2.482	0.000	0.6
545	0.5	0.052	2.472	0.000	0.6
550	0.5	0.052	2.461	0.000	0.6
555	0.5	0.052	2.447	0.000	0.6
560	0.5	0.051	2.432	0.000	0.6
565	0.5	0.051	2.416	0.000	0.5
570	0.5	0.050	2.398	0.000	0.5
575	0.5	0.050	2.378	0.000	0.5
580	0.5	0.050	2.358	0.000	0.5
585	0.5	0.049	2.336	0.000	0.5
590	0.5	0.049	2.312	0.000	0.5
595	0.4	0.048	2.288	0.000	0.5
600	0.4	0.048	2.263	0.000	0.5
605	0.4	0.047	2.237	0.000	0.5
610	0.4	0.046	2.210	0.000	0.5
615	0.4	0.046	2.182	0.000	0.5
620	0.4	0.045	2.153	0.000	0.5
625	0.4	0.045	2.124	0.000	0.5
630	0.4	0.044	2.094	0.000	0.5
635	0.4	0.043	2.064	0.000	0.5
640	0.4	0.043	2.033	0.000	0.5
645	0.4	0.042	2.001	0.000	0.5
650	0.4	0.041	1.969	0.000	0.5
655	0.4	0.041	1.937	0.000	0.5
660	0.3	0.040	1.905	0.000	0.5
665	0.3	0.039	1.872	0.000	0.5
670	0.3	0.039	1.847	0.000	0.4
675	0.3	0.039	1.832	0.000	0.4
680	0.3	0.038	1.817	0.000	0.4
685	0.3	0.038	1.801	0.000	0.4
690	0.3	0.038	1.785	0.000	0.4
695	0.3	0.037	1.768	0.000	0.4
700	0.3	0.037	1.751	0.000	0.4
705	0.3	0.036	1.734	0.000	0.3
710	0.3	0.036	1.717	0.000	0.3
715	0.3	0.036	1.699	0.000	0.3
720	0.3	0.035	1.682	0.000	0.3
725	0.3	0.035	1.664	0.000	0.3
730	0.3	0.035	1.646	0.000	0.3
735	0.3	0.034	1.628	0.000	0.3
740	0.2	0.034	1.609	0.000	0.3
745	0.2	0.033	1.591	0.000	0.3
750	0.2	0.033	1.573	0.000	0.3
755	0.2	0.033	1.554	0.000	0.3
760	0.2	0.032	1.536	0.000	0.3
765	0.2	0.032	1.517	0.000	0.3
770	0.2	0.032	1.499	0.000	0.3
775	0.2	0.031	1.480	0.000	0.3
780	0.2	0.031	1.462	0.000	0.3
785	0.2	0.030	1.443	0.000	0.3
790	0.2	0.030	1.425	0.000	0.3
795	0.2	0.030	1.406	0.000	0.3

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
800	0.2	0.029	1.388	0.000	0.2
805	0.2	0.029	1.369	0.000	0.2
810	0.2	0.028	1.351	0.000	0.2
815	0.2	0.028	1.333	0.000	0.2
820	0.2	0.028	1.314	0.000	0.2
825	0.2	0.027	1.296	0.000	0.2
830	0.2	0.027	1.278	0.000	0.2
835	0.2	0.026	1.260	0.000	0.2
840	0.1	0.026	1.241	0.000	0.2
845	0.1	0.026	1.223	0.000	0.2
850	0.1	0.025	1.205	0.000	0.2
855	0.1	0.025	1.187	0.000	0.2
860	0.1	0.025	1.169	0.000	0.2
865	0.1	0.024	1.151	0.000	0.2
870	0.1	0.024	1.134	0.000	0.2
875	0.1	0.023	1.115	0.000	0.2
880	0.1	0.023	1.097	0.000	0.2
885	0.1	0.023	1.079	0.000	0.2
890	0.1	0.022	1.060	0.000	0.2
895	0.1	0.022	1.042	0.000	0.2
900	0.1	0.022	1.024	0.000	0.2
905	0.1	0.021	1.006	0.000	0.1
910	0.1	0.021	0.988	0.000	0.1
915	0.1	0.020	0.971	0.000	0.1
920	0.1	0.020	0.953	0.000	0.1
925	0.1	0.020	0.936	0.000	0.1
930	0.1	0.019	0.919	0.000	0.1
935	0.1	0.019	0.902	0.000	0.1
940	0.1	0.019	0.885	0.000	0.1
945	0.1	0.018	0.868	0.000	0.1
950	0.1	0.018	0.851	0.000	0.1
955	0.1	0.018	0.834	0.000	0.1
960	0.1	0.017	0.818	0.000	0.1

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



MUGA Sub base
Critical by Return Period: FSR: 30 years: Increase Rainfall (%): +35: 60 mins: Summer

Type : Porous Paving

Tables

Half Drain Down Time (mins)	327
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	0.8	0.003	0.000	0.095	0.000	0.0
10	1.7	0.015	0.000	0.439	0.000	0.0
15	2.7	0.035	0.000	1.115	0.000	0.0
20	3.5	0.062	0.000	2.042	0.000	0.0
25	5.5	0.100	0.000	3.368	0.000	0.0
30	11.0	0.167	0.000	5.790	0.000	0.0
35	16.2	0.272	0.000	9.882	0.000	0.0
40	16.5	0.358	0.000	14.729	1.815	0.0
45	11.5	0.361	0.000	19.052	2.173	0.0
50	5.9	0.356	0.000	21.667	1.693	0.0
55	3.6	0.351	0.000	23.036	1.203	0.0
60	2.8	0.348	0.000	23.985	0.821	0.0
65	1.8	0.345	0.001	24.667	0.516	0.0
70	0.8	0.341	0.003	25.024	0.105	0.0
75	0.0	0.284	0.006	25.122	0.000	0.1
80	0.0	0.264	0.010	25.132	0.000	0.1
85	0.0	0.248	0.015	25.086	0.000	0.2
90	0.0	0.233	0.020	24.996	0.000	0.4
95	0.0	0.220	0.025	24.842	0.000	0.7
100	0.0	0.209	0.029	24.611	0.000	0.9
105	0.0	0.198	0.031	24.305	0.000	1.1
110	0.0	0.189	0.032	23.933	0.000	1.3
115	0.0	0.180	0.033	23.513	0.000	1.5
120	0.0	0.171	0.033	23.058	0.000	1.5

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Cellular Storage
Critical by Return Period: FSR: 30 years: Increase Rainfall (%): +35: 480 mins: Summer

Type : Cellular Storage

Tables

Half Drain Down Time (mins)	76
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Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.000	0.000	0.000	0.0
40	0.0	0.000	0.000	0.000	0.0
45	0.0	0.000	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0
65	0.0	0.000	0.000	0.000	0.0
70	0.0	0.000	0.000	0.000	0.0
75	0.0	0.000	0.000	0.000	0.0
80	0.0	0.000	0.000	0.000	0.0
85	0.0	0.000	0.000	0.000	0.0
90	0.0	0.000	0.000	0.000	0.0
95	0.0	0.000	0.000	0.000	0.0
100	0.0	0.000	0.000	0.000	0.0
105	0.0	0.000	0.000	0.000	0.0
110	0.0	0.000	0.000	0.000	0.0
115	0.0	0.000	0.000	0.000	0.0
120	0.0	0.000	0.000	0.000	0.0
125	0.0	0.000	0.000	0.000	0.0
130	0.0	0.000	0.000	0.000	0.0
135	0.0	0.000	0.000	0.000	0.0
140	0.0	0.000	0.000	0.000	0.0
145	0.0	0.000	0.000	0.000	0.0
150	0.0	0.000	0.000	0.000	0.0
155	0.0	0.000	0.000	0.000	0.0
160	0.0	0.000	0.000	0.000	0.0
165	0.0	0.000	0.000	0.000	0.0
170	0.0	0.000	0.000	0.000	0.0
175	0.0	0.000	0.000	0.000	0.0
180	0.0	0.000	0.000	0.000	0.0
185	0.0	0.000	0.000	0.000	0.0
190	0.0	0.000	0.000	0.000	0.0
195	0.0	0.000	0.000	0.000	0.0
200	0.0	0.000	0.001	0.000	0.0
205	0.0	0.000	0.005	0.000	0.0
210	0.0	0.000	0.010	0.000	0.0
215	0.0	0.000	0.017	0.000	0.0
220	0.1	0.001	0.029	0.000	0.0
225	0.1	0.001	0.045	0.000	0.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
230	0.1	0.001	0.067	0.000	0.0
235	0.1	0.002	0.095	0.000	0.0
240	0.2	0.003	0.133	0.000	0.0
245	0.2	0.004	0.181	0.000	0.0
250	0.2	0.005	0.239	0.000	0.0
255	0.3	0.007	0.312	0.000	0.0
260	0.4	0.008	0.399	0.000	0.0
265	0.4	0.011	0.504	0.000	0.1
270	0.5	0.013	0.631	0.000	0.1
275	0.7	0.017	0.783	0.000	0.1
280	0.8	0.020	0.964	0.000	0.1
285	1.0	0.025	1.176	0.000	0.2
290	1.1	0.030	1.420	0.000	0.3
295	1.3	0.036	1.689	0.000	0.3
300	1.4	0.042	1.973	0.000	0.5
305	1.6	0.048	2.273	0.000	0.5
310	1.7	0.055	2.602	0.000	0.6
315	1.8	0.063	2.953	0.000	0.6
320	1.9	0.070	3.322	0.000	0.7
325	2.0	0.078	3.703	0.000	0.7
330	2.1	0.087	4.090	0.000	0.8
335	2.1	0.095	4.478	0.000	0.8
340	2.2	0.103	4.863	0.000	0.9
345	2.2	0.111	5.244	0.000	0.9
350	2.2	0.119	5.616	0.000	1.0
355	2.2	0.126	5.979	0.000	1.0
360	2.2	0.134	6.331	0.000	1.0
365	2.2	0.141	6.669	0.000	1.1
370	2.1	0.148	6.994	0.000	1.1
375	2.1	0.154	7.303	0.000	1.1
380	2.1	0.160	7.598	0.000	1.1
385	2.1	0.166	7.876	0.000	1.2
390	2.0	0.172	8.139	0.000	1.2
395	2.0	0.177	8.387	0.000	1.2
400	2.0	0.182	8.618	0.000	1.2
405	1.9	0.186	8.834	0.000	1.3
410	1.9	0.190	9.035	0.000	1.3
415	1.9	0.194	9.221	0.000	1.3
420	1.8	0.198	9.392	0.000	1.3
425	1.8	0.201	9.550	0.000	1.3
430	1.8	0.204	9.694	0.000	1.3
435	1.7	0.207	9.824	0.000	1.3
440	1.7	0.209	9.942	0.000	1.3
445	1.7	0.212	10.047	0.000	1.3
450	1.6	0.214	10.141	0.000	1.4
455	1.6	0.215	10.223	0.000	1.4
460	1.6	0.217	10.294	0.000	1.4
465	1.6	0.218	10.354	0.000	1.4
470	1.5	0.219	10.404	0.000	1.4
475	1.5	0.220	10.445	0.000	1.4
480	1.5	0.221	10.476	0.000	1.4
485	1.4	0.221	10.499	0.000	1.4
490	1.4	0.221	10.513	0.000	1.4
495	1.4	0.221	10.518	0.000	1.4
500	1.4	0.221	10.516	0.000	1.4
505	1.3	0.221	10.507	0.000	1.4
510	1.3	0.221	10.490	0.000	1.4

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	1.3	0.220	10.466	0.000	1.4
520	1.3	0.220	10.436	0.000	1.4
525	1.2	0.219	10.399	0.000	1.4
530	1.2	0.218	10.356	0.000	1.4
535	1.2	0.217	10.306	0.000	1.4
540	1.2	0.216	10.250	0.000	1.4
545	1.1	0.214	10.188	0.000	1.4
550	1.1	0.213	10.121	0.000	1.4
555	1.1	0.211	10.048	0.000	1.3
560	1.1	0.210	9.969	0.000	1.3
565	1.0	0.208	9.885	0.000	1.3
570	1.0	0.206	9.797	0.000	1.3
575	1.0	0.204	9.703	0.000	1.3
580	1.0	0.202	9.605	0.000	1.3
585	1.0	0.200	9.503	0.000	1.3
590	0.9	0.198	9.396	0.000	1.3
595	0.9	0.195	9.286	0.000	1.3
600	0.9	0.193	9.172	0.000	1.3
605	0.9	0.191	9.055	0.000	1.3
610	0.9	0.188	8.935	0.000	1.3
615	0.8	0.185	8.811	0.000	1.2
620	0.8	0.183	8.685	0.000	1.2
625	0.8	0.180	8.557	0.000	1.2
630	0.8	0.177	8.426	0.000	1.2
635	0.8	0.174	8.293	0.000	1.2
640	0.7	0.172	8.159	0.000	1.2
645	0.7	0.169	8.023	0.000	1.2
650	0.7	0.166	7.885	0.000	1.2
655	0.7	0.163	7.746	0.000	1.2
660	0.7	0.160	7.606	0.000	1.1
665	0.7	0.157	7.465	0.000	1.1
670	0.6	0.154	7.323	0.000	1.1
675	0.6	0.151	7.181	0.000	1.1
680	0.6	0.148	7.038	0.000	1.1
685	0.6	0.145	6.895	0.000	1.1
690	0.6	0.142	6.752	0.000	1.1
695	0.6	0.139	6.610	0.000	1.1
700	0.6	0.136	6.467	0.000	1.0
705	0.6	0.133	6.325	0.000	1.0
710	0.5	0.130	6.183	0.000	1.0
715	0.5	0.127	6.041	0.000	1.0
720	0.5	0.124	5.901	0.000	1.0
725	0.5	0.121	5.761	0.000	1.0
730	0.5	0.118	5.622	0.000	1.0
735	0.5	0.115	5.484	0.000	0.9
740	0.5	0.112	5.347	0.000	0.9
745	0.5	0.110	5.211	0.000	0.9
750	0.5	0.107	5.077	0.000	0.9
755	0.4	0.104	4.944	0.000	0.9
760	0.4	0.101	4.812	0.000	0.9
765	0.4	0.098	4.682	0.000	0.9
770	0.4	0.096	4.554	0.000	0.8
775	0.4	0.093	4.427	0.000	0.8
780	0.4	0.090	4.303	0.000	0.8
785	0.4	0.088	4.180	0.000	0.8
790	0.4	0.085	4.058	0.000	0.8
795	0.4	0.083	3.939	0.000	0.8

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
800	0.4	0.080	3.822	0.000	0.8
805	0.4	0.078	3.706	0.000	0.7
810	0.3	0.076	3.593	0.000	0.7
815	0.3	0.073	3.482	0.000	0.7
820	0.3	0.071	3.373	0.000	0.7
825	0.3	0.069	3.266	0.000	0.7
830	0.3	0.066	3.161	0.000	0.7
835	0.3	0.064	3.058	0.000	0.6
840	0.3	0.062	2.958	0.000	0.6
845	0.3	0.060	2.860	0.000	0.6
850	0.3	0.058	2.764	0.000	0.6
855	0.3	0.056	2.671	0.000	0.6
860	0.3	0.054	2.580	0.000	0.6
865	0.3	0.052	2.491	0.000	0.6
870	0.3	0.051	2.404	0.000	0.5
875	0.3	0.049	2.320	0.000	0.5
880	0.2	0.047	2.238	0.000	0.5
885	0.2	0.045	2.159	0.000	0.5
890	0.2	0.044	2.081	0.000	0.5
895	0.2	0.042	2.006	0.000	0.5
900	0.2	0.041	1.934	0.000	0.5
905	0.2	0.039	1.863	0.000	0.4
910	0.2	0.038	1.811	0.000	0.4
915	0.2	0.037	1.764	0.000	0.4
920	0.2	0.036	1.720	0.000	0.3
925	0.2	0.035	1.679	0.000	0.3
930	0.2	0.034	1.639	0.000	0.3
935	0.2	0.034	1.601	0.000	0.3
940	0.2	0.033	1.566	0.000	0.3
945	0.2	0.032	1.531	0.000	0.3
950	0.2	0.032	1.498	0.000	0.3
955	0.2	0.031	1.467	0.000	0.3
960	0.2	0.030	1.436	0.000	0.3

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



MUGA Sub base
Critical by Return Period: FSR: 100 years: Increase Rainfall (%): +40: 60 mins: Summer

Type : Porous Paving

Tables

Half Drain Down Time (mins)	267
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	1.0	0.005	0.000	0.129	0.000	0.0
10	2.2	0.020	0.000	0.629	0.000	0.0
15	3.7	0.047	0.000	1.517	0.000	0.0
20	4.7	0.084	0.000	2.779	0.000	0.0
25	7.5	0.134	0.000	4.580	0.000	0.0
30	14.9	0.223	0.000	7.910	0.000	0.0
35	22.0	0.355	0.000	13.441	1.595	0.0
40	22.4	0.370	0.000	20.132	3.106	0.0
45	15.6	0.358	0.000	25.887	4.418	0.0
50	8.0	0.350	0.000	29.463	3.277	0.0
55	4.9	0.347	0.002	31.327	2.276	0.0
60	3.9	0.345	0.006	32.587	1.706	0.1
65	2.4	0.343	0.014	33.505	1.258	0.2
70	1.1	0.341	0.024	33.932	0.703	0.6
75	0.1	0.290	0.034	33.837	0.313	1.2
80	0.0	0.275	0.040	33.385	0.000	1.8
85	0.0	0.262	0.042	32.805	0.000	2.2
90	0.0	0.250	0.043	32.100	0.000	2.5
95	0.0	0.239	0.043	31.346	0.000	2.5
100	0.0	0.229	0.042	30.590	0.000	2.5
105	0.0	0.220	0.042	29.831	0.000	2.5
110	0.0	0.211	0.042	29.074	0.000	2.5
115	0.0	0.202	0.041	28.327	0.000	2.5
120	0.0	0.194	0.041	27.587	0.000	2.4

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Cellular Storage
Critical by Return Period: FSR: 100 years: Increase Rainfall (%): +40: 480 mins: Summer

Type : Cellular Storage

Tables

Half Drain Down Time (mins)	96
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Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.000	0.000	0.000	0.0
40	0.0	0.000	0.000	0.000	0.0
45	0.0	0.000	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0
65	0.0	0.000	0.000	0.000	0.0
70	0.0	0.000	0.000	0.000	0.0
75	0.0	0.000	0.000	0.000	0.0
80	0.0	0.000	0.000	0.000	0.0
85	0.0	0.000	0.000	0.000	0.0
90	0.0	0.000	0.000	0.000	0.0
95	0.0	0.000	0.000	0.000	0.0
100	0.0	0.000	0.000	0.000	0.0
105	0.0	0.000	0.000	0.000	0.0
110	0.0	0.000	0.000	0.000	0.0
115	0.0	0.000	0.000	0.000	0.0
120	0.0	0.000	0.000	0.000	0.0
125	0.0	0.000	0.000	0.000	0.0
130	0.0	0.000	0.000	0.000	0.0
135	0.0	0.000	0.000	0.000	0.0
140	0.0	0.000	0.000	0.000	0.0
145	0.0	0.000	0.000	0.000	0.0
150	0.0	0.000	0.000	0.000	0.0
155	0.0	0.000	0.000	0.000	0.0
160	0.0	0.000	0.000	0.000	0.0
165	0.0	0.000	0.000	0.000	0.0
170	0.0	0.000	0.000	0.000	0.0
175	0.0	0.000	0.000	0.000	0.0
180	0.0	0.000	0.000	0.000	0.0
185	0.0	0.000	0.002	0.000	0.0
190	0.0	0.000	0.007	0.000	0.0
195	0.0	0.000	0.014	0.000	0.0
200	0.0	0.001	0.024	0.000	0.0
205	0.1	0.001	0.039	0.000	0.0
210	0.1	0.001	0.060	0.000	0.0
215	0.1	0.002	0.089	0.000	0.0
220	0.2	0.003	0.127	0.000	0.0
225	0.2	0.004	0.175	0.000	0.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
230	0.2	0.005	0.235	0.000	0.0
235	0.3	0.007	0.308	0.000	0.0
240	0.4	0.008	0.395	0.000	0.0
245	0.4	0.011	0.498	0.000	0.1
250	0.5	0.013	0.619	0.000	0.1
255	0.6	0.016	0.763	0.000	0.1
260	0.8	0.020	0.934	0.000	0.1
265	1.0	0.024	1.143	0.000	0.2
270	1.3	0.030	1.410	0.000	0.3
275	1.6	0.037	1.751	0.000	0.4
280	2.0	0.046	2.161	0.000	0.5
285	2.5	0.057	2.666	0.000	0.6
290	2.9	0.070	3.282	0.000	0.7
295	3.2	0.085	3.987	0.000	0.8
300	3.4	0.101	4.741	0.000	0.9
305	3.5	0.117	5.506	0.000	0.9
310	3.5	0.132	6.256	0.000	1.0
315	3.4	0.148	6.975	0.000	1.1
320	3.4	0.162	7.658	0.000	1.2
325	3.3	0.175	8.301	0.000	1.2
330	3.2	0.188	8.905	0.000	1.3
335	3.1	0.200	9.469	0.000	1.3
340	3.0	0.211	9.999	0.000	1.3
345	3.0	0.221	10.496	0.000	1.4
350	2.9	0.231	10.962	0.000	1.4
355	2.8	0.240	11.399	0.000	1.4
360	2.8	0.249	11.808	0.000	1.5
365	2.7	0.257	12.177	0.000	1.5
370	2.7	0.264	12.532	0.000	1.5
375	2.6	0.271	12.868	0.000	1.5
380	2.6	0.278	13.182	0.000	1.6
385	2.5	0.284	13.475	0.000	1.6
390	2.1	0.288	13.691	0.000	1.6
395	2.1	0.292	13.845	0.000	1.6
400	2.1	0.295	13.985	0.000	1.6
405	2.0	0.297	14.114	0.000	1.6
410	2.0	0.300	14.232	0.000	1.6
415	2.0	0.302	14.339	0.000	1.6
420	2.0	0.304	14.437	0.000	1.6
425	1.9	0.306	14.525	0.000	1.7
430	1.9	0.308	14.604	0.000	1.7
435	1.9	0.309	14.674	0.000	1.7
440	1.9	0.310	14.735	0.000	1.7
445	1.8	0.311	14.788	0.000	1.7
450	1.8	0.312	14.833	0.000	1.7
455	1.8	0.313	14.871	0.000	1.7
460	1.8	0.314	14.902	0.000	1.7
465	1.7	0.314	14.925	0.000	1.7
470	1.7	0.315	14.942	0.000	1.7
475	1.7	0.315	14.953	0.000	1.7
480	1.7	0.315	14.957	0.000	1.7
485	1.7	0.315	14.956	0.000	1.7
490	1.6	0.315	14.949	0.000	1.7
495	1.6	0.314	14.937	0.000	1.7
500	1.6	0.314	14.920	0.000	1.7
505	1.6	0.314	14.898	0.000	1.7
510	1.6	0.313	14.870	0.000	1.7

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
	Designed by: JA	Checked by:	Approved By: CH
Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	1.6	0.312	14.838	0.000	1.7
520	1.5	0.312	14.801	0.000	1.7
525	1.5	0.311	14.760	0.000	1.7
530	1.5	0.310	14.713	0.000	1.7
535	1.5	0.309	14.662	0.000	1.7
540	1.5	0.307	14.606	0.000	1.7
545	1.4	0.306	14.546	0.000	1.7
550	1.4	0.305	14.481	0.000	1.6
555	1.4	0.303	14.411	0.000	1.6
560	1.4	0.302	14.337	0.000	1.6
565	1.4	0.300	14.259	0.000	1.6
570	1.3	0.298	14.176	0.000	1.6
575	1.3	0.297	14.090	0.000	1.6
580	1.3	0.295	13.999	0.000	1.6
585	1.3	0.293	13.904	0.000	1.6
590	1.3	0.291	13.806	0.000	1.6
595	1.3	0.288	13.704	0.000	1.6
600	1.2	0.286	13.599	0.000	1.6
605	1.2	0.284	13.490	0.000	1.6
610	1.2	0.282	13.377	0.000	1.6
615	1.2	0.279	13.261	0.000	1.6
620	1.1	0.276	13.135	0.000	1.6
625	1.0	0.273	12.974	0.000	1.6
630	0.9	0.269	12.791	0.000	1.5
635	0.9	0.265	12.604	0.000	1.5
640	0.9	0.261	12.411	0.000	1.5
645	0.8	0.257	12.213	0.000	1.5
650	0.8	0.253	12.012	0.000	1.5
655	0.8	0.248	11.809	0.000	1.5
660	0.8	0.244	11.604	0.000	1.5
665	0.8	0.240	11.398	0.000	1.4
670	0.7	0.235	11.191	0.000	1.4
675	0.7	0.231	10.984	0.000	1.4
680	0.7	0.227	10.775	0.000	1.4
685	0.7	0.222	10.566	0.000	1.4
690	0.7	0.218	10.357	0.000	1.4
695	0.7	0.213	10.148	0.000	1.4
700	0.6	0.209	9.938	0.000	1.3
705	0.6	0.205	9.730	0.000	1.3
710	0.6	0.200	9.522	0.000	1.3
715	0.6	0.196	9.314	0.000	1.3
720	0.6	0.192	9.108	0.000	1.3
725	0.6	0.187	8.902	0.000	1.3
730	0.6	0.183	8.698	0.000	1.2
735	0.5	0.179	8.494	0.000	1.2
740	0.5	0.174	8.293	0.000	1.2
745	0.5	0.170	8.092	0.000	1.2
750	0.5	0.166	7.893	0.000	1.2
755	0.5	0.162	7.696	0.000	1.2
760	0.5	0.158	7.501	0.000	1.1
765	0.5	0.154	7.307	0.000	1.1
770	0.5	0.150	7.115	0.000	1.1
775	0.5	0.146	6.926	0.000	1.1
780	0.4	0.142	6.739	0.000	1.1
785	0.4	0.138	6.554	0.000	1.0
790	0.4	0.134	6.371	0.000	1.0
795	0.4	0.130	6.191	0.000	1.0

Project: St Gregory's Catholic School Proposed MUGA 25m x 20m	Date: 08/12/2023		
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Report Details: Type: Stormwater Control Results Storm Phase: Porous Paving	Company Address: 1 Adam Square Brucefield Industry Park Livingston EH54 9DE		



Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
800	0.4	0.126	6.013	0.000	1.0
805	0.4	0.123	5.838	0.000	1.0
810	0.4	0.119	5.666	0.000	1.0
815	0.4	0.116	5.496	0.000	0.9
820	0.4	0.112	5.329	0.000	0.9
825	0.4	0.109	5.164	0.000	0.9
830	0.4	0.105	5.003	0.000	0.9
835	0.3	0.102	4.844	0.000	0.9
840	0.3	0.099	4.688	0.000	0.9
845	0.3	0.095	4.535	0.000	0.8
850	0.3	0.092	4.385	0.000	0.8
855	0.3	0.089	4.238	0.000	0.8
860	0.3	0.086	4.094	0.000	0.8
865	0.3	0.083	3.953	0.000	0.8
870	0.3	0.080	3.815	0.000	0.8
875	0.3	0.077	3.681	0.000	0.7
880	0.3	0.075	3.549	0.000	0.7
885	0.3	0.072	3.421	0.000	0.7
890	0.3	0.069	3.296	0.000	0.7
895	0.3	0.067	3.174	0.000	0.7
900	0.3	0.064	3.055	0.000	0.6
905	0.3	0.062	2.939	0.000	0.6
910	0.2	0.059	2.827	0.000	0.6
915	0.2	0.057	2.717	0.000	0.6
920	0.2	0.055	2.611	0.000	0.6
925	0.2	0.053	2.508	0.000	0.6
930	0.2	0.051	2.409	0.000	0.5
935	0.2	0.049	2.312	0.000	0.5
940	0.2	0.047	2.218	0.000	0.5
945	0.2	0.045	2.128	0.000	0.5
950	0.2	0.043	2.040	0.000	0.5
955	0.2	0.041	1.956	0.000	0.5
960	0.2	0.039	1.874	0.000	0.5