



Ysgol Rhyd Y Grug, Merthyr Tydfil

Drainage Strategy Report

Client: Merthyr Tydfil County Borough Council

Project Ref: CC2594

Report status: S2 Rev P01

CAMBRIA

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Status	Date	Description	Prepared by	Authorised by
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1 Introduction

- 1.1.1 Cambria Consulting Ltd have been appointed by AtkinsRealis to develop a Drainage Strategy Report in support of a planning and SAB application for the proposed extension and refurbishment to Ysgol Rhyd Y Grug. This commission is on behalf of Merthyr Tydfil County Borough Council, hereafter known as the 'Client'.
- 1.1.2 As a result of the enactment of Schedule 3 of the Flood Management Act 2010 by Welsh Government, the development will require Sustainable Drainage (SuDS) approval, as well as planning approval, to be constructed.
- 1.1.3 The objectives of this report are:
- ▶ Identify a suitable discharge strategy for the Surface Water and Foul Water from the proposed development.
 - ▶ Undertake hydraulic calculations to identify appropriate discharge rates and attenuation requirements.
 - ▶ Consult with the SAB regarding the proposals.
 - ▶ Provide a layout of the proposed foul and surface water drainage proposals.
 - ▶ Demonstrate compliance with the National SuDS standards.

2 Site Description

2.1 Site Location

- 2.1.1 The site is located at Ysgol Rhyd Y Grug in Merthys Vale, postcode CF48 4NT and shown in Figure 2-1 below.
- 2.1.2 The site is bounded by the River Taff to the North, East and South and Woodland to the West. The site is accessed via Walters Terrace to the North.

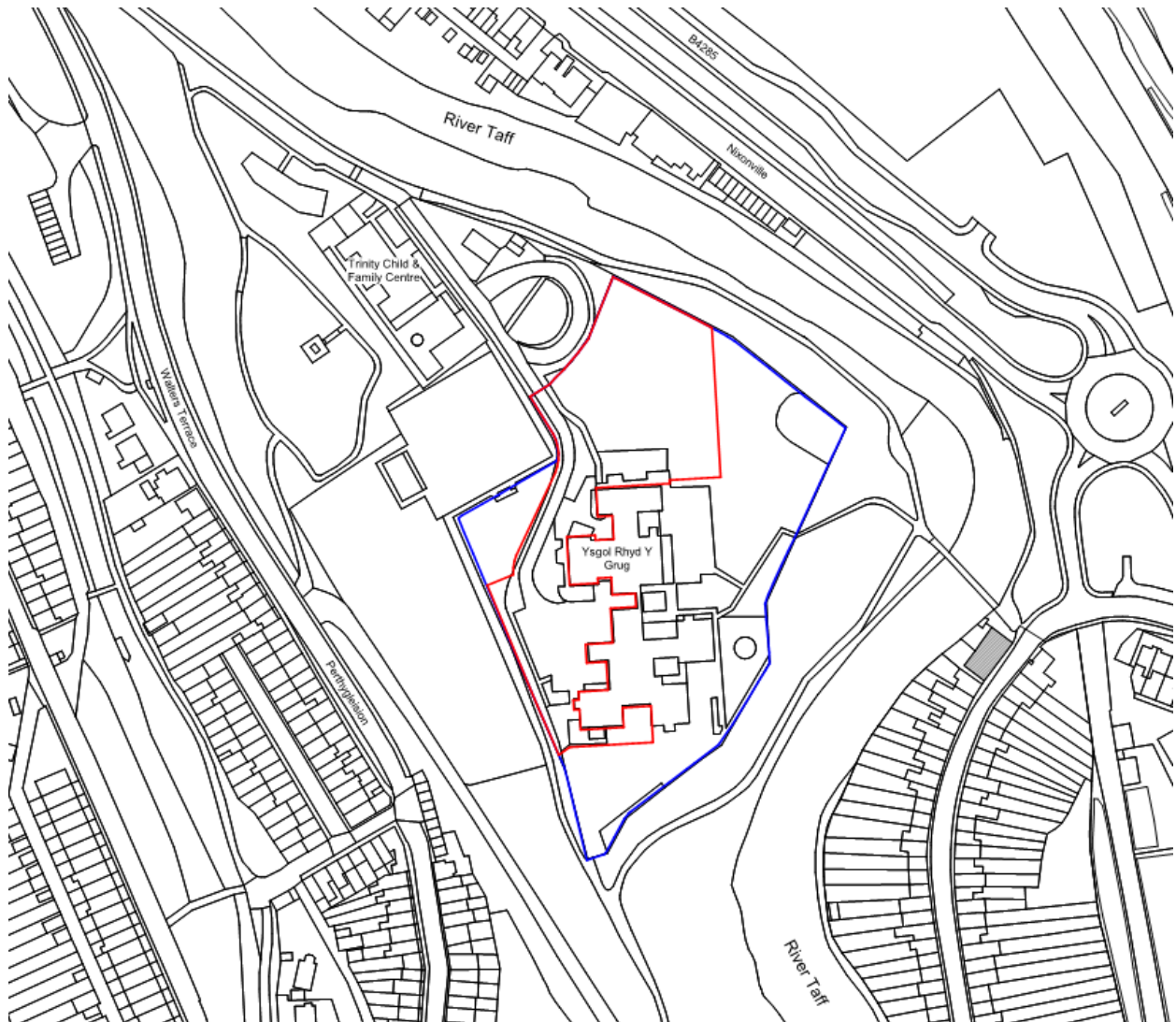


Figure 2-1 – Site location plan (AtkinsRealis)

2.2 Topography

- 2.2.1 Solum Surveying Ltd undertook a Topographical survey on 1 November 2023.
- 2.2.2 The survey indicates that the site levels are generally flat with a slight fall towards the River Taff at the eastern boundary. Site levels generally vary between 133.700 at the western boundary to 132.740 at the eastern boundary. The existing buildings have a threshold level of 133.700.
- 2.2.3 The topographic survey drawings are included in *Appendix A*.

2.3 Ground Conditions

- 2.3.1 An intrusive ground investigation was undertaken by Integral Geotechnique (IG) in August 2024.
- 2.3.2 The ground conditions generally encountered were Topsoil up to 0.35m below ground level (bgl) and subbase up to 0.5m bgl over laying suspected Colliery spoil. The made ground was identified to the full depth of the investigation at 5m bgl. The investigation did not identify the base level of the made ground.
- 2.3.3 8 Soakaway tests were undertaken in accordance with BRE Digest 365. Good infiltration rates were recorded between $1 \times 10^{-3} \text{m/s}$ and $11 \times 10^{-4} \text{m/s}$ however due to the presence of Made Ground and taking account of the proximity of the River Taff and infiltration solution has been precluded due to the potential to mobilise contaminants.
- 2.3.4 Groundwater was not encountered during the Intrusive Ground Investigation.

2.4 Flood Risk

- 2.4.1 The NRW Development Advice Map currently shows the development area and the majority of the site situated in Flood Zone B (areas known to have flooded in the past as evidenced by sedimentary deposits). This indicates a precautionary approach 'where site levels should be checked against extreme (0.1%) flood level. If flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further'. In this instance site levels are higher than the flood levels used to define extreme flood outline, therefore there is deemed to be no flood risk.
- 2.4.2 The lower south western area in currently situated in Zone A (little or no risk of fluvial or coastal/flooding).



Figure 2-2 – Extract from NRW Development Advice Map

- 2.4.3 The site is situated next to the River Taff with elevated levels deeming the site outside of the Zone C2 area (without significant defence infrastructure).
- 2.4.4 The NRW Flood Map for Planning shows areas of surface water flood risk, located to the north west of the site and within the access road and car park/hardstanding area. There are currently no proposals for works in these areas. The data is based on existing topography and any future development works in these areas shall incorporate measures such as SuDS features to capture any exceedance flows.

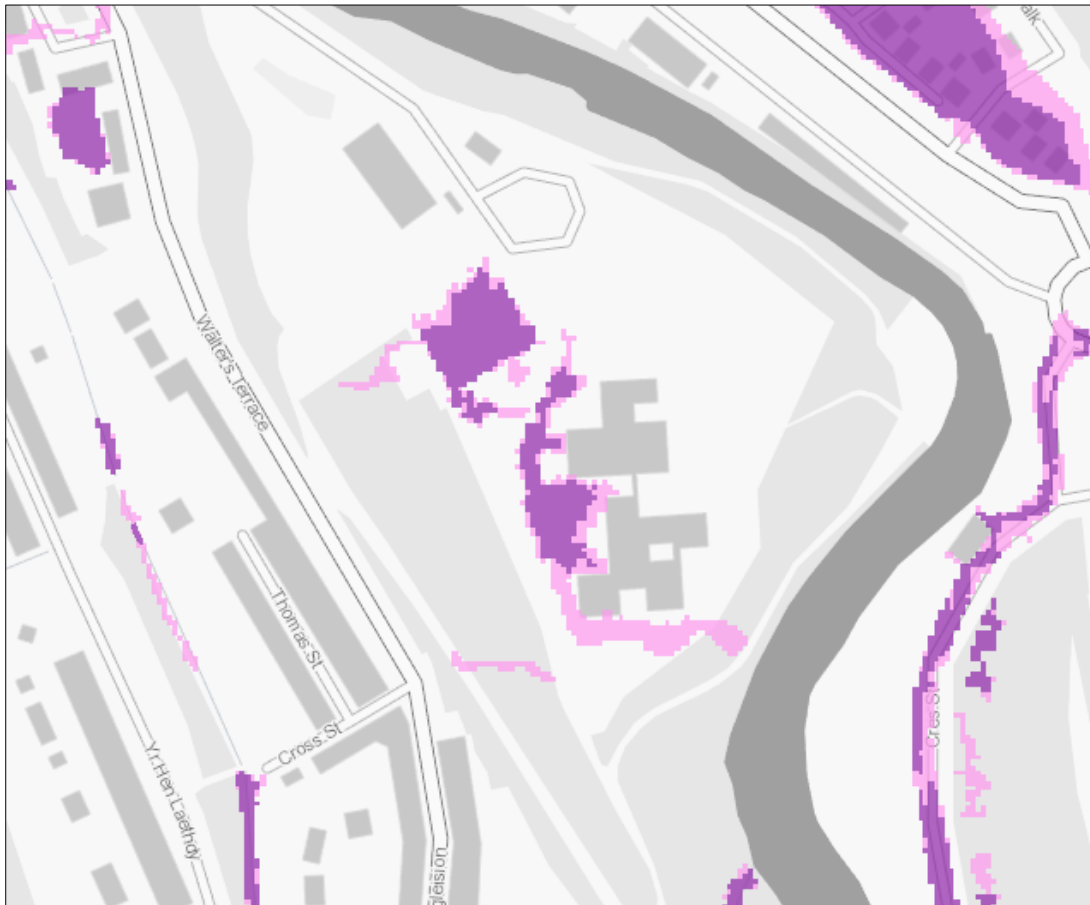


Figure 2-3 – Extract from NRW Flood Map for Planning

2.5 Proposed Development

- 2.5.1 The project comprises extensive refurbishment to the existing Ysgol Rhyd Y Grug building. Internal structural alterations are proposed to the South Area of the building, to provide new room layouts with improved circulation and access. There is to be a new build extension to the scheme which will all for 60 FTE Nursery and 24 Meithrin. The Nursery and Meithrin will be connected to the existing school building via a covered walkway.
- 2.5.2 The proposed site layout and landscaping scheme has been produced by AtkinsRealis, an extract of the landscaping layout is shown in Figure 2-4 below and included in *Appendix B*.



Figure 2-4 –Landscape General Arrangement (AtkinsRealis)

3 Existing Drainage

- 3.1.1 Welsh Water record maps show a 1850mm diameter combiner sewer running along the western boundary of the site. Solum Surveying utility surveys show that the foul from the school connects into this sewer to the west via two gravity connections



Figure 3-1 –Welsh Water Record Plan

- 3.1.2 The surface water system gravitates to an outfall in the south eastern corner of the site as shown in the extract of the utility survey below.

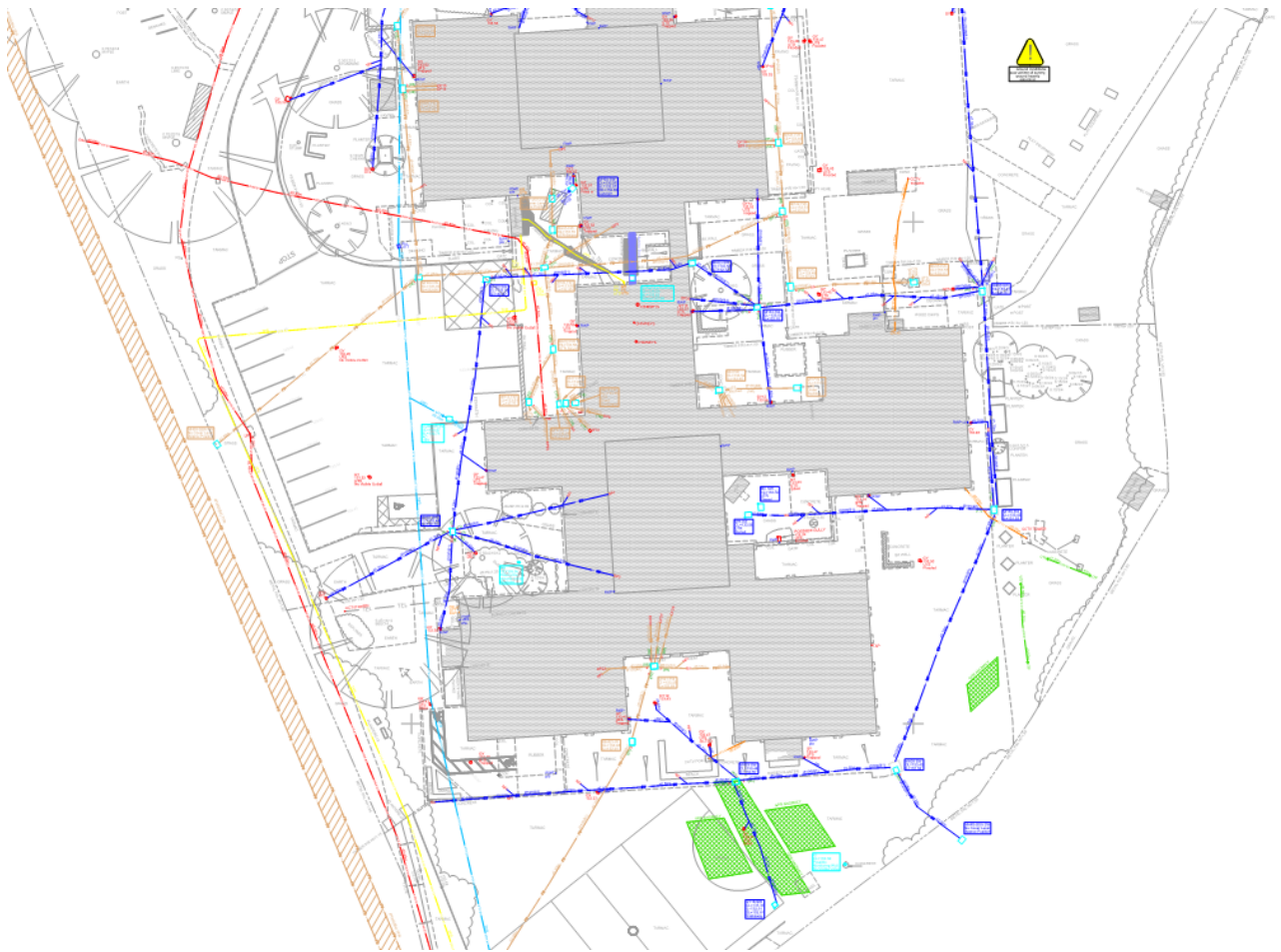


Figure 3-2 –Extract of Solum Surveying Utility Survey

4 Surface Water Drainage

4.1.1 In October 2018, Welsh Government published the 'Statutory standards for sustainable drainage systems – designing, constructing, operating, and maintaining Surface Water Drainage Systems'. This standard is now mandatory for new developments with either a construction area greater than 100m² or more than 1 dwelling.

4.1.2 The principles that underpin the design of surface water management schemes to meet the standards area as follows:

- ▶ Manage water on or close to the surface and as close to the source of the runoff as possible;
- ▶ Treat rainfall as a valuable natural resource
- ▶ Ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;
- ▶ Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;
- ▶ Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;
- ▶ Use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single “end of pipe” feature, such as a pond, the serve the whole development);
- ▶ Maximise the delivery of benefits for amenity and biodiversity;
- ▶ Seek to make the best use of available land through multifunctional usage of public spaces and the public realm;
- ▶ Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;
- ▶ Avoid the need for pumping where possible;
- ▶ Be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system

4.2 Standard S1 – Surface Water Runoff Destination

4.2.1 This standard reviews the disposal routes for surface water run-off. The destinations are split into 5 levels with level 1 being the most preferential and level 5 being the least preferred and only used in exceptional circumstances.

Priority Level 1: Surface water runoff is collected for use;

4.2.2 The installation of rainwater harvesting tanks is not deemed feasible for this proposal, see the below exemption criteria as per the Statutory Standards for SuDS:

- There is no foreseeable demand for non-potable water on the site throughout its design life;
- There is no foreseeable need to harvest water at the site as the relevant water undertakers water resources and drought management plans do not identify potential stresses on mains water supplies;
- The use of rainwater harvesting is not a viable/cost-effective part of the solution for managing water runoff on the site, taking account of the potential water supply benefits of such a system.

4.2.3 From the above exemption criteria, it is considered that the latter two points apply.

Priority Level 2: Surface water runoff is infiltrated to ground;

4.2.4 An intrusive investigation has been undertaken by Intégral Géotechnique. Soakaway tests were performed in 5 Trial pits and 3 Soakways. A good infiltration rate was identified, but within made ground (Colliery Spoil). It is considered that infiltration within the made ground will not be possible due to risk of contamination.

4.2.5 An infiltration-based solution is therefore deemed not suitable for the site. A lower priority level will need to be considered for surface water disposal from the site.

Priority Level 3: Surface water runoff is discharged to a surface water body;

4.2.6 The River Taff is the nearest watercourse to the site, approximately 25m from the south eastern boundary. A direct connection into the River Taff is not feasible due to the dense vegetation and trees present along the river bank.

Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain or other drainage;

4.2.7 It is proposed to connect into the existing private surface water network on site which outfalls into the River Taff.

Priority Level 5: Discharge to a Combined Sewer

4.2.8 Not considered, a higher priority level is feasible.

4.3 Standard S2 – Surface Water Hydraulic Control

4.3.1 The site is undeveloped playing fields. It is therefore proposed to restrict runoff from the proposed development to greenfield runoff rates, to mimic predevelopment conditions. The greenfield runoff rates have been calculated using ReFH2 data, and input into the ReFH2 software to generate the greenfield runoff rate of **1.1l/s**. A copy of the ReFH2 calculations area included in *Appendix C*.

4.3.2 Outline attenuation storage volumes have been assessed using the Quick Storage Estimate tool in MicroDrainage, this gives an attenuation storage requirement of **164m³**.

- 4.3.3 The attenuation storage will be delivered through a combination of above and below ground features. The majority of the storage is provided within a cellular storage tank (130m³) with the remaining storage provided within the raingarden and underneath the porous asphalt areas.
- 4.3.4 Interception of the first 5mm of rainfall has been provided by rain gardens, porous asphalt and green roofs.
- 4.3.5 The Proposed Drainage Layout plans, RYG-CAM-ZZ-XX-DR-C-1101,1102,1103&1104, are included in *Appendix D*. This shows the SuDS areas and general routing of the surface water drainage networks.

4.4 Standard S3 – Water Quality

- 4.4.1 The sensitivity of the receiving water body (River Taff) will be agreed with the SAB. Sufficient levels of treatment within a SUDs treatment train will be needed prior to surface water runoff being discharged from site.
- 4.4.2 The Simple Index Approach method will be adopted to ensure sufficient treatment measures are in place.
- 4.4.3 A mix of SuDS features are proposed as part of a SuDS management train, including green roofs, permeable paving and rain gardens. Proprietary treatment chambers could be used for locally constrained catchments.

4.5 Standard S4 – Amenity

- 4.5.1 The large raingarden to the east of the extension aligns play areas

4.6 Standard S5 – Biodiversity

- 4.6.1 The drainage design maximises the use of above ground soft SuDs features on site. The extension is surrounded by a large raingarden to the east and parts of the new extension roof are proposed as Green roof. The raingarden and green roof give scope for diverse planting to provide biodiversity benefits.

4.7 Standard S6 - Design of drainage for Construction, Operation and Maintenance and Structural Integrity

- 4.7.1 The SuDS solution will be designed in accordance with the SuDS manual. The site is generally served by shallow SuDS features, reducing the capital cost and long-term maintenance costs of the scheme.
- 4.7.2 The SUDS system serves one property and will therefore be maintained by the School.
- 4.7.3 Generally, the above ground SuDS features will be dry during normal conditions and limited to 100mm in terms of water depths during extreme events.
- 4.7.4 Any residual risks associated with the SuDs features will be highlighted within the designer's risk assessment submitted as part of the SuDS application.

5 Foul Drainage

- 5.1.1 It is proposed that foul flows from the proposed development will be connected to the existing private foul network serving the school discharging to the combined foul sewer running along the western site boundary, thus potentially avoiding any section agreements.
- 5.1.2 The available capacity in the existing foul sewerage network is unknown. Welsh Water (DCWW) will need to confirm there is sufficient capacity and suitable points of connection to the sewerage network.
- 5.1.3 The indirect connections to the foul sewerage network may be subject to a S106 agreement with Welsh Water.
- 5.1.4 The Proposed Drainage Layout drawings RYG-CAM-ZZ-XX-DR-C-1101,1103 & 1104 included in *Appendix D* show the proposed gravity foul connections.

6 Conclusions

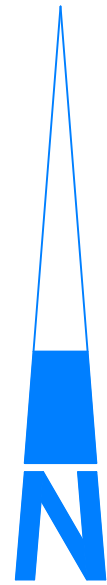
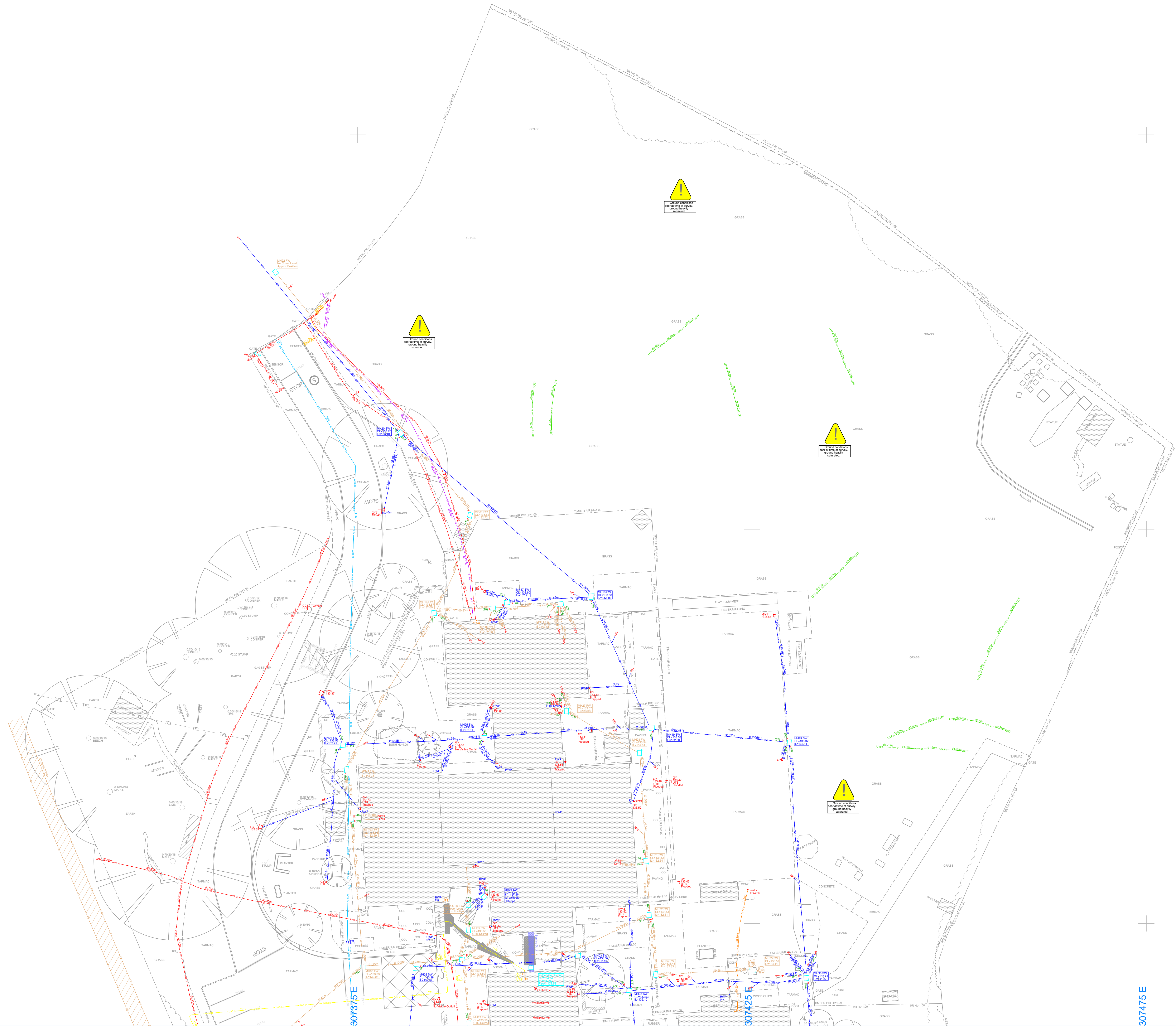
- 6.1.1 An infiltration surface water discharge solution has been discounted on site due to the presence of Made ground and potential for mobilizing contaminants. The proposed surface water solution is discharge to the River Taff via the existing surface water drainage network.
- 6.1.2 The surface water discharge from the new works will be restricted to greenfield runoff rates (1.1l/s) and attenuation storage will be provided for the 1 in 100 year storm event plus climate change.
- 6.1.3 Interception of the first 5mm of rainfall will be provided by green roofs, porous asphalt and raingardens.
- 6.1.4 The surface water strategy will be subject to SAB approval and further detailed design. It is recommended that a CCTV drainage survey will be required of the existing surface water outfall to the River Taff to review its condition, alignment and level.
- 6.1.5 The foul drainage will gravitate to the existing private foul drainage system. The proposal will be subject to acceptance from Welsh Water.

Appendix A: Solum Topographical and Utility Surveys

199725 M

199675 N

199625 N



- GRID AND LEVELS BASED ON OSGB36 NATIONAL DATUM, DERIVED FROM THE NATIONAL GPS NETWORK.
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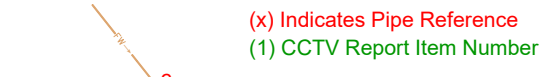
Private service pipes/connections and cables in highways may not be shown, but the presence should be anticipated.

Additional below ground structures or obstructions not shown on this drawing may be present. Review historical records/plans and any as built drawings. Excavations in the vicinity should be treated with extreme caution following the HSE documents on avoiding underground services.

Note that ground conditions, proximity of other utilities, materials and method of construction have an influence on the ability and quality of the data collected on site. Along with areas being accessible at time of survey, inaccessible areas may contain access/manhole covers that may affect the survey area.

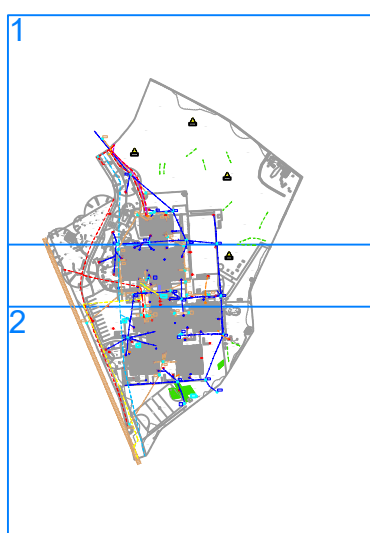
TSA Standards - "Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate".

1	BT 81 (PA512)	HEATING PERP 81 (PA512)
2	BT 82 (PA528)	HEATING PERP 82 (PA528)
3	BT 83 (PA544)	HEATING PERP 83 (PA544)
4	BT 84 (PA560)	HEATING PERP 84 (PA560)
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6	CCTV 82 (PA528)	W R 82 (PA528)
7	CCTV 83 (PA544)	W R 83 (PA544)
8	CCTV 84 (PA560)	W R 84 (PA560)
9	CCTV 85 (PA576)	POWER 85 (PA576)
10	CCTV 82 (PA528)	POWER 86 (PA528)
11	CCTV 83 (PA544)	POWER 87 (PA544)
12	CCTV 84 (PA560)	POWER 88 (PA560)
13	COMB 81 (PA512)	SERVICE DUCT 81 (PA512)
14	COMB 82 (PA528)	SERVICE DUCT 82 (PA528)
15	COMB 83 (PA544)	SERVICE DUCT 83 (PA544)
16	COMB 84 (PA560)	SERVICE DUCT 84 (PA560)
17	FUELOIL 81 (PA512)	STORM SEWER
18	FUELOIL 82 (PA528)	TRAFFIC 81 (PA512)
19	FUELOIL 83 (PA544)	TRAFFIC 82 (PA528)
20	FUELOIL 84 (PA560)	TRAFFIC 83 (PA544)
21	FUELOIL 85 (PA576)	TRAFFIC 84 (PA560)
22	FUGL SEWER	UNKNOWN 85 (PA576)
23	GAUGE LINE 81 (PA512)	UNKNOWN 86 (PA512)
24	GAUGE LINE 82 (PA528)	UNKNOWN 87 (PA528)
25	GAUGE LINE 83 (PA544)	UNKNOWN 88 (PA544)
26	GAUGE LINE 84 (PA560)	UNKNOWN 89 (PA560)
27	GAS 1 (PA512)	VENT 81 (PA512)
28	GAS 2 (PA528)	VENT 82 (PA528)
29	GAS 3 (PA544)	VENT PIPE 83 (PA544)
30	GAS 4 (PA560)	VENT PIPE 84 (PA560)
31	GENERATOR PIPE 81 (PA512)	WATER 81 (PA512)
32	GENERATOR PIPE 82 (PA528)	WATER 82 (PA528)
33	GENERATOR PIPE 83 (PA544)	WATER 83 (PA544)
34	GENERATOR PIPE 84 (PA560)	WATER 84 (PA560)
35	OFFSET FUEL GAS (PA512)	GRP 81 (PA512)
36	OFFSET FUEL GAS (PA528)	GRP 82 (PA528)
37	OFFSET FUEL GAS (PA544)	GRP 83 (PA544)
38	OFFSET FUEL GAS (PA560)	GRP 84 (PA560)



Acoustic Connection	AC	Inspection Cover	IC	Stop Valve	SV
Assumed Route	AR	Lamp Post	LP	Stail Vent Pipe	SV
Backdrop	BD	Manhole	MH	Taken From Records	TR
Base Level	BL	No Further Information	NFI	Top Of Tank	TO
CG	CG	Off Surface Area	OSA	Top Of Pipe	TOP
Catchpit	CP	Pipe To Ground	PTG	Traffic Light	TL
Drainage Channel	DCH	Pipe To Surface	PTS	Telegraph Pole	TP
Electricity Pole	EP	Pipe Riser	PR	Unable to Locate	UT
Earth Rod	ER	Rooding Eye	RE	Unable to Raise	UR
Fire Hydrant	FH	Rain Water Pipe	RWP	Unable to Survey	US
Gate Valve	GV	Silt Level	SL	Unable to Trace	UT
Gully	GY	Soil Pipe	SP	Unable to Turn Further	UT
Internal Depth	ID	Soft Height	SOF	Vent Pipe	VP
Invert Level	IL	Survey Abandoned	SA	Water Level	WL

Quality	Description
B1	Service verified in an open excavation or inside an inspection chamber
B1A	Horizontal and vertical location within $\pm 150\text{mm}$ accuracy
B2	Horizontal and vertical location within $\pm 150\text{mm}$ accuracy
B3	Horizontal location only using one geophysical technique. No depth
B4	Service is expected to exist, assumed or taken from records
B1P/B2P	Service verified using post processed GPR Data.



No	Date	Description
R0	03/11/23	SITE VISIT COMPLETE.(GB/JS/JM)
R1		
R2		
R3		
R4		

- Staff / as-built plans have been reviewed and added appropriate desk top study must be reviewed in accordance with this plan prior to any ground works.
- EM, sewerage cover condition has been inspected. The Power feed for the school was located, traced and mapped out.
- Water and Sewerage Cement and water to be traced using EM, Records have been added for the survey.
- Gas is present within the survey area however it is unable to be traced due to the material being concrete being used which is plastic and can't be traced using EM. Records have been added for the service. Gas Valves are sealed and unable to be surveyed.
- The school Foul Main sewer running along the site Western side of the survey extents. At the time of the survey sewer conditions were poor and ground conditions were therefore poor as a result of this. The grass areas were covered with a layer of silt from the GPR. The sewer was traced and mapped out. Several manholes were located.
- Manholes at the school are old steel and concrete Gastic covers that are extremely heavy, therefore the team had to raise the manhole covers with a crane and then lift them up and released from the frame as well just pushing the frame away and causing them to nearly break.
- Methyl alcohol undertaken adjacent to the building on hard areas only and M2 from the rest of the site as instructed by the client.

- Staff / as-built plans have been reviewed and added appropriate, desk top study must be reviewed in accordance with this plan prior to any ground works.
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Solum Surveying Ltd

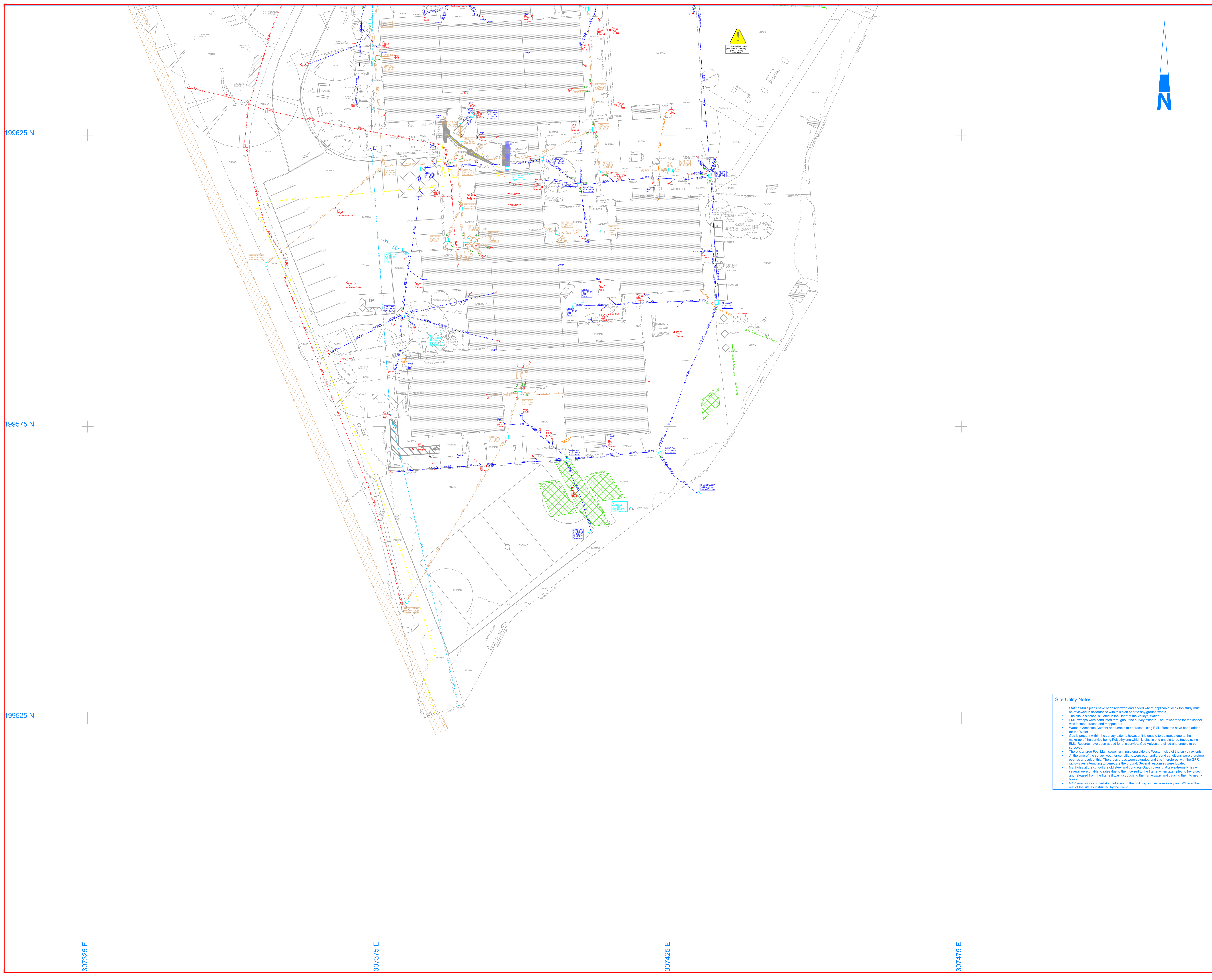
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Merthyr
Tydfil,
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Scale 1:200	Sheet Size: A0	Sheet: 1 of 2	ALSO SEE DRAWING:
		Drawing Date: 30/11/23	CCTV REPORT
Project Number: 11338	Rev. R0	Surveyed By: GB/JM/JS Drawn By: GB/ST/JM	CHECKED BY: MP



Notes :

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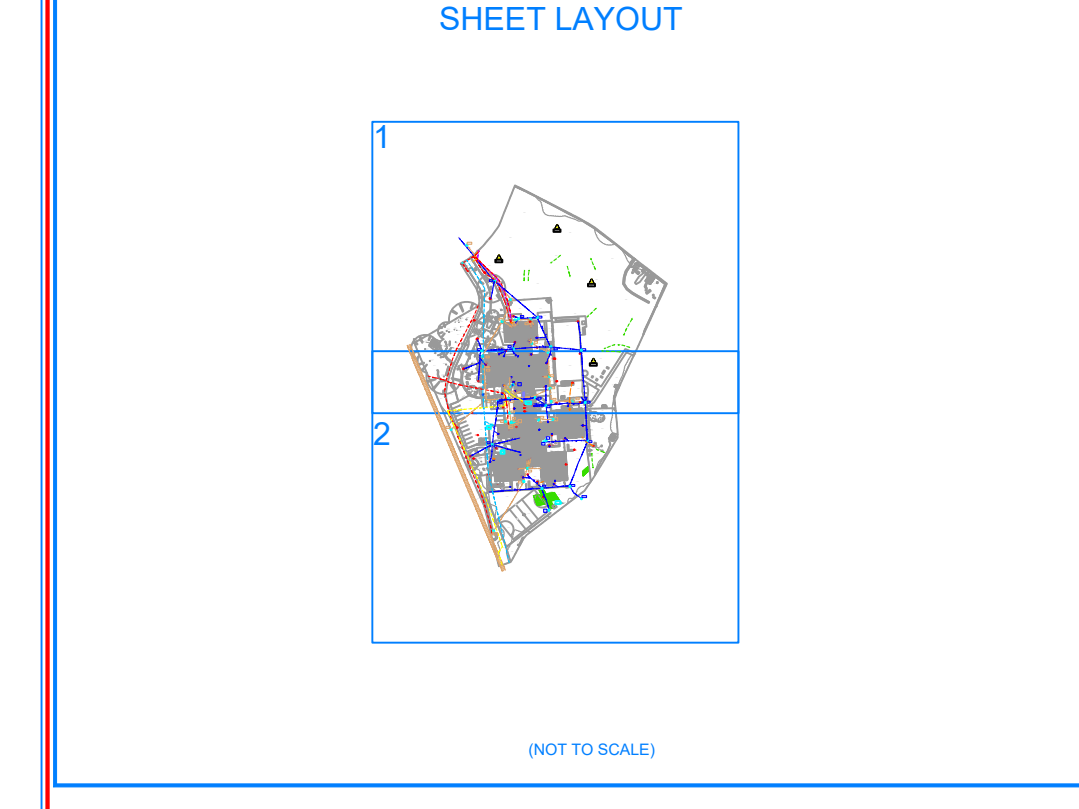
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UTILITY LINE TYPE KEY			
BT B1 (PAS128)	HEATING PIPES B1 (PAS128)	BT B1 (PAS128)	HEATING PIPES B1 (PAS128)
BT B2 (PAS128)	HEATING PIPES B2 (PAS128)	BT B2 (PAS128)	HEATING PIPES B2 (PAS128)
BT B3 (PAS128)	HEATING PIPES B3 (PAS128)	BT B3 (PAS128)	HEATING PIPES B3 (PAS128)
BT B4 (PAS128)	HEATING PIPES B4 (PAS128)	BT B4 (PAS128)	HEATING PIPES B4 (PAS128)
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CATV B3 (PAS128)	TV B3 (PAS128)	CATV B3 (PAS128)	TV B3 (PAS128)
CATV B4 (PAS128)	TV B4 (PAS128)	CATV B4 (PAS128)	TV B4 (PAS128)
CCTV B1 (PAS128)	POWER B1 (PAS128)	CCTV B1 (PAS128)	POWER B1 (PAS128)
CCTV B2 (PAS128)	POWER B2 (PAS128)	CCTV B2 (PAS128)	POWER B2 (PAS128)
CCTV B3 (PAS128)	POWER B3 (PAS128)	CCTV B3 (PAS128)	POWER B3 (PAS128)
CCTV B4 (PAS128)	POWER B4 (PAS128)	CCTV B4 (PAS128)	POWER B4 (PAS128)
COMMS B1 (PAS128)	SERVICE DUCT B1 (PAS128)	COMMS B1 (PAS128)	SERVICE DUCT B1 (PAS128)
COMMS B2 (PAS128)	SERVICE DUCT B2 (PAS128)	COMMS B2 (PAS128)	SERVICE DUCT B2 (PAS128)
COMMS B3 (PAS128)	SERVICE DUCT B3 (PAS128)	COMMS B3 (PAS128)	SERVICE DUCT B3 (PAS128)
COMMS B4 (PAS128)	SERVICE DUCT B4 (PAS128)	COMMS B4 (PAS128)	SERVICE DUCT B4 (PAS128)
FUEL OIL B1 (PAS128)	STORM SEWER	FUEL OIL B1 (PAS128)	STORM SEWER
FUEL OIL B2 (PAS128)	TRAFFIC B1 (PAS128)	FUEL OIL B2 (PAS128)	TRAFFIC B1 (PAS128)
FUEL OIL B3 (PAS128)	TRAFFIC B2 (PAS128)	FUEL OIL B3 (PAS128)	TRAFFIC B2 (PAS128)
FUEL OIL B4 (PAS128)	TRAFFIC B3 (PAS128)	FUEL OIL B4 (PAS128)	TRAFFIC B3 (PAS128)
GAUGE LINE B1 (PAS128)	TRAFFIC B4 (PAS128)	GAUGE LINE B1 (PAS128)	TRAFFIC B4 (PAS128)
GAUGE LINE B2 (PAS128)	UNKNOWN B1 (PAS128)	GAUGE LINE B2 (PAS128)	UNKNOWN B1 (PAS128)
GAUGE LINE B3 (PAS128)	UNKNOWN B2 (PAS128)	GAUGE LINE B3 (PAS128)	UNKNOWN B2 (PAS128)
GAUGE LINE B4 (PAS128)	UNKNOWN B3 (PAS128)	GAUGE LINE B4 (PAS128)	UNKNOWN B3 (PAS128)
GAS B1 (PAS128)	UNKNOWN B4 (PAS128)	GAS B1 (PAS128)	UNKNOWN B4 (PAS128)
GAS B2 (PAS128)	WATER B1 (PAS128)	GAS B2 (PAS128)	WATER B1 (PAS128)
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GAS B4 (PAS128)	WATER B3 (PAS128)	GAS B4 (PAS128)	WATER B3 (PAS128)
GENERIC PIPE B1 (PAS128)	WATER B4 (PAS128)	GENERIC PIPE B1 (PAS128)	WATER B4 (PAS128)
GENERIC PIPE B2 (PAS128)	WATER B5 (PAS128)	GENERIC PIPE B2 (PAS128)	WATER B5 (PAS128)
GENERIC PIPE B3 (PAS128)	WATER B6 (PAS128)	GENERIC PIPE B3 (PAS128)	WATER B6 (PAS128)
GENERIC PIPE B4 (PAS128)	WATER B7 (PAS128)	GENERIC PIPE B4 (PAS128)	WATER B7 (PAS128)
OFFSET FUEL B1 (PAS128)	GPR B1 (PAS128)	OFFSET FUEL B1 (PAS128)	GPR B1 (PAS128)
OFFSET FUEL B2 (PAS128)	GPR B2 (PAS128)	OFFSET FUEL B2 (PAS128)	GPR B2 (PAS128)
OFFSET FUEL B3 (PAS128)	GPR B3 (PAS128)	OFFSET FUEL B3 (PAS128)	GPR B3 (PAS128)
OFFSET FUEL B4 (PAS128)	GPR B4 (PAS128)	OFFSET FUEL B4 (PAS128)	GPR B4 (PAS128)

ABBREVIATIONS			
Acoustic Connection	AC	Imposition Cover	IC
Assumed Route	AR	Lamp Post	LP
Backstop	BD	Manhole	MH
Base Level	BL	No Further Information	NFI
Cover Level	CL	Off Survey Area	OSA
Catlight	CP	Pipe To Ground	PTG
Drainage Channel	DCH	Pipe To Surface	PTS
Electricity Pole	EP	Pipe Riser	PR
Earth Rod	ER	Rodding Eye	RE
Fire Hydrant	FH	Rain Water Pipe	RWP
Gas Valve	GV	Soil Level	SL
Gravel	GY	Soil Pipe	SP
Internal Depth	ID	Soil Height	SH
Invert Level	IL	Survey Abandoned	SA
		Water Level	WL
		Ship Valve	SV
		Soil Vent Pipe	SVP
		Taken From Records	TFR
		Top Of Tank	TOT
		Top Of Pipe	TOP
		Traffic Light	TL
		Telegraph Pole	TP
		Unable to Locate	UTL
		Unable to Raise	UTR
		Unable to Survey	UTS
		Unable to Trace	UTT
		Unable to Trace Further	UTF
		Vent Pipe	VP
		Water Level	WL

PAS UTILITY CLASSIFICATION	
Quality	Description
BA	Service verified in an open excavation or inside an inspection chamber
B1	Horizontal and vertical location within +/-150mm accuracy
B2	Horizontal and vertical location within +/-150mm accuracy
B3	Horizontal location only using one geophysical technique. No depth
B4	Service is expected to exist, assumed or taken from records
B1P/B2P	Service verified using post processed GPR Data.



Drawing Revision		
No	Date	Description
R0	03/11/23	SITE VISIT COMPLETE (GB/JS/JM)
R1		
R2		
R3		
R4		

Site Utility Notes :

- Site / as-built plans have been reviewed and added where applicable, desk top study must be reviewed in accordance with this plan prior to any ground works.
- The site is a school situated in the Heart of the Valleys, Wales.
- EMR surveys were conducted throughout the survey extents. The Power lead for the school was located, traced and mapped out.
- Water is Adcock's Cement and unable to be traced using EML. Records have been added for the Water.
- Gas is present within the survey extents however it is unable to be traced due to the make-up of the service being Polyethylene which is plastic and unable to be traced using EML. Records have been added for this service. Gas Valves are sited and unable to be surveyed.
- There is a large Foul Main sewer running along side the Western side of the survey extents.
- At the time of the survey weather conditions were poor and ground conditions were therefore poor as a result of this. The grass areas were saturated and this interfered with the GPR readings attempting to penetrate the ground. Several responses were located.
- Manholes at the school are old steel and concrete Gatic covers that are extremely heavy, several were unable to rise due to them being in the frame, when attempted to be raised and released from the frame it was just pushing the frame away and causing them to nearly break.
- MAP level survey undertaken adjacent to the building on hard areas only and M2 over the rest of the site as instructed by the client.



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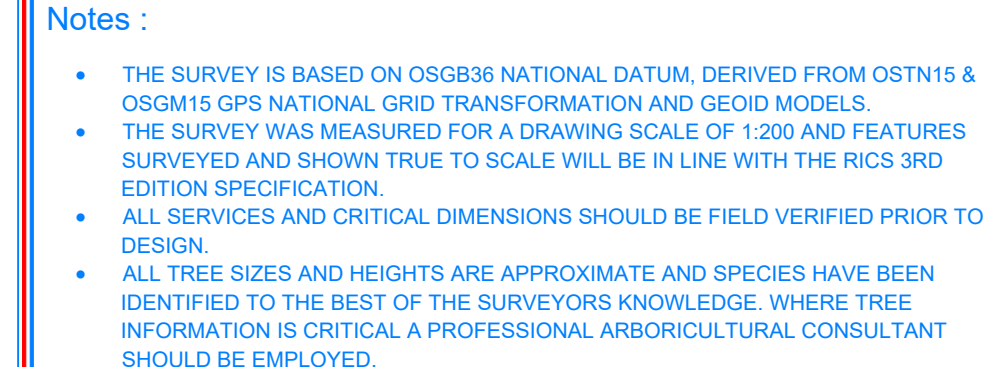
Cambria

Ysgol Rhyd Y Grug,
Merthyr
Tydfil,
CF48 4NT

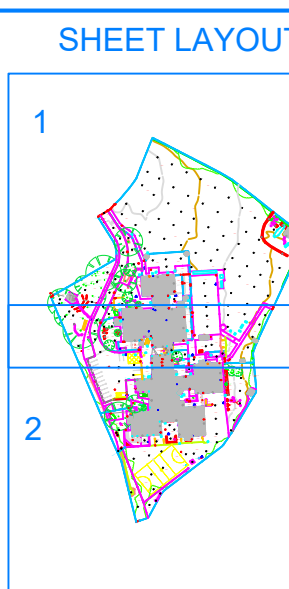
PAS128 Utility & Cctv Survey

Scale	Sheet Size	Sheet	2 of 2	ALSO SEE DRAWING:
1:200	A0	Drawing Date:	30/11/23	CCTV REPORT
Project Number:	11338	Rev:	R0	Surveyed By: GB/JS/JM
		Drawn By:	GB/ST/JM	CHECKED BY: MP

1

 SS01[illegible]

Station	Description	Eastings	Northings	Level
S501	ROAD NAIL	703777.65	195956.60	133.36
S502	ROAD NAIL	703777.65	195956.60	133.36
S502A	ROAD NAIL	703775.96	195951.70	133.67
S502B	ROAD NAIL	704201.03	19570.46	133.67
S503	ROAD NAIL	703775.96	195951.74	133.63
S503A	ROAD NAIL	703782.80	195852.67	133.59
S504	ROAD NAIL	704658.12	195658.12	133.60
S505	ROAD NAIL	704728.77	195659.102	133.53
S505A	ROAD NAIL	704658.13	195652.74	133.54
S506	ROAD NAIL	704740.07	195691.025	133.52
S506C	ROAD NAIL	704703.044	195691.161	133.53
S506B	ROAD NAIL	704740.07	195692.152	133.53
S506A	ROAD NAIL	704745.467	195691.130	133.53
S507	ROAD NAIL	704719.860	195691.679	133.54



Drawing Revision		
No	Date	Description
R0	01/11/23	Topographic Survey Complete
R1		
R2		
R3		
R4		

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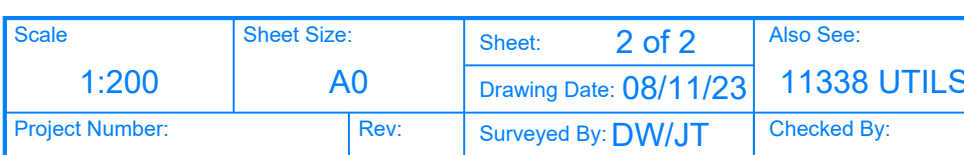
 **RICS**

Regulated by

Ysol Rhyd Y Grug
Aberfan,
Merthyr Tydfil,
CF48 4NT

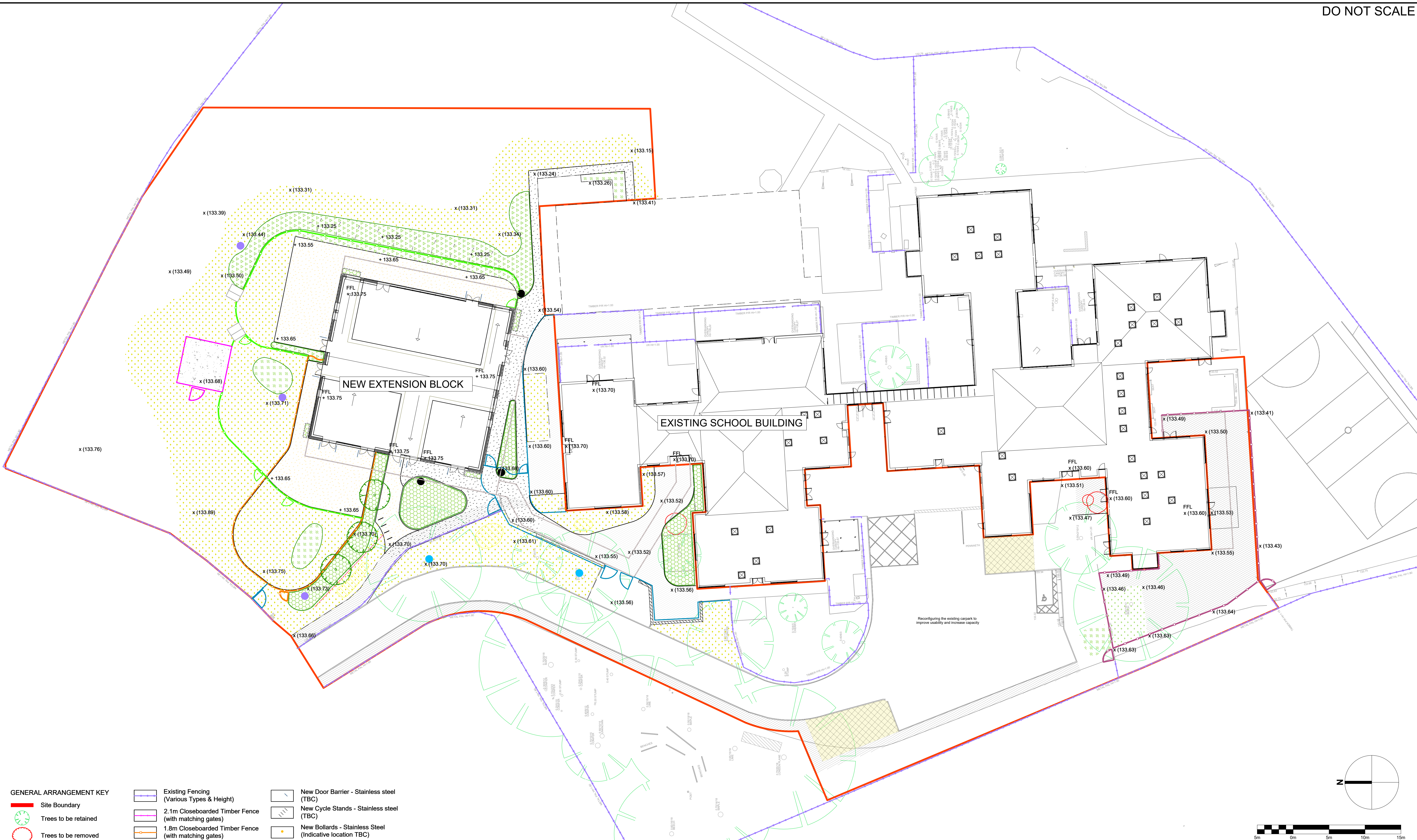
Topographical Survey

Scale 1:200	Sheet Size: A0	Sheet: 1 of 2	Also See: 11338 UTILS
		Drawing Date: 08/11/23	
Project Number: 11338	Rev: R0	Surveyed By: DW/JT	Checked By: SD
		Drawn By: DW/JT	



Appendix B: AtkinsRealis Site Layout

0 10 100
Millimetres



- GENERAL ARRANGEMENT KEY**

 - Site Boundary
 - Trees to be retained
 - Trees to be removed
 - New Tree Planting
 - New Ornamental planting
 - New Bio-retention / Rain Garden
 - SUDs Swale feature
 - New Wildflower Meadow To Habitat Area
 - Reinstated Amenity grass
 - New Bulb Planting
 - Tree Root Barrier Protecting Below Ground Services
- Existing Fencing (Various Types & Height)
 - 2.1m Closeboarded Timber Fence (with matching gates)
 - 1.8m Closeboarded Timber Fence (with matching gates)
 - 1.5m Timber Picket Round Top Fence (with matching gates)
 - 1.1m Steel / Timber Panel Fence (with matching gates)
 - 1.1m Timber Post and Rail fence (with matching gates)
 - New Vehicle Grade Asphalt (Permeable Surfacing) [Black]
 - Existing Pedestrian Asphalt [Black] to be Retained / Repaired
 - Resurfacing with Pedestrian Grade Asphalt (Impermeable) [Black]
 - New Pedestrian Grade Asphalt (Permeable Surfacing) [Black]
 - New Pedestrian Grade Asphalt (Permeable Surfacing) [Coloured]
 - New MEP External Plant Compound Concrete Plinth
- New Door Barrier - Stainless steel (TBC)
 - New Cycle Stands - Stainless steel (TBC)
 - New Bollards - Stainless Steel (Indicative location TBC)
 - New Rainwater Storage Planter (Indicative location TBC)
 - New Hedgehog house (Indicative location TBC)
 - New Bird / Bat box fixed to existing tree (Indicative location TBC)
 - New Canopy
 - Canopy Feature Rain Chain (Indicative location TBC)
 - Relocated Play Shed (Indicative location TBC)
 - Existing Brick Wall To be retained
 - Existing Spot Height Level (AOD)
 - Proposed Spot Height Level (AOD)

Rev.	Date	Description	By	Chk'd	App'd
P01	30.08.24	FOR COSTING	MM	JM	WR

Drawing Status

FOR INFORMATION

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Client

**MERTHYR TYDFIL
COUNTY BOROUGH COUNCIL**

Project Title

YSGOL RHYD Y GRUG

Drawing Title

LANDSCAPE GENERAL ARRANGEMENT

Scale	Designed	Drawn	Checked	Authorised
1:250	MM	MM	JM	WR
Original Size	Date	Date	Date	Date
A1	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Drawing Number				Revision
RYF-ATR-XX-XX-D-L-400001				P01

Appendix C: Greenfield Runoff Calculations

Description	Return period (yrs)	As-rural peak flow (m ³ /s)	Greenfield (l/s/ha)	As-rural direct runoff (ML)
1 year	1	0.006341092	6.34	0.041166216
2 year	2	0.007279761	7.28	0.047947341
5 year	5	0.010269104	10.27	0.069587371
10 year	10	0.012300958	12.30	0.08432911
30 year	30	0.015493117	15.49	0.107533503
50 year	50	0.017019843	17.02	0.118648026
75 year	75	0.018264438	18.26	0.12771561
100 year	100	0.019168373	19.17	0.134304946
200 year	200	0.021443673	21.44	0.150903517
1000 year	1000	0.027892133	27.89	0.198028592

Greenfield Rates Per Hectare

Development				
Contributing Area (m ²)	10000	Q1	6.34	
		Q2	7.28	
		Q5	10.27	
		Q30	15.49	
		Q100	19.17	
		QBAR (approx Q2.3)	7.58	l/s/ha

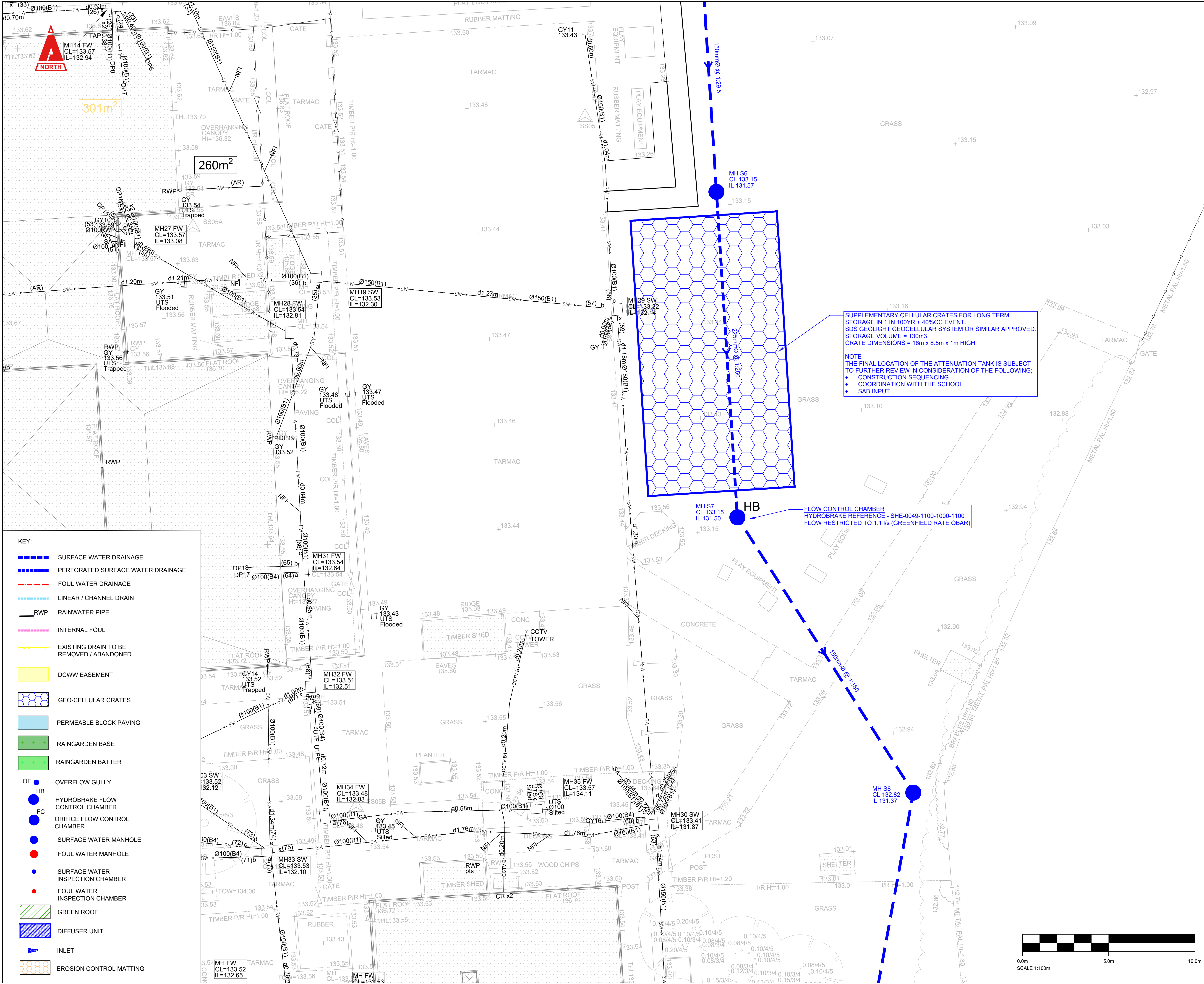
Restricted Discharge Rate - System 1

Development				
Contributing Area (m ²)	1370	Q1	0.87	
		Q2	1.00	
		Q5	1.41	
		Q30	2.12	
		Q100	2.63	
		QBAR (approx Q2.3)	1.04	l/s

Restricted Discharge Rate - System 2

Development				
Contributing Area (m ²)	355	Q1	0.23	
		Q2	0.26	
		Q5	0.36	
		Q30	0.55	
		Q100	0.68	
		QBAR (approx Q2.3)	0.27	l/s

Appendix D: Proposed Drainage Layouts



KEY:

- SURFACE WATER DRAINAGE
- PERFORATED SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- LINEAR / CHANNEL DRAIN
- RWP RAINWATER PIPE
- INTERNAL FOUL
- EXISTING DRAIN TO BE REMOVED / ABANDONED
- DCWW EASEMENT
- GEO-CELLULAR CRATES
- PERMEABLE BLOCK PAVING
- RAINGARDEN BASE
- RAINGARDEN BATTER
- OF OVERFLOW GULLY
- HB HYDROBRAKE FLOW CONTROL CHAMBER
- FC ORIFICE FLOW CONTROL CHAMBER
- SURFACE WATER MANHOLE
- FOUL WATER MANHOLE
- SURFACE WATER INSPECTION CHAMBER
- FOUL WATER INSPECTION CHAMBER
- GREEN ROOF
- DIFFUSER UNIT
- INLET
- EROSION CONTROL MATTING

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- NOTES**
- TOPOGRAPHICAL AND EXISTING UTILITY SURVEY INFORMATION PROVIDED BY SOLIM SURVEYING LTD - REFERENCE 1338, DATED 30/11/23.
 - TREE SURVEY CARRIED OUT BY ANDREW TAYLOR - ARBORICULTURALIST - FEBRUARY 2024.
- DRAINAGE STRATEGY**
- FOUL DRAINAGE**
- POPULATION NUMBERS ARE INTENDED TO INCREASE DUE TO THIS DEVELOPMENT THUS AN INCREASE IN PEAK FLOW FIGURE SHALL BE ESTABLISHED AND CATERED FOR.
 - IT IS ANTICIPATED THAT THE EXISTING ONSITE NETWORK SHALL BE UTILIZED FOR THE EXTENSION.
 - A SECTION 106 AGREEMENT SHALL BE IN PLACE PRIOR TO CONNECTION OF PROPOSED FOUL DRAINAGE.
 - A DCWW PRE-DEVELOPMENT ENQUIRY SHALL BE MADE TO ESTABLISH ALLOWANCE FOR THE DEVELOPMENT IN RESPECT OF FOUL DRAINAGE LOADING.
- SURFACE WATER DRAINAGE**
- SURFACE WATER DISPOSAL TO COMPLY WITH SUDs HIERARCHY AS SET OUT IN BUILDING REGULATIONS AND NATURAL RESOURCES WALES GUIDANCE.
 - MEETING THE 5mm INTERGRATION CRITERIA (NO INFILTRATION) ALL EXTERNAL HARDSTANDING TO BE A MIXTURE OF PERMEABLE AND RUNOFF DIRECTLY INTO BIORETENTION AREAS AND FILTER DRAINS WHERE POSSIBLE.
 - PROPOSED RUN OFF RATES SHALL BE DEPENDANT ON EXISTING LAND USAGE. RUNOFF FROM NEW IMPERMEABLE AREAS SHALL BE RESTRICTED TO GREENFIELD RATES AND RUNOFF RATES FROM THE REDEVELOPMENT OF EXISTING IMPERMEABLE AREAS SHALL PROVIDE A BETTERMENT OF 30%.
 - QUICK STORAGE ESTIMATE PROVIDES A VOLUME OF 164m³ TO CATER FOR THE 1 IN 100YR + 40% CLIMATE CHANGE EVENT.

DRAINAGE STRATEGY IS SUBJECT TO APPROVAL BY THE SAB AUTHORITY. IT IS STRONGLY ADVISED THAT A PRE-APP SAB APPLICATION IS SUBMITTED PRIOR TO RIBA STAGE 4.

SI SUGGESTS SETTLEMENT OF DRAINAGE INFRASTRUCTURE AND RECOMMENDS MINIMUM FALLS ARE AVOIDED. HOWEVER, SHALLOW EXISTING NETWORK AND FLAT SITE PROHIBIT STEEPER SLOPES.

P02	UPDATES TO DRAINAGE NETWORK AND ANNOTATIONS.	JD	BW	BW
			08/11/24	
P01	STAGE 3 ISSUE.	PY	BW	JB
			05/09/24	
Rev.	Description	By	Chk	App

Client:

Cambria Consulting Ltd
MERTHYR TYDFIL
County Borough Council

Project:

YSGOL RHYD Y GRUG

Drawing Title:

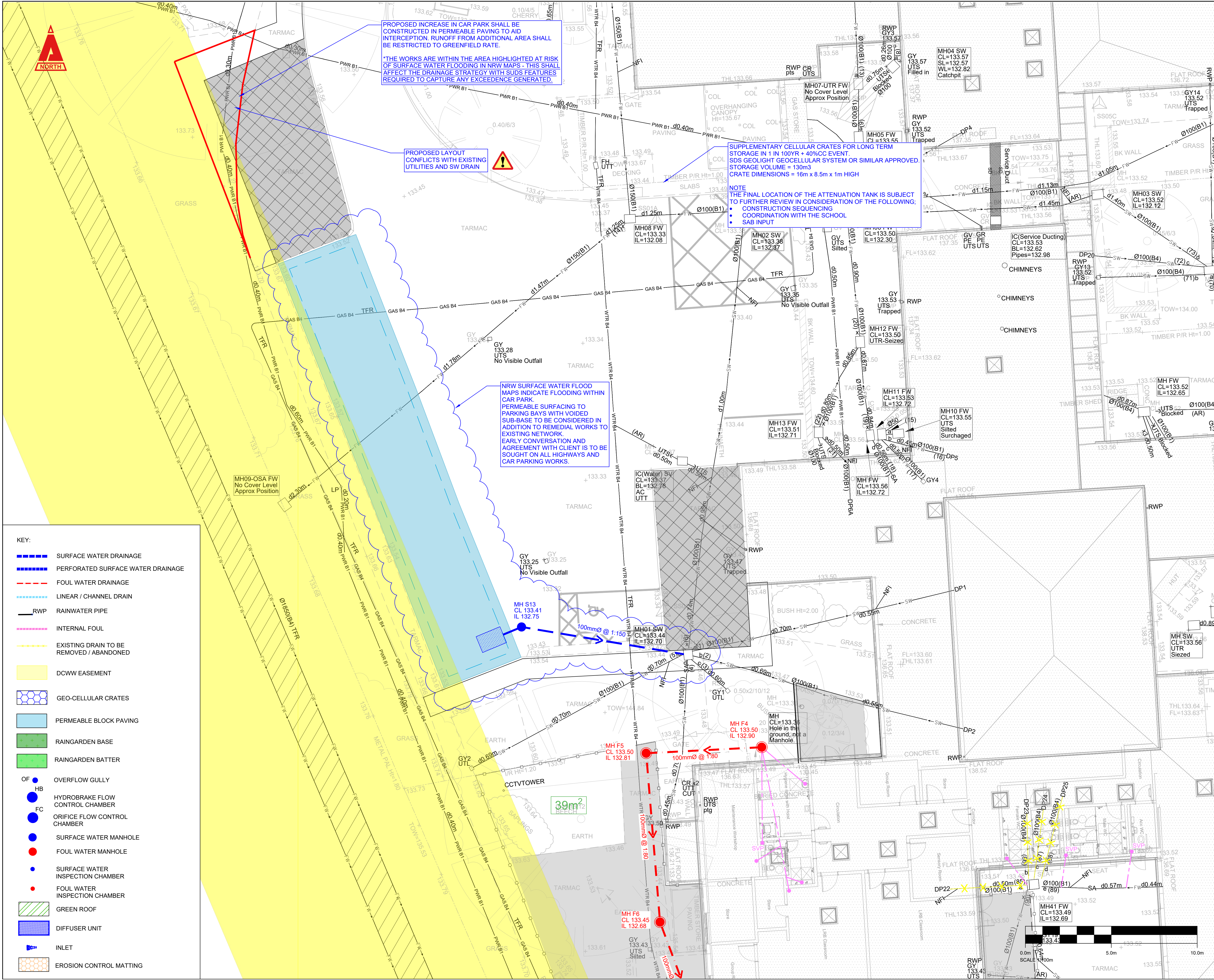
PROPOSED DRAINAGE LAYOUT (SHEET 2 OF 4)

Drawing No.	RYG	CAM	ZZ	XX	DR	C	1102
Project	Originator	Vol.	Level	Type	Role	Number	
Status:	SS	PRELIMINARY	Scale @A1:	1:100	Rev.	P02	

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NOTES

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- TREE SURVEY CARRIED OUT BY ANDREW TAYLOR - ARBORICULTURALIST - FEBRUARY 2024.

DRAINAGE STRATEGY

FOUL DRAINAGE

- POPULATION NUMBERS ARE INTENDED TO INCREASE DUE TO THIS DEVELOPMENT AND AN INCREASE IN PEAK FLOW FIGURE SHALL BE ESTABLISHED AND CATERED FOR.
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SI SUGGESTS SETTLEMENT OF DRAINAGE INFRASTRUCTURE AND RECOMMENDS MINIMUM FALLS ARE AVOIDED. HOWEVER, SHALLOW EXISTING NETWORK AND FLAT SITE PROHIBIT STEEPER SLOPES.

P03	VIEWPORT MOVED, ADDITIONAL NOTES.	JD	BW	BW
			08/11/24	
P02	REVISIONS AS PER ATKINSREALIS COMMENTS.	PY	BW	JB
			09/09/24	
P01	STAGE 3 ISSUE.	PY	BW	JB
			05/09/24	
Rev.	Description	By	Chk	App

Client:

Project:

YSGOL RHYD Y GRUG

Drawing Title:

PROPOSED DRAINAGE LAYOUT (SHEET 3 OF 4)

Drawing No.

RYG CAM ZZ XX DR C 1103

Project	Originator	Vol.	Level	Type	Role	Number
SS	PRELIMINARY		1:100			P03

Status:

SS PRELIMINARY

Scale @A1:

1:100

Rev.

P03

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