Land North of Bronwylfa Road, Wrexham - Outline Surface Water Drainage Strategy

Version 3

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Abbreviations

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BGS	British Geological Society
GI	Ground Investigation
Ha	Hectare
JBA	Jeremy Benn Associates
NRW	Natural Resources Wales
SAB	SuDS Approval Body
SuDS	Sustainable Drainage Systems

1 Introduction

1.1 Terms of Reference

JBA Consulting were commissioned by Innova Renewables Developments in April 2023 to prepare an outline surface water drainage strategy for a proposed energy storage site at Land north of Bronwylfa Road, Rhostyllen, Wrexham. The outline drainage strategy shall be used to support a planning application for the site and is to be submitted to the SuDS Approval Body (SAB) for pre-application consultation.

1.2 Site Description

The main development site is broadly triangular in shape, comprising a single agricultural field parcel and extends to approximately 5.5 ha in area. The site's boundaries feature a broad tree belt to the north and east, with hedgerows to the south and west. A former railway line runs along the northern boundary (set at a higher level and bounded by the mature vegetation) whilst the A483 lies to the east which is also elevated and bounded by mature established vegetation. The B5097 / Bronwylfa Road forms the southern boundary and Cadwgan Lane, a single-track road, forms the western boundary.

An existing vehicular access is located at the main development site's southern boundary from the B5097.

The land to the west of Cadwgan Lane comprises an L-shaped agricultural field and extends to approximately 3.4ha. It is bounded a tree belt to the north, Bersham Cricket Club to the southwest, and the B5097 / Bronwylfa Road to the south. An access track for abnormal loads extending to approximately 0.2ha is proposed on the southern part of this field.

Agricultural land and uses form the site's predominant surroundings to the north, south and west with pockets of residential properties dispersed throughout. To the east of the site (approx. 500m), on the opposite side of the A483, is the village of Rhostyllen. The Legacy National Grid Substation, which the proposals will connect to, is located approximately 750m west of the site.

Wrexham City Centre is located approximately 3km north-east.

No watercourses cross the proposed development site. The River Clywedog, an NRW Main River, flows in a general easterly direction approximately 500m to the north of the site. An unnamed ordinary watercourse flows approximately 250m to the north-west of the site and is a tributary to the River Clywedog. Approximately 550m to the south of the site is the Pentrebychan Brook, which flows into the Glanyrafon Brook to the eastern side of the A483. The Glanyrafon Brook then flows in a general easterly direction before converging with the River Clywedog around 2KM to the east of the site. A summary of the site details and the site location plan are shown in Table 1-1 and Figure 1-1 respectively.

Table 1-1 Summary of site details

Site name	Legacy Substation
Site area	5.5 ha
Existing land use	Greenfield
Proposal	Energy storage and substation
OS NGR	SJ 30546 48618
SuDS Approval Body	Wrexham County Borough Council
Sewerage Undertaker	Dŵr Cymru Welsh Water

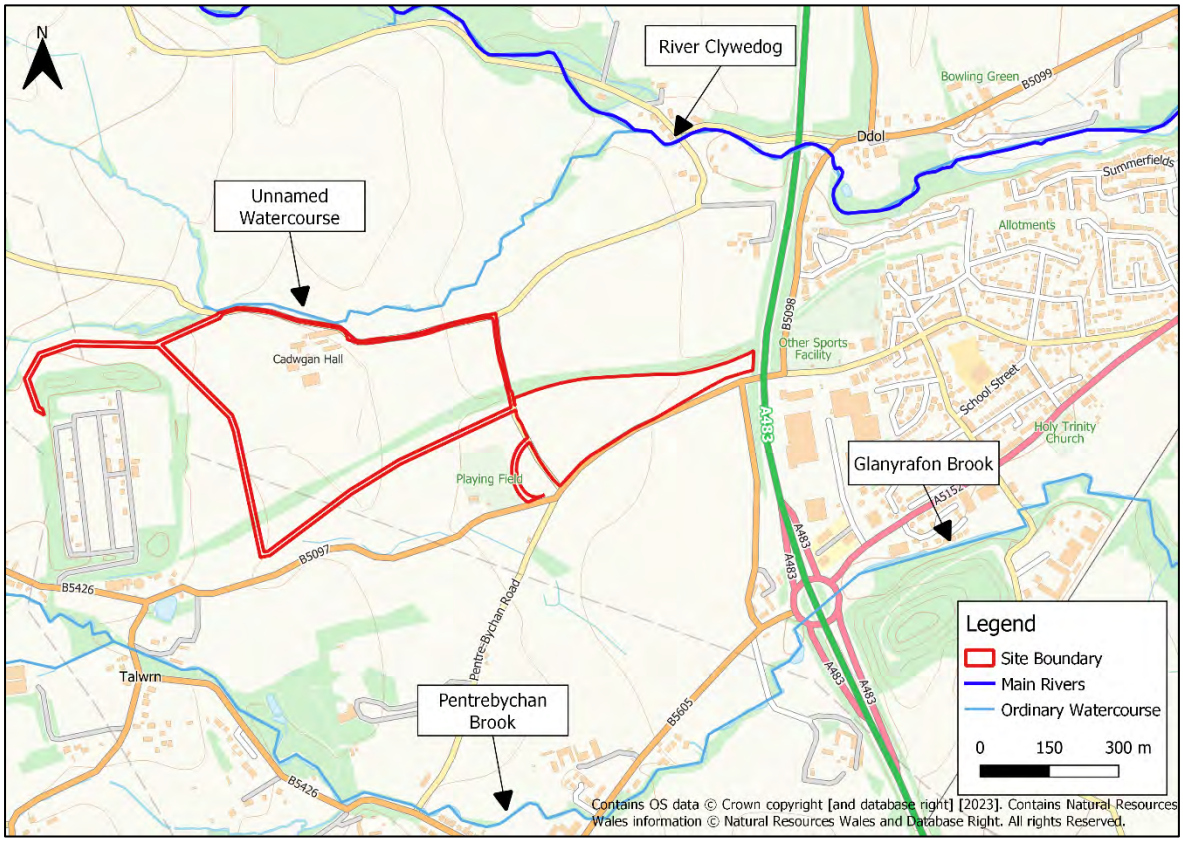


Figure 1-1 Site Location

1.3 Development Proposal

The proposal comprises installation and operation of an Energy Storage System (ESS) including energy storage units, substation, site access, cable connection, landscaping and ancillary infrastructure. A masterplan for the proposed development site is contained in Appendix A.

Access for construction and operation will be from the existing B5097 access and the new access established from the unnamed lane on the site's western boundary.

As part of the development proposals, a desk-based cut and fill exercise has been undertaken to alter ground levels across the site. A plan of the proposed ground levels across the site is included within Appendix A.

The proposed ESS development comprises:

- 400kV Substation with Gas Insulated Switchgear (GIS) building & Transformers;
- Energy storage containers;
- 33kV transformer bays;
- Medium Voltage (MV) Skid – Inverters & Transformers;
- Control buildings;
- Access from the adopted highway;
- Internal access road and crushed stone tracks;
- Drainage infrastructure, landscape, and ecological planting; and
- Security fencing and CCTV.

1.4 Existing site topography

A topographic survey of the site was undertaken by RPS Group in March 2023 and is contained in full in Appendix B. Natural Resources Wales (NRW) open source 1m Light Detection and Ranging (LiDAR) which provides an alternative illustration of the site topography, is shown in Figure 1-2.

The topographic survey indicates that a topographical ridge with levels ranging between approximately 116.36mAOD and 116.22mAOD is present in the most western part of the site. From there, ground levels generally fall in an easterly direction to approximately 105.61mAOD along the eastern boundary of the site.

The access road falls in a predominantly westerly direction with a fall from 113.05mAOD to 112.38mAOD. The camber of the road falls in a south-easterly direction, towards Bronwylfa Road.

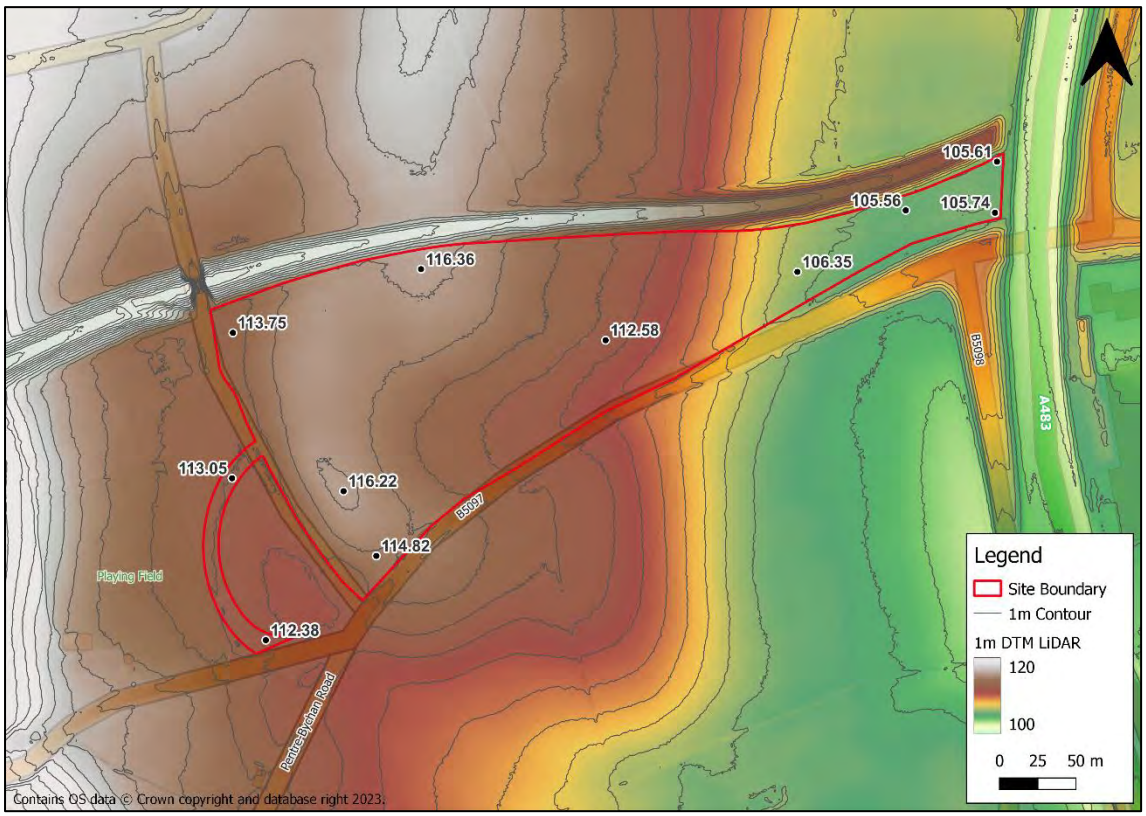


Figure 1-2 LiDAR topographic data from NRW (1m resolution) for the main site of interest

1.5 Summary of Surface Water Flood Risk

Surface water flooding occurs when rain falling on saturated ground flows overland, following the local topography. Surface water flooding and subsequent overland flow can therefore pose a risk to both the development site and the surrounding land. The overland flow may originate from the site itself or adjoining land at a higher elevation from which flow migrates onto the development.

The Natural Resources Wales (NRW) flood map for surface water and small watercourses, as shown in Figure 1-3, identifies the site as being predominantly at very low risk of surface water flooding (i.e. less than 1 in 1000 (<0.1% AEP) chance of flooding from rainfall in any given year).

A small area in the east of the site is shown to be at high risk of surface water flooding. (i.e. greater than 1 in 30 (>3.3% AEP) chance of flooding in any given year). This surface water flood risk is likely a result of a localised depression in the site topography. Development proposals do not result in a change in ground levels in this area of the site, and no built development is proposed for this area. Consequently, there shall be no change in risk as a result of the proposals.

Surface water and small watercourse mapping also indicates the presence of surface water flow paths and ponding along the western boundary of the site. Ground levels at this location fall away from the proposed development site, and it is therefore considered that there is very low risk of these flows entering the development.

An area outside of the red line boundary, located between the proposed access road and main development site, is at high risk of surface water flooding, meaning there is a greater than 1 in 10 (>3.3% AEP) chance of flooding in any given year. This surface water risk is a result of a localised depression, retaining surface water at this location. Bronwylfa Road, the development site, and the access road are raised above this area of high surface water flood risk.

Along the proposed access road, a small area is shown to be at high risk of surface water flooding, as shown in Figure 1-4. Minor alterations in ground levels are proposed in this area, however it is not anticipated that the surface water flow path shall be interrupted as a result of the proposed access road. This is further discussed in Section 3.6.2 and within Section 4.5 of the Flood Risk Statement prepared for the site (refer to document KIR-JBAU-XX-XX-RP-D-0001-S3-P02-Legacy_Substation_FRS).

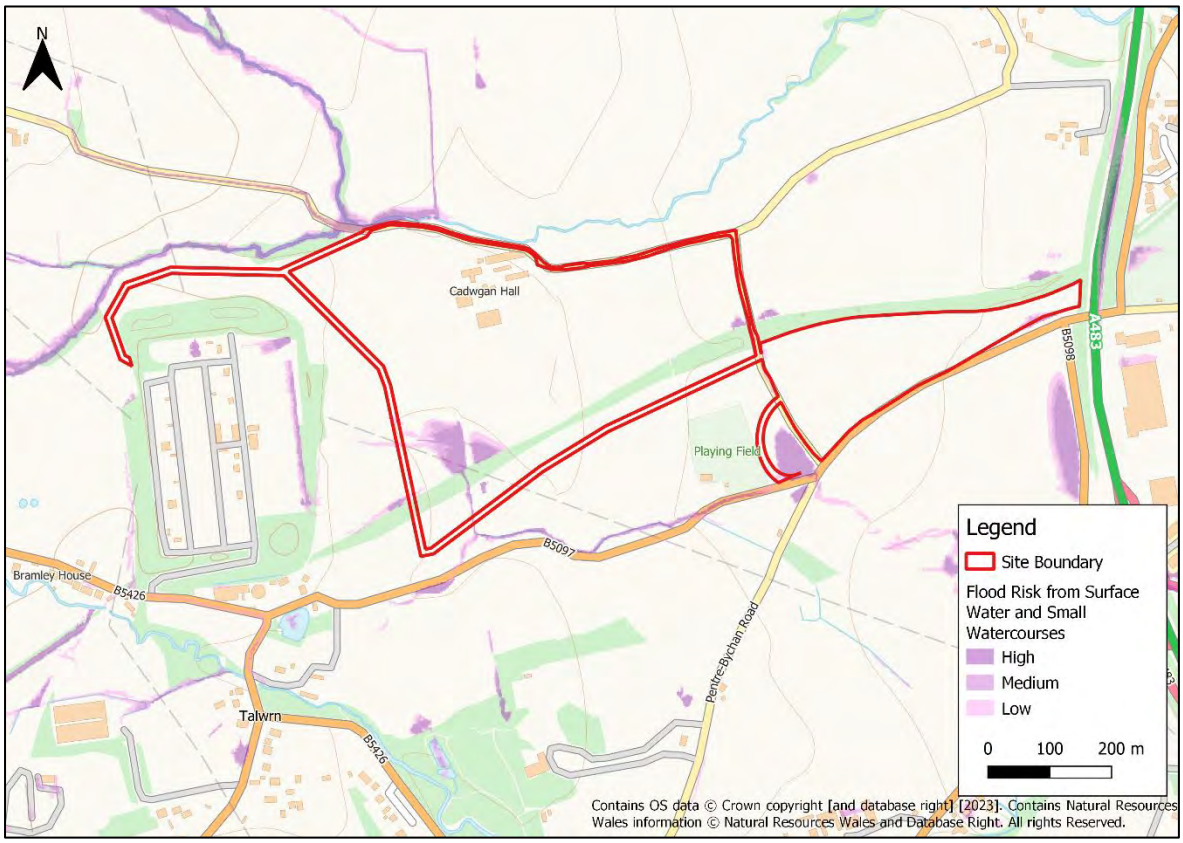


Figure 1-3 FRAW - Flood Risk from Surface Water and Small Watercourses

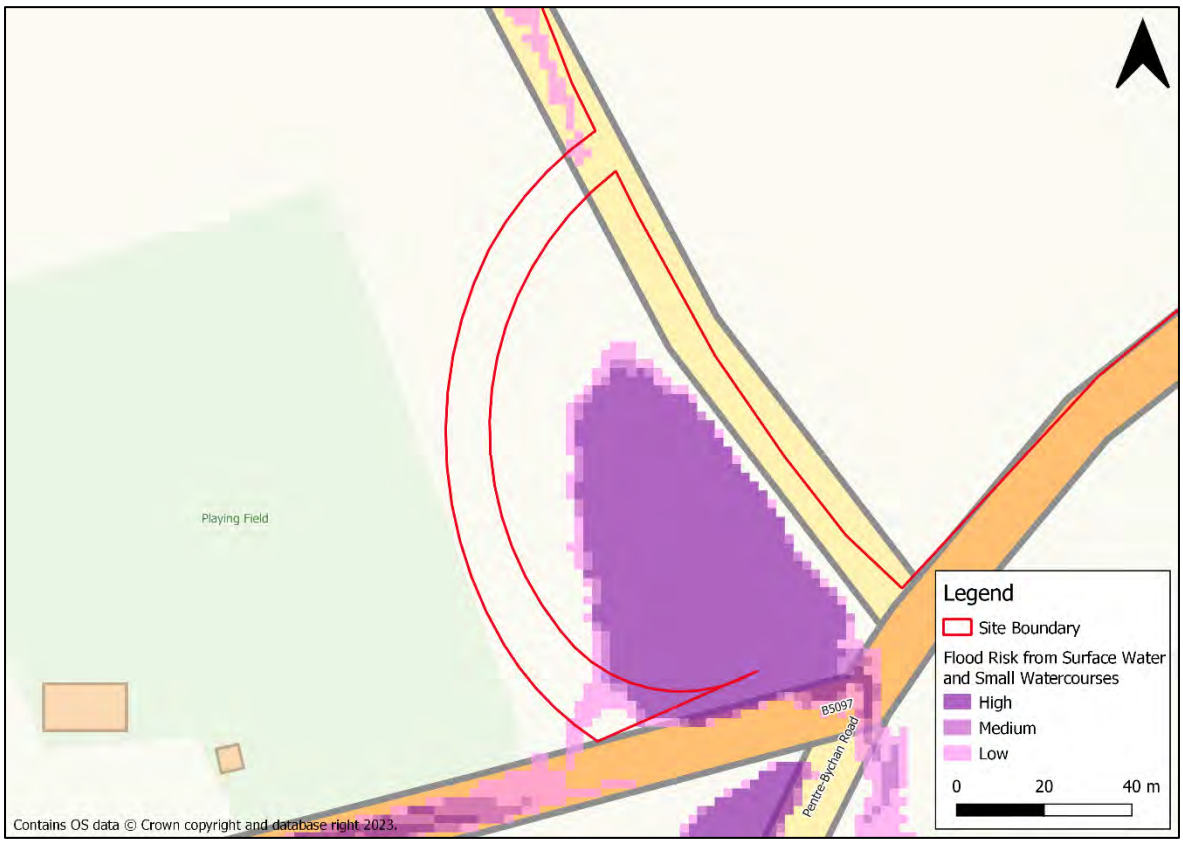


Figure 1-4 FRAW - Flood Risk from Surface Water and Small Watercourses - Access Road

1.6 Existing site constraints

Statutory undertaker's utility records have been provided by the Client to assist with this study and can be found in Appendix C. There are no gas, water, or electricity cables that are shown to cross the site underground at present, however an overhead 11kV line crosses the site.. A tree survey has been provided to inform site constraints, indicating that Root Protection Zones (RPZs) across the site are present, predominantly affecting the east of the site. The tree survey can be found in full in Appendix D. No further information has been provided at this time on any existing constraints related to ecology or land drainage. It is recommended that this information is obtained prior to detailed design.

2 Surface Water Drainage Strategy

2.1 Site geology and hydrogeology

The British Geological Society (BGS) GeoIndex[1] indicates that the western half of the proposed development is underlain by Pennine Lower Coal Measures formation - mudstone, siltstone, and sandstone. The east of the site is shown to be formed of Etruria Formation - mudstone. Superficial deposits are comprised of glaciofluvial deposits in the west and till in the east.

The soils on site have been assessed using the Cranfield University Soilscape viewer[2] and are shown to be freely draining slightly acid loamy soils.

BGS GeoIndex borehole records show a number of historical cores located near the site, to the south of the B5097. The boreholes, which were excavated in 1970 and 1978, were recorded to have been between 10 - 30m in depth, and no groundwater was recorded during these excavations.

A Ground Investigation (GI) was conducted on site by Gibbs Geotechnical in May 2023, the full report can be found in Appendix E.

Five trial pits were excavated at the site, as shown in Figure 2-1. All trial pits were successfully excavated to a depth of 1m. Grass loam was present from surface level to 0.2m, at which point a till/clay mix was encountered to the maximum depth of 1m.

Infiltration tests were carried out across the site as part of the GI and are summarised in Table 2-1, with test locations displayed in Figure 2-1.

Table 2-1 Infiltration Results

Trial Pit	Infiltration Rate (m/s)
TP6	8.5×10^{-5}
TP7	2.53×10^{-5}
TP8	Data error
TP9	6.23×10^{-6}
TP10	1.19×10^{-4}

1 https://mapapps2.bgs.ac.uk/geoindex/home.html
2 https://www.landis.org.uk/soilscapes/

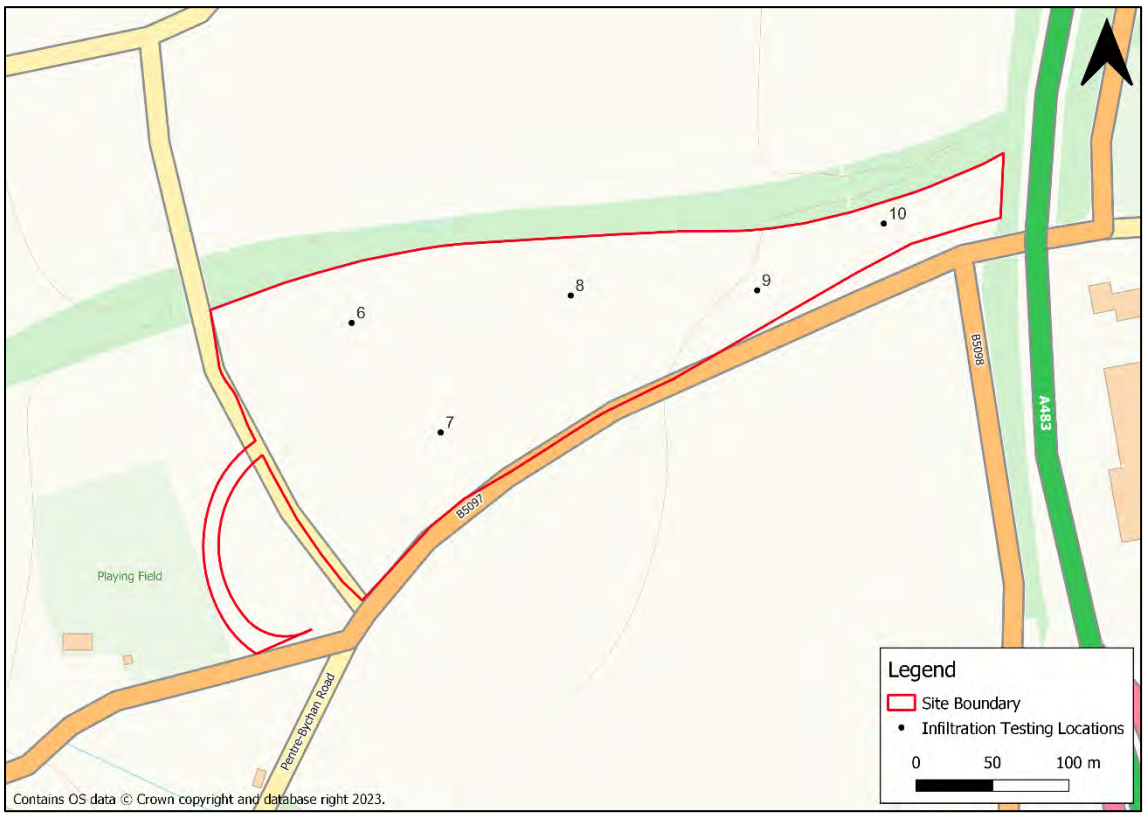


Figure 2-1 Trial Pit Locations for the main site of interest

2.2 Existing Surface Water Regime

There are no watercourses present within or in the immediate vicinity of the proposed development site. Additionally, utility records, contained in Appendix C, indicate that no public sewerage system crosses the proposed development site. Given the above positive infiltration rates, it is assumed that surface water currently drains via a combination of evapotranspiration, infiltration into underlying soils and overland flow following the local topography.

Greenfield runoff rates and volumes have been calculated and formed a key design criterion for the development of a surface water drainage system across the site.

2.3 Greenfield Runoff Rates

Table 24.1 of Ciria C753 The SuDS Manual indicates that FEH methods (FEH Statistical and ReFH20 should be the preferred method for calculating peak Greenfield runoff rates This is supported by Natural resources Wales GN008: Flood Estimation: Technical Guidance and Environment Agency Research by Faulkner et al which concluded that the FEH methods are applicable across a range of catchment sizes and that they should be used in place of outdated methods such as IH124 and ADAS 345, where possible.

The UK SuDS Tool was used to calculate the Greenfield runoff rates for the site. Catchment descriptors for the local catchment (SAAR and BFIHOST) were extracted from the FEH Web Service. The calculated Greenfield runoff rates for the main development site, with an

area of 5.5Ha are shown in Table 2-2 below and the UK SuDS calculation record is included in Appendix F.

Table 2-2 Greenfield Runoff Rates

Return Period	Specific Runoff (l/s/ha)	Peak Runoff Rate (l/s)
1	7.26	39.95
QBAR	8.25	45.40
30	14.69	80.82
100	17.99	98.98

2.4 Greenfield Runoff Volumes

Runoff volumes for the proposed development site were also calculated for the six-hour storm event using the FSSR16 method as shown in equation 1 below.

Equation 1:

Runoff Volume = Site Area x Rainfall Depth x Percentage Runoff

The rainfall depths for a six-hour 100-year storm event were extracted from the FEH Webservice and are summarised in Table 2-3 with the calculated Greenfield Runoff Volumes.

Table 2-3 Greenfield Runoff Volumes

Return Period	6-hour rainfall runoff depth (mm)	Site Runoff Volume (m^3)
30	56.73	1450
100	73.99	1975

3 Surface Water Management Approach

3.1 Surface Water Drainage Proposal

An outline surface water drainage proposal for the site has been developed, which will manage surface water runoff without increasing flood risk to other developments or impacting on water quality downstream. The development of the drainage strategy is via a number of steps where the drainage objectives and options for SuDS features are determined. The drainage strategy is contained in Appendix G. Further detailed design of the drainage scheme will be required once an agreement in principle has been received from the SuDS Approval Body (SAB).

The outline drainage strategy discusses each SuDS standard in turn and details the way in which the proposed surface water drainage strategy will comply with each standard.

3.2 Design Standards

The drainage strategy outlining the means of surface water management at the proposed development site has been produced in line with the latest guidance and design standards including:

- C753 "The SuDS Manual" (CIRIA 2015)
- Statutory standards for sustainable drainage systems - designing, constructing, operating and maintaining surface water drainage systems (Welsh Government 2018)
- Rainfall Runoff Management for Developments - SC030219 (Environment Agency 2013)
- Planning Policy Wales (Edition 9, November 2016)
- The Building Regulations 2010: Part H: Drainage and Waste Disposal

In line with Sustainable Drainage Systems Standards for Wales (2018), surface water runoff events up to the 1% AEP (1 in 100 year) plus climate change return period event should be managed to protect people and property on and adjacent to the site from flooding from the drainage system.

The Welsh SuDS Standards state that attenuation storage should be utilised to limit discharge of runoff from the site with surface storage features used in preference to underground systems as they are considered more adaptable.

Wrexham County Borough Council do not currently have specific guidance for SuDS. Should guidance be available at detailed design stage, it should also be consulted to inform the drainage strategy.

3.3 Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS) aim to mimic the natural processes of surface water drainage by allowing water to flow along natural flow routes ensuring that runoff rates and volumes during storm events are not increased above the Greenfield values. SuDS also

aim to provide water treatment, biodiversity, and amenity benefits within Blue and Green corridors.

Schedule 3 of the Flood and Water Management Act 2010 was enacted in Wales in January 2019, leading to the requirements for all new developments to incorporate the four pillars of SuDS design, shown in Figure 3-1.

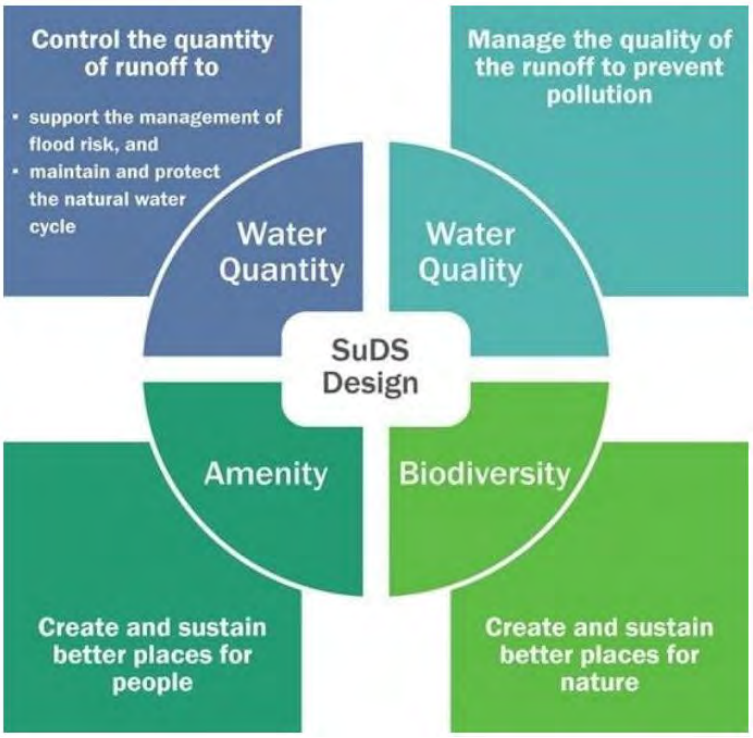


Figure 3-1 Four Pillars of SuDS Designs (CIRIA 2015)

3.4 Principles of SuDS

The proposed surface water drainage strategy complies with the standard principles of SuDS in the following way:

- Wherever possible across the site, water is managed as close to the surface as possible. Water is conveyed across the site via filter drains.
- Rainwater is treated as a valuable resource across the site by keeping water as close to the surface as possible through the use of filter drains, macro permeable paving, and an infiltration basin. SuDS assets will provide amenity and biodiversity benefits where possible across the site.
- Across the site, rainfall shall be managed to help protect critical infrastructure from increased flood risk through the implementation of techniques such as an infiltration basin and filter drains.
- Rainfall will be managed across the site to ensure the site does not flood during the 1 in 100-year plus 40% climate change event.
- A 40% climate change allowance will be applied to design flows.
- Two SuDS management trains are proposed for the site. Water falling on roofs, roads, and other hardstanding areas within the main site area will flow into filter

drains constructed adjacent to the roads. Water will then either infiltrate via the filter drain into the ground or will be conveyed into the infiltration basin in the east of the site. In the west of the site, the proposed access road shall utilise macro-permeable paving, allowing water storage and infiltration in the sub-base below impermeable surfaces in areas which are subject to high traffic loads and/or high shear forces from turning vehicles. This is based on an assumption that infiltration to ground is viable - subject to results of a more targeted ground investigation, including soakaway testing, groundwater levels monitoring, hydrogeological profiling and contamination risk assessment.

- The Simple Index Approach, in line with C753, will be used to demonstrate how surface water shall be managed to ensure that the proposed development site will not have a detrimental effect on water quality in the catchment.
- Biodiversity and amenity benefits are maximised across the site wherever possible. The use of vegetation around the infiltration basin increases opportunities for habitat creation and aids to promote a sense of wellbeing for employees A detailed Amenity and Biodiversity Plan will need to be produced at the detailed design stage.
- To make the best use of available land by working with the existing topography of the site and placing SuDS features in green areas of the proposed design, enhancing the environment and providing multifunctional areas of open space.
- To ensure that the scheme performs reliably and effectively for the lifetime of the development, a maintenance plan shall be produced during detailed design stage which shall detail the management and maintenance requirements of the system to ensure it functions to its optimal capacity in perpetuity.
- During detailed design stage, further information shall be provided on the affordability in terms of long-term maintenance costs through provision of a SuDS maintenance plan. The environmental and social benefits of the scheme are detailed in Section 3.8.

3.5 S1: Surface Water Runoff Destination

The Statutory Standards for SuDS in Wales address the use of surface water by the development and where it should be discharged. Standard S1 describes a destination hierarchy which sets out the preferred routes for discharge of runoff from the site:

- Priority Level 1: surface water runoff is collected for reuse.
- Priority Level 2: surface water runoff is infiltrated to ground.
- Priority Level 3: surface water runoff is discharged to a surface water body.
- Priority Level 4: surface water runoff is discharged to a surface water sewer; highway drain or other drainage system.
- Priority Level 5: surface water runoff is discharged to the combined sewer.

Priority Level 1 is the preferred (highest) priority and 4 and 5 should only be used in exceptional circumstances. The following outlines how the proposed development adheres to the drainage hierarchy.

3.5.1 Priority Level 1 - Water for reuse

Given the nature of the proposal for energy storage purposes, the potential for surface water re-use across the development is limited and would not provide a viable means for the disposal of surface water for the site.

3.5.2 Priority Level 2 - Infiltration

Based on the current information about underlying geology, borehole records and infiltration test results, disposal of the runoff via infiltration to ground may be viable on this site and this is being promoted as part of the drainage strategy. This will however need to be confirmed following a detailed targeted ground investigation that should include soakaway testing at specific locations and depths, soil testing for contamination and installation of permanent groundwater monitoring wells on the site and ideally monitoring groundwater conditions for 12 months (or as a minimum across late winter/early spring) to develop an understanding of groundwater level fluctuations and flow patterns in the area where the SuDS measures shall be constructed.

Depending on the ground and groundwater conditions on site either traditional shallow or deep bore soakaways may be installed.

Should these detailed investigations find that infiltration to the ground is not suitable for the site then discharge to the closest surface water body should be considered.

3.5.3 Priority Level 3 - discharge to surface water body.

An unnamed ordinary watercourse is located approximately 250m to the north of the site. This watercourse flows into the River Clywedog about 550m to the north of the site. If required surface water could be discharged into the Pentrebychan Brook to the south. Connections to any of those watercourses would require crossing third party land and obtaining appropriate consents and easements. These connections should be investigated at detailed design, should infiltration prove not to be viable.

As a suitable means of discharge is deemed to have been found, Priority Levels 4 and 5 have not been considered further.

3.6 S2: Surface Water Runoff Hydraulic Control: Proposed Discharge Rate

There are typically three design storm events which should be considered when designing the SuDS system for managing flows and volumes:

- 1 in 1 year event, on sloping sites where surcharging above soffits of any surface water drainage pipework is not permitted.
- 1 in 30-year storm event, where surface water flooding of the site does not occur at this frequency.
- 1 in 100-year storm event with allowance for future climate change, where runoff from the site should be controlled to Greenfield rate using SuDS attenuation features to manage flows and volumes within the extents of the development site.

3.6.1 Interception of Rainfall

When rainfall occurs on greenfield sites there is, for the majority of rainfall events no runoff due to evapotranspiration or groundwater recharge. Therefore, interception mechanisms are based on runoff volume reduction using evapotranspiration and infiltration processes. Table G2.1 of the Statutory Standards for SuDS in Wales lists the interception drainage components which have assumed compliance.

Given that the surface water drainage strategy proposes to discharge surface water via infiltration, it is evident that the site complies with the requirements for interception across the site.

3.6.2 Discharge limits and attenuation volume

Main Development Site

For the main development site, the infiltration rate recorded during the preliminary GI at the proposed location of the infiltration basin has been used (TP10 = 1.19 x 10^{-4} m/s) to estimate the total required attenuation volume for the site. This is based on a total proposed impermeable area of 1.71 ha.

MicroDrainage Source Control model has been utilised to estimate the required surface water storage for the 1 in 100-year plus 40% climate change event. Catchment descriptors were obtained from the Flood Estimation Handbook webservice and are summarised in Table 3-1 along with other user defined variables. The required attenuation volume for the main site area is estimated as **1007m³**. The Source Control calculation record can be found in Appendix H.

Table 3-1 User defined values

Variable	Value
Site area	5.5 ha
Area of public space	3.79 ha
Developable area	1.71 ha
Impermeable area	1.71 ha
Climate change allowance	40%
Urban creep allowance	N/A
BFI Host	0.413
SPR Host	43.22%
Cv (summer and winter)	0.95

As discussed in section 3.5.2 infiltration as a means of surface water discharge is dependent on detailed ground investigation findings. Should infiltration not be possible the

drainage strategy should be revised accordingly. This could include lining the basin on site, and introducing filter drains where possible and surface water pipes to convey water to the attenuation basin. Surface water could then be discharged at the existing QBAR rate of 47.31 l/s, as shown in Section 2.3, to the local watercourse.

Filter drains across the site will intercept runoff generated by the access roads, roofs, and other hardstanding areas and either infiltrate it to the ground or convey it to an infiltration basin, which will slowly drain it into underlying soils. It is proposed that the basin has a maximum water depth of 0.7m, including a 0.3m freeboard, and side slopes no steeper than 1 in 3. The approximate available storage in the basin is 974m³.

The approximate volume of storage provided in filter drains is 86m³, based on a depth of 0.6m, width of 0.3m and porosity of 30%.

Access Road

For the proposed access road to the west of the main development site, the infiltration rate recorded during the preliminary GI at the western boundary of the site has been used (TP7 = 2.53 x 10^{-5} m/s) to estimate the total required attenuation volume for the site. This is based on a total proposed impermeable area of 0.17 ha.

MicroDrainage Source Control model has been utilised to estimate the required surface water storage for the 1 in 100-year plus 40% climate change event. Catchment descriptors were obtained from the Flood Estimation Handbook webservice and are summarised in Table 3-1 along with other user defined variables. The required attenuation volume for the main site area is estimated as **84m³**. The Source Control calculation record can be found in Appendix H.

Variable	Value
Site area	0.17 ha
Area of public space	0.0 ha
Developable area	0.17 ha
Impermeable area	0.17 ha
Climate change allowance	40%
Urban creep allowance	N/A
BFI Host	0.413
SPR Host	43.22%
Cv (summer and winter)	0.95

Macro-permeable paving is proposed along the access road in the west of the site. It is proposed that macro-permeable paving shall be used to attenuate, as necessary, and

infiltrate surface water that lands on the proposed access road. It is proposed that the macro-permeable paving has a depth of 0.2m, a porosity of 0.3, and provides approximately 107m³ of storage volume.

Macro-permeable paving allows water storage and infiltration in the sub-base below impermeable surfaces in areas which are subject to high traffic loads and/or high shear forces from turning vehicles.

Due to site constraints, it is proposed to locate a small area of macro-permeable paving within the high-risk extent for surface water flooding, in order to provide sufficient storage for the proposed impermeable area. The requirement for abnormal loads to access the site means that the proposed access road cannot be modified to be sized or positioned outside of the surface water flood extent. It should be noted that only up to 6 abnormal load vehicle deliveries are forecast for the construction phase, and it is very unlikely any further deliveries will be required thereafter.

Existing flow paths shall not be interrupted, as surface water will be able to flow over the proposed macro-permeable paving. It is understood that a proportion of road shall experience surface water flooding of up to 90mm during high-risk flood events, however this only affects a fraction of the width of the road at the entrance, leaving 13m of road width flood free to ensure safe access and egress. Consequently, it is recommended that abnormal load deliveries shall only be scheduled to access the site around local weather warnings, to avoid surface water flood risk constraints or impacts to the development.

Due to the proposed ground levels of the site, it may be appropriate to include check dams within SuDS assets to slow the flow of water, increase storage potential of the asset and enhance infiltration.

3.6.3 Exceedance Events

Extreme events exceeding the design event or internal drainage blockages / failures could occur and result in overland flows across the site. The duration of flooding, maximum depths, velocity and route of flood flows should be established by detailed hydraulic modelling and managed. The impact of exceedance flows onto adjacent land should also be considered - the return period of this assessment will be related to the potential consequences associated with the impact, and further guidance is requested from the SAB. For the proposed development site, it is envisaged that flows generated by exceedance events shall be conveyed easterly along the proposed access tracks towards the infiltration basin in the lowest area of the site. It is recommended that critical infrastructure such as the storage units are raised to avoid being affected by exceedance flows. Exceedance flows shall be directed towards and managed by the basin before infiltrating after the storm subsides. Potential exceedance routes based on existing site ground levels can be seen on the drawing in Appendix G.

3.7 S3: Water Quality

The surface water drainage system should provide a sufficient level of water quality treatment to prevent pollution of receiving waterbodies. During the water treatment design event (5mm rainfall across the site) no runoff should leave the site. This is usually achieved through source control techniques such as permeable pavements and rain gardens.

Table 4.3 of the SuDS Manual advocates the use of the "simple index approach" to determine an appropriate level of pollution mitigation for such sites. This splits pollution into three contaminant types (Total Suspended Solids, Metals, and Hydrocarbons) and assigns a "pollution hazard index" to each type. Different SuDS features are then assigned a "SuDS Mitigation Index" and sufficient treatment is deemed to have been provided if the "SuDS Mitigation Index" is equal to or greater than the "pollution hazard index" for each pollutant type. When more than one SuDS component is required a multiplication factor of 0.5 is applied to mitigation indices for secondary and tertiary components to account for reduced performance.

As the proposed development is for energy storage with low traffic roads, it is defined as having a Low Pollution Hazard Level in line with Table G3.1 of the Statutory Standards for SuDS in Wales.

The "pollution hazard indices" for a low pollution site are given in Table 3-2 below.

Table 3-2 Pollution Hazard Indices for a Low Pollution Hazard Site

Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Low	0.5	0.4	0.4

Table 26.4 of the SuDS Manual provides indicative SuDS mitigation indices for discharges to groundwater. The key conveyance routes for surface water to be discharged into groundwater is through filter drains, and infiltration basins.

Table 3-3 details the SuDS mitigation indices for the main components across the site. It indicates that the proposed surface water drainage scheme provides sufficient treatment across the site.

Table 3-3 SuDS mitigation indices for discharge to groundwater

SuDS Feature	Total Suspended Solids (TSS)	Metals	Hydrocarbons	Sufficient Mitigation Supplied?
Infiltration trench underlain by a soil with good contaminant attenuation potential of at last 300mm in depth (Filter Drain sub-base)	0.4	0.4	0.4	N/A

SuDS Feature	Total Suspended Solids (TSS)	Metals	Hydrocarbons	Sufficient Mitigation Supplied?
Bioretention underlain by a soil with good contaminant attenuation of at least 300mm in depth (Infiltration Basin)	0.8	0.8	0.8	N/A
Total	**0.8**	**0.8**	**0.8**	**Yes**
Constructed permeable pavement underlain by a soil with good contaminant potential of at least 300mm in depth (Macro-permeable paving)	0.7	0.6	0.7	Yes

3.8 S4 & S5: Amenity and Biodiversity

The aim of Standard 4 (S4) is to ensure that wherever possible and having regard to the need to prioritise infiltration drainage, the SuDS scheme makes the best contribution towards maximising benefits for amenity.

The surface water drainage system should seek to enhance existing habitats within the site and complement neighbouring habitats. Vegetated SuDS are proposed in the form of an infiltration basin. It is proposed that native plants and grasses will be used in and around the infiltration basin to improve biodiversity and ecological potential across the site.

The landscape masterplan details planting in the attentuation basin, which is currently proposed to be wet grassland EM8 meadow mix for wetland or similar. The detailed design phase of the proposed surface water drainage strategy will provide further information on the proposed ecological enhancements to be provided across the site.

3.9 S6: Design for Construction, Maintenance, and Structural Integrity

The national SuDS standards state that components must be designed to ensure structural integrity of the drainage system and any adjacent structures or infrastructure under anticipated loading conditions over the design life of the development, taking into account the requirement for reasonable levels of maintenance. The detailed design will include a maintenance plan and associated costs for the development site.

3.9.1 Health and Safety

Under the Construction (Design and Management) Regulations 2015 (CDM 2015) it is the designer's duty to:

- Eliminate foreseeable health and safety risks to anyone affected by the project.
- Take steps to recue or control any risks that cannot be eliminated.

- Communicate, cooperate and coordinate with the client, other designers and contractors involved in the project so that designs are compatible, and health and safety risks are accounted for during the project and beyond.

The potential significant hazards and risks associated with the construction, operation, and maintenance of the proposed surface water drainage system, have been identified during the design process. The information on the identified hazards and potential mitigation measures of the risks presented by the hazards is summarised in the 'Designer's Risk Assessment', included in Appendix I.

It should be noted that the document identifies only significant hazards and risks associated within and in the immediate vicinity of the site based on a desk-based assessment of available information. The list therefore should not be considered as exhaustive, and a detailed site survey should be undertaken prior to commencing any construction activities on site. A further detailed CDM risk assessment should be undertaken during the detailed design stage, when the development proposals are finalised.

3.9.2 Adoption and maintenance

Schedule 3 of the Flood and Water Management Act was implemented in Wales on the 7th of January 2019. Under this legislation, SuDS that serve multiple properties must be approved and adopted by the SuDS Approval Body (SAB) - a function performed by the Lead Local Flood Authority at Wrexham County Borough Council. Any SuDS that serve a single curtilage will not typically be adopted by the SAB. Therefore, it is unlikely that any SuDS on the proposed development site will be offered for adoption.

3.9.3 Construction Stage

The surface water runoff will need to be managed during the construction stage of the development to minimise the risk of flooding and pollution to the surrounding environment. This will be addressed within an Environmental Management Plan prepared for the development by an appointed contractor for the works prior to construction commencing and shall be submitted with the full application for approval.

4 Conclusions and Recommendations

JBA Consulting were commissioned by Innova Renewables Developments in April 2023 to prepare an outline surface water drainage strategy for a proposed energy storage site at land north of Bronwylfa Road, Rhostyllen, Wrexham.

The proposed development site is approximately 5.5 ha in size and currently greenfield. The development proposal comprises energy storage and construction of an associated substation along with an access road and access tracks, and other necessary hardstanding areas.

Infiltration tests undertaken by Gibbs Geotechnical in May 2023 indicate that infiltration rates are good across the main development area of the site (lowest rate of 6.23 x 10^{-6} m/s). In the south-west of the site, near to the proposed access road, an infiltration rate of 2.53 x 10^{-5} m/s has been utilised.

It is proposed that surface water from hardstanding areas will infiltrate into the ground. This is provided that a targeted detailed ground investigation including soakaway testing at specific locations, soil testing for contamination and installation of permanent groundwater monitoring wells on the site is undertaken and shows that infiltration is a viable means of discharge across the site.

The required 1 in 100-year plus 40% climate change attenuation storage, based on the lowest available infiltration rate, has been calculated as 1007m3 for the main development site, using Micro Drainage software. This will be incorporated through filter drains along the access roads and an infiltration basin in the east of the site. The proposed access road is calculated to require approximately 84m^3 of attenuation storage for the 1 in 100-year plus 40% climate change event. It is proposed to incorporate macro-permeable paving along the access road.

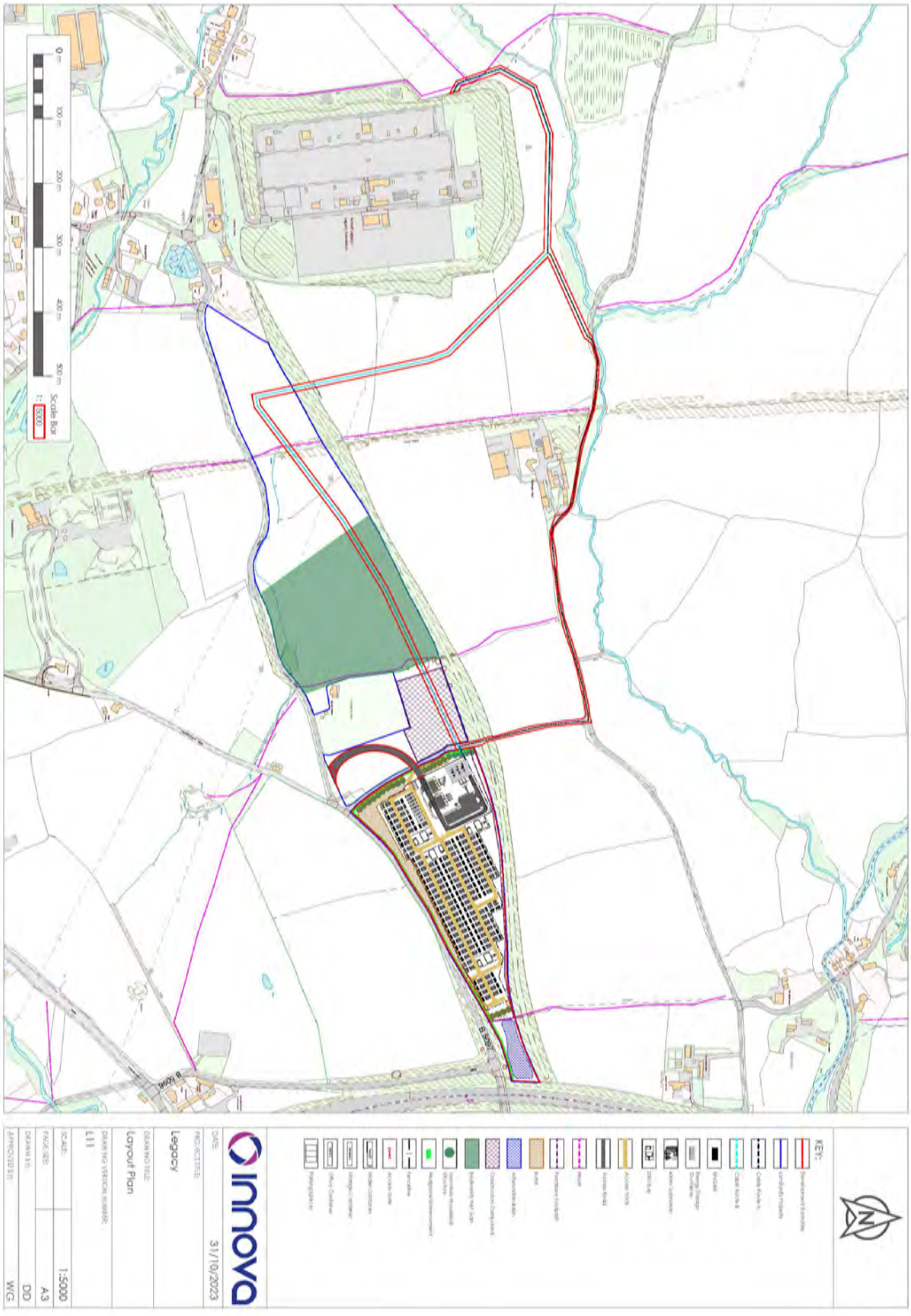
There will be two flow paths across the site. Water falling on roofs, roads, and other hardstanding areas across the site will flow into filter drains and either infiltrate into ground or be conveyed easterly to the infiltration basin and then infiltrate to ground. The access road shall retain its own drainage system, whereby water falling onto the road flows into macro-permeable paving and then infiltrates into the ground. It is possible that check dams shall be required within the macro-permeable paving, and filter drains, to slow the flow of water, and promote infiltration across the site.

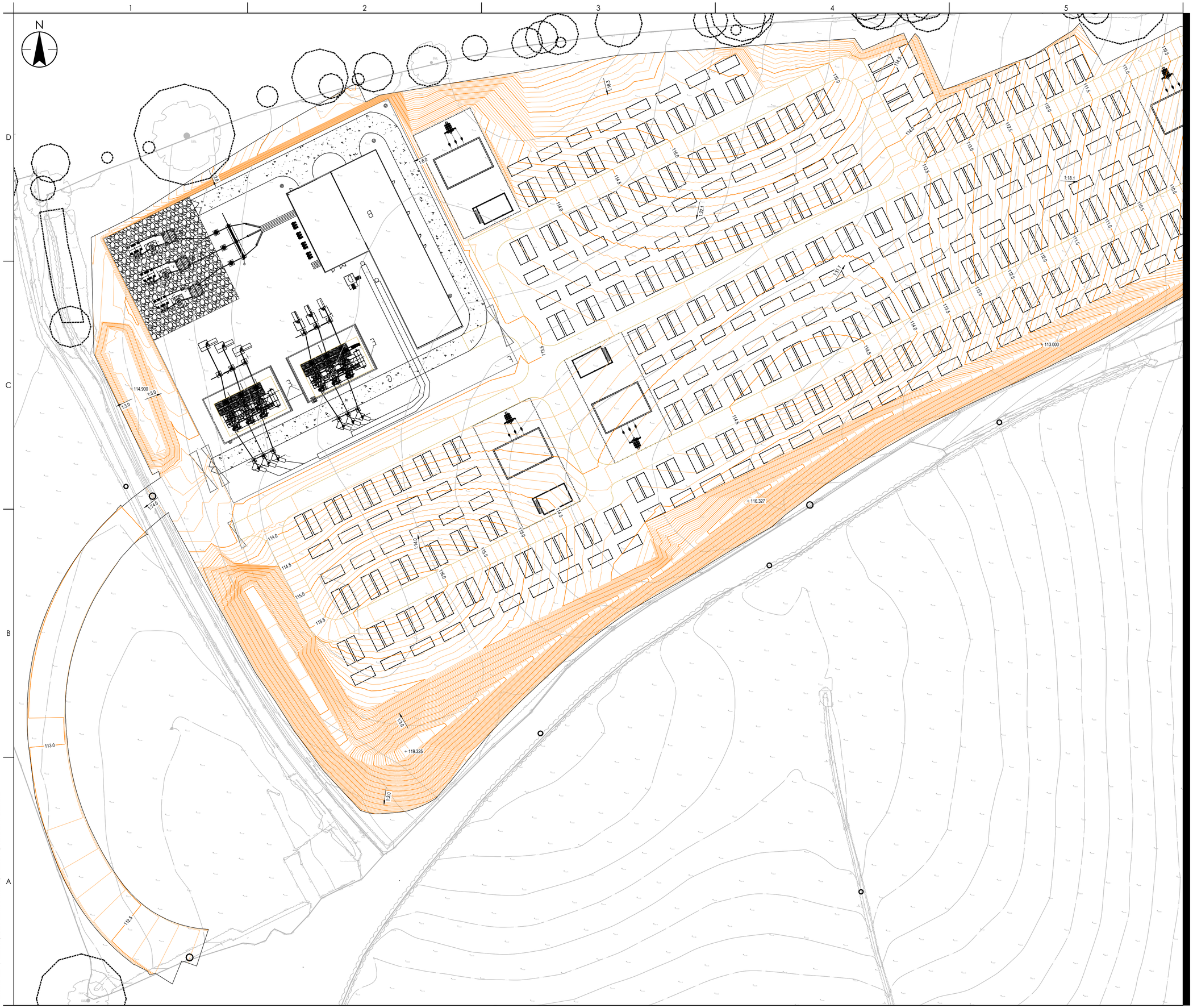
Should further investigations show that infiltration is not suitable for the site this drainage strategy should be revisited to adapt it for attenuation rather than infiltration. Runoff should then be discharged at the QBAR rate of 45.4 l/s into the local watercourse.

The proposed SuDS assets shall provide sufficient water quality and amenity benefits to the site via the use of a wide shallow infiltration basin.

Multiple biodiversity benefits will be provided by the use of native planting in and around the SuDS feature.

A Development Proposal

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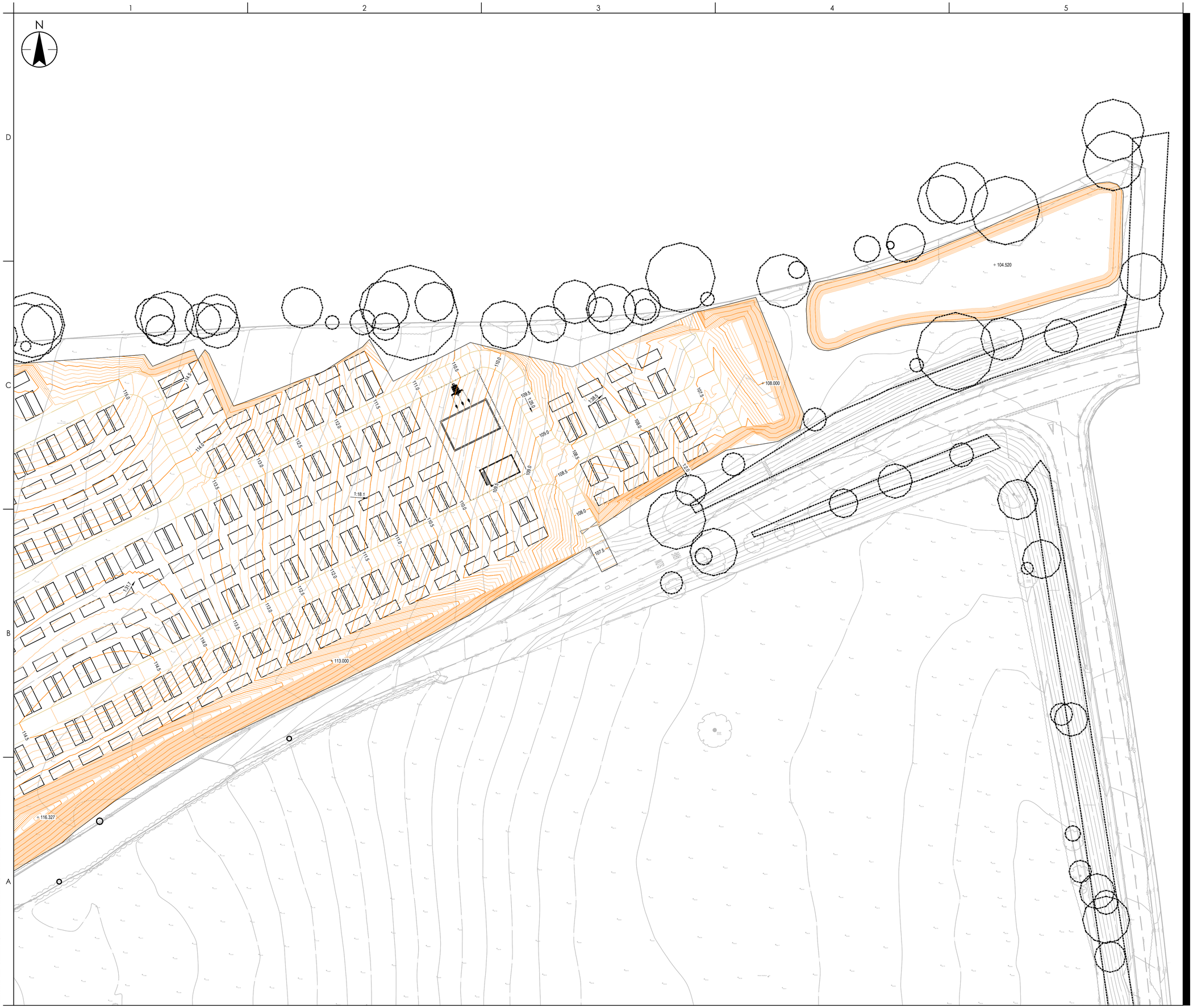

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KEY:

- PROPOSED MAJOR CONTOURS (0.5m)
- PROPOSED MINOR CONTOURS (0.1m)
- ROOT PROTECTION AREA

P01 FIRST ISSUE		HR	DG	2023.09.15
Issued/Revision		By	Appd	YYYY.MM.DD
	DF	SMW	HR	2023.09.14
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Issue Status

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BATTERY STORAGE AT LEGACY SUBSTATION, WREXHAM

Title
PROPOSED CONTOURS

SHEET 2 OF 2

Project No.	Scale
332610070	1:500
Revision	**Drawing No.**
P01	**STN-HGT-XX-DR-CE-0602**

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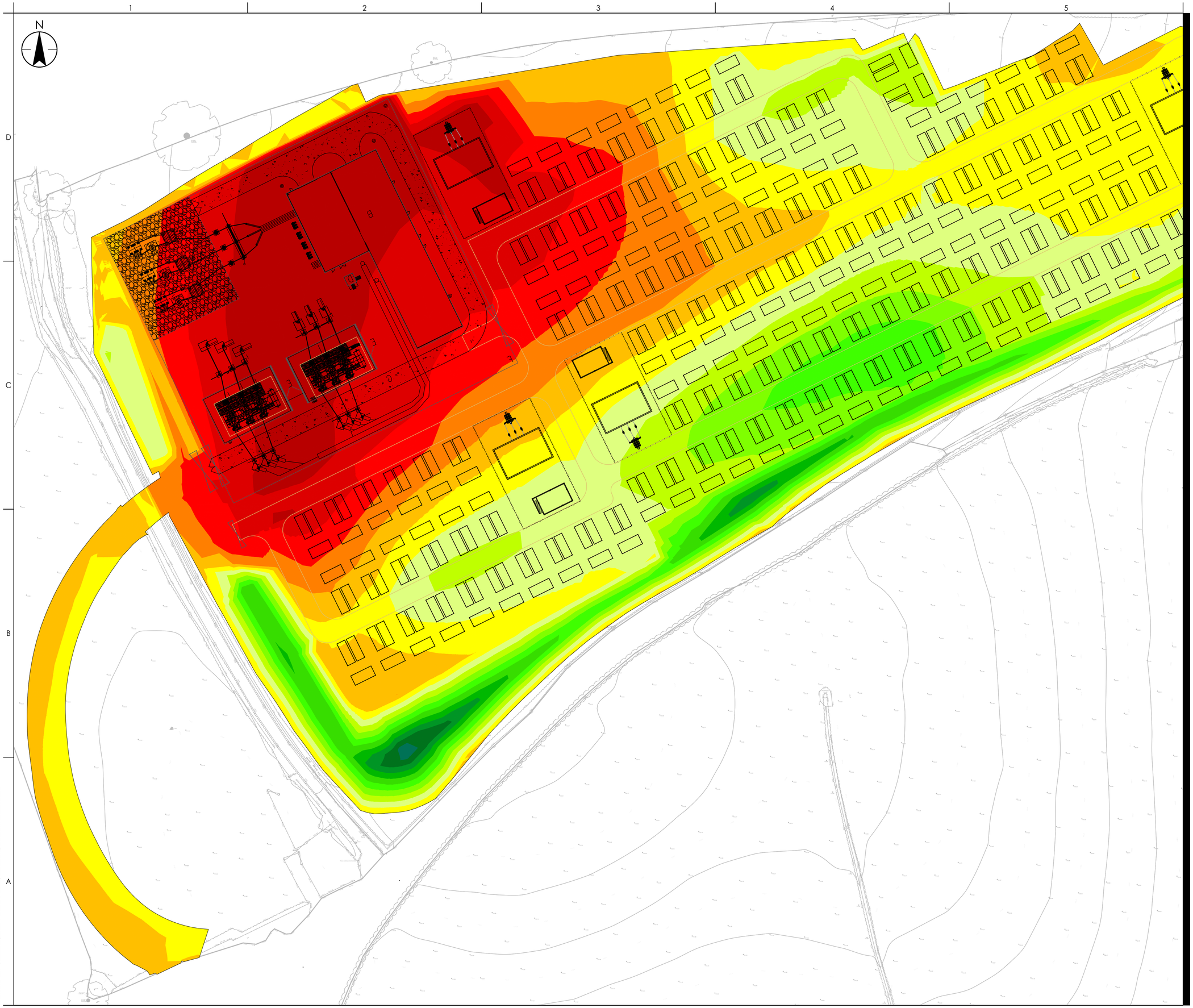

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CUT/FILL ANALYSIS

CUT: 26,955 m^3
FILL: 26,945 m^3

NET: 10 m^3 CUT

SURFACE LEVEL DATA			
No.	MIN. LEVEL	MAX. LEVEL	COLOUR
1	-2.50	-2.00	
2	-2.00	-1.50	
3	-1.50	-1.00	
4	-1.00	-0.50	
5	-0.50	0.00	
6	0.00	0.50	
7	0.50	1.00	
8	1.00	1.50	
9	1.50	2.00	
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11	2.50	3.00	
12	3.00	3.50	
13	3.50	4.00	
14	4.00	4.50	
15	4.50	5.00	

P03 AMENDED TO SUIT NOVUS COMMENTS	HR	DG	2023.09.15
P02 UPDATED LOGO	HR	DG	2023.09.01
P01 FIRST ISSUE	DF	DG	2023.08.23
Issued/Revision	By	Appd	YYYY.MM.DD
	DF	SMW	HR	2023.08.22
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

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BATTERY STORAGE AT LEGACY SUBSTATION, WREXHAM

Title
PROPOSED CUT AND FILL

SHEET 1 OF 2

Project No.
332610070

Scale
1:500

Revision
P03

Drawing No.
STN-HGT-XX-DR-CE-0611

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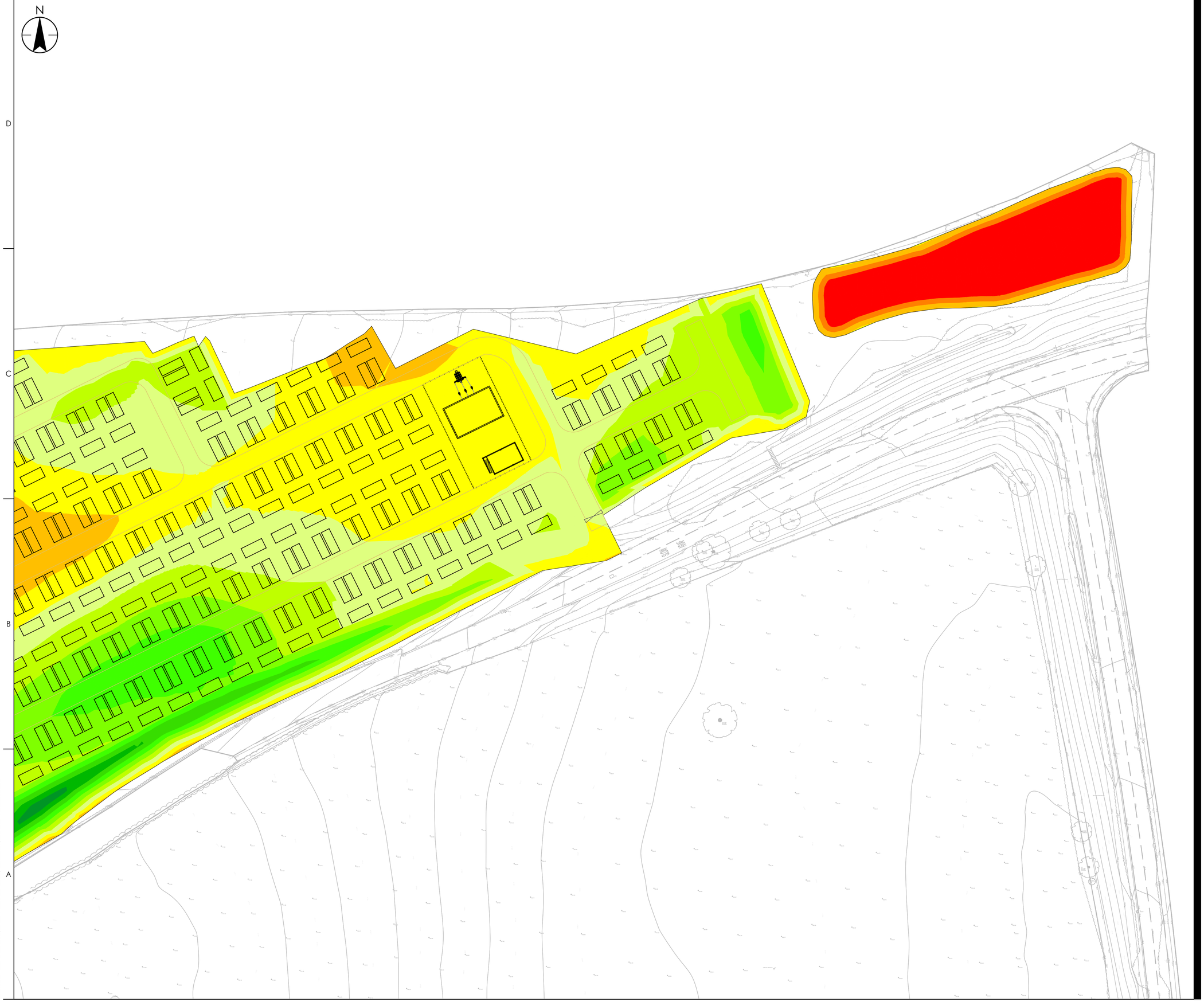

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P01 FIRST ISSUE		HR	DG	2023.09.15
Issued/Revision		By	Appd	YYYY.MM.DD
	DF	SMW	HR	2023.08.22
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BATTERY STORAGE AT LEGACY SUBSTATION, WREXHAM

Title
PROPOSED CUT AND FILL

SHEET 2 OF 2

Project No.	Scale
332610070	1:500
Revision	**Drawing No.**
P01	**STN-HGT-XX-DR-CE-0612**

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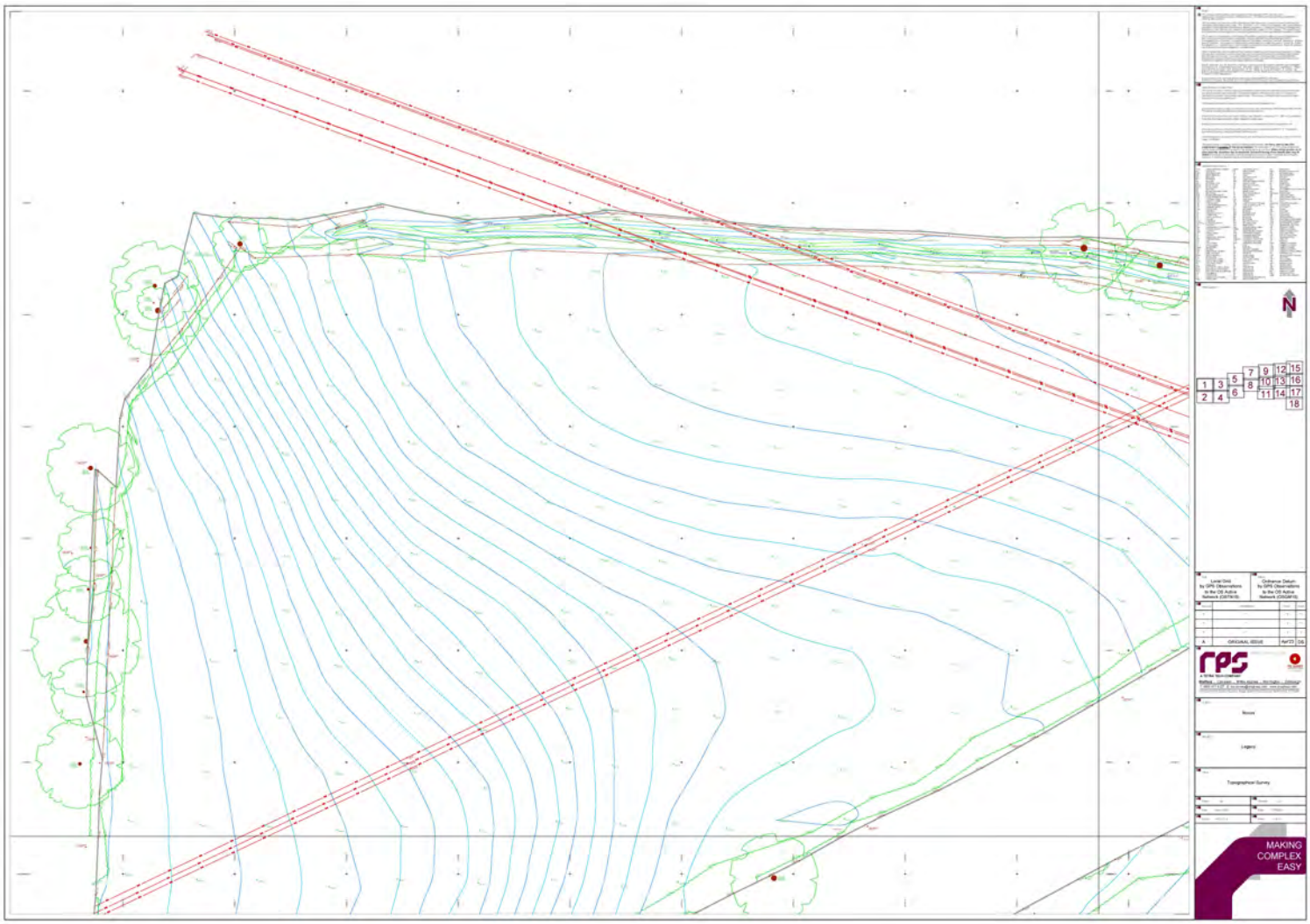
B Topographic Survey



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This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Any indication of foundations is purely diagrammatic. Ground conditions have not been generally investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing ground conditions, trees and services. Ground conditions should be investigated and foundations designed by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees to be retained should be adequately protected during the course of the works and be adequately clear from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Unless otherwise instructed by the client, RPS will base sketch proposals on survey data. Sketch proposals may be based upon arrangements of OS sheets & visual estimations of existing site conditions. Such information is deemed to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION

Utility Services Location Note:

Utility services have been plotted using a combination of observation and detection using electromagnetic and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

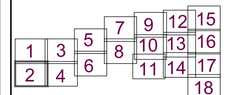
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites RPS recommend that trial excavations are carried out to confirm the position of the services traced** but this figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they contain a continuous metallic tracer wire from end of trunk to accuracy. It should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACO CHANNEL/ CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BH	RECEIVING BOX	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BUILDING	G	GULLY	RWP	RECTANGULAR PIPE
BH	BOREHOLE	GF	GAS RELIEF POINT	SB	SOIL BOARD
Bol	BOLLARD	GPR	GROUND PROBING RADAR	SB	SOIL BOX
BP	BOUNDARY POST	GV	GAS VALVE	SC	SOIL CAP
B Plug	BLOCK PLUG	GV	GAS VALVE COVER	SL	SLOTTY LEVEL
BS	BUS SHELTER	IC	INSPECTION CHAMBER	SL	SLOTTY LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL	IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARED PATH
CA	CARRIAGEWAY CLOSE	LA	LOCAL AUTH.	SS	STAINLESS STEEL
CAR	CARRIAGEWAY LEVEL	LG	LOCK GATE	ST	STAND PIPE / SUPPLY TAP
CB	CATCH PIT	LP	LAMP POST	STA	STATION
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (ph)	Stone Pav	STONE PAVING SLABS
CBF	CHAIN LINK FENCE	LP	LAMP POST (No. 24/25)	STP	STOP POST
CC	CHAMBER DEPTH	LP	LAMP POST	SVP	STAK POST
CC	CONCRETE CAP	MH	MANHOLE	SW	SOIL WASTE
CP	CAST IRON	MH	MANHOLE	SW	STOP WIRE
CP	CONCRETE POST	MP	MARKER POST	SY	STONE YARD
CL	COVER LEVEL	MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Conc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE WALL	MU	EXISTING MAST/	TBM	BOLLARD (Real Transport)
CP	CATCH PIT	NP	NAME PLATE	TBM	TEMPORARY BENCH MARK
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CHILDRENS PLAY EQUIPMENT	OBW	OLD BOUNDARY WALL	TL	TRAFFIC LIGHTS
Cpy	BUILDING CANOPY	OSBM	OS BENCH MARK	TL	THRESHOLD LEVEL
Cplan	CAPSTAN	OSC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CP	CONCRETE POST	OSC	OVERGROUND CONDUIT	TP	TELEGRAPH POLE
CP	CAR PARK	OSE	OVERGROUND ELECTRIC	TP	TELEPHONE POLE
CR	CONCRETE RAILY / ROUGH	OSE	OVERGROUND ELECTRIC	TW	TRIAL WINDOW
CW	CONCRETE WALL	OSStruct	OVERHEAD STRUCTURE	TW	TRIAL PIT
D	DOOR	OSW	OVERGROUND WATER	UC	UNKNOWN
DC	DUCT COVER	PAV	OVERHEAD AWNIGNN	UTA	UNABLE TO ACCESS
DCP	DUCT COVER & POST	PB	PUSH BUTTON	UTC	UNABLE TO CLOSE
(dmp)	DILAPIDATED	PB	POST BOX	UTR	UNABLE TO RAISE
DP	DOWN PIPE	PC	PEDESTRIAN CAMERA	UTT	UNABLE TO TRACE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	VC	VENTILATED CLOT
DW	DRAIN WELL	PM	PARKING METER	VP	VENTILATION PIPE
Ea	EAVES LEVEL	PP	PETROL PUMP	WF	VENT WIRE
EB	ELECTRICITY BOXES	PP	PHOTOGRAPHIC STANCE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pwk	PENSTOCK	WB	WEIR BRIDGE
ER	EARTH ROD	PY	PEDESTRIAN (ph)	WL	WATER LEVEL
ER	EARTHED	PY	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	RB	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Reg	REGULATOR	WW	WIRE MESH FENCE
Ex	EXISTING VEHICLE OVERSPAN	RL	RAIL LEVEL	WP	WOODEN POST
FB	FOOTBRIDGE	RL	RAIN GAUGE	WS	WIND SOCK POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL (GROUND LEVEL)	RM	RADIO MONITORING Pnt		
Flig	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



Grid:	Datum:
Local Grid by GPS Observations to the OS Active Network (OSTN15)	Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
-	-	-	-
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-	-	-	-
A	ORIGINAL ISSUE	APR'23	DS

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CLIENT:

Novus

PROJECT:

Legacy

TITLE:

Topographical Survey

Drawn:	SB	Checked:	CA
Date:	March 2023	Scale:	1:200 @ A0
Dig No:	UA73172_A	Sheet:	2 of 18

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Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. This drawing is to be read in conjunction with all relevant Statutory Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Where trees are to be retained, the soil conditions, foundations and potential root systems should be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing and proposed trees. Where trees are to be planted, the soil conditions should be investigated and tested by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees to be felled should be removed and the stumps ground out. Retained trees should be protected from damage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Proposed underground services are shown for illustrative purposes only and accurate routing of proposals may be based upon arrangements of Utility Boards & visual estimations of existing site features. Proposed services need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Utility services have been plotted using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

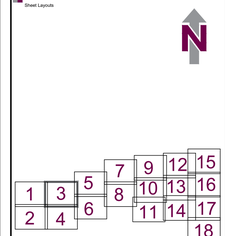
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition :

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 85% accuracy is normally achievable, but on Light, open sites 95% accuracy is normally achieved** but this figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless a tracing wire/tape was installed with the pipe. Without proof and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACO CHANNEL	CHANNEL	Flat RP	FLAT ROOF LEVEL	RG	ROAD SIGN
AV	AIR VALVE		FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BH	BOREHOLE		FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BELLMOUTH		G	GULLY	RWP	RECTANGULAR PIPE
BC	BOLLARD		GF	GAS RELIEF POINT	SB	SOIL BOARD
BH	BOREHOLE		GP	GUIDE POST	SB	SIGN BOARD
Bol	BOLLARD		GPR	GROUND PROBING RADAR	SW	SHED TOP
BP	BOUNDARY POST		GV	GAS VALVE	SL	SLOPE LEVEL
BPlug	BLOCK PAVING		GV	GAS VALVE COVER	SL	SUPPLY LEVEL
BS	BUS STOP		HC	HEDGE CUTTER	SL	SURFACE LEVEL
BS	BUS STOP		IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER		IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL		IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWF	BARBED WIRE FENCE		KO	KERB OUTLET	SPR	SHARP ROCK POINT
CA	CATTLE GRID ACROSS ROAD		LA	LIGHTING ARM	SR	SHARP ROCK
CAT	CATHODIC LEVEL		LB	LOCAL DATE	ST	STAKE
CB	CONTROL BOX		LC	LOCAL CENTRE	STP	STOP POST
CB	CONTROL BOX		LOR	LOSS OF REFLECTION (gpr)	Stone Pvg	STONE PAVING SLABS
CF	CHAIN LINK FENCE		LP	LAMP POST (Electric Unit)	STP	STOP POST
CO	CHAMBER DEPTH		LP	LAMP POST	SVP	STAK POST
CP	CONCRETE POST		M	MANHOLE	SW	SOIL VENT PIPE
CP	CAST IRON		MH	MANHOLE	SW	STATIONS
CP	CAST IRON POST		MP	MARKER POST	SW	SOIL WASTE
CL	COVER LEVEL		MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE		MP	MILE POST	Tac	TACTILE PAVING
CL	CABLE		MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE		MV	EXISTING MOTOR	TBM	BOLLARD (Dept Transport)
COP	CONCRETE TO KERB		NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CATCHPIT		NP	NAME PLATE	TCP	TELEPHONE CALL POST
CPE	CHILDREN'S PLAY EQUIPMENT		OBH	OBSERVATION BOREHOLE	TH	THRESHOLD
Cpy	BUILDING CANOPY		OBM	OS BENCH MARK	TL	THRESHOLD LEVEL
Cpw	CARPORT		OC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Cr	CONCRETE		OE	OVERGROUND ELEC	TP	TELEGRAPH POLE
Cr	CAR PARK		OHE	OVERHEAD ELECTRIC	TP	TELEPHONE POLE
CW	CONCRETE WALL		OHL	OVERHEAD LINE	TP	TELEPHONE POLE
CW	CONCRETE WALL		OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DRAIN		OP	OVERHEAD POWER	TR	TRENCH
DC	DUCT COVER		OWin	OVERHEAD WINDOWS	UA	UNABLE TO ACCESS
DE	DRAIN ENTRY		P	PIPE	UB	UNABLE TO LOCATE
(dmp)	DILAPIDATED		PB	POST BOX	UTB	UNABLE TO RAISE
DP	DRAIN POINT		PC	PEDESTRIAN CAMERA	UTC	UNABLE TO TRACE
DPC	DAMP PROOF COURSE		PCr	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN		PIT	PIT DEPTH	VC	VITRIFIED CLAY
DW	DRAIN WATER		PM	PARKING METER	VCP	VITRIFIED CLAY/CONCRETE PAD
Ele	EAVES LEVEL		PR	PETROL PUMP	VP	VENT PIPE
EOT	END OF TRACE (OHL)		PS	PEDESTRIAN REFUGE	WB	WATER BOARD
EOT	END OF TRACE (utility)		Pwk	PENSTOCK	WB	WEIGH BRIDGE
ER	ELECTRIC RISER		PY	PEDESTRIAN YARD	WC	WATER COURSE
ER	EARTH ROD		Py	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST		R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST		Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EV	ELECTRICITY VEHICLE CHARGING		RE	RODDING EYE	WW	WOVEN WIRE FENCE
FL	FOOTBRIDGE		RG	RAIN GAUGE	WS	WHO SIGN POST
FL	FLOOR LEVEL		RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FLG	FLOOR LEVEL (GROUND)		RM	RISK MANAGEMENT MONITORING Pnt		
FLight	FLOOR LIGHT		RP	REFLECTOR POST		

Sheet Layouts



Grid:
Local Grid by GPS Observations to the OS Active Network (OSTN15)

Datum:
Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	APR'23	DS

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CLIENT:
Novus

PROJECT:
Legacy

TITLE:
Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Drg No: UA73172_A	Sheet: 3 of 18

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Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. This drawing is to be read in conjunction with all relevant Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Where trees are to be retained, the exact location of foundations and underground services should be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing trees, hedges and shrubs. Where trees are to be retained, the exact location of foundations should be investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees to be felled should be grubbed out and the roots removed to a depth sufficient to avoid future growth from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions, underground services, trees, levels, ecology, archaeology, etc. Sketch proposals may be based upon arrangements of OS sheets & visual estimations of existing site conditions. Dimensions and levels need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Utility services have been plotted using a combination of observation and detection using electromication and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 85% success is normally achievable, but on Open, rural sites this may be reduced to 50%.** The percentage quoted but this figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they contain a continuous metallic element, such as a tracer wire and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACO CHANNEL CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
AV	AIR VALVE	FP	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BH	BOREHOLE/PIT	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BELISHA BEACON	G	GULLY	RWP	RECTANGULAR PIPE
BH	BOREHOLE	GF	GAS RELIEF FLOAT	SB	SIGN BOARD
Bol	BOLLARD	GP	GUIDE POST	SB	SIGN BOARD
BP	BOUNDARY POST	GPR	GROUND PROBING RADAR	SW	SHED TOP
BP Plug	BLOCK PLUGG	GV	GAS VALVE	SL	SLOPE LEVEL
BV	BOUNDARY POST	GV	GATE VALVE COVER	SL	SUPPLY LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SM	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SM	SETTLEMENT MONITORING Pnt
BW	BRICK WALL	IRW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARP PIN POINT
CAB	CONTROL CABINET	LA	LIGHTING ARM	SS	SOIL STACK PIPE
CAT	CATENARY CABLE	LG	LOCK GATE	ST	STUMP
CB	CATCH BASIN	LP	LAMP POST	STP	STOP VALVE
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	Stone Pav	STONE PAVING SLABS
CC	CONCRETE CHANNEL	LS	LIGHTING SPOTLIGHTS (ARC	SW	STOP VALVE
CC	CHAMBER DEPTH	LP	LAMP POST	SWD	STAY POST
CL	CABLE LOOP	MH	MANHOLE	SWP	SOIL WASTE PIPE
CP	CAST IRON	MH	MANHOLE	SW	STEPWIRE
CP	CONCRETE POST	MP	MARKER POST	TB	TELEGRAPH
CL	COVER LEVEL	MP	MARKER POST	TB	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
CL	CABLE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MP	EXISTING MAST	TBM	BOLLARD (Mast Transport)
CP	CONCRETE PAVING	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CONTROL PLANT EQUIPMENT	OB	OBSERVATION BOREHOLE	TH	THRESHOLD LEVEL
Cov	BUILDING CANOPY	OSBM	OS BENCH MARK	TH	THRESHOLD LEVEL
Cpole	CAPSTAN	OSC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CP	CONCRETE POST	OSC	OVERGROUND CONDUIT	TP	TELEGRAPH POLE
CP	CAR PARK	OSE	OVERGROUND ELECTRIC	TP	TELEGRAPH POLE
CP	CABLE PIPE / PICKUP	OSE	OVERGROUND ELECTRIC	TP	TELEGRAPH POLE
CW	CONCRETE WALL	OSBridge	OVERHEAD STRUCTURE	Tpit	TRIAL PIT
D	DOOR	OSL	OVERGROUND LIGHT	TR	TREE
DC	DUCT COVER	OHW	OVERHEAD WARNING	UTA	UNABLE TO ACCESS
DP	DRAINAGE POST	P	POST	UTA	UNABLE TO ACCESS
(dras)	DILAPIDATED	PB	POST BOX	UTR	UNABLE TO RAISE
DW	DOOR WAY	PC	PEDESTRIAN CAMERA	UTR	UNABLE TO RAISE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	UC	UTMOST CLUCT
DS	DOWN SPOUT	PL	PLANTER	VP	VENTILATION PAD
DL	DAVES LEVEL	PP	PETROL PUMP	VP	VENT PIPE
E	ELECTRIC COVER	PF	PROTECTIVE FENCE	WB	WATER BOARD
ELT	ENG.CM TRACE (utils)	Pnt	PENSTOCK	WB	WEAR BRIDGE
EP	ELECTRIC POST	PV	PIPE VALVE	WL	WATER LEVEL
EL	EARTH LEVEL	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	RB	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EC	ELECTRICITY SERVICE CHAMBER	RL	RAIL LEVEL	WP	WOOD POST
FC	FOOTBRIDGE	RG	RAIN GAUGE	WS	WING SCR POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FM	FLOOD MONITORING Pnt	RM	RAIL MONITORING Pnt		
Flug	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts

1		3		5		7		9		12		15					
	2		4		6		8		10		13		16				
									11		14		17				
																	18

Grid:
Local Grid by GPS Observations to the OS Active Network (OSTN15)

Datum:
Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
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-	-	-	-
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A	ORIGINAL ISSUE	APR'23	DS

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CLIENT:
Novus

PROJECT:
Legacy

TITLE:
Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Dig No: UAT3172_A	Sheet: 4 of 18

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Notes:

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Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Where trees are to be retained, adequate precautions must be taken to protect trees and their root systems from damage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Information regarding existing services, ducts, cables, pipes and manholes shown on sketch proposals may be based upon arrangements of GIS sheets & visual estimations of existing site features. All information is required to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to RMS specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Underground services are plotted using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

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Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

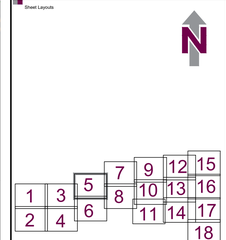
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition :

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65%** success is normally achievable, but this figure will be reduced on more open sites. **Success is usually high but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they incorporate a continuous metallic tracer from one end of itsuitful accuracy - it should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACO CHANNEL/ CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	RODD IRON
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BH	RECEIVING HOUSE	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BOREHOLE	G	GULLY	RWP	WALKWAY/PATHWAY
BH	BOREHOLE	GF	GAS VALVE FLOAT	SB	SOIL PIPE
Bol	BOLLARD	GP	GUIDE POST	SB	SIGN BOARD
BP	BOLLARD POST	GPR	GROUND PROBING RADAR	SW	SHELTER
B Plug	BLOCK PAVING	GV	GAS VALVE COVER	SL	SLOPE
BS	BUS STOP	GV	GAS VALVE COVER	SL	SLOPE LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BW	BRICK WALL/ BELOW COVER	IC	INSPECTION COVER	SP	SIGN POST
BW	BRICK WALL	IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWP	BARRIED WIRE FENCE	KO	KERB OUTLET	SPR	SHARED PATH
CAB	CABLE TELEVISION COVER	LA	LOCAL AUTH	ST	STONE PITCHING
CAT	CATENARY CABLE	LG	LOCK GATE	ST	STONE PIPE / SUPPLY TAP
CB	CATCH BASIN	LP	LAMP POST	ST	STREET
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	Stone Pav	STONE PAVING SLABS
CF	CHAIN LINK FENCE	LP	LAMP POST (PHOTO_tech)	STP	STOP POST
CO	CHAMBER DEPTH	LP	LAMP POST	SWP	STAY POST
CP	CONCRETE POST	MH	MANHOLE	SW	SOIL VENT PIPE
CP	CAST IRON	MH	MANHOLE	SW	STATHRE
CP	CONCRETE POST	MP	MARKER POST	SW	STORM WELL
CL	COVER LEVEL	MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Cnc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	EXISTING MATCH	Tbol	BOLLARD (Road Transport)
CP	CATCHPIT	NP	NAME PLATE	TCP	TRAFFIC CONTROL POST
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpe	CONCRETE PLAT EQUIPMENT	OBH	OBSERVATION BOREHOLE	TH	THRESHOLD
Cpe	BUILDING CANOPY	OBM	GB BENCH MARK	TH	THRESHOLD LEVEL
Cpw	CAPSTAN	OHC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CR	CONCRETE	OHC	OVERHEAD CABLE	TP	TELEGRAPH POLE
CR	CAST IRON	OHE	OVERHEAD ELECTRIC	TP	TELEPHONE PILLAR
CW	CONCRETE WALL	OHL	OVERHEAD LINE	TP	TRIAL PIT
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DUCT	OHT	OVERHEAD TELE	TR	TREE
DC	DUCT COVER	OHW	OVERHEAD WARNING	UTA	UNABLE TO ACCESS
DP	DRAINAGE POINT	P	POST	UTB	UNABLE TO ACCESS
DP(Ant)	DILAPIDATED	PB	POST BOX	UTR	UNABLE TO RAISE
DP(C)	DRAIN	PC	PEDESTRIAN CAMERA	UTT	UNABLE TO TRACE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	VC	VERGE/CLUCT
Dsh	DISH ANTENNA	PM	PEDESTAL MARK	VP	VENT PIPE / SECTION PAD
Dw	BARES LEVEL	PR	PETROL PUMP	WP	VENT MAN
EOT	END OF TRACE (cable)	Pwr	POWER SUPPLY METER	WB	WATER BOARD
EOT	END OF TRACE (utility)	Pwr	PENSTOCK	WB	WATER BRIDGE
EP	ELECTRIC POST	PY	PYLON	WC	WATER COURSE
ER	EARTHLED	PY	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EV	ELECTRIC VEHICLE CHARGING	RL	RAIL LEVEL	WW	WOOD WORM FENCE
Fb	FOOTBRIDGE	RL	RAIN GAUGE	WS	WING SIGN POST
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FLM	FLOOD LEVEL MONITOR LEVEL	RM	REFERENCE MONITORING Pnt		
Flgt	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



Grid:	Datum:
Local Grid by GPS Observations to the OS Active Network (OSTN15)	Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
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Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT: Novus

PROJECT: Legacy

TITLE: Topographical Survey

Drawn:	BB	Checked:	CA
Date:	March 2023	Scale:	1:200 @ A0
Dwg No:	UAT3172_A	Sheet:	5 of 18

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Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at the commencement of the works. Any discrepancies are to be reported. All works are to comply with current Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Any indication of foundations is diagrammatic only. Ground conditions should be investigated and investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing trees, drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Information regarding existing services is from plans provided by others and the accuracy of proposals may be based upon arrangements of GA sheets & visual estimations of scaling. Site dimensions and proposals need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to Client specification and in accordance with RICS publication "GUIDANCE NOTES FOR SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Underground services are plotted using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

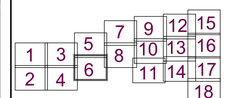
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65%-80% success is normally achievable, but on Open, rural sites 95% success may be claimed** but this figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they contain a continuous metallic element.** Depth is a source and of doubtful accuracy - it should be regarded only as an indication and cannot be guaranteed"

Standard Abbreviations

ACO	ACCESS CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
AP	ARCHAEOLOGICAL PROTECTED AREA	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BUILDING	G	GULLY	RWP	RAIN WATER PIPE
BC	BOLLARD	GF	GAS RELIEF POINT	SB	SOIL BOARD
Bol	BOLLARD	GIR	GAS VALVE HEAT	SB	SOIL BOARD
BP	BUILDING POST	GPR	GROUND PROBING RADAR	SW	SHED TOP
Bpl Pay	BLOCK PAVING	GV	GAS VALVE COVER	TL	TOP LEVEL
BS	BUS STOP	HC	HAND HOLE	TL	SUPPLY LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL	IR	IRON RAILING FENCE	Spl Hdrail	SPEED HUMP
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARE AN POINT
CA	CARRIAGEWAY CLEAR	LA	LOCAL AUTHORITY	ST	STAY WIRE
CA	CATHWAY LEVEL	LG	LOCK GATE	ST	STAND PIPE / SUPPLY TAP
CB	CATCH BASIN	LP	LAMP POST	ST	STUMP
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	Stone Pav	STONE PAVING SLABS
CC	CONCRETE CHIPPING FENCE	LS	LANDSCAPED AREA (edit)	SV	STOP VALVE
CC	CHAMBER DEPTH	LP	LAMP POST	SVP	STAY POST
CC	CONCRETE	M	MANHOLE	SW	SHED WINDOW
CF	CAST IRON	MH	MANHOLE	SW	STATWIRE
CL	CENTRE LINE POINT	MP	MARKER POST	SW	SOIL WASTE
CL	COVER LEVEL	MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Con	CONIFER	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MV	ELECTRIC MOTOR	TBM	BOLLARD (Road Transport)
CP	CONCRETE PAVING	NP	NOTICE BOARD	TBM	TEMPORARY BENCH MARK
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpl	CONTROL PLANT EQUIPMENT	OBW	OVERHEAD BOUNDARY WIREA	TL	TOP LEVEL
Cpy	BUILDING CANOPY	OBW	OB BENCH MARK	TL	THRESHOLD LEVEL
Cpw	CARPARK	OC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CS	CONCRETE SETT	OC	OVERGROUND CABLE	TP	TELEGRAPH POST
CT	CAR PARK	OE	OVERHEAD ELECTRIC	TP	TELEPHONE KIOSK
CW	CONCRETE WALL / RCUGH	OHL	OVERHEAD LINE	TP	TELEPHONE POST
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DITCH	OL	OVERHEAD LINE	TR	TREE
DC	DUCT COVER	OHW	OVERHEAD WARNING	UTA	UNABLE TO ACCESS
DE	DRAINAGE EASEMENT	P	POST	UTA	UNABLE TO ACCESS
DP(bh)	DILAPIDATED	PB	POST BOX	UTA	UNABLE TO RAISE
DP	DRAIN PIPE	PC	PEDESTRIAN CAMERA	UTA	UNABLE TO ACCESS
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PF	PIT DEPTH	UC	UTRREDUCED
Dw	DRAINAGE WELL	PF	PIT DEPTH	UC	UTILITY DETECTION PAD
Ea	EAVES LEVEL	PH	PETROL HUMP	VP	VENT PIPE
EB	ELECTRICITY BOX/POLE	PI	PEDESTRIAN INTERFACE	WB	WATER BOARD
EOT	END OF TRACE (utility)	Pnt	PENSTOCK	WB	WEIGH BRIDGE
ER	EARTH ROD	PO	POST OFFICE PIN	WC	WATER COURSE
ER	EARTHED	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	Pwg	PEDESTRIAN WAGON	WM	WATER METER
ESW	ELECTRICITY SUPPLY POINT	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EW	EXPOSED WALLS (CHANGE)	RL	RAIN GAUGE	WW	WOOD WASTE BIN
FL	FOOTBRIDGE	RL	RAIN GAUGE	WS	WIND SOCK POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
Flat RF	FLAT ROOF LEVEL	RM	RAIL MONITORING Pnt		
Flt	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



Grid:	Datum:
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CLIENT:

Novus

PROJECT:

Legacy

TITLE:

Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Dig No: UAT3172_A	Sheet: 6 of 18

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Notes:

1. This drawing and the building works depicted are the copyright of RPS and may not be reproduced or amended except by written permission. No liability will be accepted for amendments made by other persons.

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at the connection to the existing foul drainage BEFORE any work is put in hand. All work is to be carried out to Legislation, British Standard Specifications, Building Regulations, Chinchurter, (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Any indication of foundations is based on visible evidence only. Ground conditions should be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing trees, drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Information contained within this drawing is for Planning purposes only and details of any proposals may be based upon arrangements of GA sheets & visual estimations of existing site conditions. All dimensions need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication "GUIDANCE NOTES FOR SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Underground services have been plotted using a combination of observation and detection using electromagnetic and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

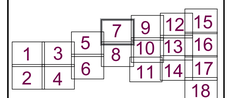
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65%-80% success is normally achievable, but on open sites with few services 100% success is claimed but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be dependent on the presence of entrained metallic tracer wire.** Depth is a further area of doubtful accuracy. *It should be regarded only as an indication and cannot be guaranteed*"

Standard Abbreviations

ACO	ACCESS CHANNEL	Flat RF	FLAT ROOF LEVEL
AV	AIR VALVE	FH	FIRE HYDRANT
BH	RESSHED HOUSE	FL	FLOOR LEVEL
BB	BOREHOLE	G	GULLY
BC	BOLLARD	GF	GAS RELIEF POINT
BH	BOREHOLE	GP	GUIDE POST
BP	BOLLARD	GPR	GROUND PROBING RADAR
BS	BUS STOP FOOT	GV	GAS VALVE
C Pay	BLOCK PAVING	GV	GATE VALVE COVER
CB	CATCH BASIN	HH	HANDHOLE
BS	BUS STOP	IC	INSPECTION COVER
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL
BW	BRICK WALL	IR	IRON RAILING FENCE
BWF	BARBED WIRE FENCE	KO	KERB OUTLET
CA	CARRIAGEWAY CENTRE	LA	LIGHTING ARM
CAN	CATHWAY CANAL	LG	LOCK GATE
CC	CONCRETE COVER	LP	LAMP POST
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)
CF	CHAIN LINK FENCE	LS	LIGHTING COLUMN, (with
CI	CHAMBER DEPTH	LP	LAMP POST
CL	CENTRE LINE	M	MANHOLE
CP	CAST IRON	MH	MANHOLE
CP	CONCRETE POST	MP	MARKER POST
CL	COVER LEVEL	MP	MARKER POST
CL	CHAIN LINK FENCE	MP	MILE POST
CO	CLEANOUT	MP	MILE POST
Conc	CONCRETE	MV	ELECTRIC METER
CP	CONCRETE PAVING	NP	NOTICE BOARD
CP	CATCHPIT	NP	NAME PLATE
Cpe	CONCRETE PLAT EQUIPMENT	OBH	OVERHEAD BOUNDARY ARCH
Cpe	BUILDING CANOPY	OBM	OB BENCH MARK
Cpw	CARPORT	OGC	OVERGROUND CONDUIT
CS	CONCRETE SLAB	OGC	OVERGROUND CONDUIT
CT	CULVERT	OHE	OVERHEAD ELECTRIC
CW	CONCRETE WALL / RCUGH	OHL	OVERHEAD LINE
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE
D	DRAIN	OHW	OVERHEAD WIRES
DC	DUCT COVER	PAV	OVERHEAD AMENDMN
DCP	DRAINAGE CHAMBER	PB	PUSH BOX
DEMPED	DILAPIDATED	PB	POST BOX
DP	DRAIN POINT	PC	PEDESTRIAN CAMERA
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING
DS	DIRECTION SIGN	PIT	PIT DEPTH
DW	DRAIN WELL	PO	POST OFFICE
Ele	EAVES LEVEL	PP	PETROL PUMP
EC	ELECTRICITY COVER	PP	POWER POLE/STANCE
EOT	END OF TRACE (utility)	Pwk	PENSTOCK
ER	EARTH ROD (utility)	PW	PUMP WELL (PW)
ER	EARTHED	PV	PYLON
ESP	ELECTRICITY SUPPLY POST	RE	RODDING EYE
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL
EW	EXPANSION JOINT CHAMBER	RL	RECORDED LEVEL
FL	FOOTBRIDGE	RL	RAIN GAUGE
FL	FLOOR LEVEL	RL	RIDGE LEVEL
FL	FLOOR LEVEL (OR LEVEL	RM	RADIO MONITORING Pro
Flgt	FLOOR LIGHT	RP	REFLECTOR POST
RS	ROAD SIGN		
RSP	RAILWAY SIGNAL POST		
RW	RAIN WATER PIPE		
RWP	RAILWAYSTOPPING		
SB	SOIL BOX		
SB	SIGN BOARD		
SBV	SHELTER		
SL	SLOPE LEVEL		
SL	SLOPE LEVEL		
SMP	SETTLEMENT MONITORING Pro		
SP	SIGN POST		
Spl Hydt	SPIGOT HUMP		
SPR	SHARE AN POINT		
SPR	SHARE AN POINT		
ST	STOP PIPE / SUPPLY TAP		
ST	STUMP		
Stone Pav	STONE PAVING SLABS		
STP	STOP PIPE		
SVP	STAY POST		
SW	SOIL VENT		
SW	STATHPIPE		
SW	STORM WATER		
SW	STONE WALL		
Tac	TACTILE PAVING		
TBM	TEMPORARY BENCH MARK		
Tbol	BOLLARD (Road Transport)		
TCP	TRAFFIC CONTROL POST		
TCP	TELEPHONE CALL POST		
TH	THRESHOLD LEVEL		
TH	THRESHOLD LEVEL		
TL	TRAFFIC SIGNAL POST		
TP	TELEGRAPH POLE		
TP	TELEGRAPH POLE		
TP	TRIAL PIT		
TP	TRIAL PIT		
UTA	UNABLE TO ACCESS		
UTA	UNABLE TO ACCESS		
UTA	UNABLE TO RAISE		
UTA	UNABLE TO RAISE		
UTT	UNABLE TO TRACE (utilities)		
VC	VITREOUS CLAY		
VC	VALVE CHAMBER COVER PAD		
VP	VENT PIPE		
WB	WATER BOARD		
WB	WEIGH BRIDGE		
WC	WATER COURSE		
WL	WATER LEVEL		
WM	WATER METER		
WPF	WIRE MESH FENCE		
WT	WATER TANK		
WWS	WHO SIGN POLE		
WSR	WATER LEVEL SENSOR		

Sheet Layouts



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THE SURVEY ASSOCIATION

A TETRA TECH COMPANY

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Topographical Survey

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Date:	March 2023	Scale:	1:200 @ A0
Dig No:	UAT3172_A	Sheet:	7 of 18

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This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Any indication of foundations is purely diagrammatic. Ground conditions have not been investigated by the Surveyor. A suitable method of foundation should be provided, allowing for existing ground conditions, trees and their anticipated future growth. Ground conditions should be investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees should be protected during the course of the development by the erection of suitable barriers to keep from damage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Sketch proposals are based upon OS mapping & as such are subject to detailed survey. Sketch proposals may be based upon arrangements of OS sheets & visual estimations of existing site conditions. Proposals will need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to RMS specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION

Utility Services Location Note:

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The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

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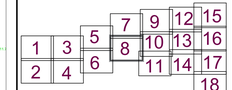
Standard Abbreviations

ACO	ACCESS CHANGE CHANNEL	Flat RP	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FP	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BB	BEDDING BLOCK	FS	FLOOD SENSOR	RWP	RAIN WATER PIPE
BE	BEDDING LEVEL	G	GULLY	RWP	WALL MOUNTED PIPE
Bol	BOLLARD	GF	GAS GUARD POST	SA	SAMPLE
Bollard	BOLLARD	GPR	GROUND PROBING RADAR	SB	SIGN BOARD
BP Post	BUTTON POST	GV	GAS VALVE	Shr	SHRUB
BP Plug	BLOCK PAVING	GV	GAS VALVE COVER	SL	SLOPE LEVEL
BS	BUS STOP	HP	HANDRAIL POST	SL	SURVEY LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	Spr	SPRINKLER
BW	BRICK WALL	LR	IRON RAILING FENCE	Spr Hyd	SPEED HUMP
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARE AND POINT
CA	CARRIAGEWAY CHANNEL	LA	LOCAL AUTH	SS	SOIL STACK PIPE
CAT	CATHWAY LEVEL	LG	LOCK GATE	ST	STAND PIPE / SUPPLY TAP
CB	CONTROL BOX	LP	LAMP POST	ST	STUMP
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (grt)	Stone Pvg	STONE PAVING SLABS
CC	CONCRETE CHANNEL	LPS	LOW PRESSURE GAS (wm)	SW	SOIL WASTE
CC	CHAMBER DEPTH	LT	LAMP POST	SWD	STAY POST
CL	CABLE LEVEL	M	MANHOLE	SWP	SOIL WASTE PIPE
CP	CAST IRON	MH	MANHOLE	SW	STATIONS
CP	CONCRETE POST	MP	MARKER POST	TA	TOP OF ARM
CL	COVER LEVEL	MP	MARKER POST	TA	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Cnc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	ELECTRIC MOTOR	TBM	BOLLARD (Dept Transport)
CP	CATCHPIT	NP	NAME PLATE	TBM	TELEPHONE BOLLARD
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpe	CRASH BARRIER / PLAY EQUIPMENT	OBH	OVERHEAD BOOM ARCH	TH	THRESHOLD
Cpt	BUILDING CANOPY	OBM	GB BENCH MARK	TL	THRESHOLD LEVEL
Cptw	CARPORT	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CR	CONCRETE RING	OHL	OVERHEAD LINES	TP	TELEGRAPH POLE
CV	CAR PARK	OHE	OVERHEAD ELECTRIC	TP	TOP OF ARM PLATE
CW	CONCRETE / PICKUSH	OHT	OVERHEAD TELE	TP	TELEGRAPH POLE
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DRAIN	OHW	OVERHEAD WIRES	TR	TREE
DC	DUCT COVER	OHW	OVERHEAD WARNING	UTA	UNABLE TO ACCESS
DE	DRAIN ENTRY	P	POST	UTB	UNABLE TO ACCESS
(dmo)	DILAPIDATED	PB	POST BOX	UTB	UNABLE TO RAISE
DP	DRAIN POT	PC	PEDESTRIAN CAMERA	UTC	UNABLE TO TRACE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PF	PIT DEPTH	VC	VERGE CLOT
Dsh	DISH ANTENNA	PF	PETROL FILLER	VP	VENT PIPE / ELECTRON PAD
Dw	BARES LEVEL	PF	PETROL PUMP	WF	VENT MAN
E	ELECTRICITY COVER	PG	PEDESTRIAN GATE	WG	WATER GATE
EOT	END OF TRACE (utility)	Pnt	PENSTOCK	WB	WEIR BRIDGE
ER	ELECTRIC RISER	PO	PULL OFF POINT	WL	WATER LEVEL
Ew	EARTHLED	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
F	FOOTBRIDGE	RL	RAIL CROSSING	WW	WOOD WIRE FENCE
Fb	FOOTBRIDGE	RL	RAIN GAUGE	WS	WHO SIGN POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FL	FINISHED FLOOR LEVEL	RM	RAIL MONITORING Pnt		
Flg	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



Grid:
Local Grid by GPS Observations to the OS Active Network (OSTN15)

Datum:
Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
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A	ORIGINAL ISSUE	APR'23	DS

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CLIENT:
Novus

PROJECT:
Legacy

TITLE:
Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Drg No: UAT3172_A	Sheet: 8 of 18

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Notes:

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This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Where trees are to be retained, the exact method of foundation construction and service routing is to be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing roots and soil conditions. Where trees are to be planted, a suitable method of foundation is to be provided/investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees to be retained should be protected during the course of the development by the erection of barriers to prevent damage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions, underground services, etc. Any sketch proposals are indicative only and proposals may be based upon arrangements of OS sheets & visual estimations of existing site conditions. Proposals will need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to RICS specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Utility services have been plotted using a combination of observation and detection using electromicrosonde and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

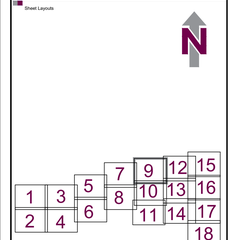
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65% success is considered good, 80% success is exceptional. Lighter sites will achieve 90% success and but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited to those fitted with electronic markers or conductors.** Depth is a function of size and of duct/pipe accuracy - it should be regarded only as an indication and cannot be guaranteed"

Standard Abbreviations

ACO	ACCESS CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
AP	ARCHAEOLOGICAL PIT	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BOREHOLE	G	GULLY	RWP	RAIN WATER PIPE
BH	BOREHOLE	GF	GAS BLAST FUNNEL	SB	SIGN BOARD
Bol	BOLLARD	GPR	GROUND PROBING RADAR	SB	SIGN BOARD
BP	BOUNDARY POST	GV	GAS VALVE	SB	SIGN BOARD
BTap	BLOCK PAVING	GV	GAS VALVE COVER	SL	SLOPE LEVEL
BW	BOUNDARY WALL	HC	HEDGE CUTTING	SL	SLOPE LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL	IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARE AN POINT
CA	CONCRETE APRON	LA	LOCAL AUTH	SS	SOIL SAMPLE
CAT	CATHODIC LEVEL	LG	LOCK GATE	ST	STAKE
CB	CONTROL BOX	LP	LAMP POST	STP	STAKE PIPE - SUPPLY TAP
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	Stone Pvg	STONE PAVING SLABS
CF	CHAIN LINK FENCE	LS	LANDSCAPED AREA (soft)	STP	STAKE PIPE
CO	CHAMBER DEPTH	LP	LAMP POST	SWP	STAY POST
CP	CONCRETE POST	MH	MANHOLE	SY	STAY WIRE
CP	CAST IRON	MH	MANHOLE	SW	STAYWIRE
CP	CONCRETE POST	MP	MARKER POST	TA	TOP OF ARM
CL	COVER LEVEL	MP	MARKER POST	TW	RTAINE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Conc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	ELECTRICITY METER	TBol	BOLLARD (Type Unspcfd)
CP	CATCHPIT	NP	NAME PLATE	TBol	BOLLARD (Type Unspcfd)
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpt	CHILDREN'S PLAY EQUIPMENT	OBH	OVERHEAD BOUNDARY ARCH	TCP	TELEPHONE CALL POST
Cpt	BUILDING CANOPY	OBM	OB BENCH MARK	TL	THRESHOLD LEVEL
Cpw	CARPORT	OHC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CP	CONCRETE POST	OHC	OVERHEAD CONDUIT	TP	TELEGRAPH POLE
CP	CAR PARK	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
CR	CONCRETE RAILS / ROUGH	OHL	OVERHEAD LINE	TP	TRIAL PIT
CW	CONCRETE WALL	OHShad	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DITCH	OHT	OVERHEAD TELECOM	TS	TRAFFIC SIGNAL
DC	DUCT COVER	PAV	OVERHEAD WARNING	UTA	UNABLE TO ACCESS
DC	DUCT COVER	PB	POST BOX	UTA	UNABLE TO ACCESS
DRain	DILAPIDATED	PB	POST BOX	UTA	UNABLE TO RAISE
DT	DITCH	PC	PEDESTRIAN CAMERA	UTA	UNABLE TO RAISE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	UC	UTMOST CLEAT
Dw	DRAIN WELL	PL	PETROL LEVEL	UP	UTILITY PROTECTION POST
Ea	EAVES LEVEL	PP	PETROL PUMP	VP	VENT PIPE
EC	ELECTRICITY COVER	PR	PEDESTRIAN RAMP	WB	WATER BOARD
EOT	END OF TRACE (utility)	Pnt	PENSTOCK	WB	WELSH BRIDGE
ER	ELECTRIC RISER	PV	PIT VOLUME	WC	WATER COCK
Ea	EARTH ROD	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	RE	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
Ex	EXCAVATION OR CHAMBER	RL	RAIL LEVEL MONITORING Pnt	WP	WOOD POST
Fb	FOOTBRIDGE	RG	RAIN GAUGE	WS	WELSH SLATE POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FLR	FINISHED FLOOR LEVEL	RM	RAIL LEVEL MONITORING Pnt		
Flg	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



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CLIENT:
Novus

PROJECT:
Legacy

TITLE:
Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Dtg No: UAT3172_A	Sheet: 9 of 18

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. This drawing is to be read in conjunction with all relevant Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Where trees are to be retained, the presence of tree roots and their influence on foundations should be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing trees and proposed trees. Where trees are to be removed, the influence of roots on foundations should be investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees should be protected during construction works in accordance with BS5837 and be adequately clear from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation and design. Existing information is shown for guidance only. Site boundaries are indicative only and sketch proposals may be based upon arrangements of OS sheets & visual estimations of existing site boundaries. Site boundaries need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION

Utility Services Location Note:

Underground services have been plotted using a combination of observation and detection using electromication and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 85% success is considered reasonable.** Greater success may be achieved on lighter, less built up sites **but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they contain a continuous metallic element, such as a tracer wire and of ductile accuracy. It should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACCESS CHANNEL	Pwr RP	FLAT ROOF LEVEL	RG	RODD IRON
Air	AIR VALVE		FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
AP	ARCHAEOLOGICAL	Fu	FLOOR LEVEL	RW	RAIN WATER PIPE
BB	BED BOOK	G	GULLY	RWP	RECTANGULAR PIPE
BH	BOREHOLE	GF	GAS BLAST FLOAT	S	SOIL PIPE
Bol	BOLLARD	GPR	GROUND PROBING RADAR	SB	SIGN BOARD
BP	BOUNDARY POST	GV	GAS VALVE	SW	SHED TOP
BPeg	BUCKS PEGING	GC	GAS VALVE COVER	Sy	SURVEY LEVEL
BS	BUS STOP	H	HYDRANT	Sc	SECURITY CAMERA
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL	IR	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWP	BARBED WIRE FENCE	KO	KERB OUTLET	SPR	SHARER POINT
CA	CATTLE GRID/CATTLE	LA	LOCAL AUTH	SS	SOIL STACK PIPE
CAT	CATHMAT COVER	LA	LOCK GATE	ST	STAND PIPE - SUPPLY TAP
CB	CONTROL BOX	LC	LAMP COLUMN	St	STONE
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (ppl)	Stone Pvg	STONE PAVING SLABS
CC	CONCRETE CHIMNEY STACK	LP	LAMP POST (with)	SV	STOP VALVE
CO	CHAMBER DEPTH	LP	LAMP POST	SVP	STAY POST
CP	CONCRETE POST	MH	MANHOLE	SW	STOP VALVE
CP	CAST IRON	MH	MANHOLE	SW	STATIONS
CP	CONCRETE POST	MP	MARKER POST	TH	TOP HOUSE
CL	COVER LEVEL	MP	MARKER POST	TW	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
CM	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	EXISTING MAST/OH	TBM	BOLLARD (Real Transport)
CP	CONCRETE PILLING	NP	NAME PLATE	TBM	TEMPORARY BENCH MARK
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpe	COMMUNICATION EQUIPMENT	OBM	OS BENCH MARK	TL	TRAFFIC LIGHTS
Cpy	BUILDING CANOPY	OSBM	OS BENCH MARK	TN	THRESHOLD LEVEL
Cptn	CAPSTAN	OSC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CS	CONCRETE SLAB	OSC	OVERGROUND CABLE	TP	TELEGRAPH POLE
CT	CULVERT	OHL	OVERGROUND ELECTRIC	TVP	TELEVISION POLE
CW	CONCRETE WALL / ROUGH	OHL	OVERGROUND LINE	TW	TOP OF WALL
CW	CONCRETE WALL	OHBridge	OVERHEAD STRUCTURE	Tpt	TRIAL PIT
D	DOOR	OHP	OVERHEAD POWER	TV	TELEVISION
DC	DUCT COVER	OHW	OVERHEAD WIRE/PIPE	UTA	UNABLE TO ACCESS
DP	DRAINAGE POINT	P	POST	UTB	UNABLE TO ACCESS
(dmo)	DILAPIDATED	PB	POST BOX	UTB	UNABLE TO RAISE
DP	DRAIN POST	PC	PEDESTRIAN CAMERA	UTC	UNABLE TO CLEAR
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	UC	UTRIED COLLECT
Dr	DRAIN COVER	PO	PETROL OUTLET	UP	UNABLE TO LOCATION PAD
Dw	BANKS LEVEL	PP	PETROL PUMP	UP	VENT PIPE
E	ELECTRICITY COVER	PR	PROTECTIVE FENCE	VP	VENT PIPE
EOT	END OF TRACE (utility)	Pnt	PENSTOCK	WB	WEIR BRIDGE
EP	ELECTRIC POST	PV	PETROL VENT PIPE	WC	WATER COURSE
ER	EARTH ROD	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
Ex	EXISTING SPOT HEIGHT	RL	RAIL LEVEL	WP	WOOD POST
FB	FOOTBRIDGE	RG	RAIN GAUGE	WS	WHO SIGN POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FMP	FLOOD MONITORING LEVEL	RMP	RADIO MONITORING Pnt		
Flig	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts

Grid:	Datum:
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March 2023	1:200 @ A0
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UAT3172_A	10 of 18

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   This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Any indication of foundations is approximate only. Foundation design and ground conditions must be investigated by the Contractor. A suitable method of foundation should be provided, allowing for existing trees on site and proposed trees to be planted. Ground conditions must be investigated and foundations designed by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

   Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees to be felled should be removed and the stumps ground out to a depth of 600mm below ground level, away from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

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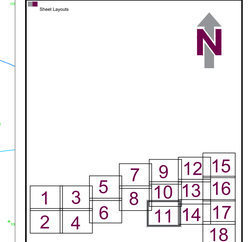
"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65%** accuracy is normally achievable, **but on lighter sites 95% accuracy may be claimed**, the accuracy figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be impossible unless they contain a continuous metallic element** such as a tracer wire and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"

Standard Abbreviations

ACO	ACCESS CHANNEL	Flat RP	FLAT ROOF LEVEL	RG	RODD SIGN
AV	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BB	BOUNDARY BOX	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BE	BEGINS/ENDS	FT	FUEL TANK	RWP	RAIN WATER PIPE
BH	BOREHOLE	GF	GUIDE POST	SB	SIGN BOARD
Bol	BOLLARD	GPR	GROUND PROBING RADAR	SB	SIGN BOX
BP	BOUNDARY POST	GV	GAS VALVE	SL	SLOPE
BPlug	BLOCK PLUG	GV	GAS VALVE COVER	SL	SLOPE LEVEL
BS	BUS SHELTER	HH	HANDHOLE	SL	SLOPE LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pin
BT	BRITISH TELECOM COVER	IL	INVERT LEVEL	SP	SIGN POST
BW	BRICK WALL	IR	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWP	BARRIED WIRE FENCE	KO	KERB OUTLET	SPR	SHARED PATH
CA	CATTLE GRID AND FENCE	LA	LIGHTING ARM	SS	SOIL STACK PIPE
CAT	CATENARY CABLE	LG	LOCK GATE	ST	STAIRS
CB	CATCH PIT CHAMBER	LP	LAMP POST	ST	STAIRS
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	Stone Pav	STONE PAVING SLABS
CCTV	CCTV CAMERA AND FENCE	LP	LIGHTING COLUMN, (with	SV	SCOUR VALVE
CC	CHAMBER (WITH	LP	LAMP POST	SWP	STAY POST
CC	CONCRETE COVER	MH	MANHOLE	SWP	SOIL WASTE PIPE
CP	CAST IRON	MH	MANHOLE	SW	STOPWIRE
CP	CONCRETE POST	MP	MARKER POST	SW	STOPWIRE
CL	COVER LEVEL	MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Cnr	CORNER	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MV	EXISTING MOTOR	TBM	BOLLARD (Post Tensioned)
COP	CONCRETE COPING	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CPE	CHILDRENS PLAY EQUIPMENT	OB	OBSERVATION BOREHOLE	TH	THRESHOLD
Cpy	BUILDING CANOPY	OBBH	OB BENCH MARK	THL	THRESHOLD LEVEL
Cptw	CAPSTAN	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CR	CONCRETE RING	OHL	OVERHEAD LINE	TP	TELEGRAPH POLE
CV	CAT V	OHL	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
CW	CONCRETE WALL / ROUGH	OHL	OVERHEAD LINE	TP	TRIAL PIT
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE	TP	TRIAL PIT
D	DRAIN	OHW	OVERHEAD WIRES	TR	TREE
DC	DUCT COVER	PAV	OVERHEAD ANNOPAN	UTA	UNABLE TO ACCESS
DCP	DRAINAGE CHAMBER	PB	PUSH BUTTON	UTB	UNABLE TO ACCESS
(dmo)	DILAPIDATED	PB	POST BOX	UTR	UNABLE TO RAISE
DP	DRAIN POST	PC	PEDESTRIAN CAMERA	UTT	UNABLE TO TRACE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PIT	PIT DEPTH	VC	VITREOUS CLAY
DW	DRAIN WELL	PL	PIPE LEVEL	VP	VENTILATION SHAFT PAD
Ea	EAVES LEVEL	PP	PETROL PUMP	VP	VENT PIPE
EB	ELECTRICITY BOX	PP	PHOTOGRAPHIC POINT	WB	WATER BOARD
EOT	END OF TRACE (utility)	Pwk	PENSTOCK	WB	WEIR BRIDGE
EP	ELECTRIC POLE	PY	PYLON	WC	WATER COURSE
Ea	EARTHED	PY	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	RE	RODDING EYE	WM	WATER METER
ESW	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
FL	FENCE LEVEL	RL	RAIL LEVEL (TRACK)	WW	WOOD WIRE FENCE
FL	FOOTBRIDGE	RL	RAIN GAUGE	WS	WHO SIGN POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FLL	FINISHED FLOOR LEVEL	RMP	RAIL MONITORING Pin		
Flig	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



Grid:	Datum:
Local Grid by GPS Observations to the OS Active Network (OSTN15)	Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
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CLIENT:

Novus

PROJECT:

Legacy

TITLE:

Topographical Survey

Drawn:	SB	Checked:	CA
Date:	March 2023	Scale:	1:200 @ A0
Dtg No:	UAT3172_A	Sheet:	11 of 18

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   Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees should be protected during the course of the development and adequately watered to prevent harm from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

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   SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

Underground services were plotted using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

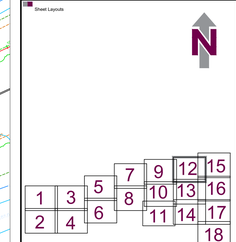
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition:

"Electronic tracing is a relative method of locating buried services. **On Heavy, built up sites 65% success is normally achievable, but on light, open sites this success rate may be greatly increased** but this figure will depend on the depth of the service below ground level. **Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be dependent upon the presence of reference points such as valves, chambers and end of trunk/lot accuracy. It should be regarded only as an indication and cannot be guaranteed"**

Standard Abbreviations

ACO	ACO CHANNEL	CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
AV	AIR VALVE		FH	FIRE HYDRANT	RGP	RAILWAY SIGNAL POST
BB	BELOW BENCH		FL	FLOOR LEVEL	RM	RISING MAIN
BE	BOLLARD		G	GULLY	RWP	RAIN WATER PIPE
BH	BOREHOLE		GF	GAS FLOAT FLOAT	SB	SAND BOX
Bol	BOLLARD		GP	GUIDE POST	SB	SIGN BOARD
BP	BOUNDARY POST		GPR	GROUND PROBING RADAR	SW	SHED TOP
BPlug	BLOCK PLUG		GV	GAS VALVE	SL	SLOPE LEVEL
BV	BOUNDARY VALVE		GV	GATE VALVE COVER	SL	SUPPLY LEVEL
BS	BUS STOP		IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BT	BRITISH TELECOM COVER		IL	INVERT LEVEL	SP	SIGNAL POST
BW	BRICK WALL		IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
BWF	BARBED WIRE FENCE		KO	KERB OUTLET	SPR	SHARP PEAK
CA	CARRIAGEWAY CLOSE		LA	LOCAL AUTH	SS	STAINLESS STEEL
CA	CATHWAY LEVEL		LG	LOCK GATE	ST	STAIR
CB	CONTROL BOX		LP	LAMP POST	STW	STOP VALVE
CB	CONTROL BOX		LOR	LOSS OF REFLECTION (gpr)	Stone Pav	STONE PAVING SLABS
CF	CHAIN LINK FENCE		LW	LOW RAILING (with)	SV	SLUICE VALVE
CO	CHAMBER DEPTH		LP	LAMP POST	SVP	STAK POST
CP	CONCRETE POST		M	MANHOLE	SW	SOIL VENT
CP	CAST IRON		MH	MANHOLE	SW	STATIONS
CP	CONCRETE POST		MP	MARKER POST	SW	SLOPE WALL
CL	COVER LEVEL		MP	MARKER POST	SW	STONE WALL
CL	CHAIN LINK FENCE		MP	MILE POST	Tac	TACTILE PAVING
Cnc	CONCRETE		MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cnc	CONCRETE (in kerb)		MV	EXISTING MOTOR	TBM	BOLLARD (Dept Transport)
CP	CATCHPIT		NP	NOTICE BOARD	TBM	TEMPORARY BENCH MARK
CP	CATCHPIT		NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpe	CHILDRENS PLAY EQUIPMENT		OB	OBSERVATION BOREHOLE	TH	THRESHOLD LEVEL
Cpe	BUILDING CANOPY		OBH	OB BENCH MARK	TH	THRESHOLD LEVEL
Cpw	CARPARK		OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CR	CONCRETE		OHC	OVERGROUND CABLE	TP	TELEGRAPH POLE
CS	CULVERT		OHE	OVERHEAD ELECTRIC	TP	TELEPHONE POLE
CSP	CORRUGATED PIGUGH		OHL	OVERHEAD LINE	TP	TELEPHONE POLE
CW	CONCRETE WALL		OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DOOR		OP	OVERHEAD POWER	TR	TREE
DC	DUCT COVER		OPen	OVERHEAD OPENPOWL	UTA	UNABLE TO ACCESS
DC	DUCT COVER		P	POST	UTA	UNABLE TO ACCESS
DRen	DILAPIDATED		PB	POST BOX	UTA	UNABLE TO RAISE
DW	DOORWAY		PC	PHOTOGRAPHIC CAMERA	UTA	UNABLE TO ACCESS
DPC	DAMP PROOF COURSE		Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN		PF	PIT DEPTH	UC	UTRIRED DUCT
Dw	DRAINAGE WELL		PH	PETROL HOSE	UP	UTILITY PROTECTION POD
Ea	EAVES LEVEL		PM	PETROL PUMP	VP	VENT PIPE
EB	ELECTRICITY BOXES		PO	PROTECTIVE OFFENCE	WB	WATER BOARD
EOT	END OF TRACE (utility)		Pwk	PENSTOCK	WB	WEIGH BRIDGE
EP	ELECTRIC POLE		PW	PUMP WELL (Pit)	WC	WATER COURSE
ER	EARTHLOED		PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST		R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST		Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
FB	FLOWER BED OR SHRUBS		RE	RAILWAY ELECTRIC	WW	WOOD WORM FENCE
Fc	FOOTBRIDGE		RL	RAIN GAUGE	WS	WHO SIGN POST
FL	FLOOR LEVEL		RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FLev	FLOOR LEVEL (OF LEVEL)		RM	RISING MAIN/MONITORING Pnt		
FLig	FLOOR LIGHT		RP	REFLECTOR POST		

Sheet Layouts



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Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Org No: UAT3172_A	Sheet: 12 of 18

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Offset 100.000

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   Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. Trees should be protected during construction works and adequate space should be allowed for their roots from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

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Utility Services Location Note:

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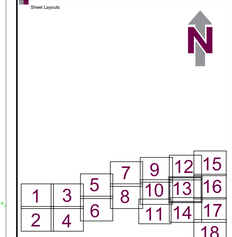
Standard Abbreviations

ACO	ACO DRAINAGE CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
BH	RECEIVING HOUSE	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BOREHOLE	G	GULLY	RWP	RECTANGULAR PIPE
BH	BOREHOLE	GF	GUIDE FLOAT	SB	SOIL BOARD
Bol	BOLLARD	GF	GUIDE MAST	SB	SIGN BOARD
BP	BOUNDARY POST	GPR	GROUND PROBING RADAR	SW	SHELTER
B Pag	BLOCK PAVING	GV	GAS VALVE	Sc	SCRUB
BS	BUS SHELTER	GV	GATE VALVE COVER	SL	SLOPE LEVEL
BS	BUS STOP	H	HANDRAIL	SP	SERVICE POST
BSC	BRITISH STEEL COVER	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BW	BRICK WALL	IL	INVERT LEVEL	SP	SIGN POST
BWP	BARBED WIRE FENCE	IW	IRON RAILING FENCE	Spd Hump	SPEED HUMP
CAB	CABLE TELEVISION COVER	KO	KERB OUTLET	SPR	SHARE AN POINT
CP	CATENARY POLE	LA	LOCAL AUTH	SS	SOIL STACK PIPE
CA	CATTLE GRID	LG	LOCK GATE	ST	TRIGG PIPE - SUPPLY TAP
CB	CONTROL BOX	LOR	LOSS OF REFLECTION (gpr)	T	TREE
CF	CHAIN LINK FENCE	LP	LAMP POST (Electric, wire)	Stone Pvg	STONE PAVING SLABS
CO	CHAMBER DEPTH	LP	LAMP POST	SWP	STAY POST
CP	CAST IRON	MH	MANHOLE	SWP	STAY WIRE
CP	CAST IRON	MH	MANHOLE	SW	STATWIRE
CP	CONCRETE POST	MP	MARKER POST	TP	TELE POST
CL	COVER LEVEL	MP	MARKER POST	TP	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Conc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	EXISTING MARKER	TBM	BOLLARD (Road Transport)
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CP	CATCHPIT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpt	CONTROL PLAY EQUIPMENT	OBS	OBSERVATION ENTRY AREA	TH	THRESHOLD
Cpt	BUILDING CANOPY	OSBM	OS BENCH MARK	TH	THRESHOLD LEVEL
Cpw	CARPORT	OSC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
CP	CONCRETE POST	OSC	OVERGROUND CONDUIT	TP	TELE POST
CP	CAR PARK	OSE	OVERHEAD ELECTRIC	TP	TELEPHONE PILLAR
CW	CONCRETE WALL / PICKUP	OSL	OVERHEAD LINE	TP	TELEPHONE POST
CW	CONCRETE WALL	OSStruct	OVERHEAD STRUCTURE	Tpt	TRIAL PIT
D	DOOR	OSW	OVERHEAD WIRES	TR	TREE
DC	DUCT COVER	Pmn	OVERHEAD WINDOWN	UTA	UNABLE TO ACCESS
Dec	DECIDUOUS TREE	PB	POST BOX	UTB	UNABLE TO ENTER SITE
(dmp)	DILAPIDATED	PB	POST BOX	UTR	UNABLE TO RAISE
DP	DOWN PIPE	PC	PEDESTRIAN CAMERA	UTT	UNABLE TO TRACE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	UTT	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PF	PIT DEPTH	VC	VITREOUS CLAY
Dw	DRAINAGE WELL	PF	PIT DEPTH	VP	VENTILATION PAD
Ea	EAVES LEVEL	PP	PETROL PUMP	VP	VENT PIPE
EC	ELECTRICITY COVER	PR	PEDESTRIAN RAMP	WB	WATER BOARD
EOT	END OF TRACE (utility)	Pwk	PENSTOCK	WB	WEAK BRIDGE
ER	EARTH ROD	PV	PRIVATE VALVE	WC	WATER COURSE
ER	EARTHED	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	RE	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EW	ELECTRICITY SERVICE CHAMBER	RL	RAIL ROAD LEVEL	WP	WOOD POST
Fe	FOOTBRIDGE	RL	RAIN GAUGE	WS	WIND SOCK POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FL	FINISHED FLOOR LEVEL	RMP	RAILWAY MONITORING Pnt		
Flg	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



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Drawn:	SB	Checked:	CA
Date:	March 2023	Scale:	1:200 @ A0
Drg No:	UAT3172_A	Sheet:	13 of 18

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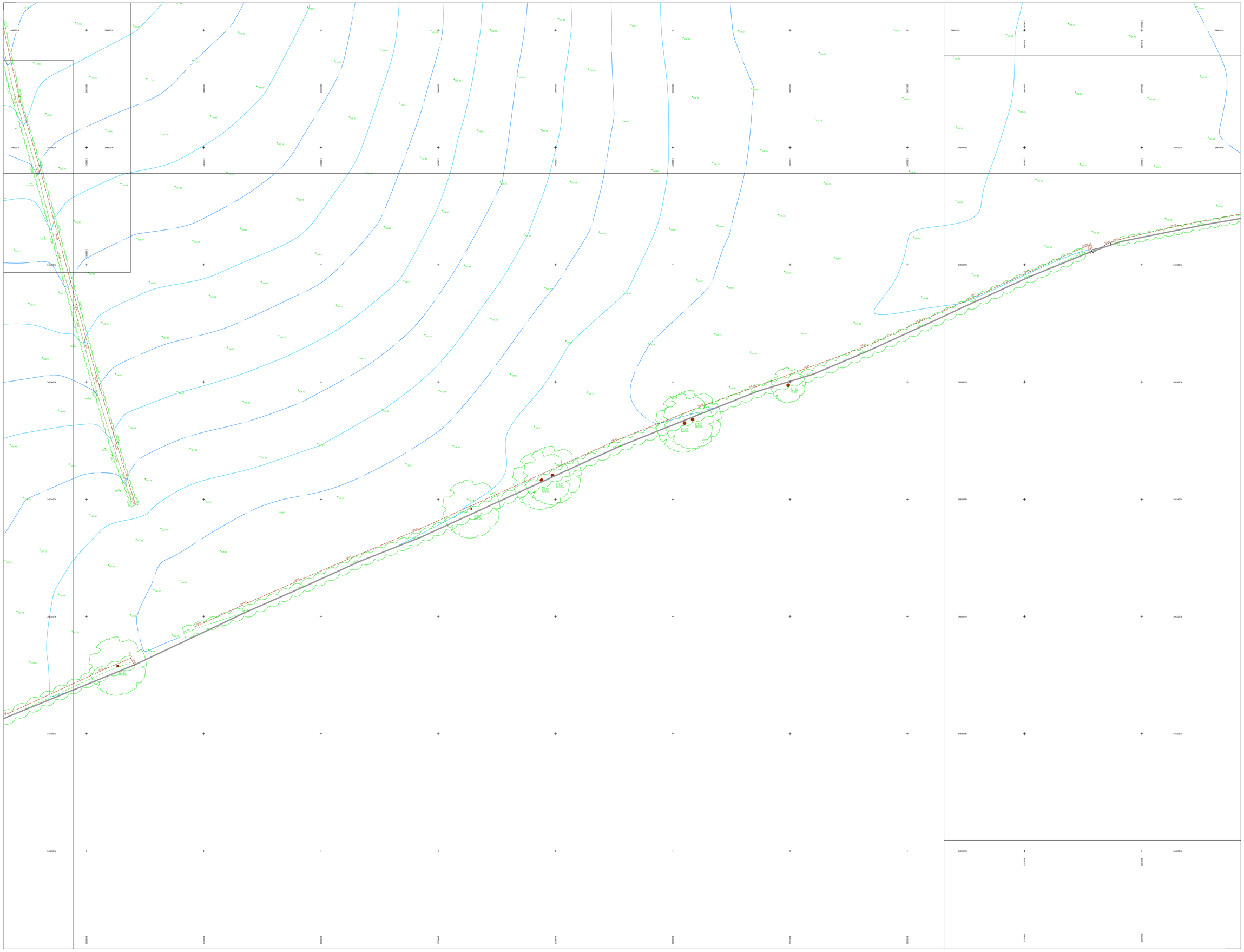
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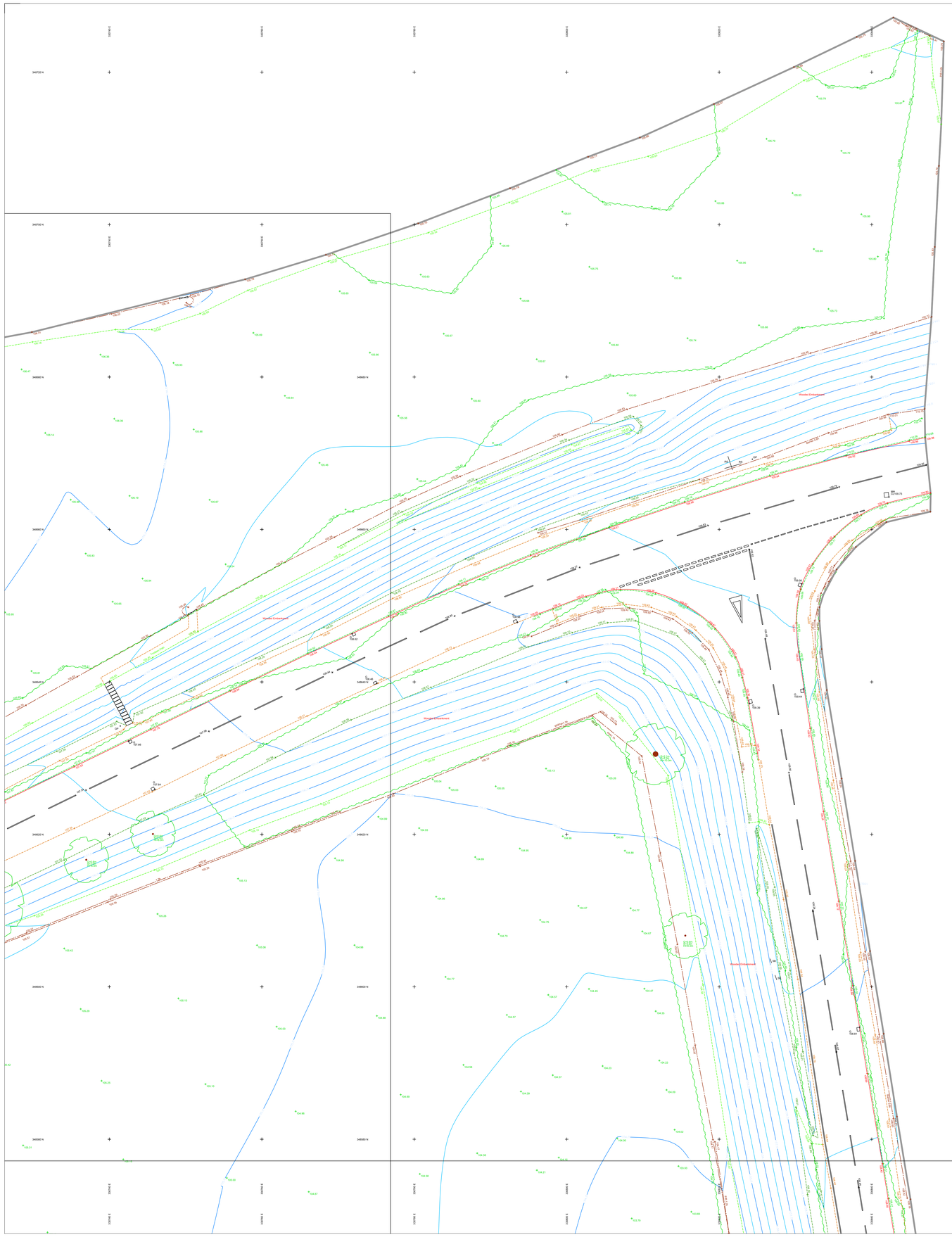
Wooded Embankment
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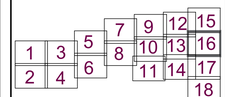
Standard Abbreviations

ACO	ACCESS CHANNEL	Flat RF	FLAT ROOF LEVEL	RG	ROAD SIGN
Air	AIR VALVE	FH	FIRE HYDRANT	RSP	RAILWAY SIGNAL POST
AP	ACCESS POINT	FL	FLOOR LEVEL	RWP	RAIN WATER PIPE
BB	BED BENCHMARK	G	GULLY	RWP	RECLAMATION PIPE
BH	BOREHOLE	GF	GAS RELIEF FLOAT	SB	SOIL BOARD
Bol	BOLLARD	GP	GUIDE POST	SB	SIGN BOARD
BP	BOUNDARY POST	GPR	GROUND PROBING RADAR	SW	SHED TOP
BPad	BLOCK PAVING	GV	GAS VALVE	Sk	SKYLIGHT
BS	BUS SHELTER	GV	GATE VALVE COVER	SL	SUPPLY LEVEL
BS	BUS STOP	IC	INSPECTION COVER	SP	SERVICE POST
BSC	BRITISH STEELWORK COVER	IC	INSPECTION COVER	SMP	SETTLEMENT MONITORING Pnt
BW	BRICK WALL	IR	IRON RAILING FENCE	SP	SIGN POST
BWF	BARBED WIRE FENCE	KO	KERB OUTLET	SpH Hyd	SPEED HUMP
CA	CARRIAGEWAY CENTRE	LA	LOCAL AUTH.	SPB	SHARED PATH
CA	CATHWAY LEVEL	LB	LOCAL BATT.	SS	SOIL STACK PIPE
CB	CONTROL BOX	LCR	LOSS OF REFLECTION (gpr)	ST	STAIR
CF	CHAIN LINK FENCE	LP	LAMP POST (Electric, unit)	Stone Pvg	STONE PAVING SLABS
CO	CHAMBER DEPTH	LP	LAMP POST	SW	SOIL WASTE
CP	CAR PARK	MH	MANHOLE	SWH	STOP VALVE
CP	CAST IRON	MH	MANHOLE	SW	STATIONING
CP	CONCRETE POST	MP	MARKER POST	TA	TOP OF BANK
CL	COVER LEVEL	MP	MARKER POST	TH	STONE WALL
CL	CHAIN LINK FENCE	MP	MILE POST	Tac	TACTILE PAVING
Conc	CONCRETE	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Conc	CONCRETE	MU	EXISTING MAST	TBM	BOLLARD (Rail Transport)
CP	CATCHPIT	NP	NAME PLATE	TBM	BOLLARD (Rail Transport)
CP	CATCHPIT PLAY EQUIPMENT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
Cpy	BUILDING CANOPY	OBM	OS BENCH MARK	TE	TELEPHONE EXCHANGE
Cpy	CARPORT	OGC	OVERGROUND CONDUIT	TL	THRESHOLD LEVEL
Cpy	CANOPY/PORCH	OHC	OVERHEAD CABLES	TL	TRAFFIC SIGNAL POST
CT	CABLE TV	OHL	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
CT	CABLE TV BOX / PEDISH	OHL	OVERHEAD ELECTRIC	TP	TELEPHONE POLE
CW	CONCRETE WALL	OHStruct	OVERHEAD STRUCTURE	Tpl	TRIAL PIT
D	DOOR	Ped	OVERHEAD PEDESTAL	TR	TRENCH
DC	DUCT COVER	PHC	OVERHEAD HARDPAN	U/Ha	UNABLE TO ACCESS
DE	DOOR ENTRANCE	PL	PIPE	U/Ha	UNABLE TO ACCESS
(dmo)	DILAPIDATED	PB	POST BOX	U/Ra	UNABLE TO RAISE
DP	DOWN PIPE	PC	PEDESTRIAN CAMERA	U/Ra	UNABLE TO RAISE
DPC	DAMP PROOF COURSE	Ped	PEDESTRIAN CROSSING	U/T	UNABLE TO TRACE (utilities)
DS	DIRECTION SIGN	PP	PIT DEPTH	UC	UTRIDEC/ELEC
Dw	DRIVEWAY	PP	POWER POLE	UC	UTRIDEC/TELECTION PAD
Ea	EAVES LEVEL	PR	RETAIL POINT	UP	VENT PIPE
EB	ELECTRICITY BOARD	PS	PEDESTRIAN SENSE	VP	VENT PIPE
EOT	END OF TRACE (utility)	Pvb	PENSTOCK	WB	WEIGH BRIDGE
ER	EARTH ROD	PV	PETROL VENT PIPE	WL	WATER LEVEL
Ert	EARTHED	PV	PYLON	WL	WATER LEVEL
ESP	ELECTRICITY SUPPLY POST	R	RODDING EYE	WM	WATER METER
ESP	ELECTRICITY SUPPLY POST	Rdg	RIDGE LEVEL	WW	WIRE MESH FENCE
EW	EXPOSED VEHICLE CHAMBER	RL	RAIN GAUGE	WW	WOOD PANEL FENCE
Fb	FOOTBRIDGE	RL	RAIN GAUGE	WS	WIND SOCK POLE
FL	FLOOR LEVEL	RL	RIDGE LEVEL	WSR	WATER LEVEL SENSOR
FMP	FLOOD MONITORING PNT	RP	REFLECTOR POST		
Fpy	FLOOR LIGHT	RP	REFLECTOR POST		

Sheet Layouts



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Local Grid by GPS Observations to the OS Active Network (OSTN15)	Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	APR'23	DS

MAKING COMPLEX EASY

A TETRA TECH COMPANY

Stafford - Clevedon - Milton Keynes - Warrington - Edinburgh

T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com

Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT:

Novus

PROJECT:

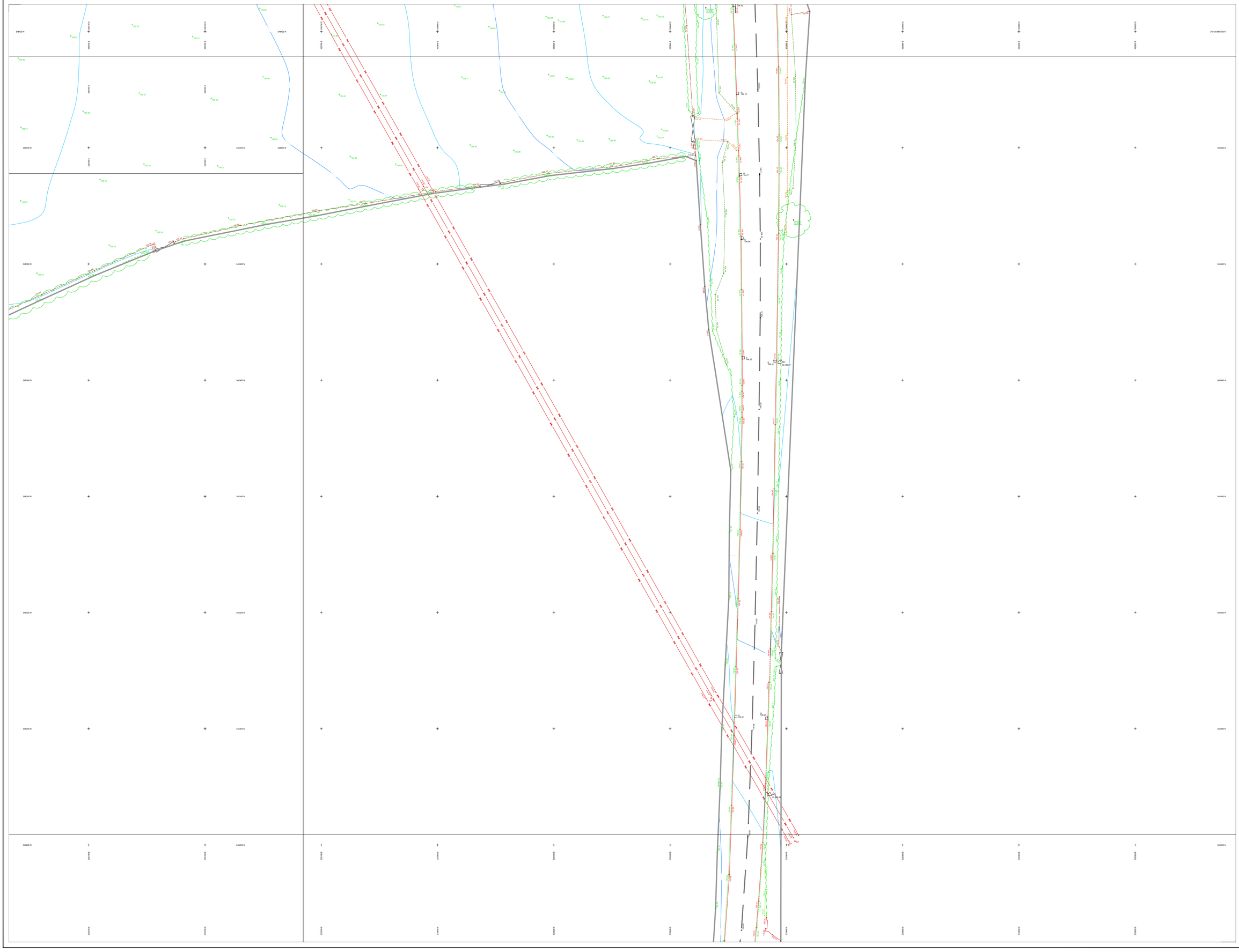
Legacy

TITLE:

Topographical Survey

Drawn: SB	Checked: CA
Date: March 2023	Scale: 1:200 @ A0
Drg No: UAT3172_A	Sheet: 16 of 18

MAKING COMPLEX EASY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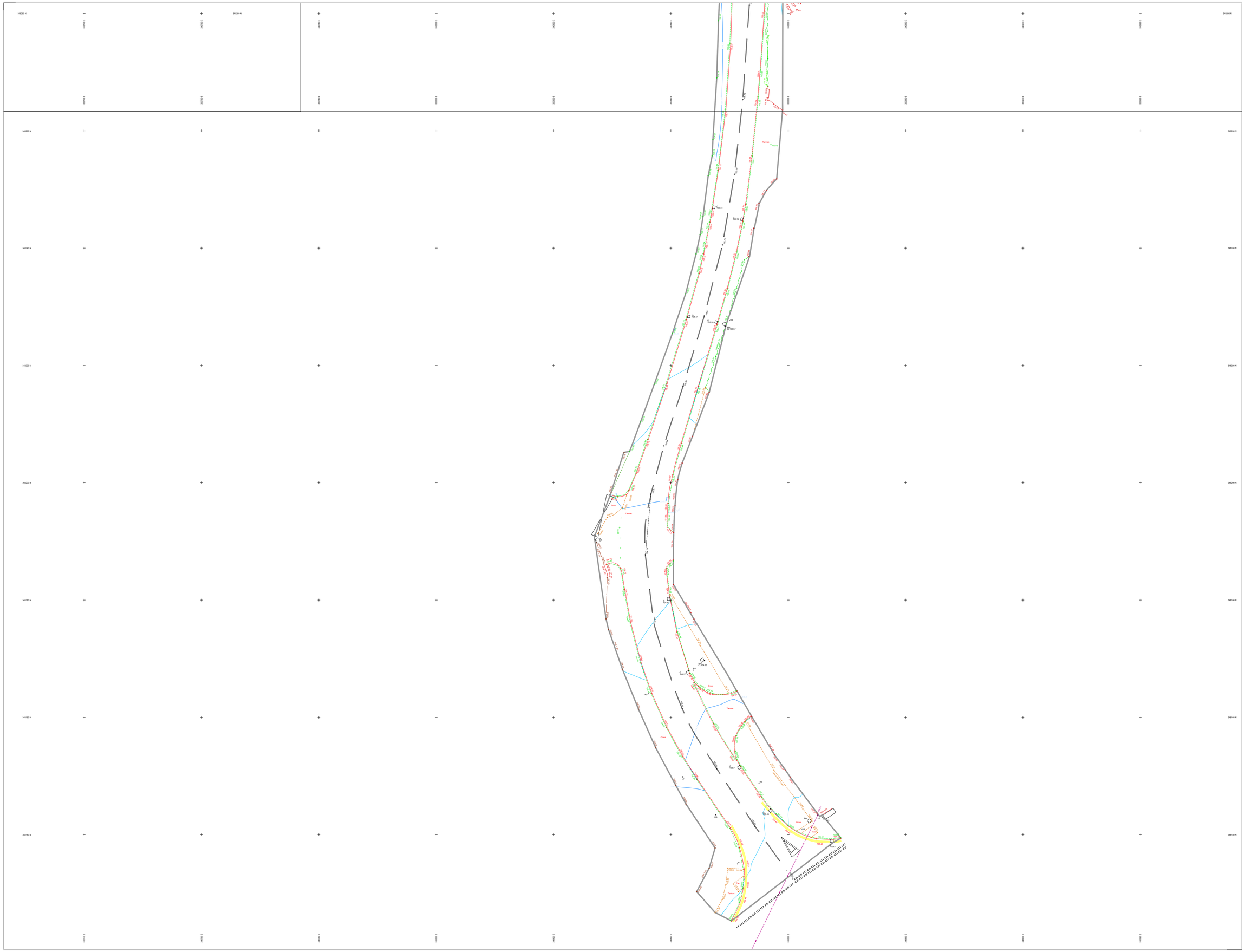
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346100 N
Tarmac
Grass
Hedge
Fence
Wall
Building
Trees
Manhole
Gully
Lamp Post
Bollard
Kerb
Edge of Water
Top of Bank
Toe of Bank
Centre Line
Footpath
Steps
Ramp
Gate
Post
Sign
Bench
Tree
Shrub
Flower Bed
Rough Grass
Concrete
Paving
Brick Paving
Setts
Drain
Inspection Cover
Catchpit
Soakaway
Culvert
Ditch
Pond
Stream
Overhead Line
Pole
Transformer
Substation
Cabinet
Meter
Valve
Hydrant
Chamber
Pit
Kiosk
Mast
Aerial
Satellite Dish
Flood Light
Traffic Light
Pedestrian Crossing
Cycle Route
Bus Stop
Seat
Litter Bin
Notice Board
Information Point
Emergency Point
Telephone
Post Box
Parking Bay
Disabled Bay
Loading Bay
Taxi Rank
Coach Bay
Motorcycle Bay
Cycle Rack
Car Park
Entrance
Exit
Barrier
Turnstile
Ticket Machine
Vending Machine
Toilet
Shower
Changing Room
Locker
Office
Reception
Meeting Room
Conference Room
Canteen
Kitchen
Store
Plant Room
Workshop
Garage
Loading Bay
Refuse Area
Recycling Point
Compost Bin
Water Butt
Rain Gauge
Weather Station
Anemometer
Wind Vane
Solar Panel
Wind Turbine
Generator
Fuel Tank
Gas Meter
Gas Valve
Gas Governor
Gas Pipeline
Water Pipeline
Water Valve
Water Meter
Water Tank
Water Pump
Water Tower
Water Treatment Plant
Sewage Treatment Plant
Septic Tank
Soil Vent Pipe
Rainwater Pipe
Downpipe
Gutter
Roof Light
Skylight
Chimney
Flue
Vent
Air Conditioning Unit
Heat Pump
Boiler
Radiator
Thermostat
Smoke Detector
Fire Alarm
Sprinkler
Fire Hose Reel
Fire Extinguisher
Fire Blanket
Emergency Exit
Assembly Point
First Aid Kit
Defibrillator
Eye Wash Station
Safety Shower
Hazardous Waste Store
Chemical Store
Gas Cylinder Store
Oxygen Store
Acetylene Store
Compressed Air
Vacuum Pipe
Steam Pipe
Condensate Pipe
Hot Water Pipe
Cold Water Pipe
Chilled Water Pipe
Refrigerant Pipe
Ventilation Duct
Extract Duct
Supply Duct
Damper
Louvre
Grille
Diffuser
Access Panel
Inspection Chamber
Rodding Eye
Interceptor
Grease Trap
Oil Separator
Silt Trap
Balancing Pond
Attenuation Tank
Flood Defence
Sluice Gate
Weir
Culvert Headwall
Outfall
Intake
Screen
Pump
Motor
Compressor
Turbine
Generator
Transformer
Switchgear
Control Panel
Relay
Fuse
Circuit Breaker
Isolator
Earthing Point
Lightning Conductor
Antenna
Satellite Dish
Microwave Dish
Radio Mast
Telecom Cabinet
Fibre Optic Cable
Data Point
Telephone Point
Intercom
CCTV Camera
Security Barrier
Access Control
Intruder Alarm
Motion Detector
Door Entry System
Fingerprint Reader
Card Reader
Keypad
Turnstile
Metal Detector
X-Ray Machine
Baggage Scanner
Conveyor
Escalator
Lift
Stairs
Handrail
Guardrail
Bollard
Speed Bump
Traffic Calming
Road Marking
Zebra Crossing
Pelican Crossing
Toucan Crossing
Puffin Crossing
Cycle Lane
Bus Lane
Taxi Rank
Coach Bay
Motorcycle Bay
Disabled Bay

C Existing Utilities

Table of contents:

Utility / Service	Included		Utility / Service	Included
Basic Search			**Independent Utilities**	
Gas	**Yes**		GTC	**Yes**
Water	**Yes**		Last Mile	**Not Affected**
Sewers	**Yes**		SSE	**Not Affected**
BT	**Yes**		Harlaxton	**Not Affected**
Electricity	**Yes**		Utility Assets	**Not Affected**
3rd Party Searches*	**Yes**		UK Power Distribution	**Yes**
			Albion Water	**Not Affected**
Cable Search			ESP	**Not Affected**
Vodafone	**Yes**		Fulcrum Pipelines	**Not Affected**
Virgin Media	**Yes**		Energy Assets	**Not Affected**
BSkyB	**Yes**		ENGIE	**Not Affected**
EXA Infrastructure	**Not Affected**		Leep Utilities	**Yes**
Colt	**Yes**		Eclipse Power Networks	**Yes**
Sota	**Not Affected**			
CGI Logica	**Yes**		**Others**	
Neos Networks	**Not Affected**		CAD Pack	**Not Requested**
City Fibre	**Yes**		Smart pdf	**Not Requested**
Arelion	**Not Affected**		Coal Authority Report	**Not Requested**
Instalcom**	**Yes**		Nat Grid Elec Trans	**Yes**
KCom	**Not Affected**			
Verizon	**Yes**			
Zayo Group	**Not Affected**			
Tata Communications	**Not Affected**			
Gamma	**Not Affected**			
Gigaclear Plc	**Not Affected**			

*Includes Utilibilly and Linesearch

**Includes Level3, GC(UK) Ltd, GC PEC, Fibrenet UK and Fibrespan

NB: All plans / responses are valid for a maximum of three months unless noted otherwise

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

CORNERSTONE PROJECTS LTD

AREA PLAN

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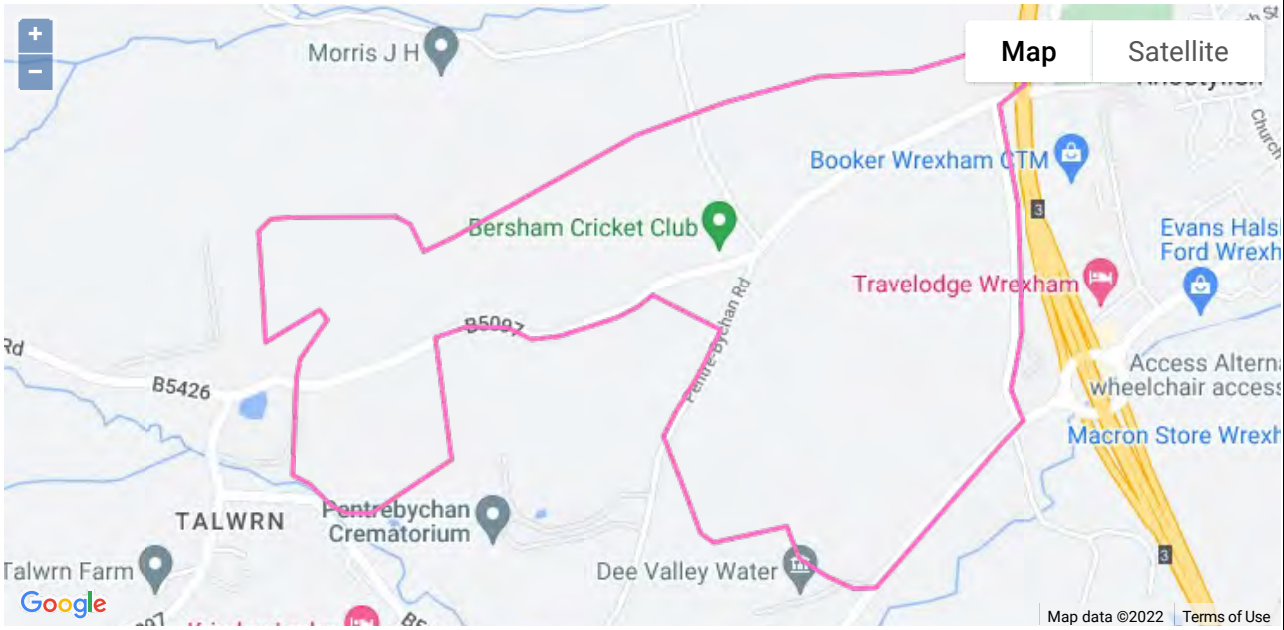
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Summary of your utility search details:

Site Name	LAND AT BRONWYLFA ROAD	
Site Ref	489507 IAP	
Address	LAND AT BRONWYLFA ROAD, RHOSTYLLEN	
Postcode		
Grid Ref	E 330229	N 348316

Area Covered



Options Selected		Options Selected	
Gas	✔	**Independent utilities search - inc non-chargeable searches**	✔
Water	✔	Harlaxton	✔
Sewer	✔	UK Power Distribution	✔
Electric	✔		
BT	✔	**Coal Authority search**	X
3rd Party searches	✔		
		Other Options	
Cable / Fibre searches inc non-chargeable searches	✔	Plans by post	X
Virgin Media	✔	CAD Pack	X
Vodafone	✔	CAD OS mapping	X
		Smart pdf	X
		Instant Access Plans	✔

CORNERSTONE PROJECTS LTD

GAS

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Company Address
Wales and West Utilities Ltd,
Wales and West House,
Spooner Close, Celtic,
Springs, Coedkernew,
Newport, NP10 8FZ

Our Ref: 26544194 489507 IAP

Tuesday, 09 August 2022

Duncan Phillips
91 Market Street
Hoylake
Merseyside
CH47 5AA

Dear Duncan Phillips

Thank you for contacting us regarding Wales & West Utilities equipment at the above site.

I enclose an extract from our mains records of the area covered by your proposals together with a comprehensive list of General Conditions for your guidance. This information is given as a general guide and its accuracy cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc., are not shown but their presence should be anticipated.

Where the Wales & West Utilities (WWU) plan includes a warning label about our higher pressure apparatus you must contact the WWU dig team for further guidance. If it is deemed that a site visit is required for this location we require a minimum of 10 days' notice to arrange a site visit for our engineers to give further guidance. Depending upon the nature of the works the site visit may be deemed chargeable.

No liability of any kind whatsoever is accepted by Wales and West Utilities (WWU), its agents or servants for any error or omission. Please note that all WWU equipment on site should be assumed to be LIVE until proven otherwise.

Safe digging practices, in accordance with HS(G)47, Avoiding Danger from underground services 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. Safe working procedures should be defined and practiced.

Irrespective of whether the pipeline is directly affected by the proposed development I enclose for information our general requirements for working in the vicinity of gas pipelines operating above 2 barg (T/SP/SSW22). It is our strong recommendation in the interests of safety that these general requirements be adhered to.

There are minimum proximity distances for buildings from WWU mains depending on both the operating pressure and the material of the main. Advice should be sought from WWU prior to building works taking place to confirm these distances. For High Pressure pipelines you must seek further guidance from the HSE and Local Authority Planning team regarding their LUP distances regarding building proximities as these may be in addition to WWU proximity distances for a pipeline.

In the presence of our >2barg gas pipelines no excavations are to take place within 10m of the confirmed position of these mains without prior consultation with WWU.

WWU reserves its position completely to enforce the terms of any existing easement against the landowner, even if this results in any planning permission granted not being able to be fully implemented.

Company Address
Wales and West Utilities Ltd,
Wales and West House,
Spooner Close, Celtic,
Springs, Coedkernew,
Newport, NP10 8FZ

You must not build over any of our plant or enclose our apparatus.

Where diversions to WWU apparatus are needed to allow change to occur on site, the cost of these alterations may be charged to the persons responsible for the works.

If you have requested a new connection the WWU connections team will where necessary prepare detailed proposals and provide a quotation for any necessary alterations and/or development of our equipment on the site.

If you require advice in connection with your proposals please contact the relevant number below.

Yours sincerely,
WWU Dig Team

Gas Emergency Number:
In an emergency call 0800 111 999, 24 hours a day.

Mapping Enquiries:
If you have an enquiry relating to this letter or the attached map plan, please contact us using the following information:

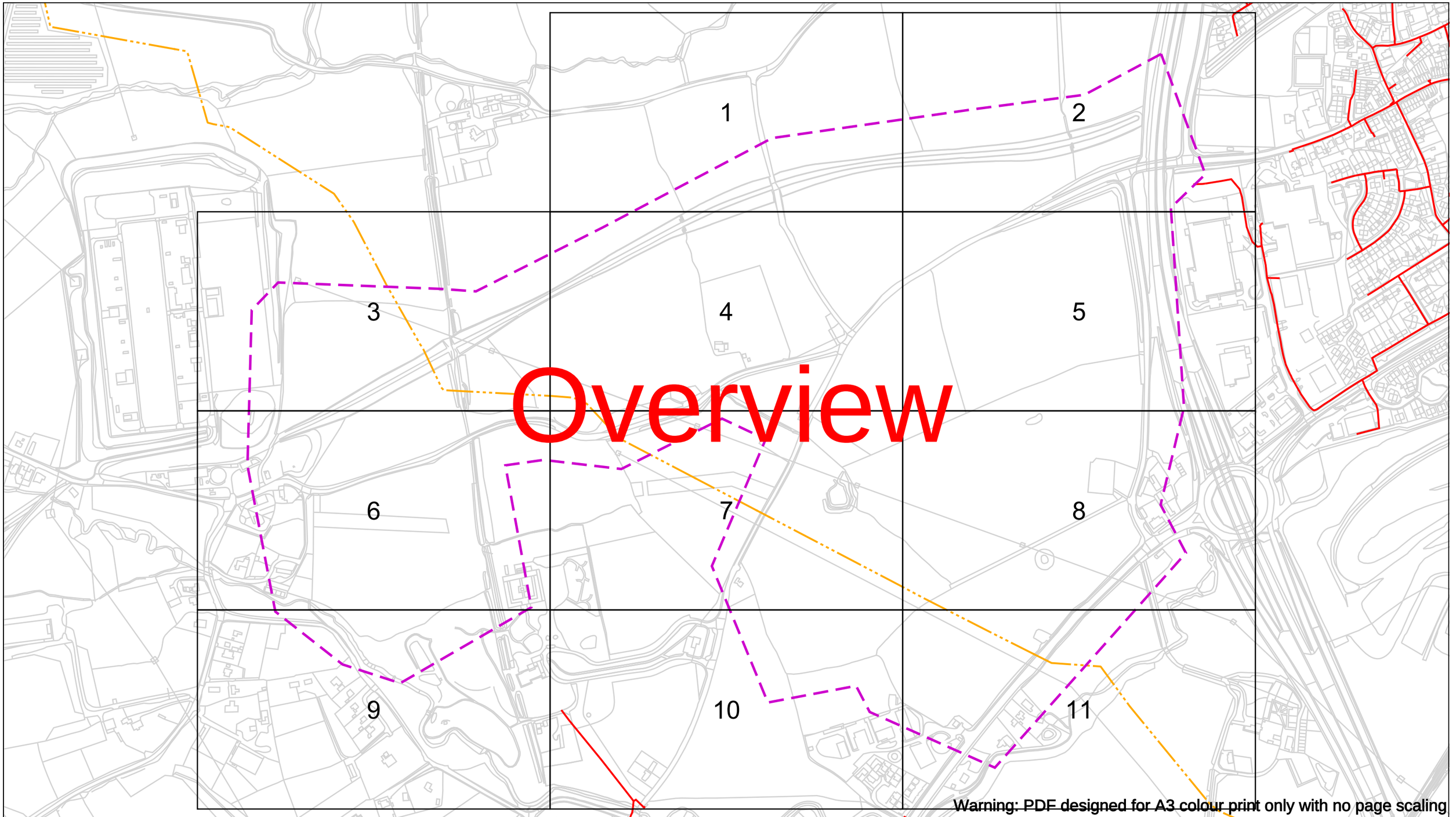
Telephone	02920 278912
Email	dig@wwutilities.co.uk

General Enquiries:
If you have a general enquiry, please call us on the following number

All areas	0800 912 29 99

LinesearchbeforeUdig:
If you have an enquiry relating to the use of the LinesearchbeforeUdig website please contact LinesearchbeforeUdig using the following information:

Telephone	0845 437 7365
Email	enquiries@linesearchbeforeudig.co.uk
Website	www.linesearchbeforeudig.co.uk



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Contact Us
Mapping Enquiries: 02920 278 912
General Enquiries: 0800 912 2999

Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference:
489507 IAP

Scale: 1:5125 (When plotted at A3)

EXTREME CAUTION. Major Accident Hazard Pipeline in Vicinity
****RISK OF DEATH OR SERIOUS INJURY****
Prior to excavation starting you must contact the plant protection team on 02920 278912

IMPORTANT NOTICES

- This information is given as a guide only and its accuracy cannot be guaranteed
- The plan only shows those pipes owned by Wales & West Utilities (WWU) as its role as a licensed Gas Transporter
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- If in doubt call the WWU dig team on 02920 278912

In case of an emergency call 0800 111 999

Dig Sites

Area: Line:

Low Pressure (LP) 21mbar – 75mbar
Medium Pressure (MP) 350mbar – 2bar
Intermediate Pressure (IP) 2bar – 7bar
High Pressure (HP) >7bar

Line/Fire Valve
Governor Station
Change of Diameter
End Cap
Depth of cover

WALES&WEST UTILITIES

Smell gas?
Call the Gas Emergency Service on 0800 111 999.

Dial before you dig

Dial
Call 029 2027 8912 before you start work.

Investigate
Before you dig, make sure you know what's below.

Go ahead
Done your research? Now you can dig safely.

We need 10 days' notice

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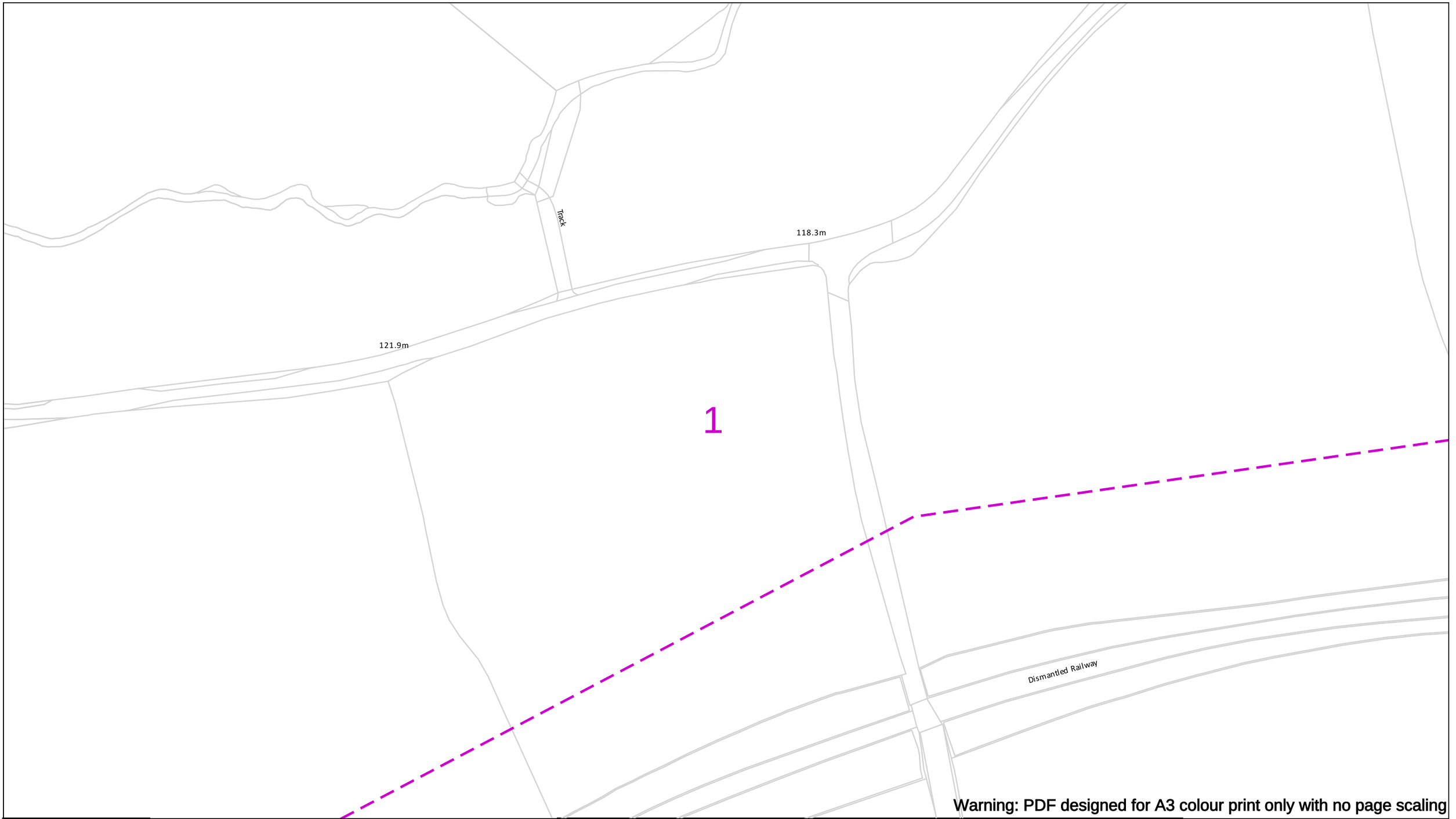

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Scale: 1:1250 (When plotted at A3)

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100m

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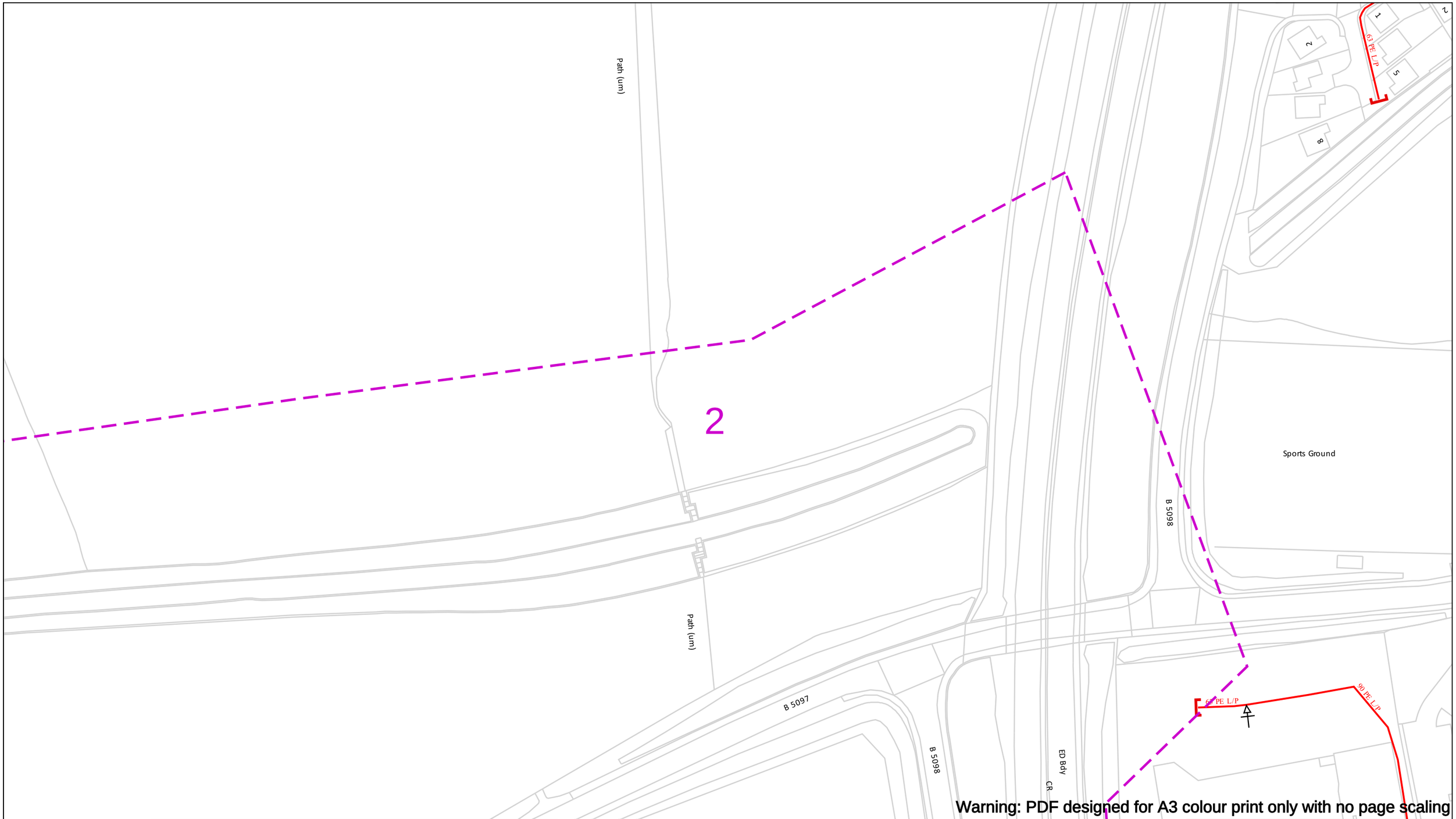

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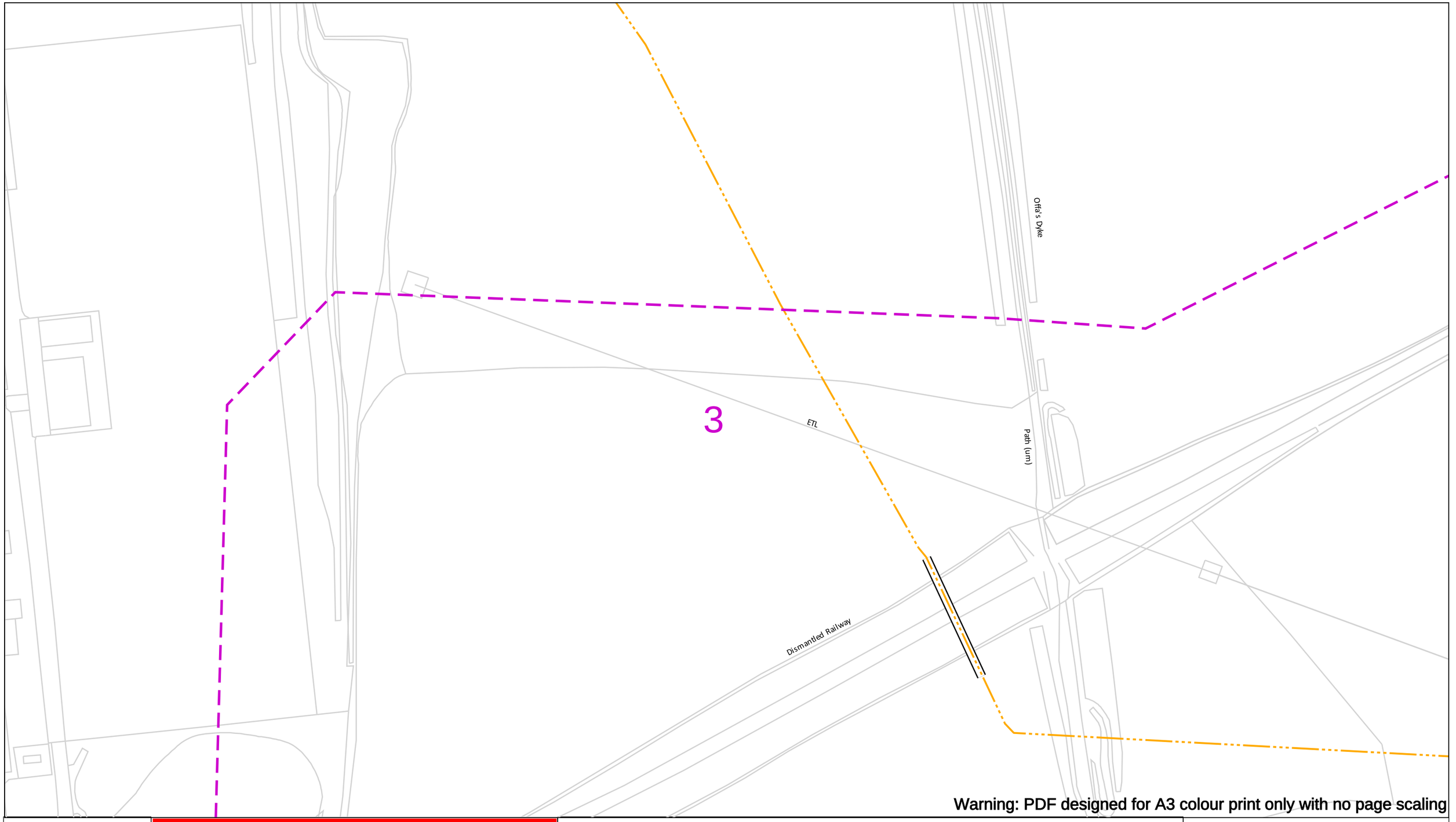

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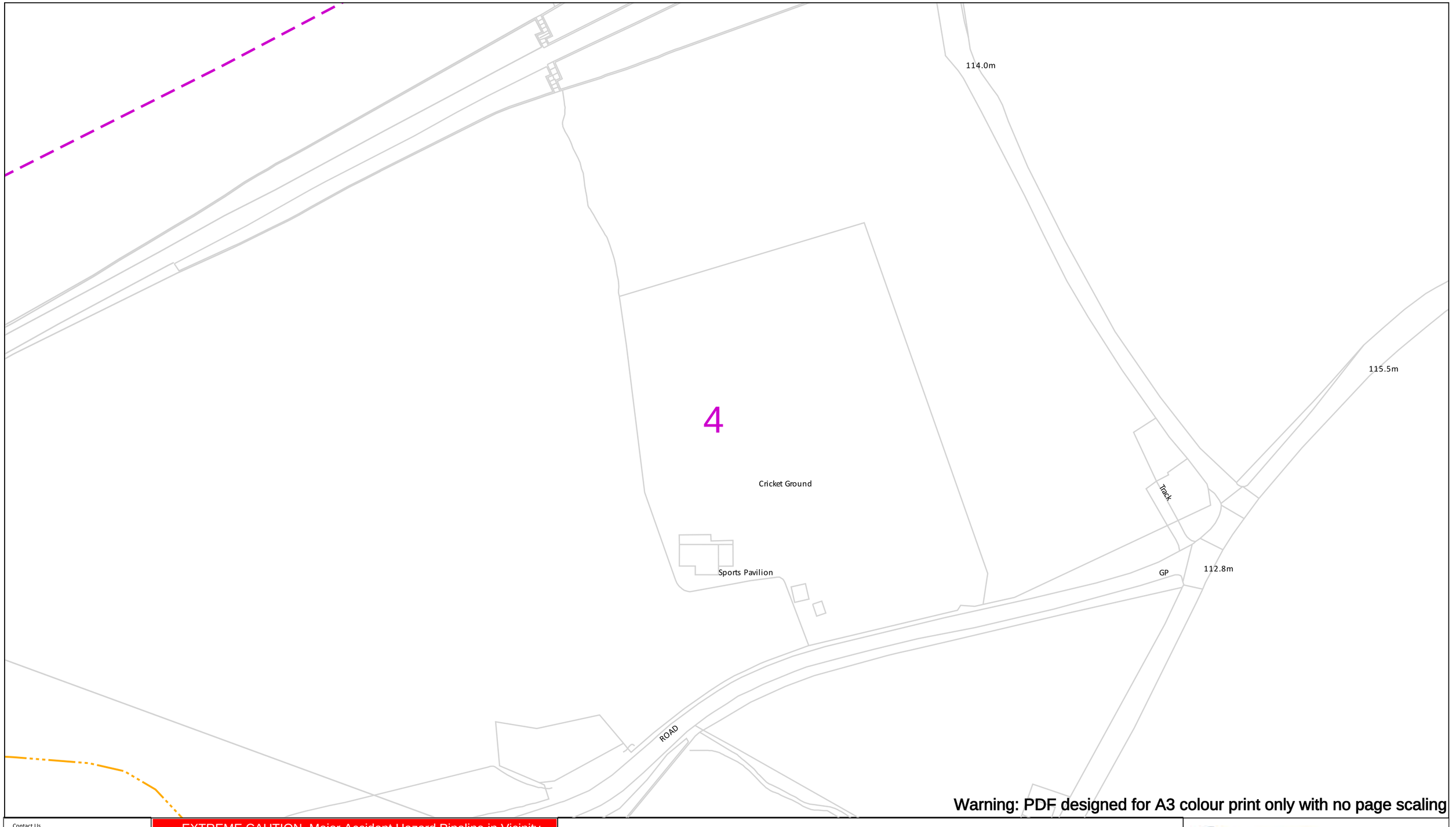

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- End Cap
- Depth of cover

WALES&WEST UTILITIES

Smell gas?
Call the Gas Emergency Service on 0800 111 999.

Dial before you dig

Dial
Call 029 2027 8912 before you start work.

Investigate
Before you dig, make sure you know what's below.

Go ahead
Done your research? Now you can dig safely.

We need 10 days' notice

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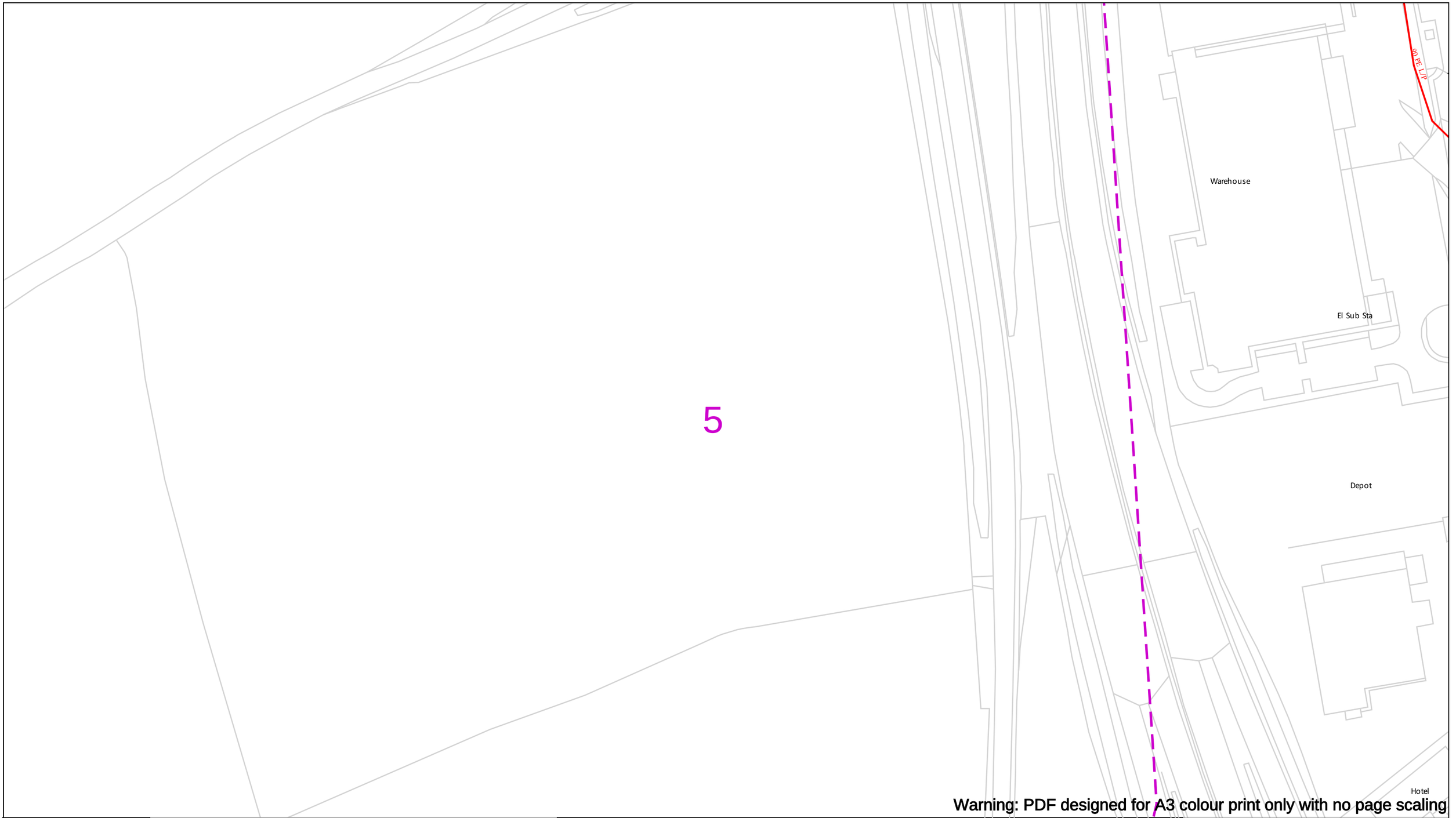

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Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference: 489507 IAP

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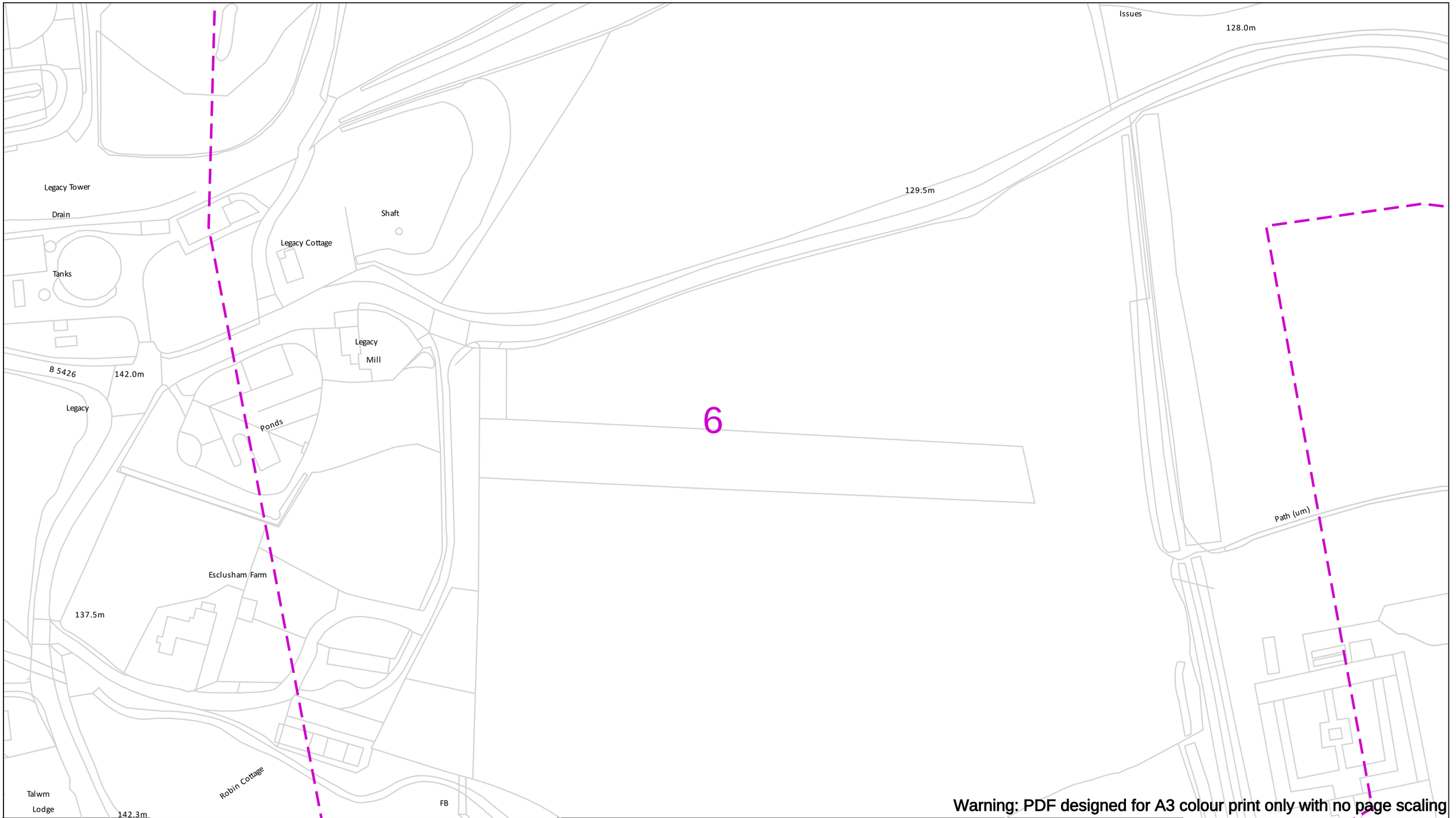

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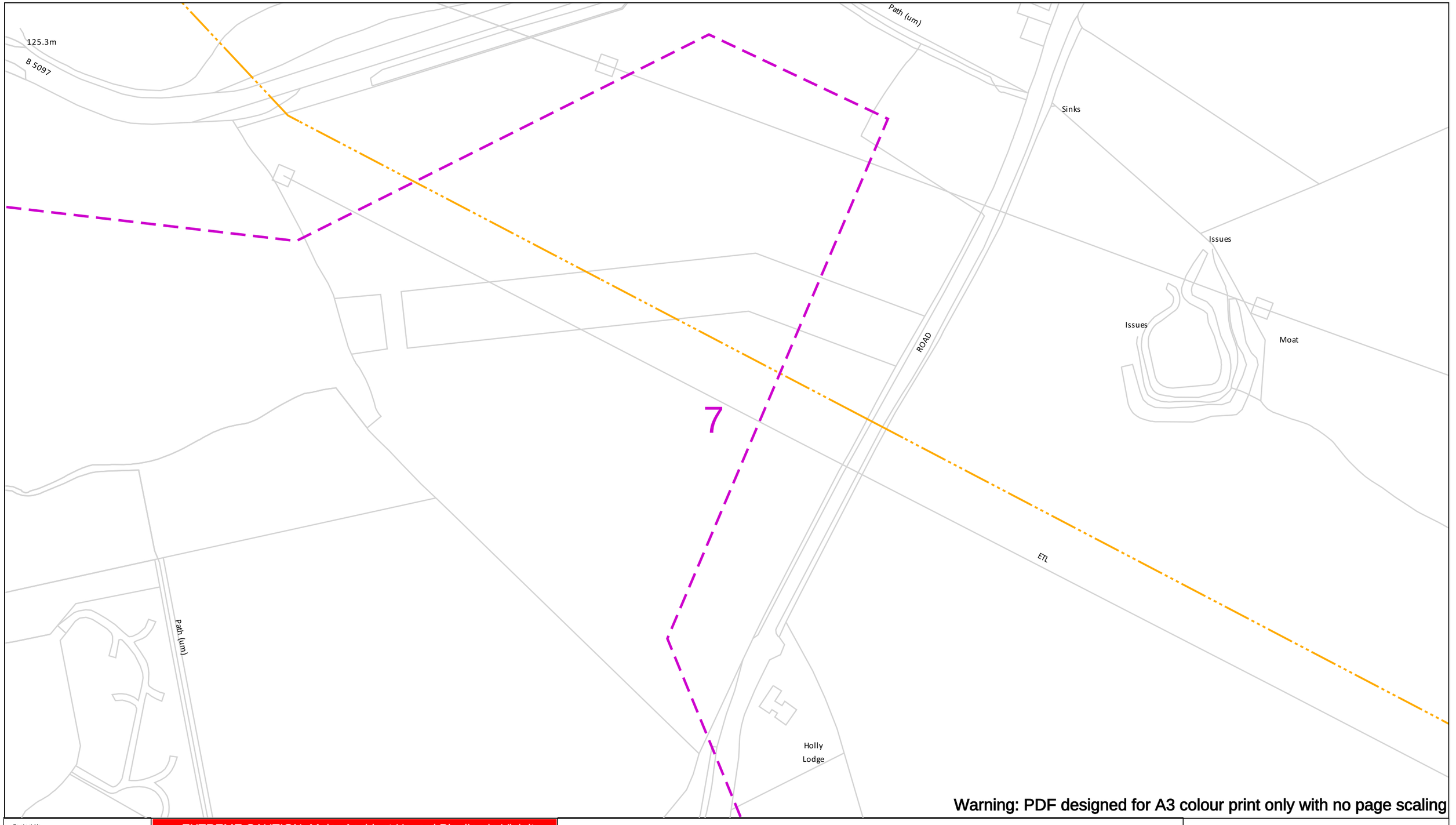

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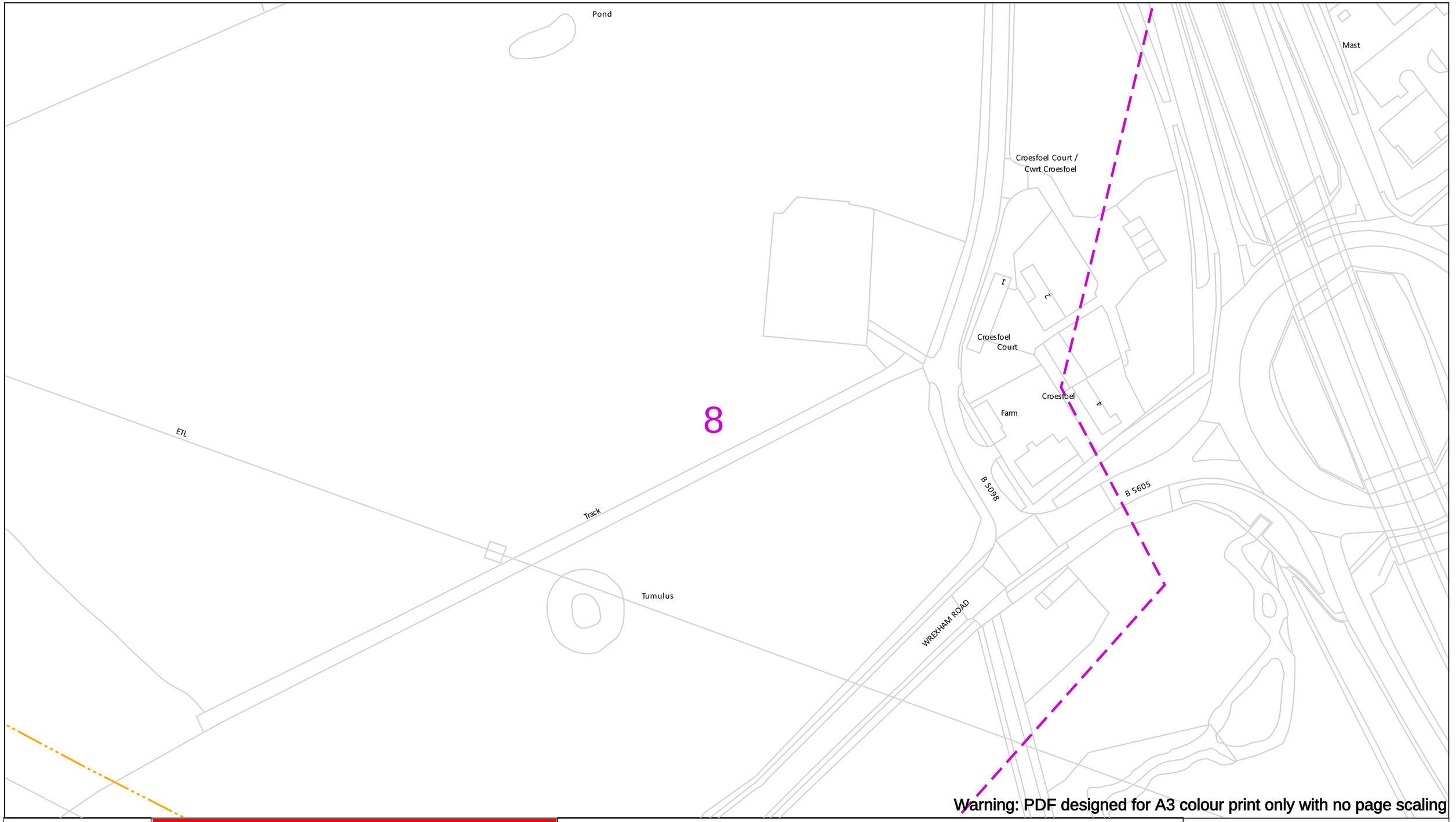

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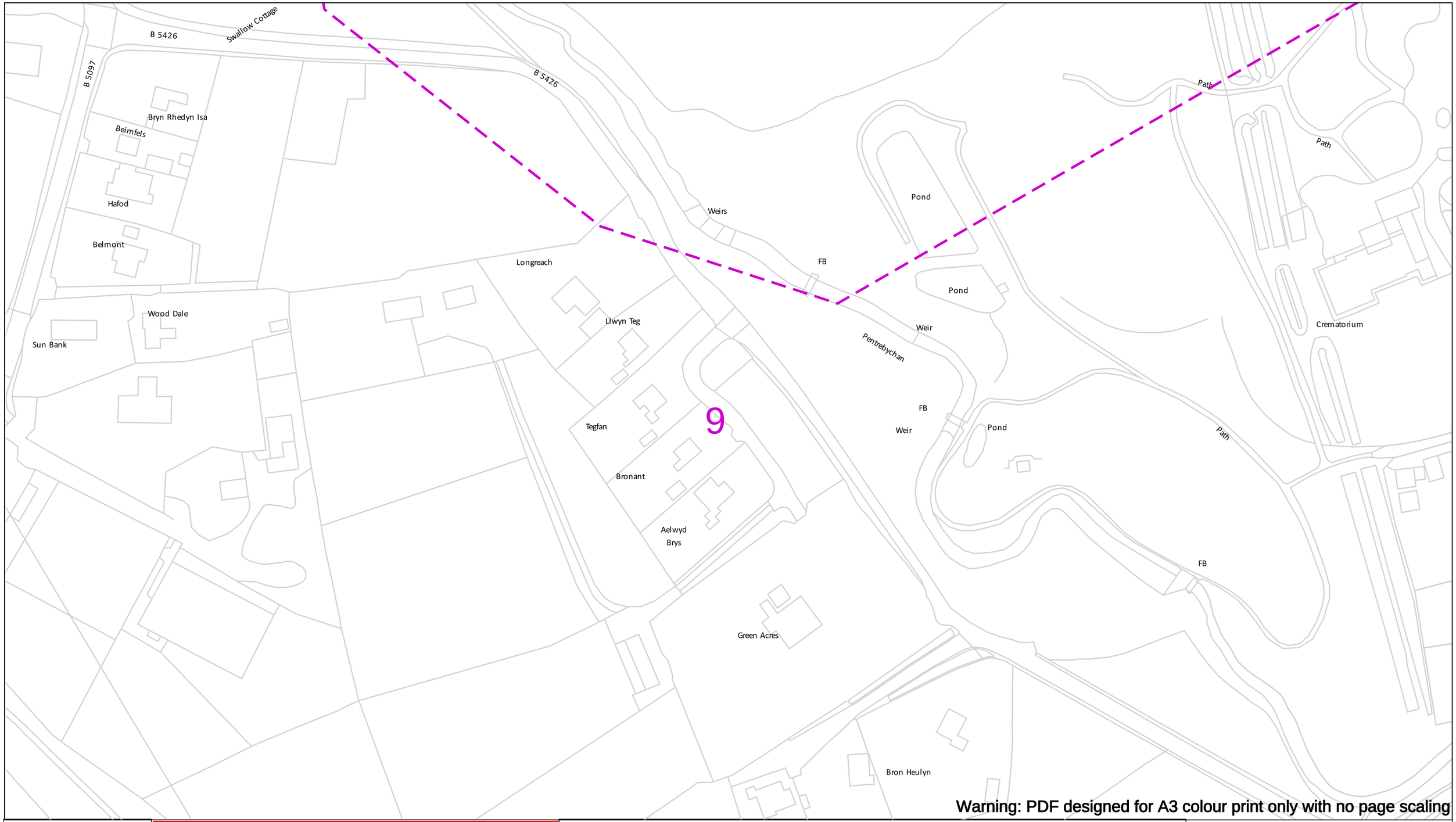

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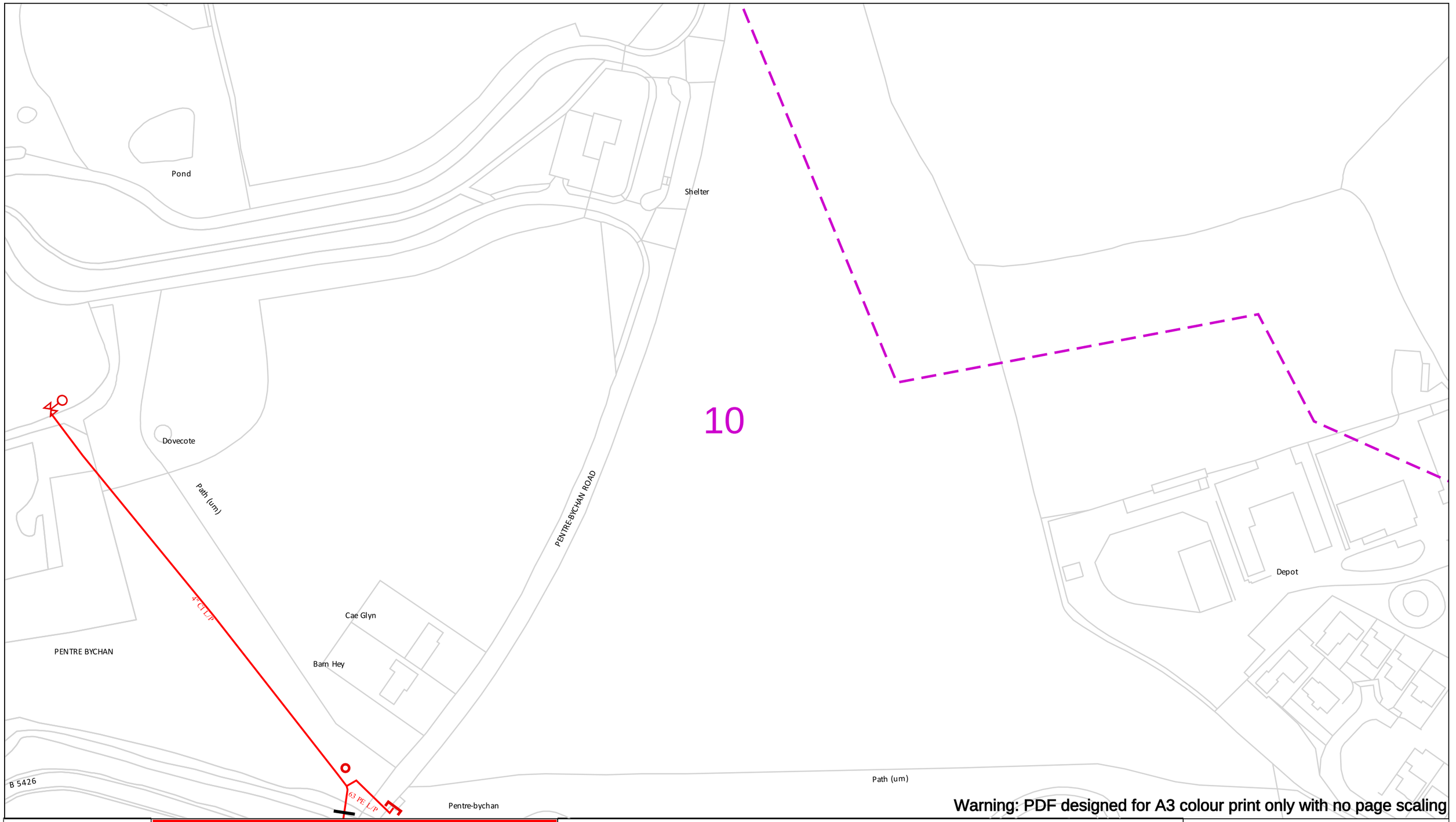

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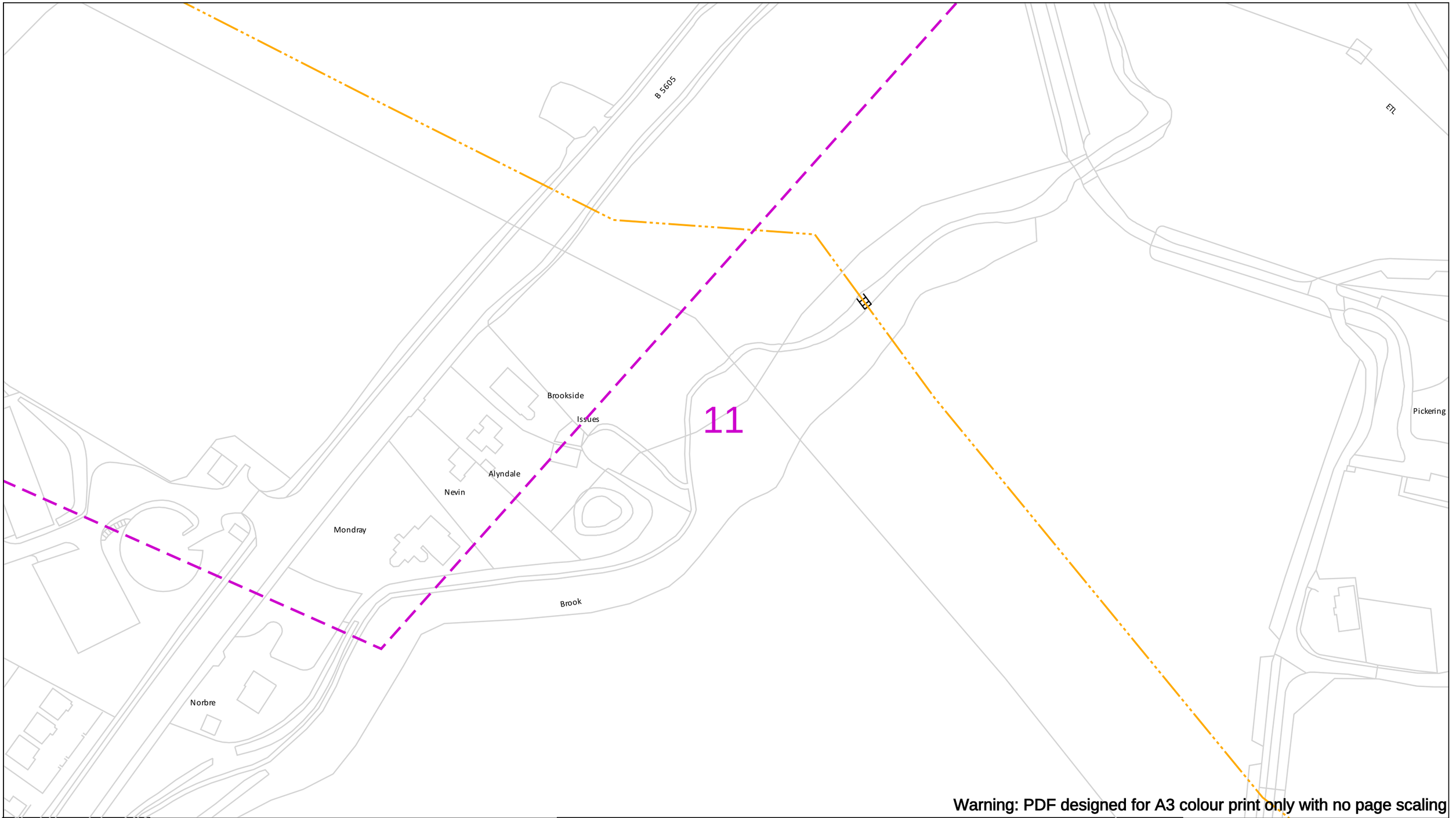

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WW/SP/SSW/22

SPECIFICATION FOR

SAFE WORKING IN THE VICINITY OF PIPELINES AND ASSOCIATED INSTALLATIONS OPERATING ABOVE 2 BARG - REQUIREMENTS FOR THIRD PARTIES

JUNE 2013

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FOREWORD

This Specification was approved, by Chris Clarke, Director of Asset Management and HS&E Dept on 21st June 2013 for use by managers, engineers and supervisors throughout Wales & West Utilities Limited.

Documents are revised, when necessary, by the issue of new editions. Users should ensure that they are in possession of the latest edition by referring to the document library available on the company intranet.

Compliance with this document does not confer immunity from prosecution for breach of statutory or other legal obligations.

BRIEF HISTORY

First published as T/SP/SSW22	October 2001	EPSG/L01/283
Editorial update to reflect merger October 2002	November 2002	
Revised and reissued.	November 2003	EPSG/A03/10125
Revised and Reissued as T/SP/SSW/22	June 2004	EPSG/T04/1209
Editorial update to comply with GRM	August 2004	
Document revised to remove reference to Transco and replace with WWU Ltd.	May 2006	
Document revised to reflect WWU management structure, include IP pipelines and update letters	April 2013	

KEY CHANGES (Identify the changes from the previous version of this document)

Section	Amendments
1	Scope extended from any pipe operating above 7bar to above 2bar gauge
5 & 6	References added to T/PR/P/18
8	References added to wind turbine development near pipelines

USE

This document is provided by Wales & West Utilities Limited for information and reference.

MANDATORY AND NON-MANDATORY REQUIREMENTS

In this document:

must: indicates a mandatory requirement.

should: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better, level of protection.

SPECIFICATION FOR

SAFE WORKING AND DEVELOPMENT IN THE VICINITY OF PIPELINES AND ASSOCIATED INSTALLATIONS OPERATING ABOVE 2 BARG - REQUIREMENTS FOR THIRD PARTIES

INTRODUCTION

This specification is for issue to third parties carrying out work in the vicinity of high pressure gas pipelines (above 2 bar gauge) and associated installations and is provided to ensure that individuals planning and undertaking work take appropriate measures to prevent damage.

Any damage to a high-pressure gas pipeline or its coating can affect its integrity and can result in failure of the pipeline with potential serious hazardous consequences for individuals located in the vicinity of the pipeline if it were to fail. It is therefore essential that the procedures outlined in this document are complied with when working near to a high pressure, above 2 bar gauge, pipeline. If any work is considered by Wales & West Utilities to be in breach of the requirements stipulated in this document then the Wales & West Utilities responsible person will suspend the work until the non-compliances have been rectified.

The Pipelines Safety Regulations state that “No person shall cause such damage to a pipeline as may give rise to a danger to persons” (Regulation 15). Failing to comply with these requirements could therefore also result in prosecution by the Health and Safety Executive (HSE).

The requirements in this document are in line with the requirements of the IGE (Institution of Gas Engineers) recommendations IGE/SR/18 Edition 2 - Safe Working Practices To Ensure The Integrity Of Gas Pipelines And Associated Installations and the HSE’s guidance document HS(G)47 Avoiding Danger from Underground Services.

It is the responsibility of the third party to ensure that any work carried out also conforms with the requirements of the Construction and Design Management Regulations and all other relevant health and safety legislation.

WHEN CARRYING OUT WORK IN THE VICINITY OF A HIGH PRESSURE PIPELINE FOLLOW THE FOLLOWING PROCESS

CONTACT WALES & WEST UTILITIES

Contact Wales & West Utilities to obtain formal consent - Section 2 of this document.

Note: at least 7 days' notice prior to commencement of the work is normally required

↓

CONSIDER SAFETY

Consider the safety requirements - Section 3 of this document.

↓

INFORM Wales & West Utilities **AND REQUEST PIPELINE LOCATION**

Inform Wales & West Utilities prior to carrying out work and arrange for Wales & West Utilities to locate the pipeline - Section 4 of this document

Note: at least 7 days' notice is normally required

↓

OBSERVE RESTRICTIONS

Observe Wales & West Utilities restrictions on the allowed proximity of mechanical excavators and other power tools and the measures to protect the pipeline from construction vehicles when carrying out the work – Sections 5, 6 and 7 of this document.

Note: Wales & West Utilities may wish to supervise the work, consult Wales & West Utilities to confirm whether or not this is the case.

↓

SPECIFIC ACTIVITIES

If work involves any of the following activities:

- No-Dig Techniques
- Increase in Cover
- Piling
- Demolition
- Hot Work
- Blasting
- Surface Mineral Extraction
- Deep Mining
- Landfilling
- Pressure Testing
- Seismic Surveys
- Wind Turbines

Comply with the requirements in Section 8 of this document

↓

CONSULT WALES & WEST UTILITIES

Consult Wales & West Utilities prior to any backfilling over, alongside or under the pipeline and obtain Wales & West Utilities agreement to proceed. Normally Wales & West Utilities require 48 hours notice prior to backfilling - Section 9 of this document.

IMPORTANT: This flowchart should be used in conjunction with the entire SSW22 document and not in isolation, AND if at any time during the works the pipeline is damaged even slightly then observe the precautions in Section 10 of this document.

IF IN DOUBT CONTACT Wales & West Utilities

1. SCOPE

This specification sets out the safety precautions and other conditions affecting the design, construction and maintenance of services, structures and other works in the vicinity of Wales & West Utilities pipelines and associated installations operating at pressures greater than 2 bar gauge, located in both negotiated easements (see Section 12), in public highways and within the wider area of interest around a pipeline.

2. FORMAL CONSENT

High pressure pipelines are generally laid across country within an easement agreed with the landowner or within the highway.

As the required arrangements for working within an easement and working within the highway differ, this document has been structured to highlight the specific requirements for these two types of area where work may be carried out.

Generally, normal agricultural activities are not considered to affect the integrity of the pipeline, however consult Wales & West Utilities prior to undertaking deep cultivation in excess of 0.5m.

In all other cases no work shall be undertaken in the vicinity of the pipeline without the formal written consent of Wales & West Utilities.

Any documents, handed to contractors on site by Wales & West Utilities must be signed for by the site manager. Wales & West Utilities will record a list of these documents using the form in Appendix A, and the contractor should maintain a duplicate list.

2.1 Within an Easement

The promoter of any works (see Section 12) within an easement must provide Wales & West Utilities with details of the proposed works including a method statement of how the work is intended to be carried out.

Work must not go ahead until formal written consent has been given by Wales & West Utilities. This will include details of Wales & West Utilities protection requirements, contact telephone numbers and the emergency telephone number.

On acceptance of Wales & West Utilities requirements the promoter of the works must give Wales & West Utilities 7 working days' notice, or shorter only if agreed with Wales & West Utilities, before commencing work on site.

2.2 Within the Highway

Work must be notified to Wales & West Utilities in accordance with the requirements of The New Roads and Street Works Act (NRSWA) and HS(G)47.

The promoter of any works within the highway should provide Wales & West Utilities with details of the proposed works including a method statement of how the work is intended to be carried out. This should be submitted 7 working days before the planned work is to be carried out or shorter, only if agreed with Wales & West Utilities. If similar works are being carried out at a number of locations in close proximity a single method statement should be adequate.

Work should not go ahead until formal written consent has been given by Wales & West Utilities. This will include details of Wales & West Utilities' protection requirements, contact telephone numbers and the emergency telephone number.

2.3 Within the Area of Interest

Certain other activities , such as the development of adjacent land with buildings, or other constructions which may have an impact on the safe operation of above 2 bar gauge pipelines, must also be notified to Wales & West Utilities, for example the construction of wind turbines, masts or aerials.

Developers should ensure early consultation with Wales & West Utilities in respect of such development, rather than relying on local authority planning consultation, which may lead to substantial late changes to design or constraints on the planned development.

3. HS&E CONSIDERATIONS

3.1 Safe Control of Operations

All working practices must be agreed by Wales & West Utilities prior to work commencing. All personnel working on site must be made aware of the potential hazard of the pipeline and the actions they should follow in case of an emergency. The Site Document Control Form (Appendix A) should be used to record the list of relevant documents that have been provided by Wales & West Utilities to the contractor.

3.2 Deep Excavations

Special consideration should be given to the hazards associated with deep excavations. The HSE document CIS08 'Safety in Excavations' provides further guidance and is available on the HSE web site www.hse.gov.uk

3.3 Positioning of Plant

Mechanical excavators must not be sited or moved above the pipeline unless written authority has been given by the Wales & West Utilities responsible person.

Mechanical excavators must not dig on one side of the pipeline with the cab of the excavator positioned on the other side.

Mechanical excavators and other traffic must be positioned far enough away from the pipeline trench to prevent trench wall collapse.

3.4 General

Activities associated with working in the vicinity of pipelines operating above 2 bar gauge may have impact on the safety of the general public, Wales & West Utilities staff and contractors, and may affect the local environment. Contractors must carry out suitable and adequate risk assessments prior to the commencement of work to ensure that all such issues are properly considered and risks mitigated.

4. PIPELINE LOCATING

The third party should give 7 working days' notice (or shorter as agreed with Wales & West Utilities) to ensure that the pipeline is suitably located and marked out by Wales & West Utilities prior to the work commencing.

Prior to work commencing on site the pipeline must be located and pegged or suitably marked out by Wales & West Utilities personnel. In exceptional circumstances with the prior agreement of Wales & West Utilities the locating and marking out of the pipeline could be carried out by competent third parties on behalf of the contractor as long as Wales & West Utilities is assured of their competence and the procedures to be followed.

Safe digging practices, in accordance with HSE publication HS(G)47 should be followed as both direct and consequential damage to gas plant can be dangerous both to employees and to the general public.

Previously agreed working practices should be reviewed and revised based on current site conditions. Any changes must be agreed by the Wales & West Utilities responsible person.

The requirements for trial holes to locate the pipeline or determine levels at crossing points must be determined on site by the Wales & West Utilities responsible person.

The excavation of all trial holes must be supervised by the Wales & West Utilities responsible person.

5. SLABBING AND OTHER PROTECTIVE MEASURES

No protective measures including the installation of concrete slab protection should be installed over or near to the Wales & West Utilities pipeline without the prior permission of Wales & West Utilities. Wales & West Utilities will need to agree the material, the dimensions and method of installation of the proposed protective measure. The method of installation must be confirmed through the submission of a formal written method statement from the contractor to Wales & West Utilities.

Where permanent slab protection is to be applied over the pipeline Wales & West Utilities should carry out a survey (Pearson or DCVG Survey) of the pipeline to check that there is no existing damage to the coating of the pipeline prior to the slab protection being put in place. In addition the pipeline records should be consulted to determine whether any other investigations or remedial works would be needed in advance of the slab construction, e.g. reference to T/PR/P/18. Wales & West Utilities must therefore be contacted prior to the laying of any slab protection to arrange this survey. The Safety precautions detailed in Sections 3 and 6 of this document should also be observed during the installation of the pipeline protection.

6. EXCAVATION

6.1 In Proximity to a Pipeline in an Easement

Third parties must not excavate unsupervised, with a powered mechanical excavator closer than 3 metres to the Wales & West Utilities located pipeline or with hand held power tools closer than 1.5 metres. Any fitting, attachment or connecting pipework on the pipeline must be exposed by hand. All other excavation must be by hand.

Consideration may be given to a relaxation of these limits by agreement with the Wales & West Utilities responsible person on site and only whilst he remains on site. In this case a powered mechanical excavator must not be allowed to excavate closer than 0.6 metres to the nearest part of the pipeline.

Where sufficient depth of cover exists, following evidence from hand dug trial holes, light tracked vehicles may be permitted to strip topsoil to a depth of 0.25 metres, using a toothless bucket.

No topsoil or other materials should be stored within the easement without the written permission of Wales & West Utilities.

No topsoil or materials should be stored over the pipeline.

No fires should be allowed in the easement strip or close to above ground gas installations.

After the completion of the work the level of cover over the pipeline should be the same as that prior to work commencing unless agreed otherwise with the Wales & West Utilities responsible person.

No new service shall be laid parallel to the pipeline within the easement. In special circumstances, and only with formal written agreement from Wales & West Utilities, this may be relaxed for short excursions where the service shall be laid no closer than 600 mm to the side of the pipeline.

Where work is being carried out parallel to the pipeline within or just alongside the easement a post and wire fence must be erected as a protective barrier between the works and the pipeline.

6.2 In Proximity to a Pipeline in the Highway

Removal of the bituminous or concrete highway surface layer by mechanical means is permitted to depth of 300 mm, although the use of chain trenchers to do this shall not be permitted within 3 metres of the pipeline. The Wales & West Utilities responsible person may want to monitor this work.

Where the bituminous or concrete highway surface layer extends below 0.3 metres deep it should only be removed by handheld power assisted tools under the supervision of the Wales & West Utilities responsible person. In exceptional circumstances, and following a risk assessment, these conditions may be relaxed by the Wales & West Utilities responsible person.

Third parties should not excavate, unsupervised, with a powered mechanical excavator closer than 3 metres to the located Wales & West Utilities pipeline or with hand held power tools closer than 1.5 metres. Any fitting or attachment must be exposed by hand.

In special circumstances consideration may be given to a relaxation of these rules by agreement with the Wales & West Utilities responsible person on site and only whilst he remains on site only whilst he remains on site and only whilst he remains on site to supervise this work..

The use of 'No dig' techniques is covered in Section 8.1.

Any new service running parallel to the pipeline should be laid no closer than 600 mm to the pipeline (see Section 6.4).

6.3 Crossing Over a Pipeline

Where a new service is to cross over the pipeline a clearance distance of 600 mm between the crown of the pipeline and underside of the service must be maintained. If this cannot be achieved the service must cross below the pipeline with a clearance distance of 600 mm.

In special circumstances this distance may be reduced at the discretion of the Wales & West Utilities responsible person on site.

6.4 Crossing Below a Pipeline

Where a service is to cross below the pipeline a clearance distance of 600 mm between the crown of the service and underside of the pipeline should be maintained.

The exposed pipeline must be suitably supported. The Wales & West Utilities responsible person must be consulted and a stress analysis may be required in order to establish support requirements. The stress analysis should be carried out by individuals with demonstrated expertise in this area, Wales & West Utilities can be consulted for advice on suitable specialists. Wales & West Utilities may request a copy of the stress analysis to confirm its adequacy.

Specific additional constraints apply to Wales & West Utilities pipelines that fall under the requirements of T/PR/P/18.

All supports must be removed prior to backfilling.

The exposed pipelines must be protected by matting and suitable timber cladding.

6.5 Cathodic Protection

Cathodic Protection is applied to all of Wales & West Utilities above 2 bar gauge buried steel pipelines and is a method of protecting pipelines with damaged coatings from corrosion by maintaining an electrical potential difference between the pipeline and anodes placed at strategic points along the pipeline.

Where a new service is to be laid and similarly protected, Wales & West Utilities will undertake interference tests to determine whether the new service is interfering with the cathodic protection of the Wales & West Utilities pipeline.

Should any cathodic protection posts or associated apparatus need moving to facilitate third party works reasonable notice, typically 7 days, should be given to Wales & West Utilities. Wales & West Utilities will undertake this work and any associated costs will be borne by the third party.

7. CONSTRUCTION TRAFFIC

Where existing roads cannot be used construction traffic should ONLY cross the pipeline at previously agreed locations. All crossing points will be fenced on both sides with a post and wire fence and with the fence returned along the easement for a distance of 6 metres. The pipeline shall be protected at the crossing points by temporary rafts of either sleeper or reinforced concrete construction, constructed at ground level. The Wales & West Utilities responsible person will review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required.
Notices directing traffic to the crossing points should be erected.

8. SPECIFIC ACTIVITIES

This section details the precautions that need to be taken when carrying out certain prescribed activities in the vicinity of the pipeline. Consult Wales & West Utilities if you are intending to undertake one of the listed prescribed activities and/or you require further advice on whether the work that you are intending to undertake has the potential to affect the pipeline.

8.1 No-Dig Techniques

Where the contactor intends using no dig techniques then a formal method statement must be produced for all work that would encroach (either above or below ground) within the pipeline easement. This method statement must be formally agreed with Wales & West Utilities prior to the commencement of the work. Wales & West Utilities may wish to be present when the work is being carried out and must therefore be given adequate advance notice before the commencement of the work.

8.2 Increase in Cover

A pipeline integrity assessment must be provided for situations involving a final cover depth exceeding 2.5 metres. This assessment should take due account of both soil ‘dead’ loading and ground settlement due to earthworks. Embankment design and construction over pipelines must give consideration to prevention of any instability. Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.3 Piling

No piling will be allowed within 15 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline should be limited to a maximum level of 75 mm/sec. In any event the ground vibration shall be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request. A typical monitoring device would be the Vibrock V801 seismograph and tri-axial geophone sensor.

Where ground conditions are of submerged granular deposits of silt and sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.4 Demolition

No demolition should be allowed within 150 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline must be limited to a maximum level of 75 mm/sec. In any event the ground vibration shall be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

Where ground conditions are submerged granular deposits of silt or sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.5 Blasting

No blasting should be allowed within 250 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline must be limited to a maximum level of 75 mm/sec. In any event the ground vibration must be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

Where ground conditions are of submerged granular deposits of silt or sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.6 Surface Mineral Extraction

An assessment must be carried out on the effect of surface mineral extraction activity within 100 metres of a pipeline. Consideration should also be given to extraction around groundbeds and other pipeline associated plant and equipment.

Where the mineral extraction extends up to the pipeline easement, a stable slope angle and stand-off distance between the pipeline and slope crest must be determined by Wales & West Utilities. The easement strip should be clearly marked by a suitable permanent boundary such as a post and wire fence, and where appropriate, slope indicator markers shall be erected to facilitate the verification of the recommended slope angle as the slope is formed, by the contractor. The pipeline easement and slope needs to be inspected periodically to identify any signs of developing instability. This may include any change of slope profile including bulging, the development of tension cracks on the slope or easement, or any changes in drainage around the slope. The results of each inspection should be recorded.

Where surface mineral extraction activities are planned within 100 metres of the pipeline but do not extend up to the pipeline easement boundary, an assessment, by Wales & West Utilities must be made on whether the planned activity could promote instability in the vicinity of the pipeline. This may occur where the pipeline is routed across a natural slope or the excavation is deep. A significant cause of this problem is where the groundwater profile is affected by changes in drainage or the development of lagoons.

Where the extraction technique involves explosives the provisions of section 8.5 apply.

8.7 Deep Mining

Pipelines routed within 1 km of active deep mining may be affected by subsidence resulting from mineral extraction. The determination of protective or remedial measures will normally require expert assistance, which can be arranged through Wales & West Utilities.

8.8 Landfilling

The creation of slopes outside of the pipeline easements may promote instability within the vicinity of the pipeline. An assessment should therefore be carried out, by Wales & West Utilities, on the effect of any landfilling activity within 100 metres of a pipeline. The assessment is particularly important if landfilling operations are taking place on a slope in which the pipeline is routed.

8.9 Pressure Testing

Hydraulic pressure testing will not be permitted within 8 metres of the pipeline unless suitable precautions have been taken against the effects of a burst. These precautions should include limiting of the design factor to 0.3 for the third party pipeline for a distance of 6 metres either side of the Wales & West Utilities pipeline, and the use of mill tested pipe or sleeving.

8.10 Seismic Surveys

Wales & West Utilities must be advised of any seismic surveying work in the vicinity of pipeline that will result in Wales & West Utilities' pipeline being subjected to peak particle velocities in excess of 50 mm/sec. In any event the ground vibration near to the pipeline shall also be monitored by the contractor whilst the survey work is being carried out.

Where the peak particle velocity is predicted to exceed 50 mm/sec, the ground vibration should be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

8.11 Hot Work

The Wales & West Utilities responsible person on site should supervise all welding, burning or other 'hot work' that takes place within the easement.

8.12 Wind Turbines

Wales & West Utilities must be advised of any planned development of wind turbines in the vicinity of an above 2 bar gas pipelines to ensure the development does not impact on the future safe operation of the pipeline. Industry guidance states that any wind turbine must be sited no closer than 1.5 times the proposed height of the turbine mast away from the nearest edge of the pipeline.

9. BACKFILLING

Third parties must provide Wales & West Utilities with 7 days' notice, or shorter notice only if agreed with Wales & West Utilities, of the intent to backfill over, under or alongside the pipeline. This requirement should also apply to any backfilling operations alongside the pipeline within 3 metres of the pipeline. Any damage to the pipeline or coating must be reported to the Wales & West Utilities responsible person in order that damage can be assessed and repairs can be carried out.

Minor damage to pipe coating and damage to test leads will normally be repaired by Wales & West Utilities free of charge.

No backfilling should be undertaken without Wales & West Utilities agreement to proceed. When backfilling, the pipeline should be surrounded by at least 300mm of soft fill (i.e. stone dust) containing no stones, bricks, lumps of concrete, etc. The Wales & West Utilities responsible person will stipulate the necessary consolidation requirements.

If the pipeline has been backfilled without the knowledge of the Wales & West Utilities responsible person then he will require the material to be re-excavated in order to enable the condition of the pipeline coating to be confirmed.

10. ACTION IN THE CASE OF DAMAGE TO THE PIPELINE

If the Wales & West Utilities pipeline is damaged, even slightly, and even if no gas leak has occurred then the following precautions must be taken immediately:-

- Shut down all plant and machinery and extinguish any potential sources of ignition.
- Evacuate all personnel from the vicinity of the pipeline.
- Notify Wales & West Utilities using the free 24 hour emergency telephone number **0800 111 999***[1]
- Notify the Wales & West Utilities responsible person or his office immediately using the contact telephone number provided.
- Ensure no one approaches the pipeline.
- Do not try to stop any leak.

[1] * All calls are recorded and may be monitored

11. REFERENCES

NRSWA	New Roads & Street Works Act
HS(G)47	Avoiding Danger from Underground Services
IGE/SR/18	Safe Working Practices to Ensure the Integrity of Gas Pipelines and Associated Installations
T/PR/P/18	Working on Pipelines Containing Defective Girth Welds or Girth Welds of Unknown Quality
CIS08	Safety in Excavations (HSE document)

12. GLOSSARY OF TERMS

Contractor:	the person, firm or company with whom Wales & West Utilities enters into a contract to which this specification applies, including the Contractor's personal representatives, successors and permitted assigns.
Easement:	Easements are negotiated legal entitlements between Wales & West Utilities and landowner and allow Wales & West Utilities to lay, operate and maintain pipelines within the easement strip. Easement strips may vary in width typically between 6 and 25 metres depending on the diameter and pressure of the pipeline. Consult Wales & West Utilities for details of the extent of the easement strip where work is intended.
Liquefaction:	Liquefaction is a phenomenon in which the strength and stiffness of the soil is reduced by earthquake shaking or other rapid loading. Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. When liquefaction occurs, the strength of the soil decreases and the ability of the soil to support pipelines or other components is reduced.
Pearson Survey:	a survey used for locating coating defects on buried pipeline services.
DCVG Survey:	Direct Current Voltage Gradient, a survey for locating and grading coating defects on buried pipeline service
Promoter of new works:	the person or persons, firm, company or authority for whom new services, structures or other works in the vicinity of existing Wales & West Utilities pipelines and associated installations operating above 7 bar gauge are being undertaken.
Wales & West Utilities responsible person:	the person or persons appointed by Wales & West Utilities with the competencies required to act as the Wales & West Utilities representative for the purpose of the managing the particular activity.
Wayleave:	general term which is considered equivalent to 'easement' in this document.

APPENDIX A

SITE DOCUMENT CONTROL FORM - SAMPLE

Emergency Telephone No. **0800 111 999***

Plant Protection Telephone No. **02920278912**

SITE DOCUMENT CONTROL FORM	
Activity Reference:	
Activity Location:	
Site Manager: *(name & telephone number)*	
Wales & West Utilities Contact: *(name & telephone number)*	

The following documents were issued to *(individual's name)*
…… **of**
(company name and address)
……
by *(Wales & West Utilities representative)*
……**on**
(date)……**:-**

Documents:-

(List of documents)

_____

Signed : *(by the recipient)*

Date of signature :

SITE DOCUMENT CONTROL FORM

Emergency Telephone No. 0800 111 999*

Plant Protection Telephone No. 02920 278912

SITE DOCUMENT CONTROL FORM

Activity Reference:	
Activity Location:	
Site Manager: *(name & telephone number)*	
Wales & West Utilities Contact: *(name & telephone number)*	

The following documents were issued to (Individuals Name)
……**of**
(company name and address)
……

by *(Wales and West Utilities representative)*
…… ……**on**
(date) …….. **:-**

Documents:-

_____

Signed :

Date of signature :

This Document is Uncontrolled When Printed – See Intranet for Current Copy

ENDNOTE

Comments

Comments and queries regarding the technical content of this document should be directed to:

Asset Management & HSE Dept
Wales & West Utilities Ltd
Wales & West House
Spooner Close
Celtic Springs
Coedkernew
Newport
NP10 8FZ.

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Wales & West Utilities Limited

General Conditions to be observed for the Protection of Apparatus and the Prevention of Disruption to Gas Supplies.

General conditions affecting the design, construction or maintenance of services and/or structures or other works in the vicinity of Wales & West Utilities (WWU) plant, pipelines and associated installations:

These general conditions apply only to the gas apparatus and pipes operated by WWU. It is possible that there may be other gas transporters with apparatus in the vicinity, therefore you should ensure that you have made enquiries of them and have complied with their requirements.

1. GRAPHIC REPRESENTATION OF GAS MAINS

Any plans supplied or marked up by WWU will indicate the **APPROXIMATE** location of its apparatus. This information is provided as a general guide only; its accuracy cannot be guaranteed and is given without obligation or warranty. Service pipes are not shown but their presence should be anticipated. No liability whatsoever is accepted by WWU, its agents or servants for any error, omission, discrepancy or deviation. Plans on site should be current, i.e. no older than 28 days from the date of issue. Gas pipes owned by other Gas Transporters, or otherwise privately owned, may be present in this area (pink areas indicated on our plans). Information with regard to such pipes should be obtained from the relevant owners.

Should you require assistance on site locating WWU apparatus, please contact our Plant Protection Team on **02920 278912.**

2. METHODS OF WORKING

The following methods of work shall not normally be permitted within the limits of distance indicated (relative to the established pipe position). Any variances must have consent from WWU before works commence on site:

Mechanical Excavation	**3m** (**1m** for low pressure mains)	Hydraulic Testing	**8 m**
Piling / Pile removing / Boring	**15m**	Welding or other hot works*	**15m**
Directional Drill Operations	**15m**	Explosives	**250m**

* NOTE: Welding or other hot works involving naked flames shall be carried out at a safe distance to the satisfaction of a WWU Engineer. A check should be made prior to the commencement of works, to ensure a gas free atmosphere exists. It is also necessary to monitor the atmosphere at regular intervals for the duration of the works. In no case shall such activities take place in any Wales & West Utilities Easement without the written consent and in the presence of a WWU representative.

WWU must be consulted prior to carrying out any excavation work within **10m** of any above or below ground gas installations or pipeline. No excavation works may commence within **50m** of a High Pressure or Very High Pressure Pipeline unless the pipeline has been located by tracing and its precise route identified.

In addition to the above methods of working, WWU must be contacted prior to any External Wall Installation (EWI) schemes, proposed solar farms and wind turbine installations.

No work shall be undertaken near, nor heavy plant or equipment moved over, any gas pipeline or apparatus until all of the conditions specified by WWU have been complied with.

Where WWU have apparatus in the vicinity of your work, any damage to it could have serious consequences. In view of this and in the interests of safety, a meeting should be arranged before the commencement of work on site between WWU representatives, representatives of the promoting authority, the contractors and any other interested parties. At this meeting the suggested program of site works and plant safety should be discussed. It is essential that this meeting is convened well in advance of commencement on site. Access to WWU plant and facilities for inspection by WWU staff must not be affected. Where formal consent has been given, **A MINIMUM OF SEVEN DAYS NOTICE IS REQUIRED** before carrying out work in WWU easements, or the appropriate notice under the New Roads & Street Works Act (NRSWA) where existing plant is situated within the public highway.

Further guidance can also be sought from the document **HS(G)47 – Avoiding Danger from Underground Services** from the HSE website**.**

3. PROXIMITY OF OTHER PLANT

A minimum clearance of **600 millimetres (mm)** should be allowed between all plant being installed and an existing gas main operating above 2 bar medium pressure (MP), whether the adjacent plant is parallel to or crossing the gas pipe. For mains operating at MP or below, this distance can be reduced to 300mm. **NO APPARATUS SHOULD BE LAID OVER AND ALONG THE LINE OF A GAS PIPE, IRRESPECTIVE OF CLEARANCE**.

No manhole or chamber shall be built over or around a gas pipe and no work should be carried out which results in a reduction of cover or protection over a pipe without consultation with and the agreement of WWU staff.

4. PROTECTION

Where any works cross or run in close proximity to WWU apparatus, periodic visits must be made by a WWU engineer. His requests for protection or support to the apparatus shall be immediately observed.

Suitably designed crossing points are to be constructed to the satisfaction of a WWU Engineer. These crossing points shall be clearly indicated by the erection of bunting and crossings at other places should be prevented.

Backfill material adjacent to WWU apparatus shall be soft fill or sand, containing no stones, bricks, or lumps of concrete etc., placed to a minimum 150mm around the mains and is to be well compacted by hand. No power consolidation shall take place above the main until 300mm of soft fill has been compacted by hand.

Wales & West Utilities Limited

5. DAMAGE TO COATINGS

Where a gas pipe is coated with special wrapping and this is damaged, even to a minor extent, WWU must be notified so that repairs can be made to prevent future corrosion and subsequent leakage. **WHERE MINOR DAMAGE TO COATING IS REPORTED TO WWU PRIOR TO BACKFILL, THE NECESSARY REPAIR WILL BE MADE FREE OF CHARGE**.

6. CATHODIC PROTECTION

Where WWU apparatus is cathodically protected either by sacrificial anode or impressed current systems and where new apparatus is to be laid and is to be similarly protected, WWU will require to carry out interaction tests to determine whether its own system is adversely affected. The cost of any mutually agreed remedial action will be recharged to the authority installing the new apparatus. If any bond wires, test leads etc., used in connection with cathodic protection systems are damaged or found to be in poor condition, broken or disconnected, WWU must be notified prior to backfilling so that a repair can be made.

7. HOT WORKS

Even when a gas free atmosphere exists care must be taken when carrying out hot works in close proximity to gas plant in order to ensure that no damage occurs. Particular care must be taken to avoid damage by heat or naked flames to plastic gas pipes or to the protective coatings on other pipes.

8. DEMOLITION

Live gas services must be disconnected **PRIOR** to demolishing any property, arrangements must be made for WWU to check for the presence of any live gas services.

9. TREE PLANTING

WWU must be contacted prior to all tree-planting works above or near our apparatus. Further information can then be made available.

10. DEEP EXCAVATIONS

Any work involving deep excavations (1.5m or more) will be subject to the "Model Consultative Procedure for Pipeline Construction involving Deep Excavations". This may require the diversion of WWU apparatus prior to the commencement of your works. Detailed plans and cross sections will be required in order to determine the effect of these works on WWU apparatus.

11. RENEWABLE ENERGY INSTALLATIONS

Wind Turbines – WWU must be advised of any planned development of wind turbines in the vicinity of an above 2 bar gas pipelines to ensure the development does not impact on the future safe operation of the pipeline. Industry guidance states that any wind turbine must be sited no closer than 1.5 times the proposed height of the turbine mast away from the nearest edge of the pipeline.

Solar Farms – WWU must be contacted regarding planned solar farms being considered in the vicinity of WWU gas pipelines.

EWI – WWU must be contacted regarding any EWI scheme to ensure the scheme does not impact upon WWU's apparatus.

12. LEAKAGE FROM GAS MAINS OR SERVICES

If damage or leakage is caused or an escape of gas is smelt or suspected the following action should be taken at once:

- Remove all personnel from the immediate vicinity of the escape.
- Inform the 24hr Gas Emergency Service on **0800 111 999**
- Prevent any approach by the public, prohibit smoking, and extinguish all naked flames or other sources of ignition for at least 15 metres from the leakage. Do not operate any electrical switches in the vicinity of the escape.
- Assist gas personnel, Police and/or Fire Services as requested.

IN THE EVENT OF A LEAK, OBSERVE THE ABOVE BUT DO NOT ATTEMPT TO SEAL THE LEAK
REMEMBER - IF IN DOUBT; SEEK ADVICE FROM WWU

13. BUILDING PROXIMITIES

There are minimum proximity distances for buildings from WWU mains depending on both the operating pressure and the material of the main. Advice should be sought from WWU prior to building works taking place to confirm these distances. For High Pressure pipelines you must seek further guidance from the HSE and Local Authority Planning team regarding their PADHI distances regarding building proximities as these may be in addition to WWU proximity distances for a pipeline.

Temporary buildings should not be placed above any gas pipe or within 3.0 metres of mains operating above 75mbar (medium, intermediate and high pressure mains) during construction activities and in no circumstances should permanent structures be built over any pipe transporting gas.

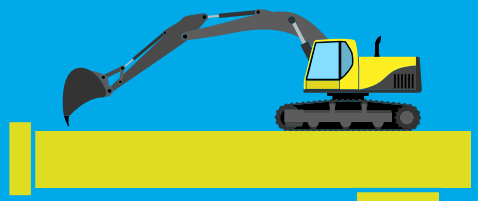
14. SITE RESPONSIBILITIES

All costs incurred by WWU for the repair of direct or consequential damage to gas plant will be rechargeable (with the exception of paragraph 5). WWU reserves the right to divert any affected apparatus or alternatively specify suitable protection of its apparatus. If proved necessary during the course of site works, the cost of which will be chargeable.

The above requirements do not relieve you of the responsibility of taking all precautions necessary to safeguard the Company's plant and to avoid risk to persons and property. The persons for whom the works are being undertaken, their servants, agents and contractors shall indemnify WWU servants, agents and contractors against any loss, damage, expenses, claims and actions incurred or brought against Wales & West Utilities, its servants, agents and contractors in consequence of the provision of these works and activities associated therewith or ancillary thereto.

KEY TO MAPS

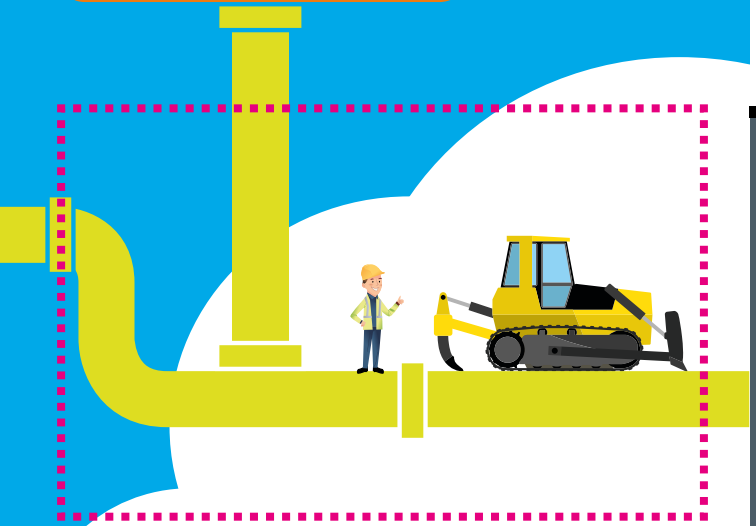
LP	Low Pressure	**CI**	Cast Iron
MP	Medium Pressure	**SI**	Spun Iron
IP	Intermediate Pressure	**DI**	Ductile Iron
HP	High Pressure	**PE**	Polyethylene
		ST	Steel



Every day, underground gas pipes get damaged by people digging without knowing what's below. This can be catastrophic. It might cause serious injury to you and others around you. The costs of repair, fines and fees can be huge. Your project will be delayed and your reputation damaged.

We have designed this leaflet to help you dig safely. And the first thing to do – long before you start work – is call us.

What's the number?
029 2027 8912



CARD POSITION (DO NOT PRINT)

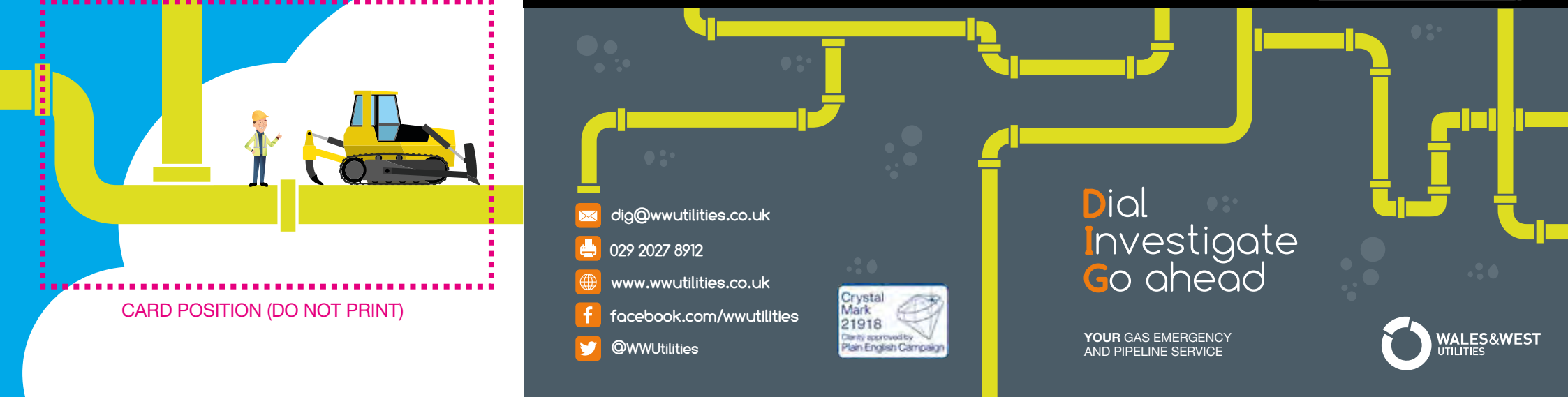
We're here to
help

Need help or advice?
Call our **Plant Protection team** on
029 2027 8912
or email **dig@wwutilities.co.uk**

Smell gas?
Call the **Gas Emergency Service** on
0800 111 999.

Dial before you dig

We need **10 days'** notice



dig@wwutilities.co.uk
029 2027 8912
www.wwutilities.co.uk
facebook.com/wwutilities
@WWUtilities

Crystal Mark 21918
Clarity approved by Plain English Campaign

Dial
Investigate
Go ahead

YOUR GAS EMERGENCY AND PIPELINE SERVICE

WALES&WEST UTILITIES

Can you DIG it?

We bring the gas to homes and businesses across Wales and the south west of England. We invest money, time and effort every year to make sure our pipelines are protected – but the biggest danger to our network is you.

D is for Dial

Digging can be dangerous. Hit a gas pipe and you might cause a gas leak, a fire or explosion.

So phone us first on **029 2027 8912** or email **dig@wwutilities.co.uk**

- You can find out where our pipes are.
- You need to give us 10 working days' notice before you start working.

I is for Investigate

It's the only way to stay safe

- Before you start work, you must get a copy of our up-to-date gas plans and General Conditions and keep them with you on site.
- Use our online mapping service to find the mains pipes under your land.
- Working near a medium-, or intermediate- or high-pressure gas pipe? You might need a site visit – call us so we can arrange it.
- Plan ahead – we need at least 10 days' notice for a site visit.
- You'll also need our publication 'SSW22 Safe working in the vicinity of high-pressure pipelines and associated installations'.
- Remember, you can't work on a Wales & West Utilities wayleave or easement (land which we have rights over to maintain our gas network) without written permission.
- And you can't work near or move heavy equipment over any gas pipeline until all our conditions have been met and we agree your method of working.
- Watch the video on our website to find out more.

G is for Go ahead

- Make sure you have our up-to-date gas plans on site.
- Need extra advice? Call our Plant Protection team on **029 2027 8912** or email **dig@wwutilities.co.uk**
- Use cable- and pipe-locating devices.
- Use safe digging practices, taking every precaution to avoid damaging gas pipes, damaging yourself and damaging your bank balance. You will be billed for any costs if something goes wrong.
- If in doubt, phone us again. We're happy to help.

We need **10 days'** notice

Smell gas?

Our Gas Emergency Service is on call 24 hours a day, seven days a week, 365 days a year.

If you cause a gas leak, or think the network might be leaking, call the Gas Emergency Service immediately on **0800 111 999**.

- Get everyone away from the leak.
- Ask everyone in nearby buildings to leave until we're sure it's safe.
- Put out all naked flames and other sources of ignition and make sure no one smokes within 15 metres of the leak.
- Don't try to fix the leak by filling the hole, as gas may enter buildings.
- Don't try to operate any valves.
- Don't let anyone go near the leak.
- Help our engineers, the police or fire services if they ask.

CORNERSTONE PROJECTS LTD

WATER

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

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Data updated: 14/07/22

Scale: 1:1250 | Date: 22/07/22 | Clean Water Plan A0

Map Centre: 329366,348885 | Our Ref: 907971 - 13 | Powered by digdat

Hydrant | Valve | Aqueduct

Washout | Water Main | Duct

Meter | Abandoned Pipe | Service Pipe/ Private Pipe

duncan@cornerstoneprojects.co.uk

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HAFREN DYFRDWY severn dee

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Path (um)
Bersham Lodge
Track
Path (um)
Track
Bersham Bank
St Mary's Church
Mill Farm
Mill Terrace
The Smithy
The White House
Track
Cadwgan Hall
Path (um)
B 5097
Path (um)
Sports Pavilion
GP
BRONWYLFA ROAD
Path (um)
B 5097
Track
0m
100m
200m
300m

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Data updated: 14/07/22

Scale: 1:1250
Map Centre: 330300,348882
Date: 22/07/22
Our Ref: 907971 - 4
Clean Water Plan A0
Powered by digdat

Hydrant
Washout
Meter
Valve
Water Main
Abandoned Pipe
Aqueduct
Duct
Service Pipe/ Private Pipe

duncan@cornerstoneprojects.co.uk

489507 2

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Date: 09/08/22 | Scale: 1:1250 | Map Centre: 330301,347974 | Data updated: 14/07/22 | Our Ref: 922181 - 2 | Clean Water Plan A0

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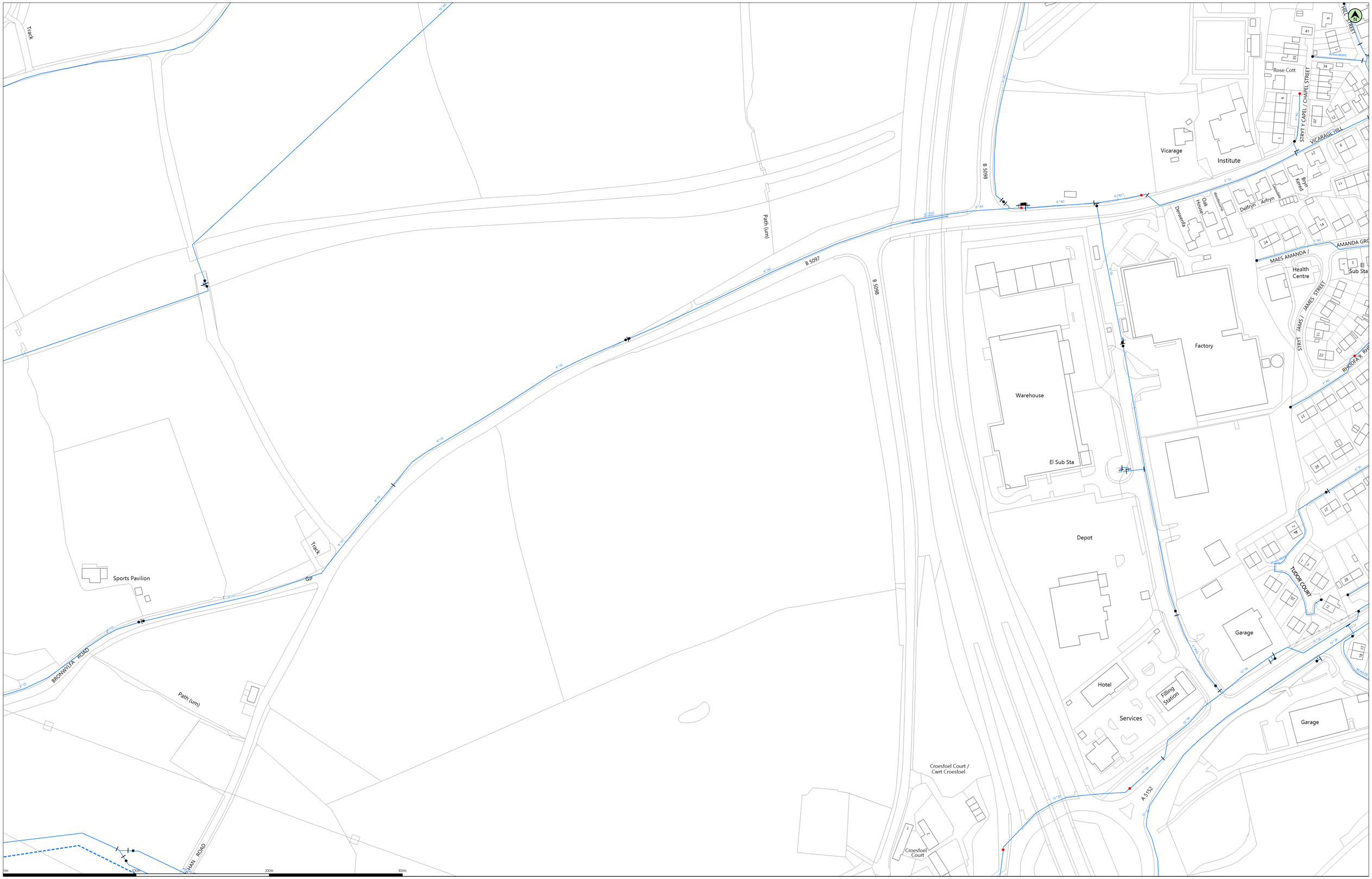

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Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Hafren Dyfrdwy (HD) apparatus (defined below), the person, contractor or subcontractor responsible must inform HD immediately on: **0800 085 8033 (24 hours)**

a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991(a legal agreement between a developer and HD, where a developer agrees to build sewers to an agreed standard, which HD will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with HD and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "HD Apparatus" in these general conditions and precautions.

b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.

c) On request, STW will issue a copy of the plan showing the approximate locations of HD Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and HD does not guarantee its accuracy.

d) STW does not update these plans on a regular basis. Therefore the position and depth of HD Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.

e) The plan must not be relied upon in the event of excavations or other works in the vicinity of HD Apparatus. It is your responsibility to ascertain the precise location of any HD Apparatus prior to undertaking any development or other works (including but not limited to excavations).

f) No person or company shall be relieved from liability for loss and/or damage caused to HD Apparatus by reason of the actual position and/or depths of HD Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any HD Apparatus the following should be observed:

1. All HD Apparatus should be located by hand digging prior to the use of mechanical excavators.

2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to HD Apparatus. You or your contractor must ensure the safety of HD Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).

3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.

4. During construction work, where heavy plant will cross the line of HD Apparatus, specific crossing points must be agreed with HD and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of HD Apparatus at other locations must be prevented.

5. Where it is proposed to carry out piling or boring within 20 metres of any HD Apparatus, HD should be consulted to enable any affected HD Apparatus to be surveyed prior to the works commencing.

6. Where excavation of trenches adjacent to any HD Apparatus affects its support, the HD Apparatus must be supported to the satisfaction of HD. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.

7. Where a trench is excavated crossing or parallel to the line of any HD Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the HD Apparatus. In special cases, it may be necessary to provide permanent support to HD Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the HD Apparatus.

8. No other apparatus should be laid along the line of HD Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of HD Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any HD Apparatus.

9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing HD Apparatus. We reserve the right to increase this distance where strategic assets are affected.

10. Where any HD Apparatus coated with a special wrapping is damaged, even to a minor extent, HD must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any HD Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.

11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with HD Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such HD Apparatus in order to determine any necessary alterations in advance of the works.

12. With regard to any proposed resurfacing works, you are required to contact HD on the number given above to arrange a site inspection to establish the condition of any HD Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. HD will then advise on any measures to be taken, in the event of this a proportionate charge will be made.

13. You are advised that HD will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,

14. No explosives are to be used in the vicinity of any HD Apparatus without prior consultation with HD.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other HD Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other HD Apparatus.

15. Please ensure that, in relation to HD Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.

16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other HD Apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other HD Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May 2014

18. HD personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other HD Apparatus.

19. In certain circumstances, both HD and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main of other HD Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

CORNERSTONE PROJECTS LTD

SEWER

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Dŵr Cymru
Welsh Water

LAND AT BRONWYLFA ROAD, RHOSTYLLEN

N
W E
S

LEGEND(Representative of most common features)

Waste network:

	Foul chamber		Outfall
	Surface water chamber	LH	Lamphole
	Combined chamber		Storm Overflow
C O	Combined sewer overflow		Rising main
SPC	Special purpose chamber		Gravity sewer
	Treatment works		Private sewer
	Pumping station	S 104	Private sewer subject to Sect. 104 adoption agreement

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Private Sewer Transfer
Lateral Drain
Inspection Chamber

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

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Map Ref:	330327,348308
Map scale:	1:3500
Printed by:	Stephen Burton
Printed on:	10 Aug 2022

CORNERSTONE PROJECTS LTD

BT

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Our Ref: Ref shown on map

email: nnhc@openreach.co.uk

Date of issue shown on map

Dear Customer,

NR & SW ACT 1991 – PROPOSED WORKS AT:

Prior to commencement of work: for free onsite guidance and accurate up to date location of BT plant please contact our Plant Protection Service by the following methods
Email Dial before you dig CBYD@openreach.co.uk
Visit the website www.openreach.co.uk/cbyd

Thank you for your request of describing the above proposals.

Enclosed are copies of our drawing marked up to show the approximate locations of BT apparatus which is present in the immediate vicinity of your works. It 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 made near to British Telecommunications plc apparatus which may exist at various depths and may deviate from the marked route.

To avoid damage it is recommended that mechanical excavators or borers are not used within 600mm of British Telecommunications plc plant. If scaffolding is erected, please ensure that our equipment is not enclosed, blocked, covered or otherwise obstructed by the scaffolding.

In the event of BT apparatus being in the area of works we recommend that your plant/vehicle crossing is either resited, or apply for a budget estimate by submitting detailed plans to the above address, these will be forwarded to the appropriate department for their comments.

Please ensure you quote our reference on any future correspondence.

Yours faithfully,

Openreach Plant Maps Requested

NewSite Office (addresses can be found on the New Developments contact page)

Dear Sir/Madam,

You have downloaded copies of our drawings marked up to show the approximate location of Openreach apparatus, which is present in the immediate vicinity of your works. It 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 made near to Openreach apparatus, which may, exist at various depths and may deviate, from the marked route.

To avoid damage it is recommended that mechanical excavators or borers are not used within 600mm of Openreach plant. Please ensure that our equipment is not enclosed, blocked, covered or otherwise obstructed by your plant. In the event of clearance not being adequate we anticipate that your plant is either resited, or an order is placed with Openreach for rearrangements of its plant. If there are any difficulties with the Map please email cbyd@openreach.co.uk

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Please contact our Network Protection Service by Email on cbyd@openreach.co.uk giving four calendar weeks notice of your commencement date. This will provide you with on-site advice and a check of location for any Openreach apparatus.

Further to this, I hope the following points will assist you at the new development: -

Openreach has a licence obligation to provide service to any end customer requiring a connection. A Developer would not normally be charged for provision of service, our standard connection charges would apply to the end user when orders are placed with the communication provider of choice. However, should a Developer insist on an underground service in an area where Openreach plant is provided overhead, charges may be incurred.

When the Developer has obtained contract and planning permission Openreach would request a 'Clean', scaled Site Layout, Location Map and a covering letter be sent to the relevant newSite Office. We would particularly request that you give details of your programmed site start date and likely first occupancy date where possible. To obtain contact details of the newSite office covering the development area click on the URL below.

http://www.newdevelopments-openreach.co.uk/ContactUs.aspx

Where a development affects existing Openreach apparatus in the public highway, the cost of any necessary protection or diversionary works must be borne by the Developer. In this case where a budget estimate is required a Site Plan, Location Map and a covering letter should be forwarded to the Repayments Project Office. Please visit www.openreach.co.uk/alterationscontacts for contact details of the Repayments Office covering the development area.

Yours faithfully,

Openreach newSites

Maps by email Plant Information Reply

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CLICK BEFORE YOU DIG

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

email cbyd@openreach.co.uk

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

Accidents happen

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

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : FMS03294T
Map Reference : (centre) SJ2965748443
Easting/Northing : (centre) 329657,348443
Issued : 09/08/2022 15:29:21

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

Maps by email Plant Information Reply

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
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	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : RCQ03294E
Map Reference : (centre) SJ3004648475
Easting/Northing : (centre) 330046,348475
Issued : 09/08/2022 15:29:34

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Maps by email Plant Information Reply

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : PTZ03307O
Map Reference : (centre) SJ3045248498
Easting/Northing : (centre) 330452,348498
Issued : 09/08/2022 15:30:35

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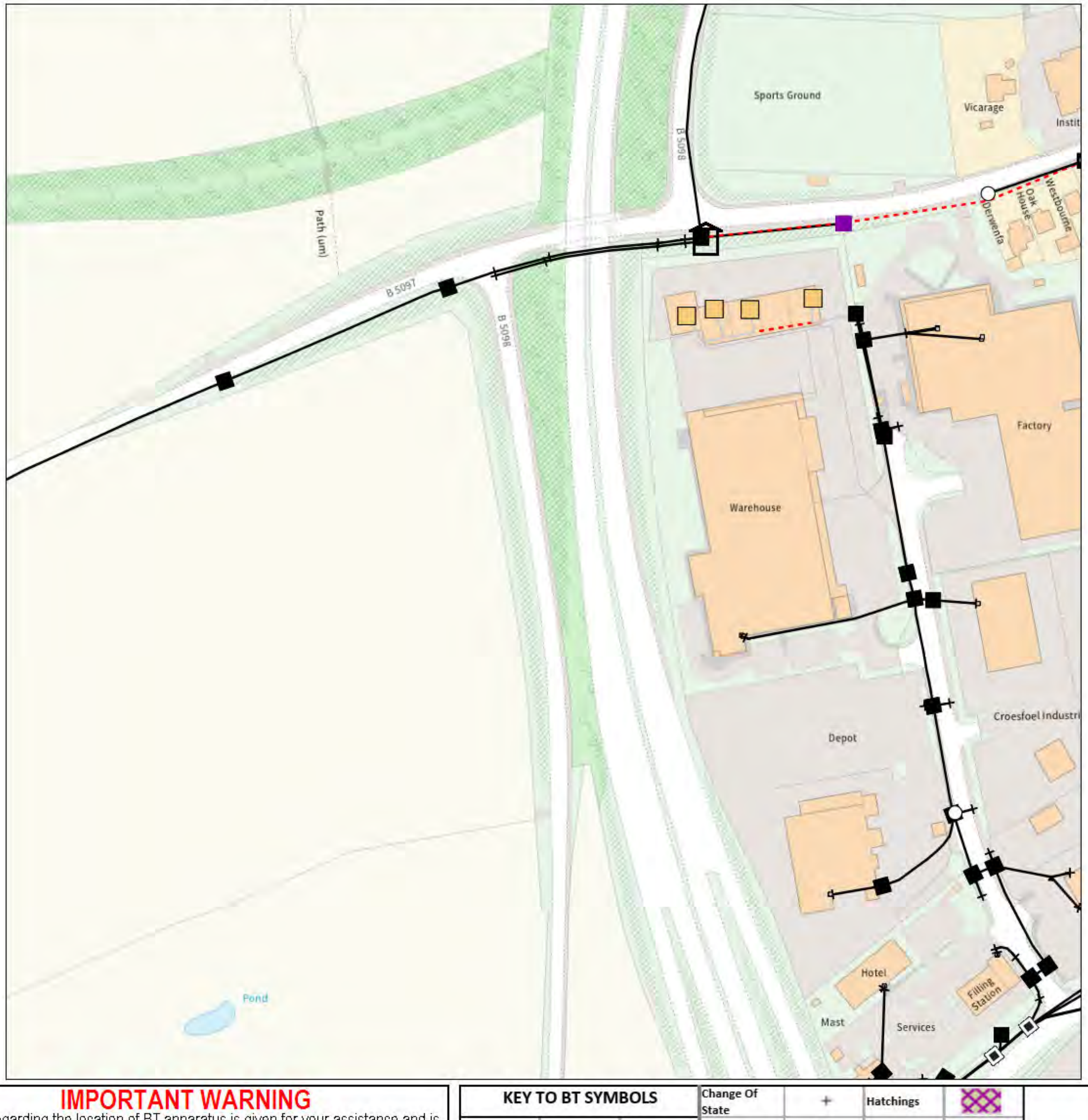
Maps by email Plant Information Reply



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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : ZYX03308F
Map Reference : (centre) SJ3084748529
Easting/Northing : (centre) 330847,348529
Issued : 09/08/2022 15:30:54

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Maps by email Plant Information Reply

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
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Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : NAD03303H
Map Reference : (centre) SJ3045448808
Easting/Northing : (centre) 330454,348808
Issued : 09/08/2022 15:30:55

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Maps by email Plant Information Reply

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KEY TO BT SYMBOLS

	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	In Place	Pending Remove	Not In Use
Power Cable				
Power Duct				N/A

BT Ref : HWD03305J
Map Reference : (centre) SJ3085448845
Easting/Northing : (centre) 330854,348845
Issued : 09/08/2022 15:30:57

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
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Cabinet		

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

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	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : HWD03313S
Map Reference : (centre) SJ2966748065
Easting/Northing : (centre) 329667,348065
Issued : 09/08/2022 15:31:09

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

Maps by email Plant Information Reply

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www.openreach.co.uk/cbyd

Accidents happen

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

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : VKX03314P
Map Reference : (centre) SJ3005948091
Easting/Northing : (centre) 330059,348091
Issued : 09/08/2022 15:31:20

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

Maps by email Plant Information Reply

IMPORTANT WARNING

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

openreach

CLICK BEFORE YOU DIG

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

email cbyd@openreach.co.uk

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

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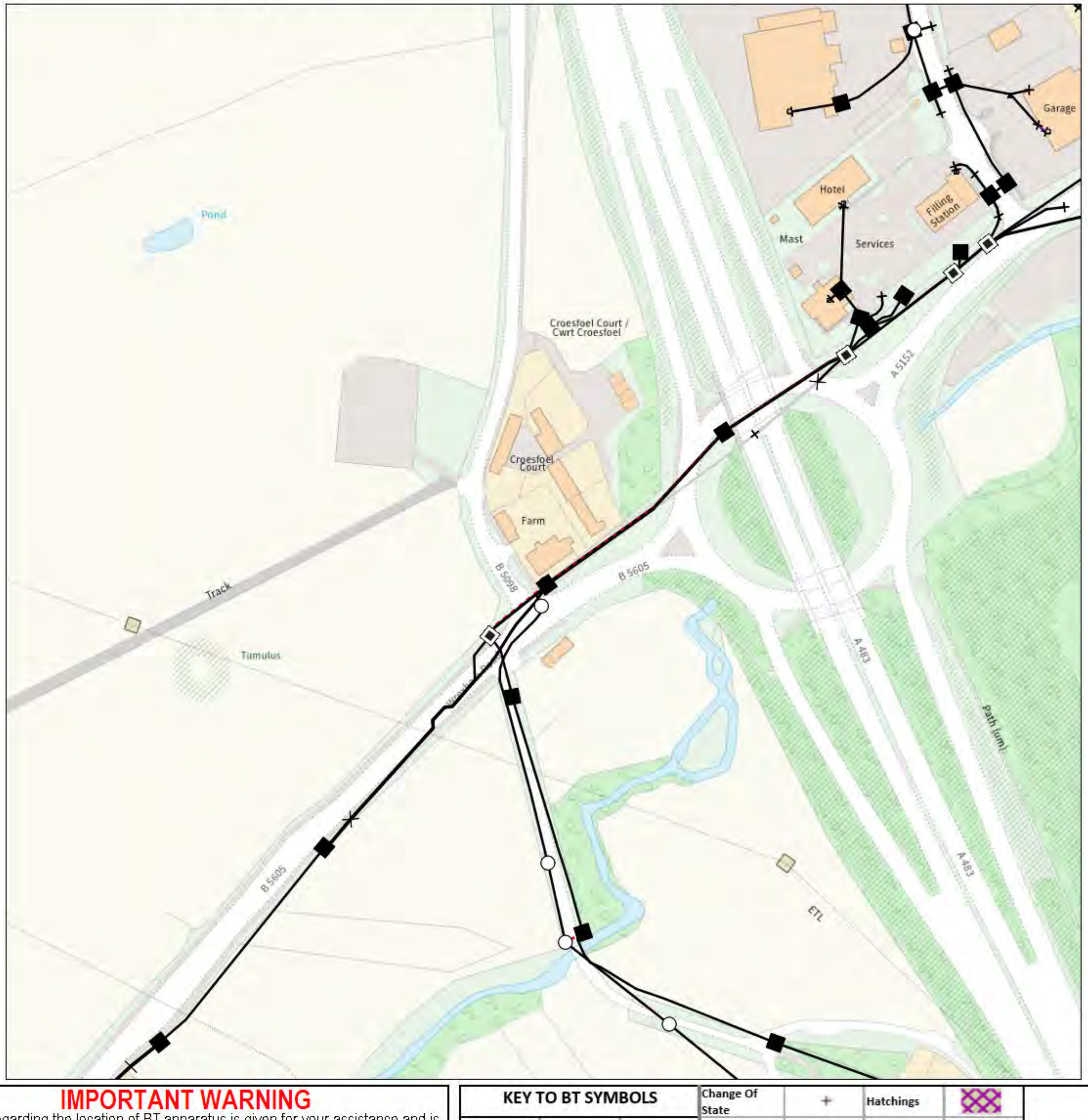
	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : HHT03312N
Map Reference : (centre) SJ3045948111
Easting/Northing : (centre) 330459,348111
Issued : 09/08/2022 15:31:32

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

Maps by email Plant Information Reply



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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

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	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : PLL03316C
Map Reference : (centre) SJ3086648165
Easting/Northing : (centre) 330866,348165
Issued : 09/08/2022 15:31:42

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Maps by email Plant Information Reply

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	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

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	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : TZA03318R
Map Reference : (centre) SJ3043247782
Easting/Northing : (centre) 330432,347782
Issued : 09/08/2022 15:31:46

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

Maps by email Plant Information Reply

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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

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

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	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : YMO03317T
Map Reference : (centre) SJ3081947866
Easting/Northing : (centre) 330819,347866
Issued : 09/08/2022 15:32:01

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CORNERSTONE PROJECTS LTD

ELECTRIC

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Our Ref: 26544194 489507 IAP

Tuesday, 09 August 2022

Duncan Phillips
91 Market Street
Hoylake
Merseyside
CH47 5AA

Dear Duncan Phillips

SP Energy Networks - Asset Network Plans

Thank you for your recent request for information concerning the location of SP Energy Networks electrical equipment / network drawings in the vicinity of your proposed works.

Please find plan(s) enclosed showing the SP Energy Networks equipment within your area of interest, along with links to our current electrical safety awareness guides and our SP Energy Networks contact document.

As much information as possible has been given, however cable locations shown on the plans are indicative only and the positions of cables may have altered since being recorded. A line on a plan may represent more than one cable and services to houses, street lamps, etc. may be omitted or included only as a schematic representation. Cables shown as, “Out of use,” should not be assumed to be dead or abandoned.

If you discover or cause any damage to ScottishPower cables, then please call our Power Emergencies Line - 0800 092 9290 or 105 immediately giving all relevant information.

Please note that the plans are only valid for 28 days from the date of issue. Updated plans should be requested before any work commences on site if this period has expired.

Please note that the following publications are available from HSE Books PO Box1999, Sudbury, Suffolk, CO10 2WA — Tel. 01787 881165 — www.hse.gov.uk :-

Avoiding Danger from Underground Services – HSG47
Avoidance of Danger from Overhead Electrical Lines – GS6

Yours sincerely,

Request For Plans Team, SP Energy Networks.
Contact Us

SP Power Systems Limited Registered Office: 1 Atlantic Quay, Glasgow G2 8SP.
Registered in Scotland No. 215841 Vat No. GB 659 3720 08

SP ENERGY NETWORKS

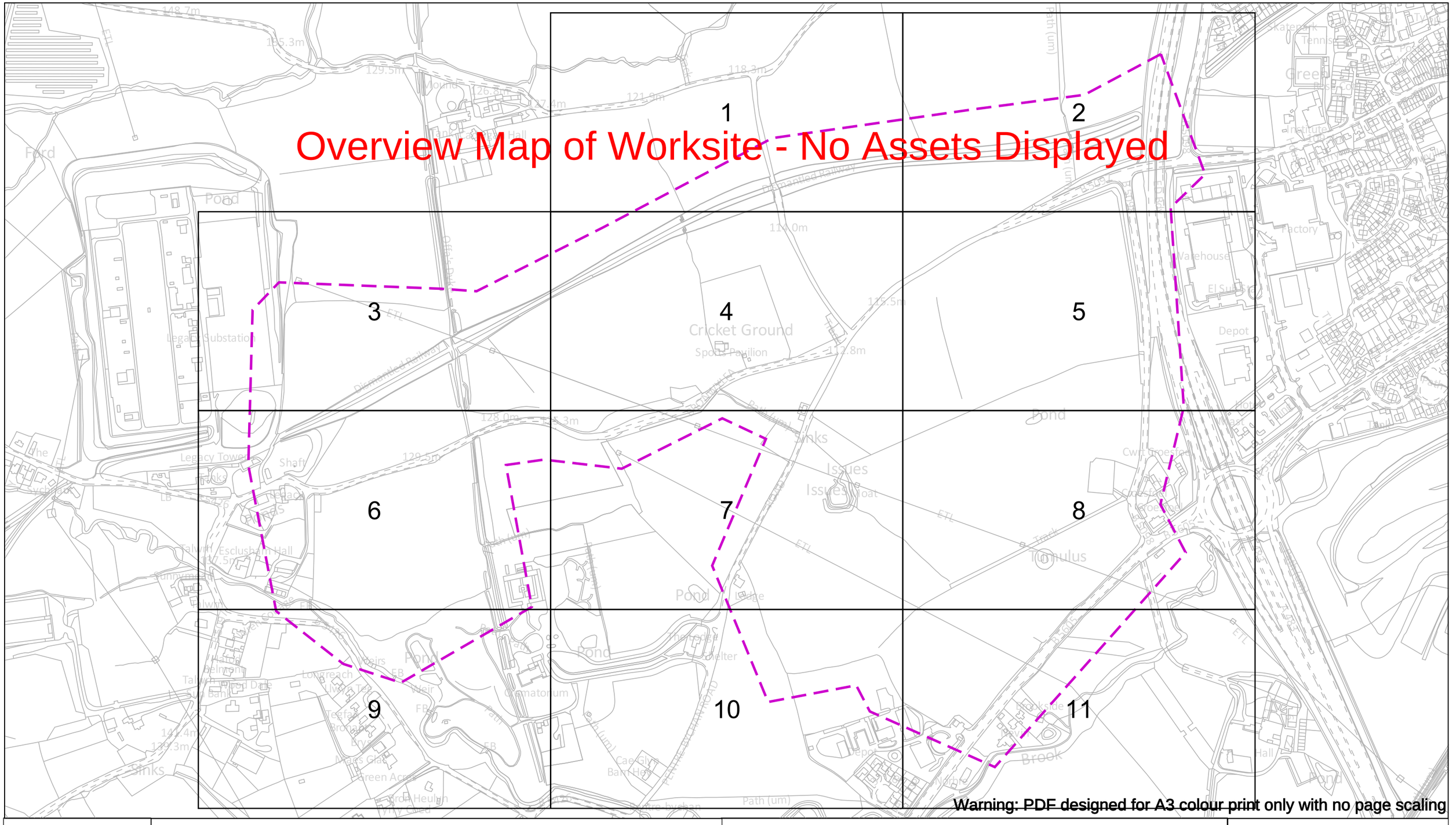
Linesearch before dig

Central & Southern Scotland		Cheshire, Merseyside, N. Wales & N.Shropshire	
Power cuts & emergencies	0800 092 9290	Power cuts & emergencies	0800 001 5400
Connections	0845 270 0785	Connections	0845 270 0783
General enquiries	0330 10 10 444	General enquiries	0330 10 10 444

POWER CUT? CALL 105

SP Power Systems Limited Registered Office: 1 Atlantic Quay, Glasgow G2 8SP.
Registered in Scotland No. 215841 Vat No. GB 659 3720 08

Overview Map of Worksite - No Assets Displayed



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Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference:
489507 IAP

Scale: 1:5125 (When plotted at A3)

IMPORTANT NOTICES

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- The plan only shows assets owned by SP Energy Networks.
- Positions and depths of cables may have altered since being recorded. A line on a plan may represent more than one cable. Normally electric cables are laid at depths between 450mm and 1m but depths may have changed if land surface levels have since altered.
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- Where overhead lines cross your site, you must comply with the requirements of Health & Safety Executive guidance as laid down in GS6, Avoidance of Danger from Overhead Electric Lines.
- Any works that fall within **5m** of any 132kv or Transmission cables, or within **15m** of any 132kV or Transmission OHL's, please contact our General Enquiries Team **0845 273 4444 / 0330 10 10 444** for further safety advice.
- In the event of an emergency or for further assistance contact **0800-092-9290 (Central & Southern Scotland) or 0800-001-5400 (Merseyside, Cheshire & North Wales) or by dialling 105**
- It is your responsibility to ensure this information is provided to all persons working near our plant.

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Dig Sites
Area:
Line:

Overhead Line
LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

SP ENERGY NETWORKS

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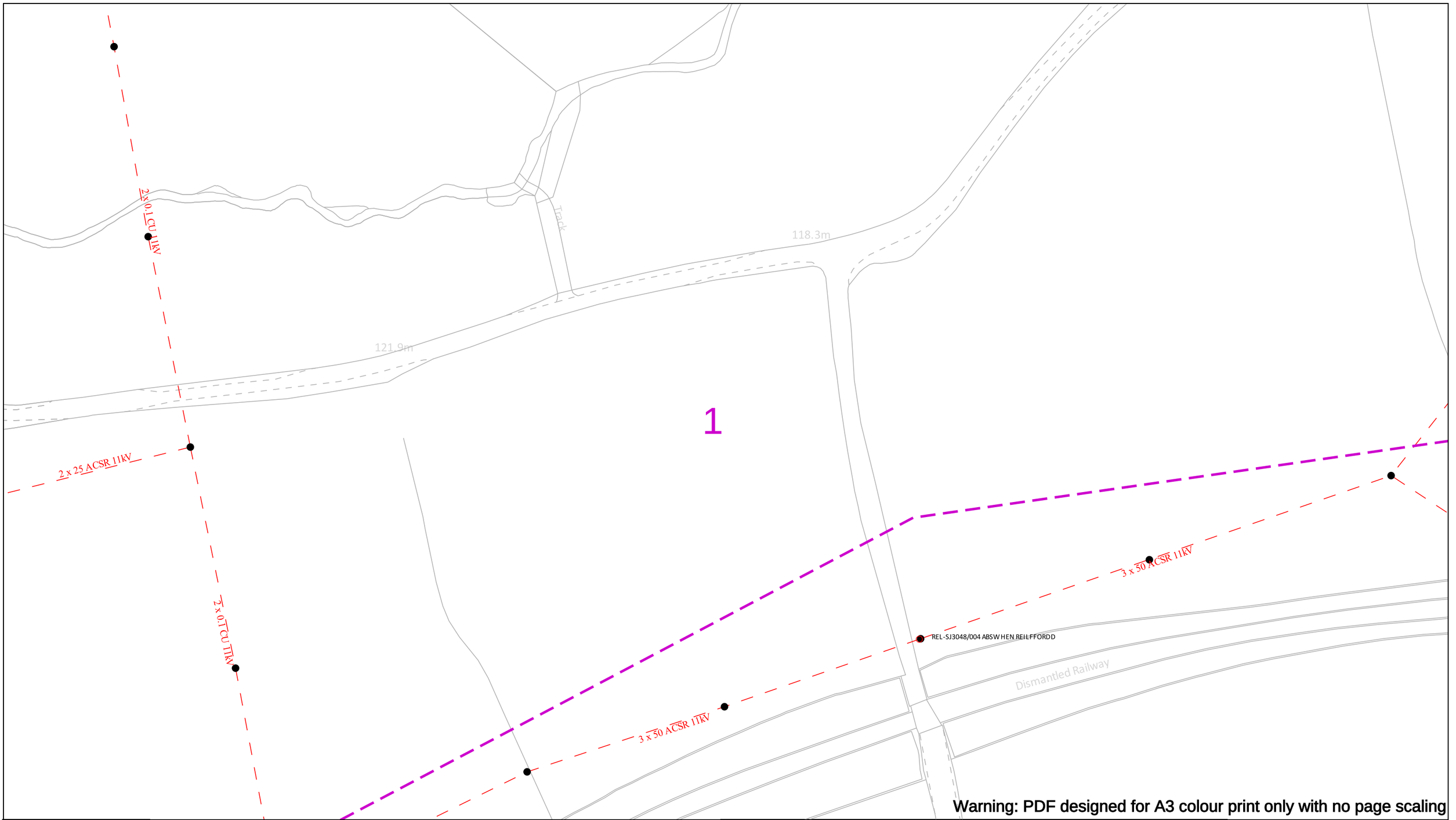

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Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference:
489507 IAP

Scale: 1:1250 (When plotted at A3)

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100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Dig Sites
Area:
Line:

Overhead Line

LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

SP ENERGY NETWORKS

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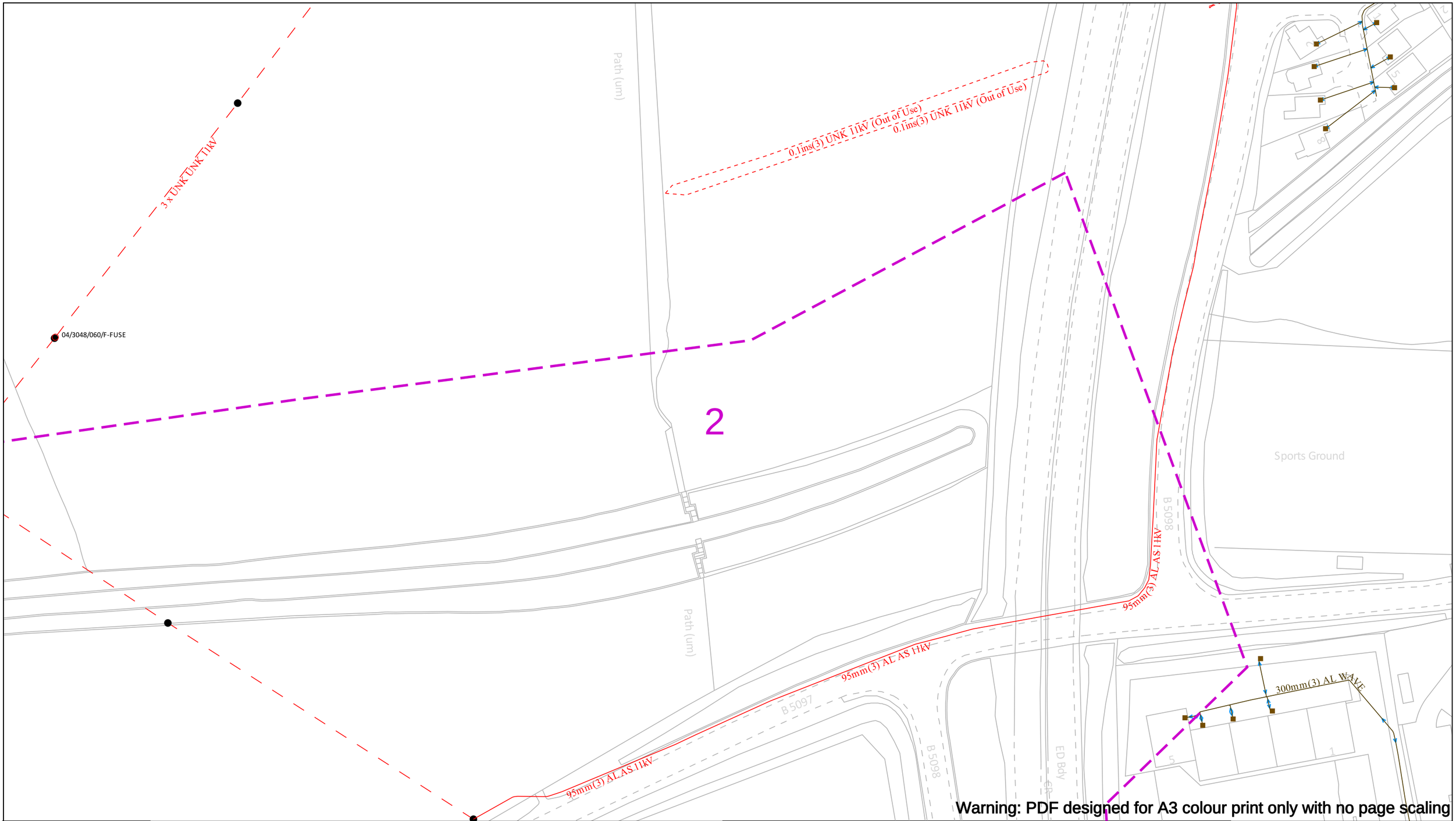

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100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Overhead Line

Dig Sites
Area:
Line:

LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

SP ENERGY NETWORKS

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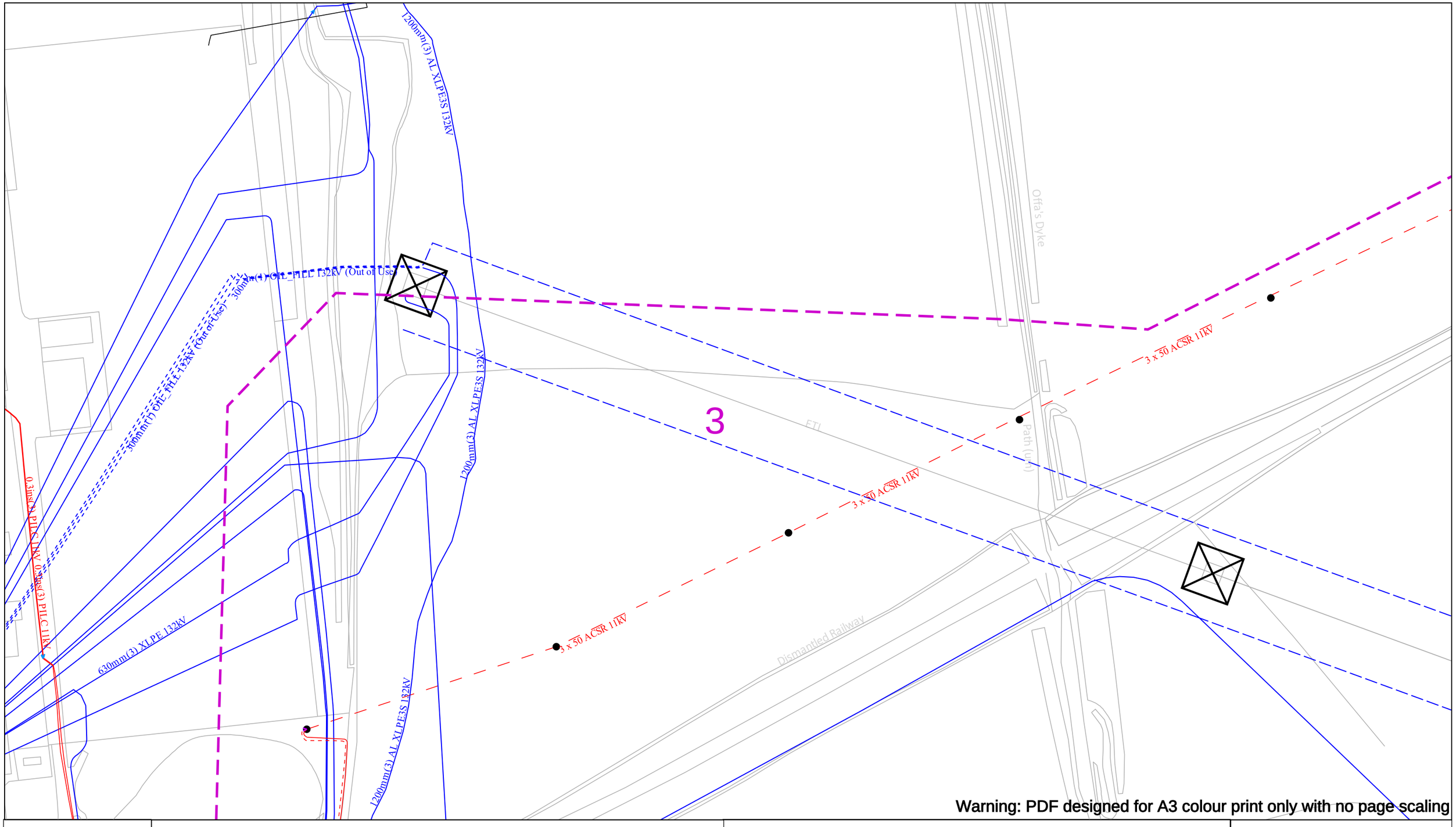

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Site Location: 330234 348322
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100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Dig Sites
Area:
Line:

Overhead Line

LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

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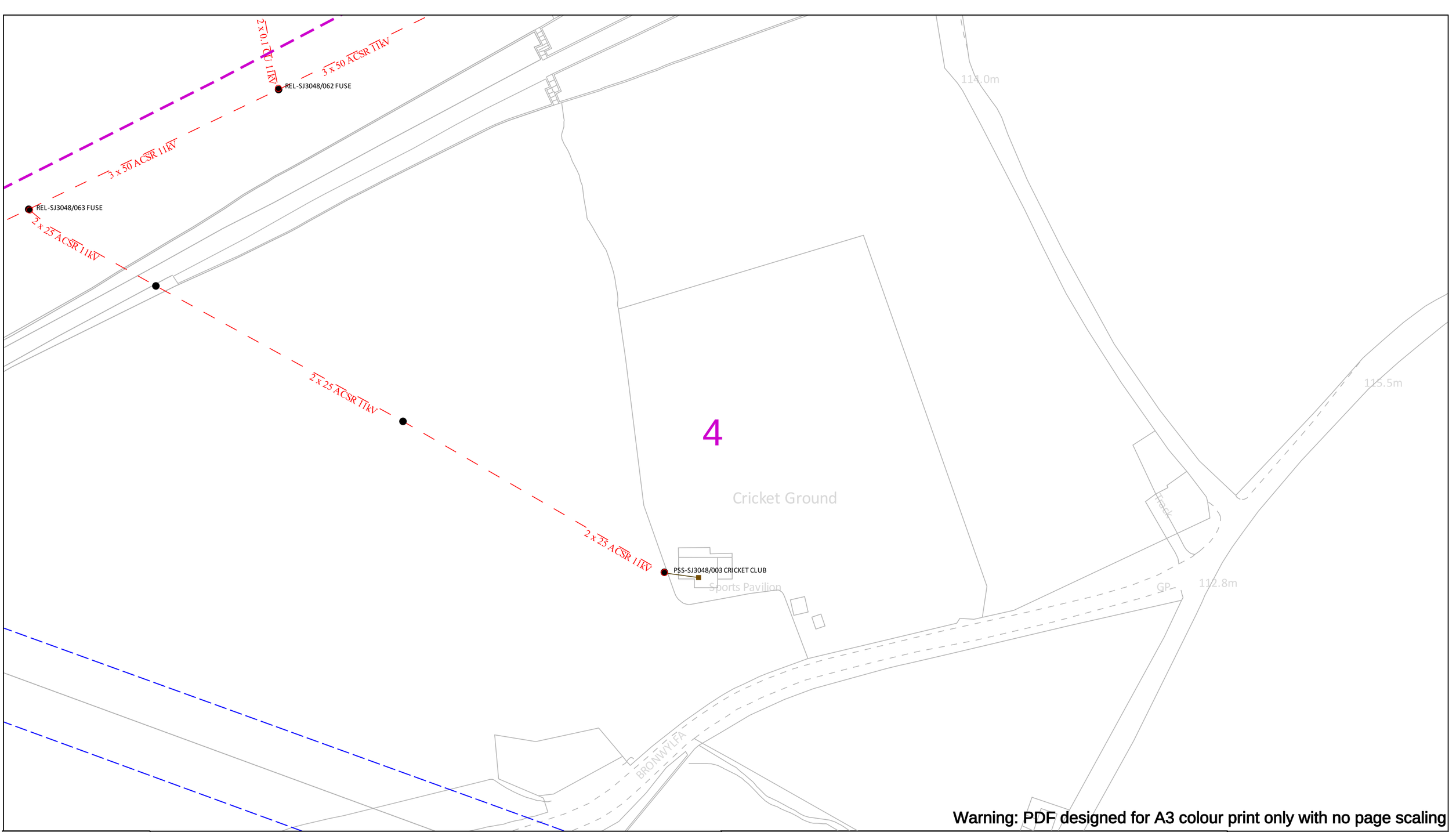

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Date Requested: 09/08/2022
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100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Overhead Line

LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

Dig Sites
Area:
Line:

SP ENERGY NETWORKS

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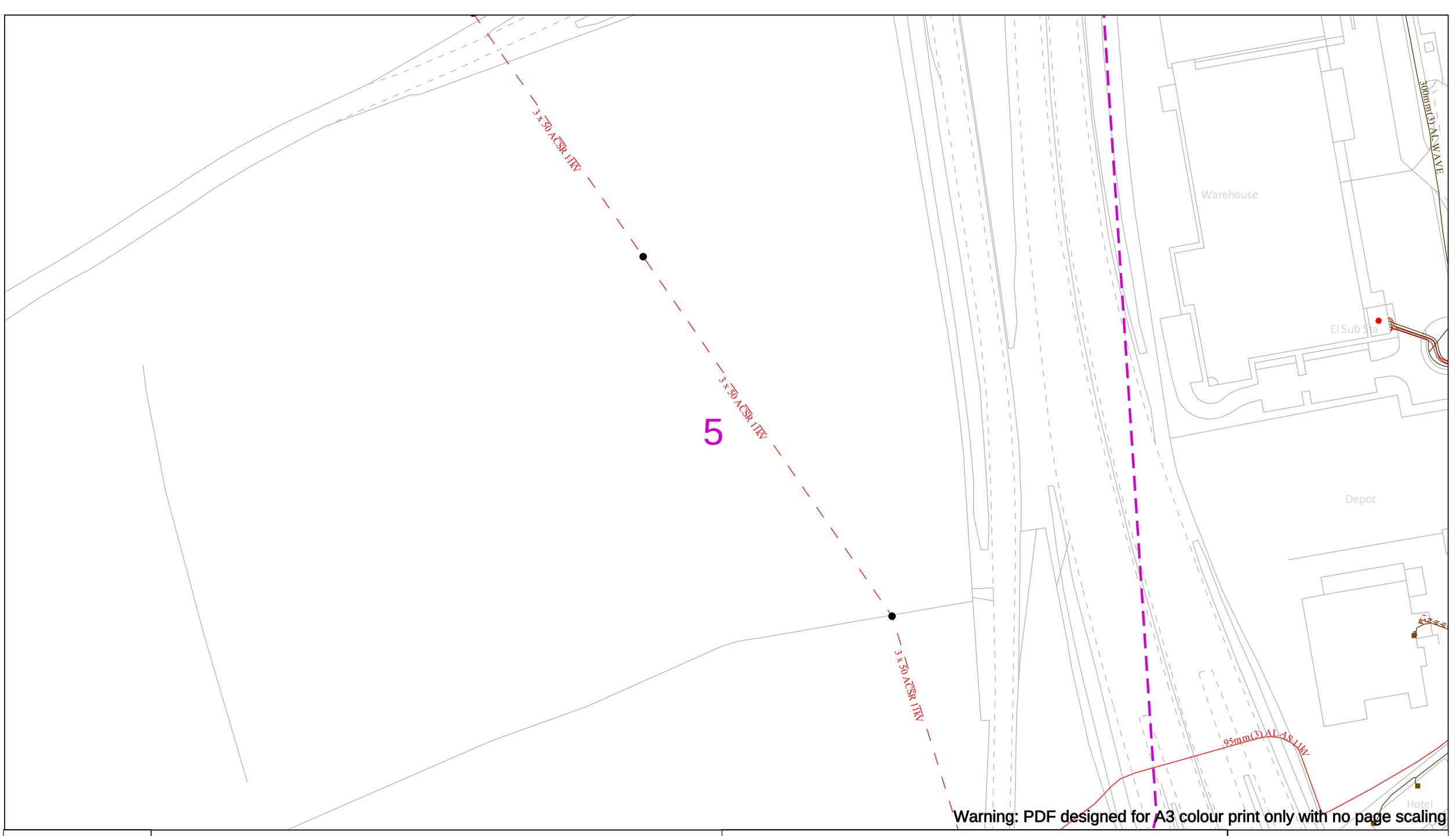

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Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
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100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Dig Sites
Area:
Line:

Overhead Line
LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

SP ENERGY NETWORKS

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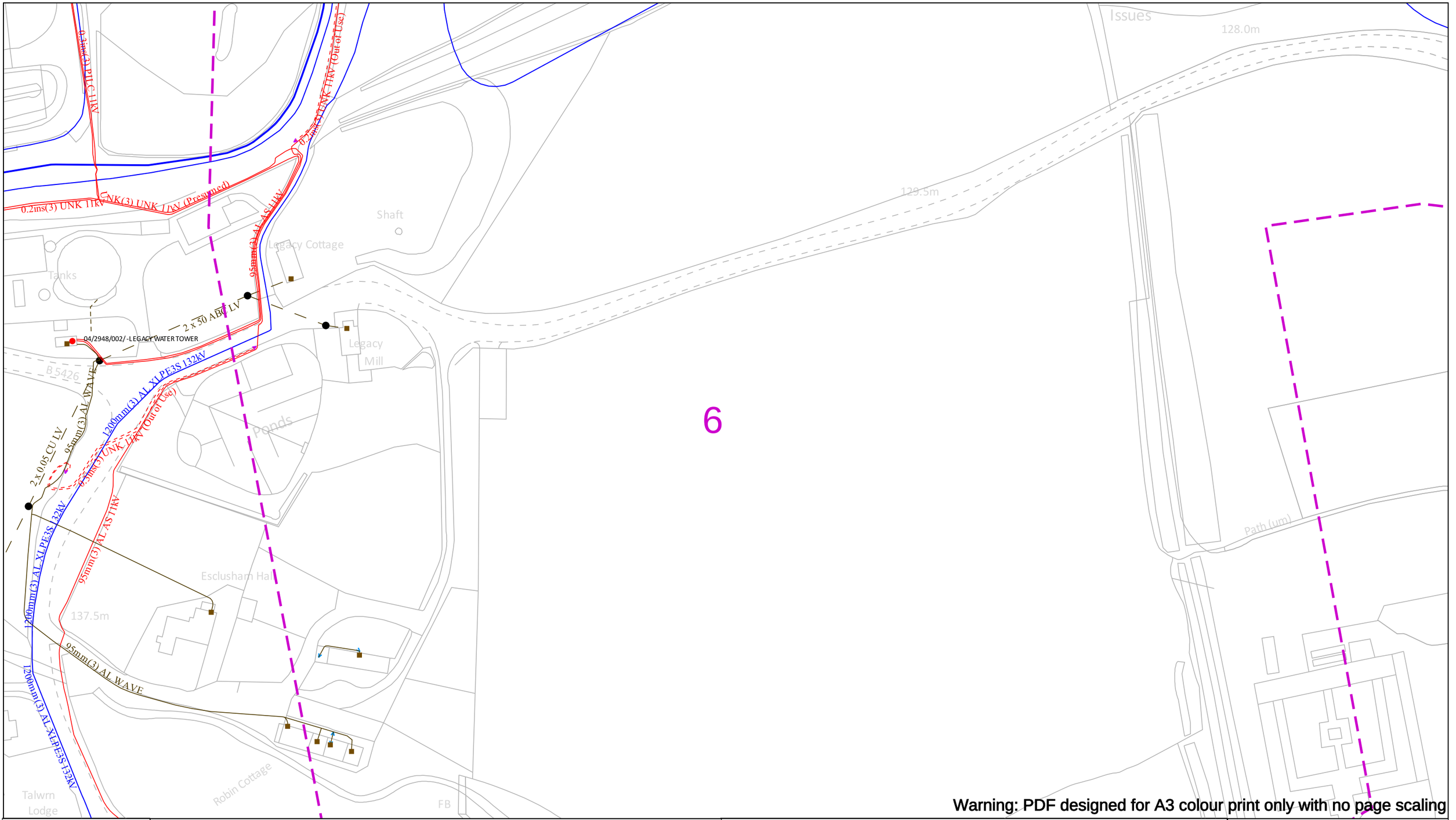

Warning: PDF designed for A3 colour print only with no page scaling

Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference:
489507 IAP

Scale: 1:1250 (When plotted at A3)

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- In the event of an emergency or for further assistance contact **0800-092-9290 (Central & Southern Scotland) or 0800-001-5400 (Merseyside, Cheshire & North Wales) or by dialling 105**
- It is your responsibility to ensure this information is provided to all persons working near our plant.

100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Overhead Line

Dig Sites
Area:
Line:

LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

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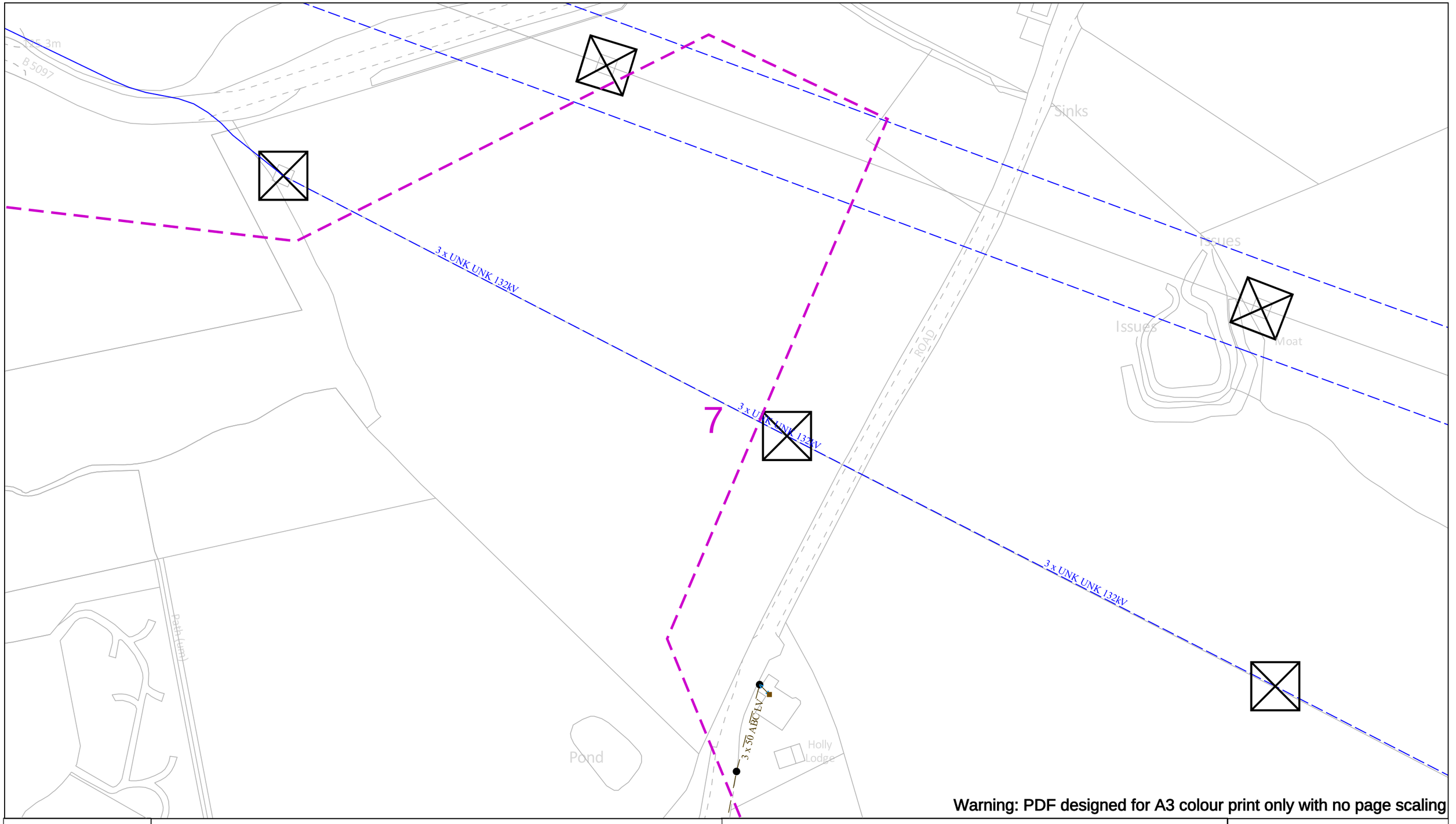

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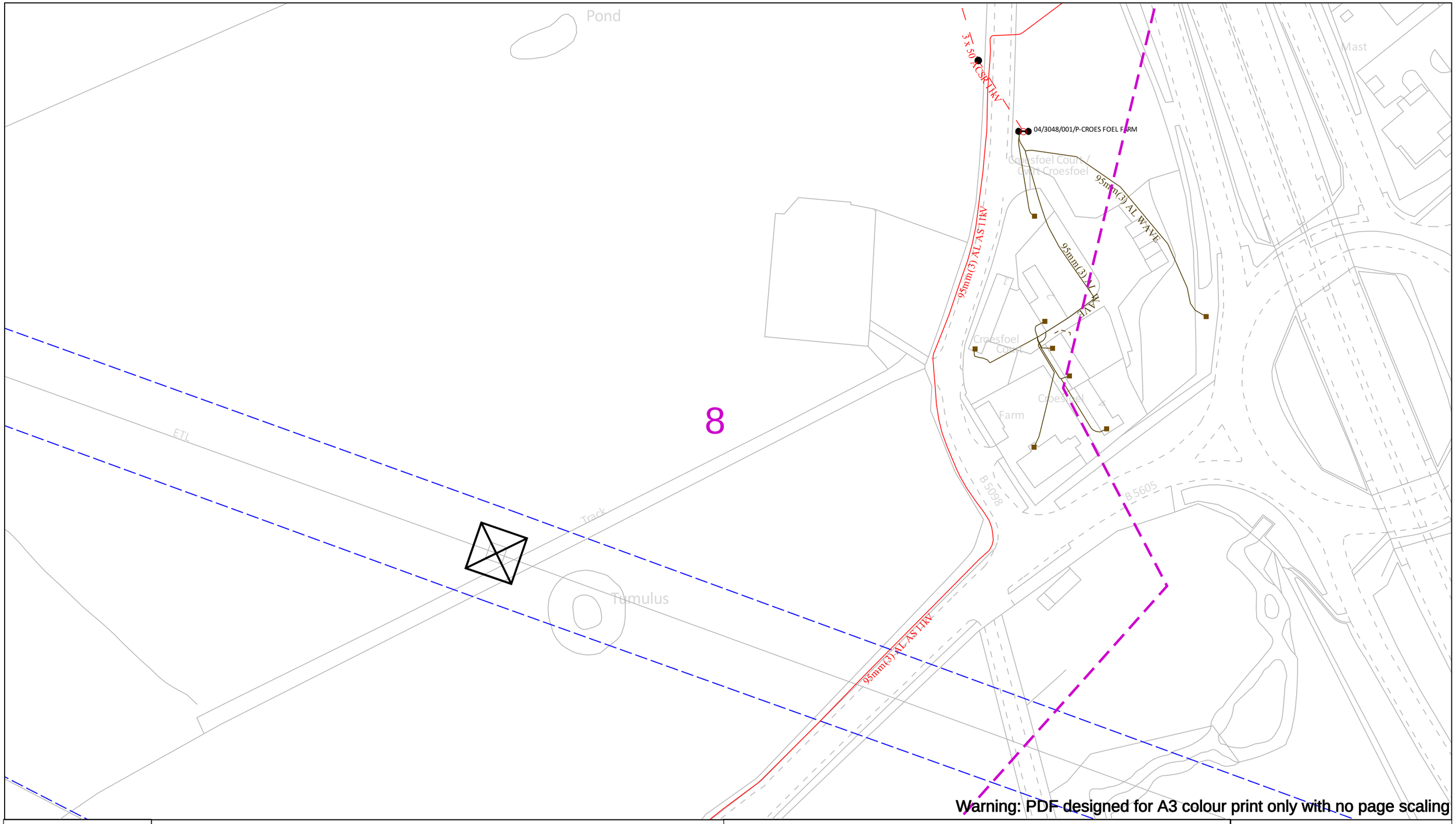

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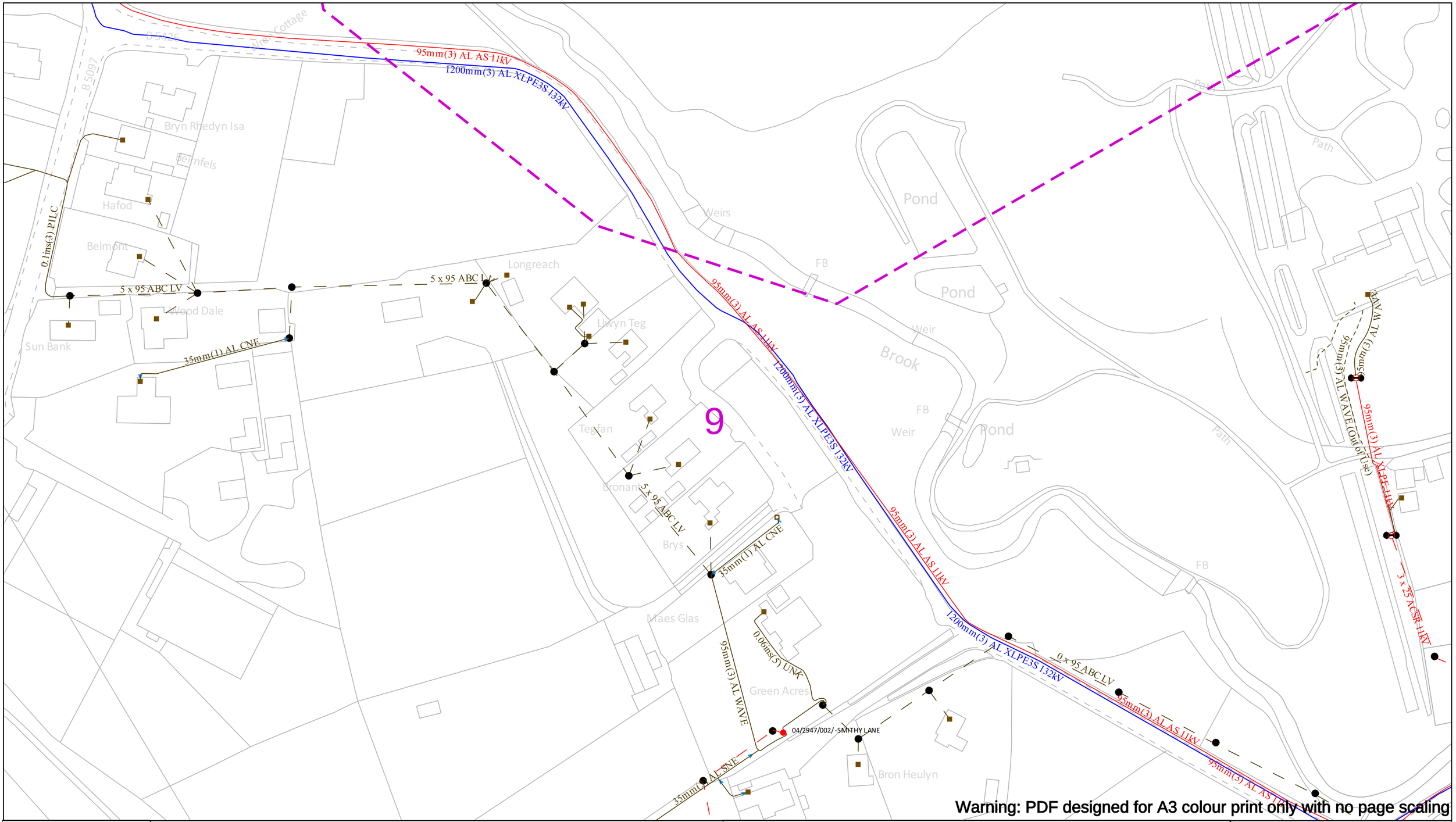

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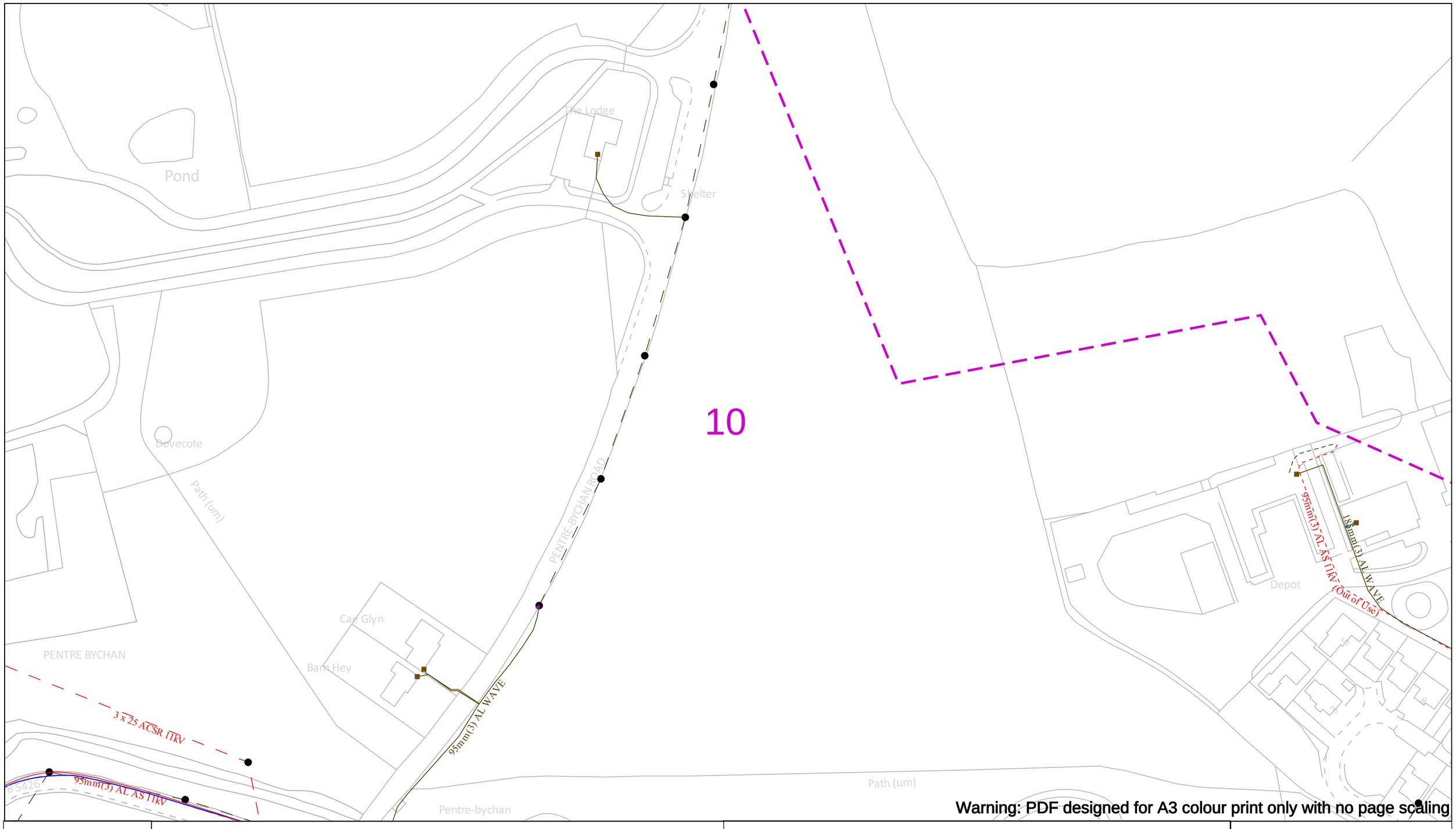

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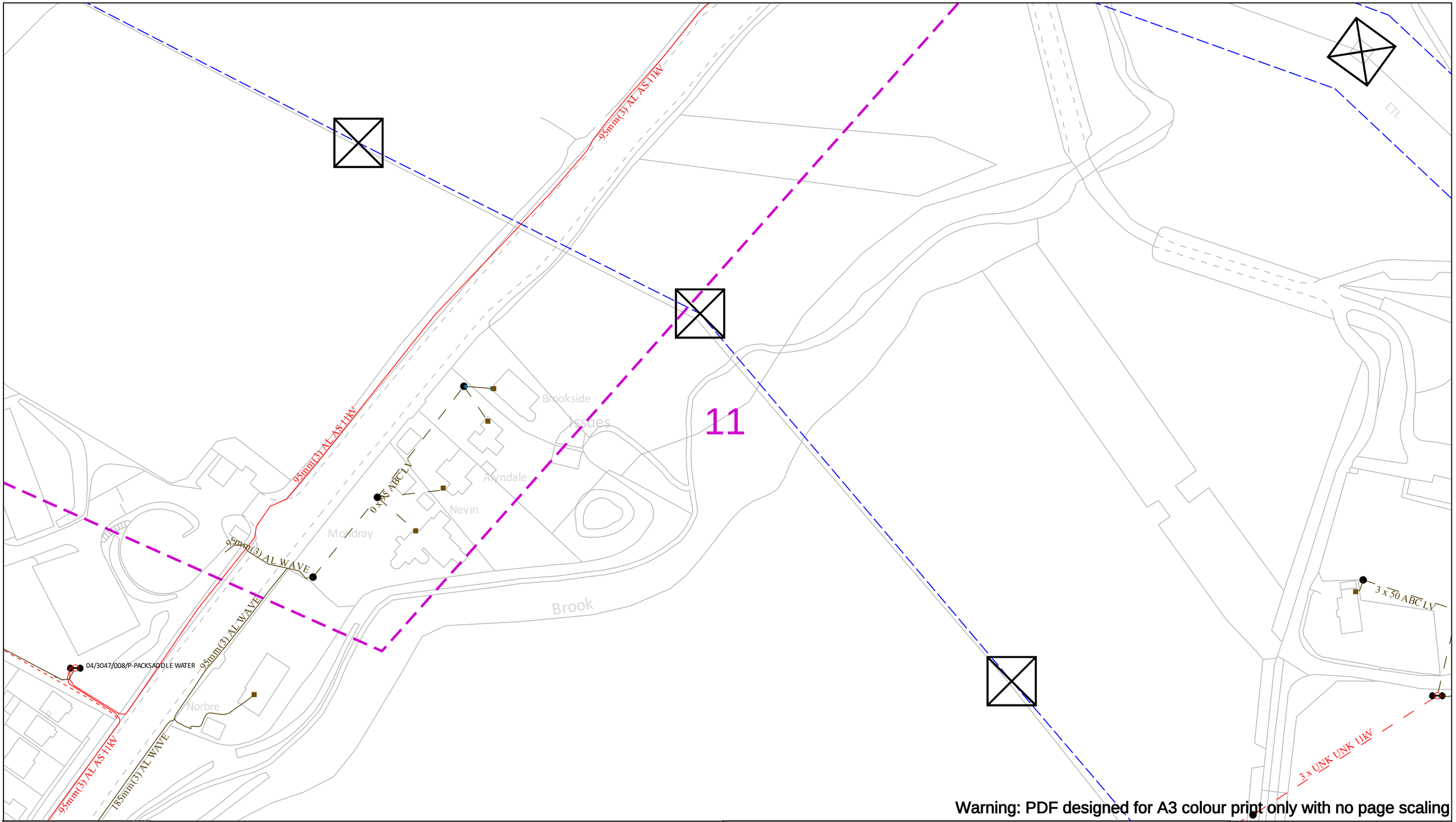

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UTILITY MAP VIEWER (UMV)

SYMBOLS AND SCALES

VERSION 1.1

Author: Louise Edwards, Steve Holmes

Date: 4th November 2011

SYMBOL	NAME	LOCATION	VISIBILITY BETWEEN SCALES
GIS			
	SOP	Substation Locations – SOP	250-25,000
	Trans/Grid Substation	Substation Locations – Ground Mounted Sub	<51,000
	Primary Substation	Substation Locations – Ground Mounted Sub	<50,000
	Secondary Substation	Substation Locations – Ground Mounted Sub	40-7,505
	LV Only Substation	Substation Locations – Ground Mounted Sub	40-5,005
	Externally Deleted Substation	Substation Locations – Ground Mounted Sub	same as their voltages above
	Building/Site/Switchgear Only	Substation Locations – Ground Mounted Sub	same as their voltages above
	Pole Mounted Secondary Substation	Substation Locations- Pole Mounted Sub	>25,000
	Pole Mounted Secondary Substation (externally deleted)	Substation Locations- Pole Mounted Sub	>25,000
	Remote Equipment Location	Substation Locations- Pole Mounted Sub	>25,000
?	Distribution Transformer(unknown)	Substation Locations – Distribution Transformer	>40
	Pole Mounted/Ground Mounted Secondary Transformer	Substation Locations – Distribution Transformer	>40
	Pole Mounted/ Ground Mounted Secondary Transformer Out Of Use	Substation Locations – Distribution Transformer	>40
	LV Fuse	Substation Locations- LV Fuse	>40
	Circuit Breaker	Substation Locations – Dynamic Protective Devices	>40
	Sectionaliser	Substation Locations – Dynamic Protective Devices	>40
	PM Auto Recloser	Substation Locations – Dynamic Protective Devices	>40

	Single Pole	Overhead Assets – under each voltage	>7,5005
	H Pole	Overhead Assets – under each voltage	>7,505
	Tower	Overhead Assets – Trans – Tower	>40,005
	Cable Joint	Ground Assets – under each voltage	>2,505
	Pillar	Ground Assets –LV- LV Switch Point	>2,505
	Link Box	Ground Assets –LV- LV Switch Point	>2,505
	LV Metered Service Point	Ground Assets –LV-LV Metered Service Point	>2,000
	Unmetered Service Point	Ground Assets –LV- Unmetered Service Point	>2,000
	Medically Sensitive Customer	Ground Assets –LV- Medically Sensitive Customer	>5,005
	Commercially Sensitive Customer	Ground Assets –LV- Commercially Sensitive Customer	>25,000
	Fault Symbol	Ground Assets –LV- Fault Symbol	None
	Working In Progress	Ground Assets –LV- Working in Progress	>5,005
	System Abnormal	Ground Assets –LV- System Abnormal	>7,505
	11Kv Surge Divertor	General- General Info	>2,000
	LVFM	General- General Info	>2,000
	Generator	General- General Info	>2,000
	IDNO	General- General Info	>2,000
	Lateral Mains	General- General Info	>2,000
	HVCI	General- General Info	>2,000
	Point Of Connection	General- General Info	>2,000

	Sensitive Building	General- General Info	>2,000
	33Kv Surge Divertor	General- General Info	>2,000
	Approximation	General- General Info	>2,000
	Assumed Position	General- General Info	>2,000
	Clarity Point	General- General Info	>2,000
	Earth Point	General- General Info	>2,000
	Edge Connector	General- General Info	>2,000
	Fault Indicator	General- General Info	>2,000
	Note	General- General Info	>2,000
	Pseudo Joint	General- General Info	>2,000
	Quality	General- General Info	>2,000
	Second corner	General- General Info	>2,000
	Danger	General- General Info	>2,000
	Voltage Regulator	General- General Info	>2,000
	Proposed Development	General – Proposed Development	>7,500
GND			
	Normally Open	GND- LV Diagram – Dress symbology- LV Link	None
	Temporary Open	GND- LV Diagram – Dress symbology- LV Link	None
	Temporary Closed	GND- LV Diagram – Dress symbology- LV Link	None
	Surveyed Open	GND- LV Diagram- Dress Symbology- Surveyed State	None

	Surveyed Closed	GND- LV Diagram- Dress Symbology- Surveyed State	None
	Fuse	GND- LV Diagram- Dress Symbology- LV Link	None
	Urban Automation	GND- LV Diagram- Dress Symbology- LV Link	None
	LV Transition Joint	GND- LV Diagram	>2,505
	Pillar	GND- LV Diagram	None
	Link Box	GND- LV Diagram	None
	Presumed Open point	GND – LV Diagram- Dress Symbology – LV Link	None
	Out of phase	GND- General	>5,500
	Commercially Sensitive Customer	GND- General	none
	Proposed Development	GND- General-	none
	Fault Symbol	GND- General	>7,505
	System Abnormal	GND- General	none
	Work In Progress	GND- General	>5,005

LV Cable

LV Cable Disconnected

LV Overhead Line

HV (11kV) Cable

HV (11kV) Cable Disconnected

HV Overhead Line

HV (6.6kV) Cable

HV (6.6kV) Cable Disconnected

EHV Cable

EHV Cable Disconnected

EHV Overhead Line

132kV and above cables

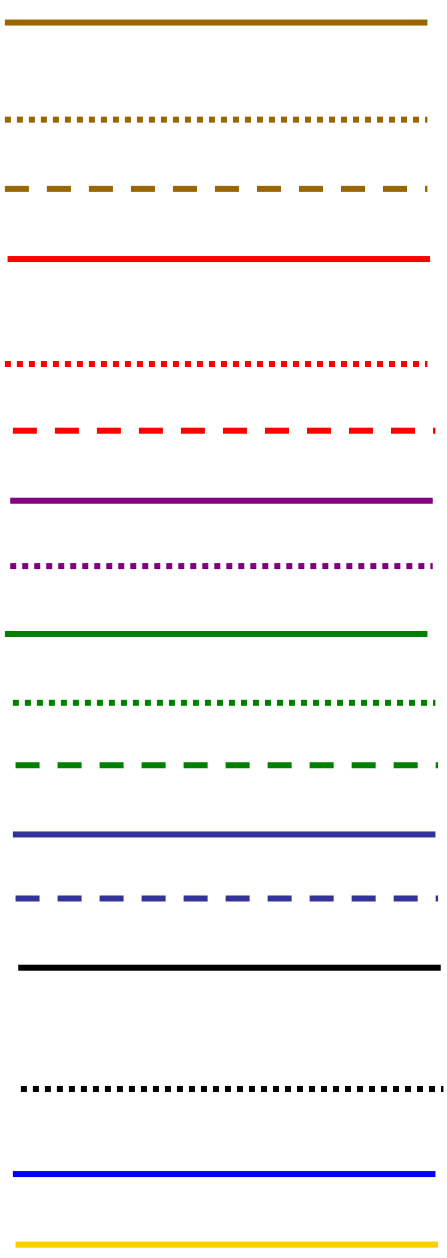
132kV and above Overhead lines

Pilot/Tele/Auxilliary Cable

Pilot/Tele/Auxilliary Cable Disconnected

Cable Duct

Third Party Pipeline



CORNERSTONE PROJECTS LTD

THIRD PARTY SEARCHES

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Enquiry Confirmation

LSBUD Ref: 26544194

Date of enquiry: 09/08/2022
Time of enquiry: 14:36

Enquirer

Name	Mr Duncan Phillips	Phone	01516325142
Company	Cornerstone Projects	Mobile	Not Supplied
Address	91 Market Street Hoylake Merseyside CH47 5AA		
Email	searches@cornerstoneprojects.co.uk		

Enquiry Details

Scheme/Reference	489507 IAP		
Enquiry type	Initial Enquiry	Work category	Development Projects
Start date	31/08/2022	Work type	Commercial/industrial
End date	31/08/2022	Site size	841113 metres square
Searched location	XY= 330229, 348316	Work type buffer*	75 metres
Confirmed location	330234 348322		
Site Contact Name	Not Supplied	Site Phone No	Not Supplied
Description of Works			

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

Site Map

Enquiry Confirmation

LSBUD Ref: 26544194

Date of enquiry: 09/08/2022
Time of enquiry: 14:36

Asset Owners

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

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

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

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

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

Below are three lists of asset owners:

1. LSBUD Members who have assets registered within your search area. ("Affected")
   a. These LSBUD Members will either:
      i. Ask for further information ("Email Additional Info" noted in status). The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.

      ii. Respond directly to you ("Await Response"). In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.

2. LSBUD Members who do not have assets registered within your search area. ("Not Affected")

3. Non LSBUD Members who may have assets within your search area. Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

Enquiry Confirmation

LSBUD Ref: 26544194

Date of enquiry: 09/08/2022
Time of enquiry: 14:36

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

List of affected LSBUD members			
Asset Owner	**Phone/Email**	**Emergency Only**	**Status**
National Grid Electricity Transmission	08000014282	0800404090	Await response
SP Energy Networks	08452734444	08000929290 / 105	Await response
Wales and West Utilities	02920278912	0800111999	Await response

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

List of not affected LSBUD members		
Angus Energy	AWE Pipeline	Balfour Beatty Investments Limited
BOC Limited (A Member of the Linde Group)	Box Broadband	BP Exploration Operating Company Limited
BPA	Cadent Gas	Carrington Gas Pipeline
CATS Pipeline c/o Wood Group PSN	Cemex	Centrica Storage Ltd
CNG Services Ltd	Concept Solutions People Ltd	ConocoPhillips (UK) Teesside Operator Ltd
D.S.Smith	Diamond Transmission Corporation	DIO (MOD Abandoned Pipelines)
DIO (MOD Live Pipelines)	E.ON UK CHP Limited	EirGrid
Eleclink Limited	Electricity North West Limited	Energy Assets Pipelines
ENI & Himor c/o Penspen Ltd	EnQuest NNS Limited	EP Langage Limited
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Fulcrum Pipelines Limited	Gamma
Gas Networks Ireland (UK)	Gateshead Energy Company	Gigaclear Ltd
Harbour Energy	Heathrow Airport LTD	Humbly Grove Energy
IGas Energy	INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)
INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)
Jurassic Fibre Ltd	Last Mile	Mainline Pipelines Limited
Manchester Jetline Limited	Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)
Melbourn Solar Limited	Moray East Offshore Windfarm	Murphy Utility Assets
National Grid Gas Transmission	Neos Networks	Northumbrian Water Group
NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd	NYnet Ltd
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	Squire Energy Networks
SSE Generation Ltd	SSE Transmission	SSE Utility Solutions Limited
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
West of Duddon Sands Transmission Ltd	Western Power Distribution	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Electricity Emergency Number:
0800 40 40 90*
*Available 24 hours, 7 days/week.
Calls may be recorded and monitored.
www.nationalgrid.com

Asset Protection
Gas Transmission
National Grid
Warwick
Email: assetprotection@nationalgrid.com

Our Ref: 26544194 489507 IAP

Tuesday, 09 August 2022

Duncan Phillips
91 Market Street

Merseyside
CH47 5AA

National Grid Electricity – High Risk Response Letter

Dear Sir/ Madam,

An assessment has been carried out with respect to National Grid Electricity Transmission plc's apparatus and the proposed work location. Based on the location entered into the system for assessment the area has been found to be within the High Risk zone from National Grid Electricity Transmission plc's apparatus and **Must Not Proceed** without further assessment by Asset Protection.

Could you please send a works description (including how deep you are excavating) and any plans including any commencement dates to the following email address assetprotection@nationalgrid.com including the LSBUD enquiry reference number.

Failure to provide this information will result in a delay to your works being assessed.

Please note this response and any attached map(s) are valid for 28 days from date of this letter. A new enquiry will need to be submitted into LSBUD if the requested information above is not supplied within 28 days.

Yours sincerely,

Asset Protection

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

Your Responsibilities and Obligations

The "Assessment" Section below outlines the detailed requirements that must be followed when planning or undertaking you activities at this location.

It is your responsibility to ensure that the information you have submitted is accurate and that all relevant documents including links are provided to all persons (either direct labour or contractors) working for you near National Grid Electricity Transmission plc's apparatus, e.g. as contained within the Construction (Design and Management) Regulations.

This assessment solely relates to National Grid Electricity Transmission plc (NGET)

This assessment does **NOT** include:

- National Grid's legal interest (easements or wayleaves) in the land which restricts activity in proximity to National Grid's assets in private land. You must obtain details of any such restrictions from the landowner in the first instance and if in doubt contact Asset Protection.
- Recently installed apparatus
- National Grid Gas plc.
- Apparatus owned by other organisations, e.g. Cadent, other gas distribution operators, local electricity companies, other utilities, etc.

It is **YOUR** responsibility to take into account whether the items listed above may be present and if they could be affected by your proposed activities.

This communication does not constitute any formal agreement or consent for any proposed development work; either generally or with regard to National Grid Electricity Transmission plc easements or wayleaves nor any planning or building regulations applications.

National Grid Electricity Transmission plc or their agents, servants or contractors do not accept any liability for any losses arising under or in connection with this information. This limit on liability applies to all and any claims in contract, tort (including negligence), misrepresentation (excluding fraudulent misrepresentation), breach of statutory duty or otherwise. This limit on liability does not exclude or restrict liability where prohibited by the law nor does it supersede the express terms of any related agreements.

If you require further assistance please contact the Asset Protection team via e-mail (assetprotection@nationalgrid.com) or via the contact details at the top of this response.

Assessment

Affected Apparatus

The apparatus that has been identified as being in the vicinity of your proposed works is:

- Electricity Transmission Underground Cables and associated apparatus.
- Substation above ground electricity sites.

Requirements

Over Head Lines

BEFORE carrying out any work you must:
(N.B. Works only to be undertaken when contact has been made and response received from Asset Protection)
- Carefully read these requirements including the attached guidance documents and maps showing the location of apparatus.
- Contact the landowner and ensure any proposed works in private land do not infringe National Grid Electricity Transmission plc's legal rights (i.e. easements or wayleaves). If the works are in the road or footpath the relevant local authority should be contacted.
- Ensure that all persons, including direct labour and contractors, working for you on or near National Grid Electricity Transmission plc's apparatus follow the requirements of the HSE Guidance Notes HSG47 - 'Avoiding Danger from Underground Services' and GS6 – 'Avoidance of danger from overhead electric power lines'. This guidance can be downloaded free of charge at www.hse.gov.uk
- In line with the above guidance, verify and establish the actual position of mains, pipes, cables, services and other apparatus on site before any activities are undertaken.

DURING any work you must:
- Comply with all guidance for working within the vicinity of overhead lines as detailed within the guidance documents listed below.
- Comply with all guidance relating to general activities and any specific guidance for each asset type as specified in the Guidance Section below.
- Ensure that access to National Grid Electricity Transmission plc's apparatus is maintained at all times.
- Prevent the placing of heavy construction plant, equipment, materials or the passage of heavy vehicles over National Grid Electricity Transmission plc's apparatus unless specifically agreed with National Grid Electricity Transmission plc's apparatus in advance.
- Exercise extreme caution if slab (mass) concrete is encountered during excavation works as this maybe protecting or supporting National Grid Electricity Transmission plc's apparatus.

Underground Cables

BEFORE carrying out any work you must:
(N.B. Works only to be undertaken when contact has been made and response received from Asset Protection)
- Refer to the attached cable profile drawings which provide details about the location of National Grid’s high voltage underground cables.
- Carefully read these requirements including the attached guidance documents and maps showing the location of apparatus.
- Contact the landowner and ensure any proposed works in private land do not infringe infringe National Grid Electricity Transmission plc's legal rights (i.e. easements or wayleaves). If the works are in the road or footpath the relevant local authority should be contacted.
- Ensure that all persons, including direct labour and contractors, working for you on or near infringe National Grid Electricity Transmission plc's follow the requirements of the HSE Guidance Notes HS(G)47 “Avoiding Danger From Underground Services”. This guidance can be downloaded free of charge at www.hse.gov.uk
- In line with the above guidance, verify and establish the actual position of mains, pipes, cables,

services and other apparatus on site before any activities are undertaken.

DURING any work you must:
- Comply with all guidance for working within the vicinity of Electricity Underground Cables as detailed within the guidance documents listed below.
- Comply with all guidance relating to general activities and any specific guidance for each asset type as specified in the Guidance Section below.
- Ensure that access to National Grid Electricity Transmission plc's apparatus is maintained at all times.
- Prevent the placing of heavy construction plant, equipment, materials or the passage of heavy vehicles over National Grid Electricity Transmission plc's apparatus unless specifically agreed with National Grid Electricity Transmission plc's in advance.
- Exercise extreme caution if slab (mass) concrete is encountered during excavation works as this maybe protecting or supporting National Grid Electricity Transmission plc's apparatus.

GUIDANCE

National Grid Electricity Transmission Network data

- The Network map for National Grid Electricity Transmission assets can be downloaded at the following link in GIS format.

https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/network-route-maps

Buried Cables

- National Grid's underground cables are protected by a Deed of grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. Which provide full right of access to retain, maintain, repair and inspect our asset. Hence we require that no permanent structures are to be built over our cables or within the easement strip.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network.

- The supplied detailed route records should not be taken as positive indication of the cable location. This can only be determined by digging trial holes. Where trial holes are dug the concrete and / or polymeric cable protection tiles must not be disturbed.

- The normal recommendation is to keep 2 metres clear either side of the 1 metre wide trench containing the AC cable.

- National Grid should be made aware of the works starting and may put in place a representative to monitor the works. The works should be carried out in accordance with the recommendations in document HS (G) 47 available from the HSE web site.

- The relocation of existing underground cables is not normally feasible on grounds of cost, operation and maintenance and environmental impact and we believe that successful development can take place in their vicinity.

- The information supplied is given in good faith and only as a guide to the location of our underground cables. The accuracy of this information cannot be guaranteed. The physical presence of such cables may also be evident from physical protection measures such as ducts or concrete protection tiles. The person(s) responsible for planning, supervising and carrying out work in proximity to our cable(s) shall be liable to us, as cable(s) owner, as well as to any third party who may be affected in any way by any loss or damage resulting from their failure to locate and avoid any damage to such a cable(s).

- The relevant guidance in relation to working safely near to existing underground cables is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance HS(G)47 "Avoiding Danger From Underground Services" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Our cables are normally buried to a depth of 0.9 metres to the protective covers but this depth can vary depending on location (bridges may have cables 100mm below surface level)..The specific cable route record drawings show further details along the route of the particular cable. The cable route drawings are attached to this letter for your information.

- Cables installed in cable tunnels, whilst less likely to be affected by surface or shallow works may be affected by activities such as piling.

- National Grid assets can be adversely affected by vibration and can provide guidance on the acceptable levels of vibration due to piling and other construction related operations in the vicinity of national grid assets

- Ground cover above our cables should not be reduced or increased without consultation with National Grid.

- If a landscaping scheme is proposed as part of the works, we request that no trees and shrubs are planted either directly above or within 3 metres of the existing underground cable, as ultimately the roots may grow to cause damage to the cable.

Cables Tunnels

- National Grid's underground cable tunnels are protected by the provisions of a Wayleave/Easement or the New Roads and Street Works Act. This provides full right of access to retain, maintain, repair and inspect our asset.

- Further information and guidance regarding National Grid Cable Tunnels is available on our website at https://www.nationalgrid.com/uk/electricity-transmission/document/121061/download

- National Grid requires that the clearances indicated in the guidance document linked above are maintained at all times. Should it be necessary to enter the exclusion zone discussion/ agreement with National Grid is required to ensure the integrity of their tunnel asset and the high voltage cables is not compromised.

- Ground levels above our cable tunnels must not be altered in any way without prior agreement with National Grid; any alterations to the depth of our tunnels can compromise its integrity which could have an adverse impact on the reliability, efficiency and safety of our electricity network.

- Any works which would create high levels of vibration such as piling would need to be assessed by National Grid to ensure it has limited impact on our cable tunnels. National Grid can advise on acceptable vibration limits.

Overhead Lines

- National Grid's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset.

- The submitted proposed design does not change after the date of this letter. Any design change that moves the proposal closer to National Grid Overhead Line Assets shall be submitted for assessment.

- Statutory electrical safety clearances shall be maintained at all times. National Grid recommends that no permanent structures are built directly beneath our overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "Overhead Line Clearances Issue 5 (2019). To purchase & download EN 43 – 8 Technical Specification for "Overhead Line Clearances Issue 5 (2019) go to https://www.ena-eng.org/ENA-Docs/

- Any changes in ground levels which are proposed either beneath or in close proximity to our existing overhead lines would serve to reduce safety clearances. Safety clearances to existing overhead lines must be maintained in all circumstances.

- To view the Development Near Overhead Lines Document. https://www.nationalgridet.com/document/130626/download

- To view the National Grid Third Party Guidance for working near National Grid Electricity Transmission equipment. https://www.nationalgridet.com/sites/et/files/documents/Working%20near%20electricity%20equipment.pdf

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines."

- If a landscaping scheme is proposed as part of the proposal, only slow and low growing species of trees and shrubs shall be planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works shall not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of our towers. These foundations extend beyond the base of the tower. Pillar of Support drawings shall be obtained using the contact details above.

- Due to the scale, bulk and cost of the transmission equipment required to operate at 275kV or 400kV we only support proposals for the relocation of existing high voltage overhead lines where such proposals directly facilitate a major development or infrastructure project of national importance which has been identified as such by government.

- To promote the successful development of sites crossed by existing overhead lines, and the creation of well-designed places, National Grid has produced 'Design guidelines for development near pylons and high voltage overhead power lines', which look at how to create high quality development near overhead lines and offer practical solutions which can assist in avoiding the unnecessary sterilisation of land in the vicinity of high voltage overhead lines.

- Further information regarding our undergrounding policy and development near transmission overhead lines is available on our website at: https://www.nationalgridet.com/network-and-assets/planning-and-development

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

Overview Map of Worksite

148.7m
135.3m
129.5m
126.8m
127.4m
Tank
ETL
Ford
Pond
1
2
Offa's Dyke
ZKA035
ETL
Path
ZZK001
Isorsaf Legacy /
Dismantled Railway
128.0m
125.3m
The
Sychnant
145.7m
ZZK002
Legacy Tower
Tanks
LB
B 5426
Shaft
Legacy
129.5m
Path (um)
Bridge
Sunnymead
142.3m
FB
3
4
Path
ZZK003
Belmont
Wood Dale
Weirs
Pond
Longreach
FB
Weir
FB
Crematorium
Path
Path (um)
141.4m
139.3m
Sinks
Bronant
Brys
Maes Glas
Green Acres
FB
B 5426
Leefdaal

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EXTREME CAUTION - HIGH VOLTAGE
RISK OF DEATH OR SERIOUS INJURY

National Grid Electricity Emergency Number: 0800 40 40 90
Available 24 hours, 7 days/week. Calls may be recorded and monitored

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Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference:
489507 IAP

Scale: 1:5125 (When plotted at A3)

IMPORTANT NOTICES

This plan shows those pipes owned by National Grid Electricity Transmission plc in its role as a Licensed Electricity Transporter (ET). Electricity cables owned by other ETs, or otherwise privately owned, may be present in this area. Information with regards to such cables should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Ancillary equipment such as cooling systems and communication cables are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by National Grid Electricity Transmission plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of cables 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 electricity apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Dig Sites Area: Line:

Underground Cables
Overhead Lines
Fibre Cables

NationalGrid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

AssetProtection@NationalGrid.com

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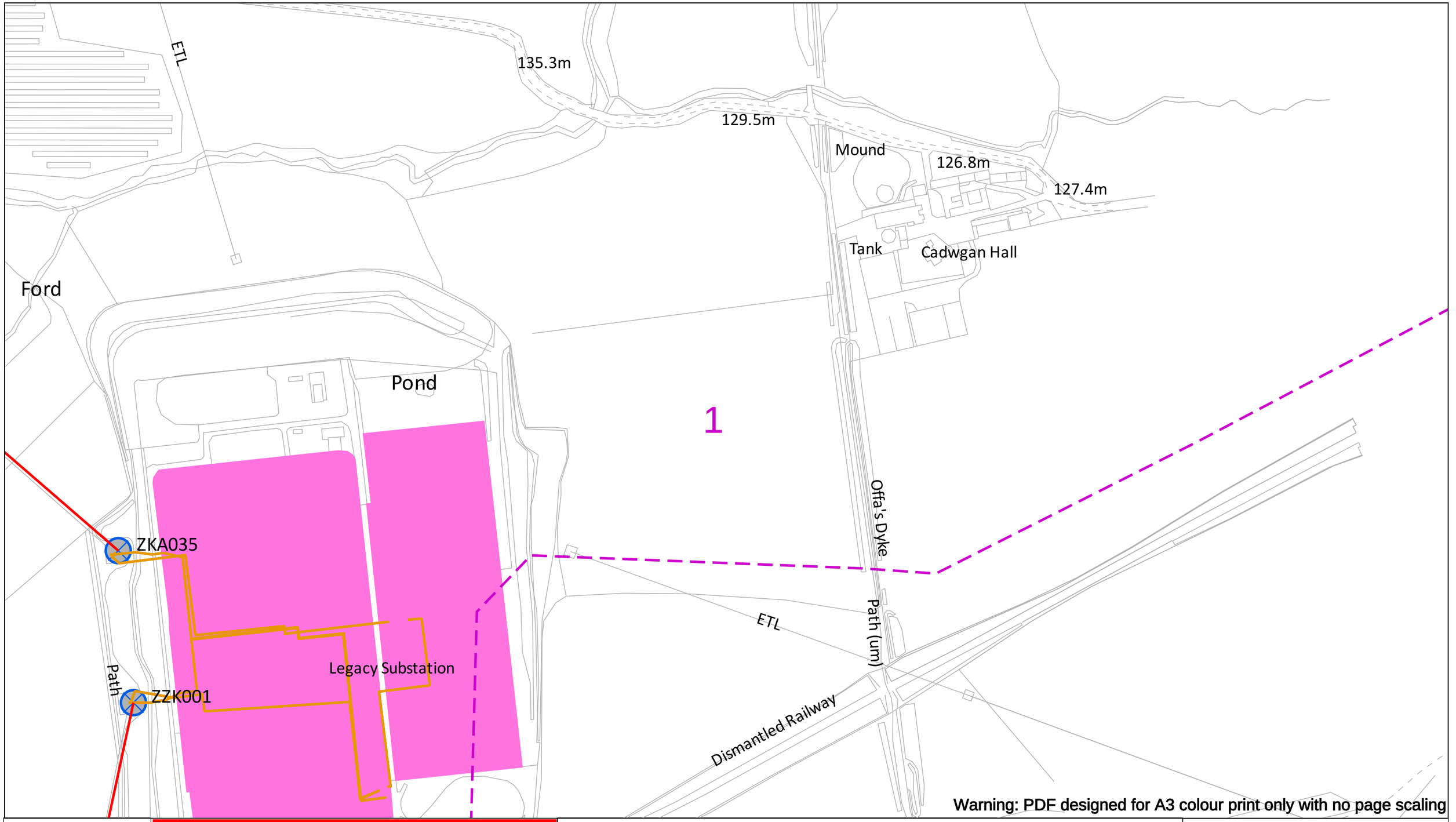

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Date Requested: 09/08/2022
Job Reference: 26544194
Site Location: 330234 348322
Requested by:
Mr Duncan Phillips
Your Scheme/Reference: 489507 IAP

Scale: 1:2500 (When plotted at A3)

EXTREME CAUTION - HIGH VOLTAGE
****RISK OF DEATH OR SERIOUS INJURY****

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National Grid Electricity Emergency Number: 0800 40 40 90
Available 24 hours, 7 days/week. Calls may be recorded and monitored

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100m

Dig Sites Area: Line:

Underground Cables
Overhead Lines
Fibre Cables

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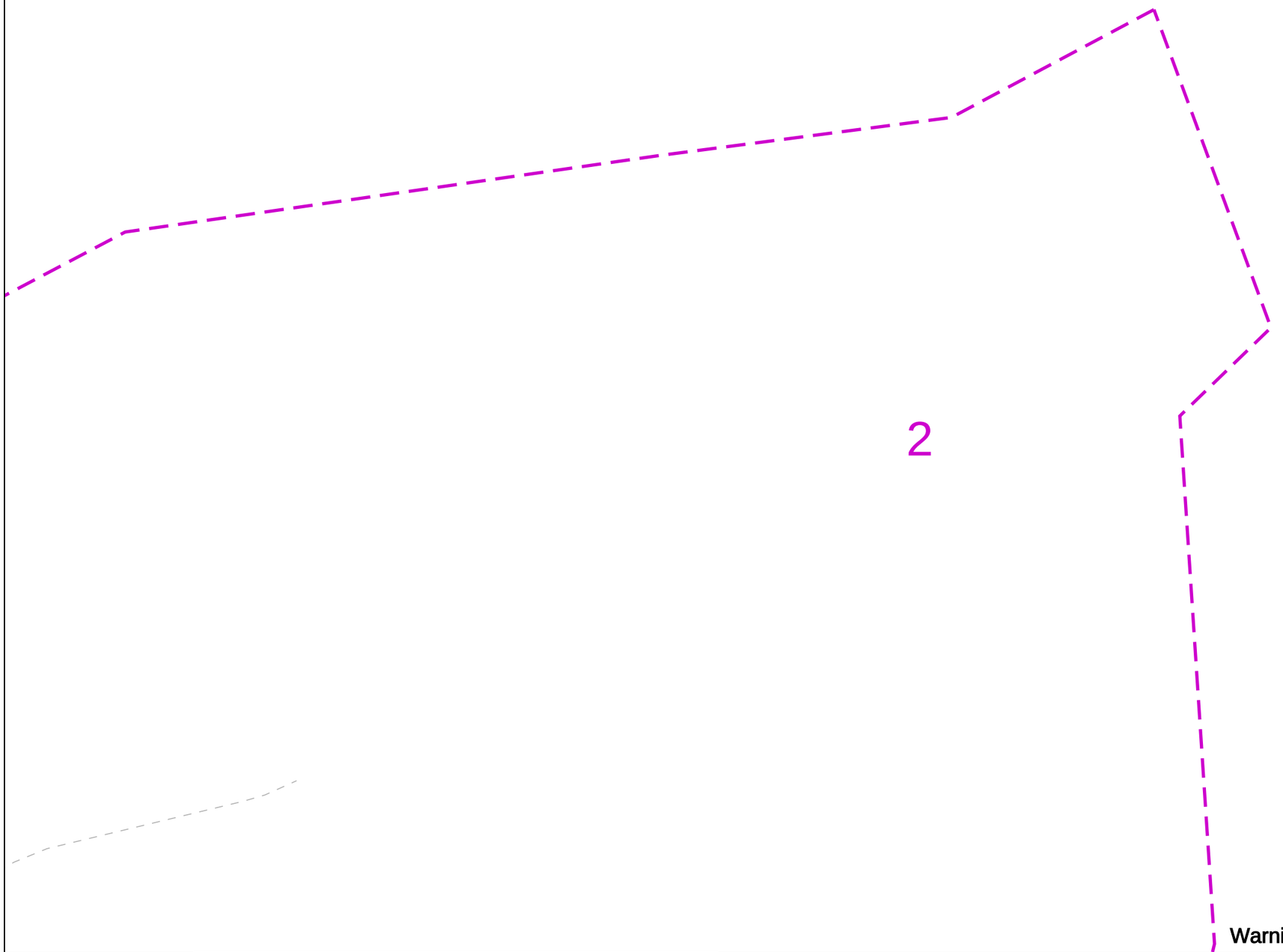

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100m

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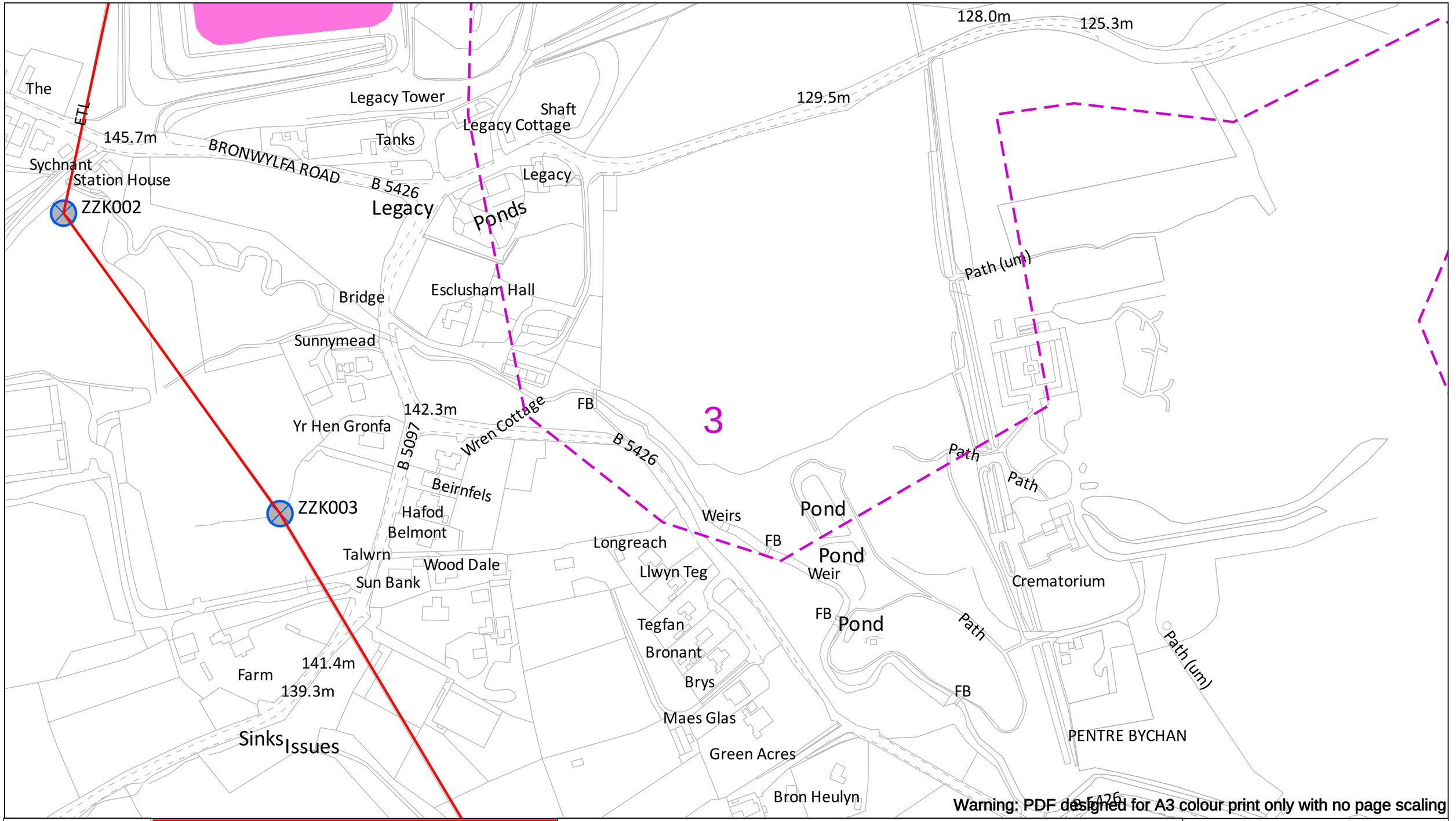

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100m

Dig Sites Area: Line:

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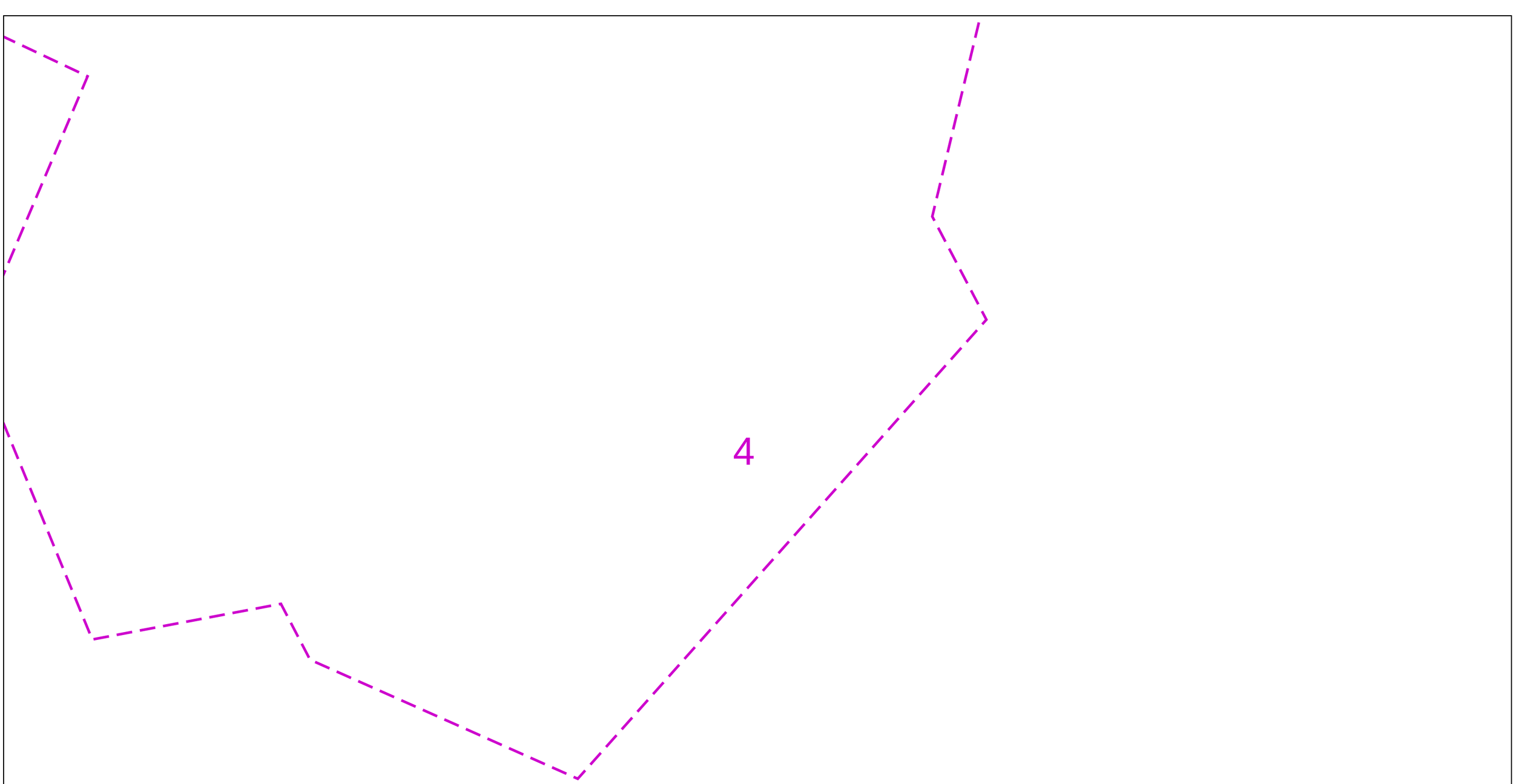

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Your search has returned a fibre optic cable(s)

The cable(s) returned are the responsibility of Vodafone UK and as such a new street works enquiry relating to these cables should be addressed to the Vodafone Streetworks Office.

osm.enquiries@atkinsglobal.com
(Attach the planned response you have received from LSBUD).

CABLE

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Searches - Cornerstone Projects Ltd

From: Murthy, Srinivasa <Srinivasa.Murthy@atkinsglobal.com>
Sent: 10 August 2022 09:40
To: Searches - Cornerstone Projects Ltd
Subject: RE: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD

Flag Status: Flagged

Please accept this email as confirmation that Vodafone: Fixed **does not** have apparatus within the vicinity of your proposed works detailed below.

Many thanks.

Plant Enquiries Team
T: +44 (0)1454 662881
E: osm.enquiries@atkinsglobal.com

This response is made only in respect to electronic communications apparatus forming part of the Vodafone Limited electronic communications network formerly being part of the electronic communications networks of Cable & Wireless UK (now re-named Vodafone Enterprise UK), Energis Communications Limited, Thus Group Holdings Limited and Your Communications Limited.

ATKINS working on behalf of Vodafone: Fixed

PLEASE NOTE:

The information given is indicative only. No warranty is made as to its accuracy. This information must not be solely relied upon in the event of excavation or other works carried out in the vicinity of Vodafone plant. No liability of any kind whatsoever is accepted by Vodafone, its servants, or agents, for any error or omission in respect of information contained on this information. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to Vodafone's apparatus and all claims made against them by Third parties as a result of any interference or damage.

IMPORTANT - PLEASE READ:-
Diversionary works may be necessary if the existing line of the highway/railway or its levels are altered, where apparatus is affected. Where apparatus is affected and requires diversion, you must submit draft details of the proposed scheme with a request for a 'C3 Budget Estimate' to c3requests@vodafone.com These estimates should be provided by Vodafone normally within 20 working days from receipt of your request. Please include proof of this C2 response when requesting a C3 (using the 'forward' option).

Please consider the environment before printing this e-mail

From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 19:12
To: National Plant Enquiries <OSM.enquiries@atkinsglobal.com>
Subject: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD

Dear Sir/Madam,

Re: - Underground Apparatus / Plant

Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

In order that all reasonable precautions may be taken to avoid risk to health and safety through contact with any of your existing apparatus during execution of works at the above site location, please provide plan(s) indicating the general position and nature of your apparatus in the locality. In addition, please highlight any likely special problems that could arise in connection with your apparatus as a result of the works and any limitations on the quality of the information provided.

digdat
Ordnance Survey © Crown Copyright, 100018507
There are no assets within this map area

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Data updated: 30/05/22

Scale: 1:1250 | Date: 22/07/22 | Telecoms Plan A0
Map Centre: 329366,348885 | Our Ref: 907971 - 12 | Powered by digdat

Duct, Trench | Chamber / Pole | Cabinet

duncan@cornerstoneprojects.co.uk

489507

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will n have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2022 Ordnance Survey 100019209.

digdat
Ordnance Survey © Crown Copyright, 100018507
There are no assets within this map area

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Data updated: 30/05/22
Scale: 1:1250
Map Centre: 330300,348882
Date: 22/07/22
Our Ref: 907971 - 2
Telecoms Plan A0
Powered by digdat

Duct, Trench | Chamber / Pole | Cabinet

duncan@cornerstoneprojects.co.uk

489507 2

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will n
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0m 250m 500m 750m

(c) Crown copyright and database rights 2022 Ordnance Survey 100019209 | Date: 09/08/22 | Scale: 1:1250 | Map Centre: 330301,347974 | Data updated: 31/07/22 | Our Ref: 922181 - 1 | Telecoms Plan A0

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Virgin Media accepts no liability for any loss or damage caused or arising from reliance on this plan. Virgin Media recommends that the actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2022 Ordnance Survey 100019209.

Duct, Trench | Chamber / Pole | Cabinet

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489507 2

Virgin media

(c) Crown copyright and database rights 2022 Ordnance Survey 100019209 | Date: 09/08/22 | Scale: 1:1250 | Map Centre: 330687,348513 | Data updated: 31/07/22 | Our Ref: 922295 - 1 | Telecoms Plan A1

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Duct, Trench | Chamber / Pole | Cabinet

duncan@cornerstoneprojects.co.uk
489507 IAP

Searches - Cornerstone Projects Ltd

From: NRSWA <nrswa.nrswa@sky.uk>
Sent: 09 August 2022 16:56
To: searches@cornerstoneprojects.co.uk
Subject: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Thank you for your enquiry.

Please be advised that Sky Telecommunications Services Ltd will not be affected by your proposal.

Best endeavours have been made to ensure accuracy, however if you require further information, please contact us by email at nrswa@sky.uk.

Regards

NRSWA Department
Sky UK – Technology - Operations
nrswa@sky.uk +44 2070323234

From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:41
To: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Subject: [EXTERNAL] Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Dear Sir/Madam,

Re: - Underground Apparatus / Plant

Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Searches - Cornerstone Projects Ltd

From: Plantenquiries - CA Telecom <plantenquiries@catelecomuk.com>
Sent: 24 August 2022 20:03
To: 'Searches - Cornerstone Projects Ltd'
Subject: RE: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Please Note: Our search criteria has changed. We previously searched for Colt Network which was within 200 metres, this has now changed to 50 metres. The negative response will be for all enquiries that the network is 50 metres or more away from the place of enquiry.

Dear Sir/Madam,

Thank you for your enquiry for the above reference.

We can confirm that Colt Technology Services do not have apparatus near the above location as presented on your submitted plan, if any development or scheme amendments fall outside the 50 metre perimeter new plans must be submitted for review.

Search is based on Overseeing Organisation Agent data supplied; we do not accept responsibility for O.O. Agent inaccurate data.

If we can be of any further assistance please do not hesitate to contact us.

Kind regards,

Plant Enquiry Team

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From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:41

Searches - Cornerstone Projects Ltd

From: CGI Plant Enquiries <cgiplantenquiries@instalcom.co.uk>
Sent: 10 August 2022 13:58
To: 'Searches - Cornerstone Projects Ltd'
Subject: RE: C08-22-0007 Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Dear Sir or Madam,

With reference to your plant enquiry below, I can confirm that CGI do not have any apparatus within the immediate proximity of your proposed works.
If you require any further information, please do not hesitate to contact me.
Regards

Plant Enquiries Dept.
Instalcom Limited
Borehamwood Ind. Park
Rowley Lane
Borehamwood
WD6 5PZ

Office: +44 (0)208 731 4613
Fax: +44 (0)208 731 4601
Email: cgi.plantenquiries@instalcom.co.uk
Web: http://www.instalcom.co.uk

From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:50
To: CGI Plant Enquiries <cgiplantenquiries@instalcom.co.uk>
Subject: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Dear Sir/Madam,

Searches - Cornerstone Projects Ltd

From: online.plantenquiries@cityfibre.com
Sent: 09 August 2022 15:20
To: searches@cornerstoneprojects.co.uk
Subject: CityFibre Plant Enquiry, issued on 8/9/22 2:19 PM. Reference 7d24f9a0-20a6-4d6d-8929-f4b7d9be5e78.
Attachments: emap.pdf

You recently requested information pertaining to the above location and in relation to CityFibre Holdings Ltd plant.

Reference 7d24f9a0-20a6-4d6d-8929-f4b7d9be5e78
User: User
Title: 489507 IAP.1
Comment:

Please find attached a plan of the area of your interest that may contain plant which may be affected by your proposed works.

The validity of this response is 6 weeks, after such time a new enquiry would need to be made.

Please see the points of contact below if they are required:

Plant Enquiries
Rutherford House
Birchwood Park
Warrington
WA3 6ZH
asset.team@cityfibre.com

Please quote the Reference ID in the subject line in any correspondence.

Please be aware that all information included in this eMap is the property of the sender and subject to copyright. It is illegal to copy or send this information to any third party without the permission of the sender.

_____
Plant Enquiries [CityFibre]

0203 5100 602

Our Full Fibre network is expanding fast. Check if you can get connected, and register for updates at cityfibre.com<https://www.cityfibre.com/?utm_source=Staff%20Email%20Signature&utm_medium=Email&utm_campaign=Cityfibreemail>

[CityFibre]<https://www.cityfibre.com>

[Follow CityFibre on LinkedIn]<https://www.cityfibre.com> [Follow CityFibre on LinkedIn] <https://www.linkedin.com/company/cityfibre> [Follow CityFibre on Twitter] <https://www.twitter.com/CityFibre>

[https://cdn.cityfibre.com/CF_Sustainable-email-footer_Leaf-icon_72dpi.png]

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LEGEND

EXISTING PLANT

EXISTING PLANT

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Head Office
CityFibre Holdings Ltd
15 Bedford Street,
London,
WC2E 9HE

Tel: 0845 293 0774
Web: www.cityfibre.com

Asset Office
CityFibre Holdings Ltd,
Rutherford House,
Birchwood,
Warrington,
WA3 6ZH

Email: asset.team@cityfibre.com

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Project

Plant Enquiry

Drawing

Existing Plant

Drawn by:

smallworld

Date: 09/08/2022

Drawing No.

CFH_EP_000001

Revision

001

Scale: 1:2500

A4

0m 20m 40m 60m 80m 100m

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LEGEND

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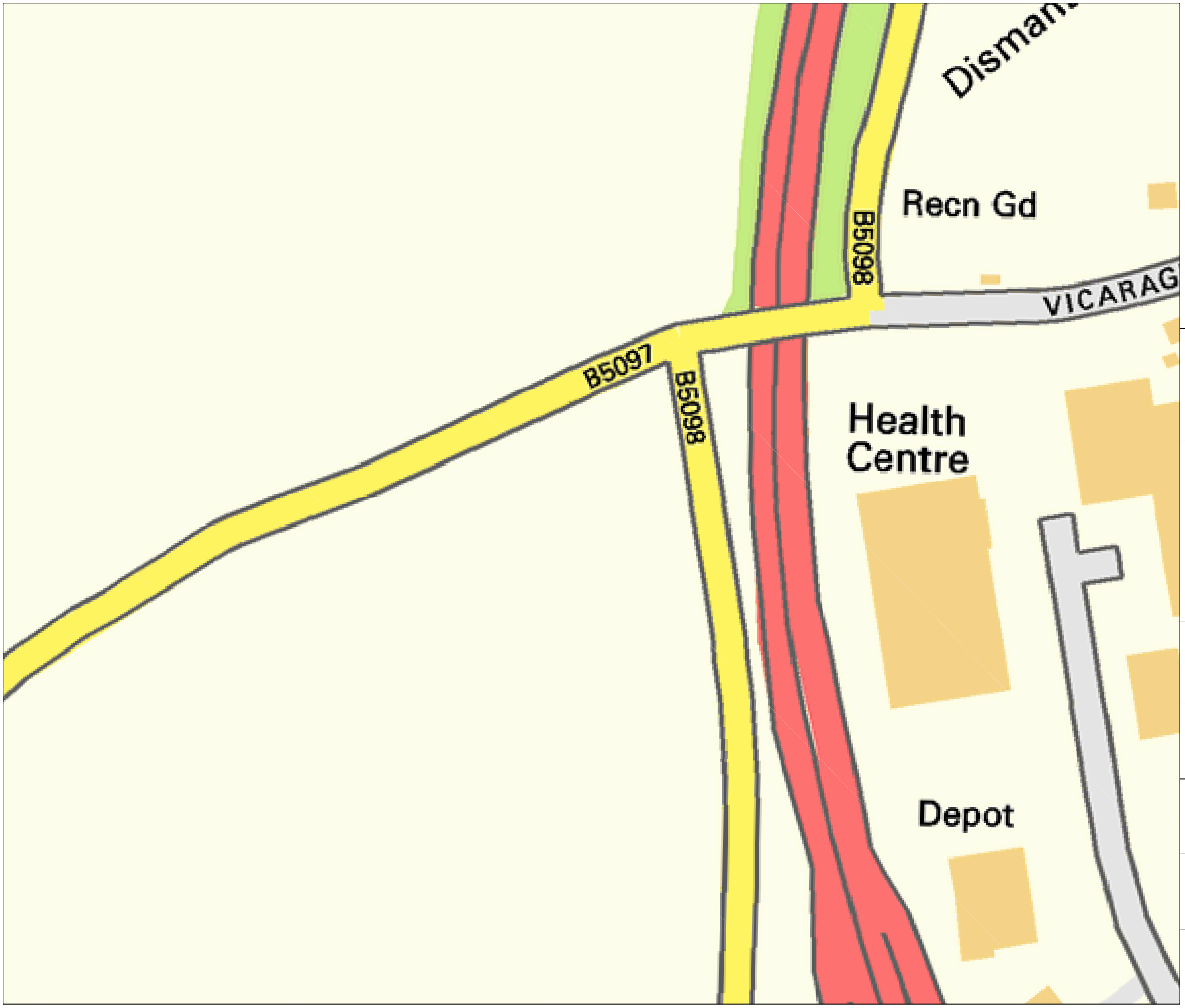

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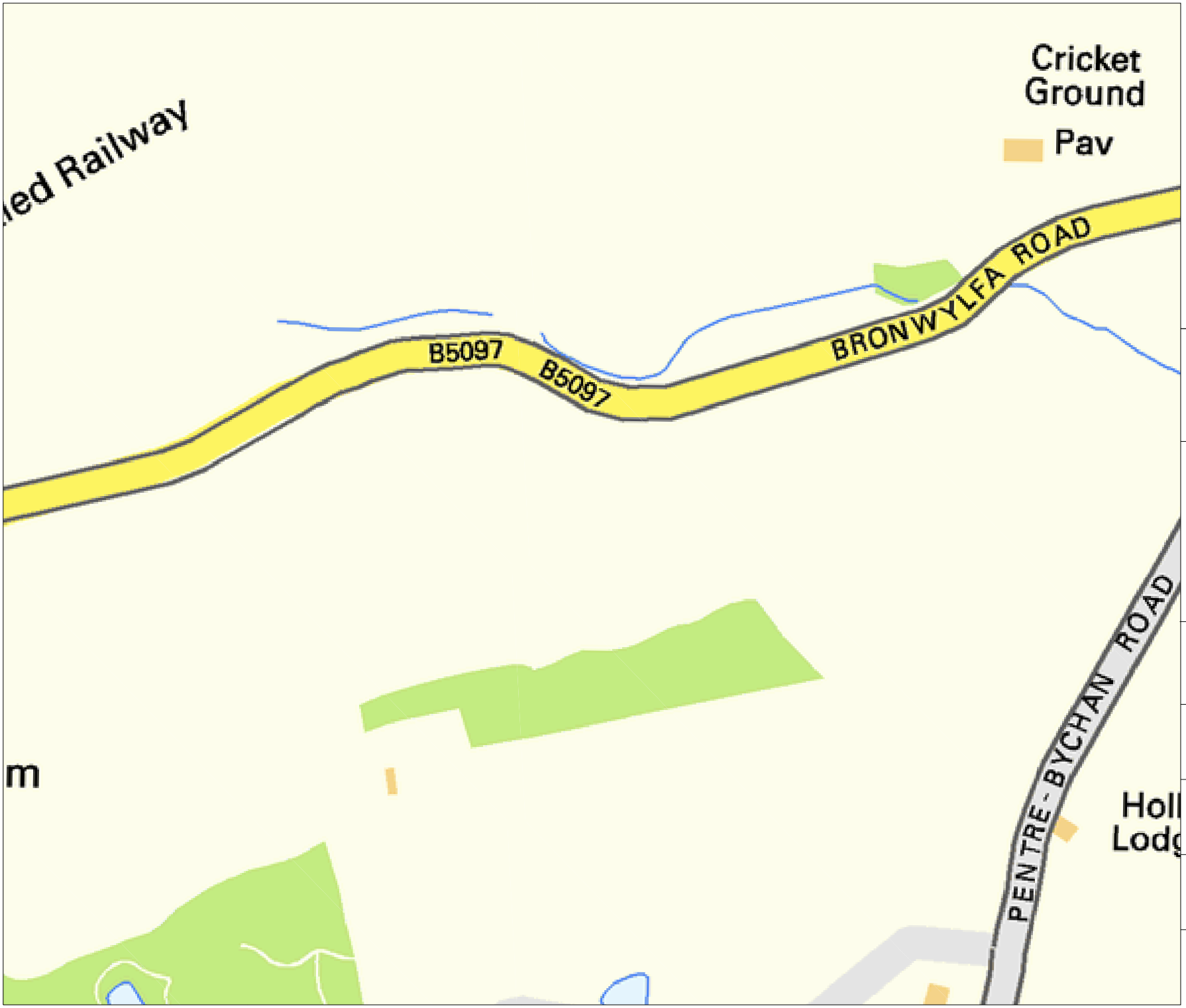

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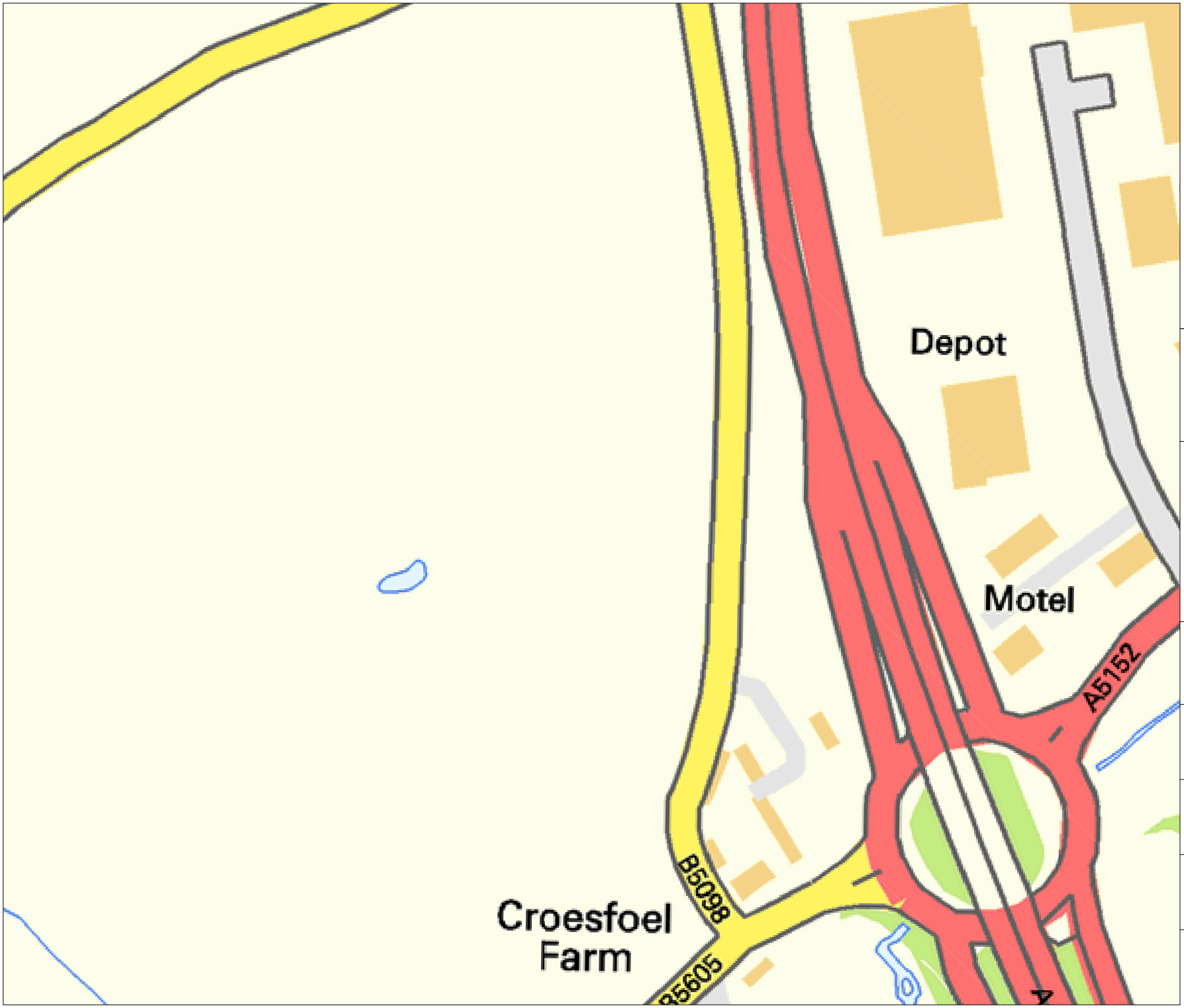

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Project

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smallworld

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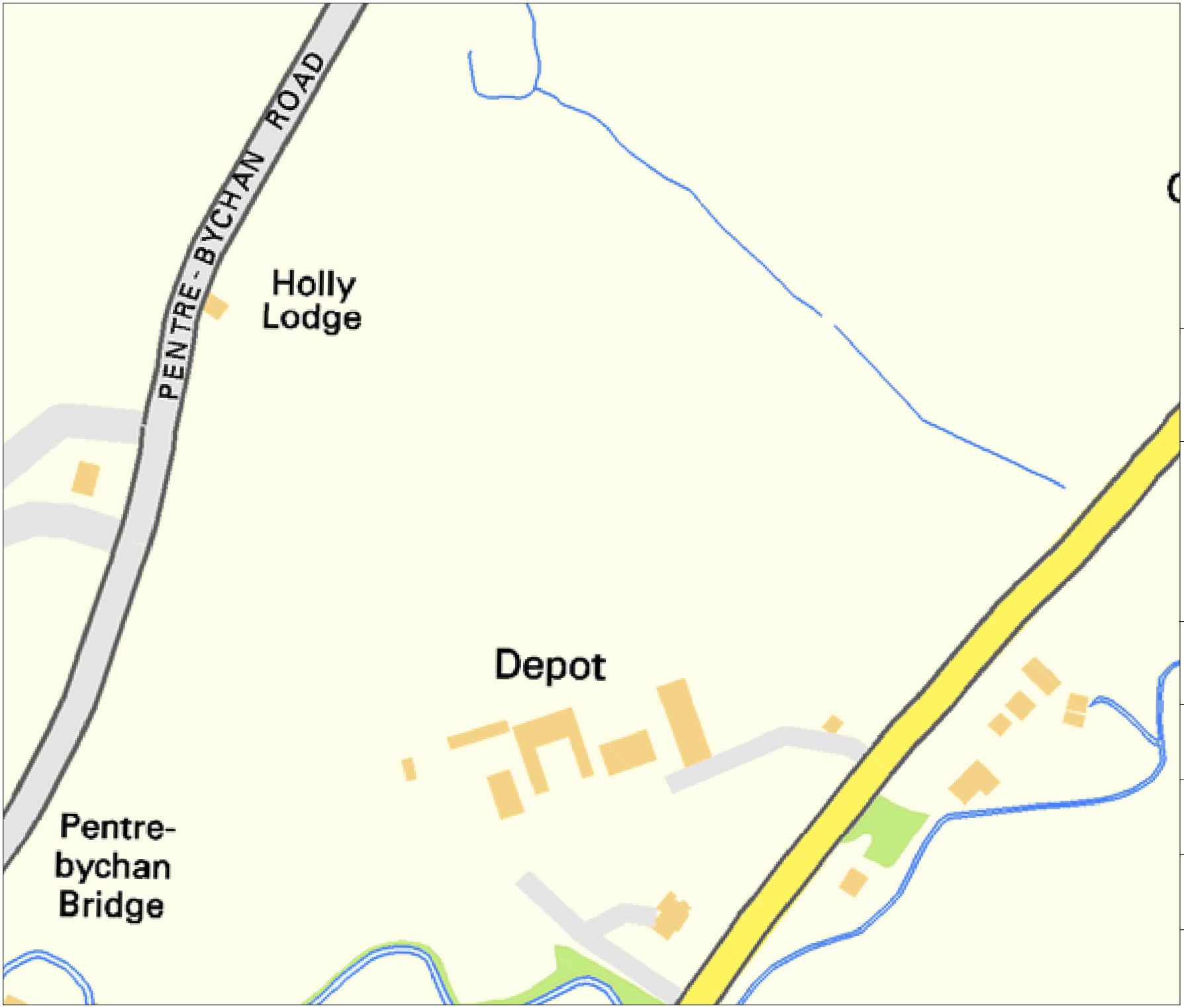

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Drawing No.

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Scale: 1:2500

A4

0m 20m 40m 60m 80m 100m

N

Searches - Cornerstone Projects Ltd

From: Plantenquiries <Plantenquiries@instalcom.co.uk>
Sent: 10 August 2022 15:24
To: 'Searches - Cornerstone Projects Ltd'
Subject: E08-22-2662 RE: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Dear Sir or Madam,

Thank you for your plant enquiry below.

We can confirm that Lumen Technologies (formerly CenturyLink Communications UK Limited, Level 3, Global Crossing (Uk) Ltd, Global Crossing PEC, Fibernet UK Ltd and Fibrespan Ltd) do not have any apparatus within the indicated works area.

Instalcom responds to plant enquiries for all of the above and therefore you only need send one plant enquiry to cover all of these companies.

Please note that this response is only valid for 3 months. If your works do not commence within this time period, please resubmit your plant enquiry for assessment before any works commence.

Regards

Plant Enquiries Dept
Instalcom Limited
Borehamwood Ind. Park
Rowley Lane
Borehamwood
WD6 5PZ

Office: +44 (0)208 731 4613
Fax: +44 (0)208 731 4601
Email: plantenquiries@instalcom.co.uk
Web: http://www.instalcom.co.uk

From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:41
To: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>

Searches - Cornerstone Projects Ltd

From: UK OSP-Team . <osp-team@verizon.com>
Sent: 10 August 2022 09:28
To: Searches - Cornerstone Projects Ltd
Cc: UK OSP-Team
Subject: Re: Plant Enquiries - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Dear Sir/Madam

Verizon is a licensed Statutory Undertaker.

We have reviewed your plans and have determined that Verizon (Formally known as MCI WorldCom, MFS) has no apparatus in the areas concerned.

If you have any further queries please do not hesitate to get in touch.

Yours faithfully

Plant Protection Officer (GB) Email osp-team@uk.verizon.com

On Tue, 9 Aug 2022 at 14:48, Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk> wrote:

> Dear Sir/Madam,
>
> Re: - Underground Apparatus / Plant

CORNERSTONE PROJECTS LTD

INDEPENDENT UTILITIES

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Searches - Cornerstone Projects Ltd

From: plantenquiryservice@gtc-uk.co.uk
Sent: 09 August 2022 15:11
To: searches@cornerstoneprojects.co.uk
Subject: GTC Plant Enquiry - Ref- 2706981
Attachments: 2706981.png; GU-DPR-IG-0022 Safe working in the vicinity of utility networks.pdf

Warning: GTC Apparatus Exists in This Area

Our Plant Enquiry Service Ref: 2706981
Your Enquiry Ref: 489507

Dear Duncan,

Thank you for your enquiry concerning apparatus in the vicinity of your proposed work. For your records, the search area is shown in the attached map.

Please click on the links below to download copies of the relevant utility asset drawings locating our assets in the area which you identified. These drawings are grouped by our relevant network reference, should you need to contact us regarding any of our networks please quote this reference. Links to files will remain live for 10 days. If you do not download these files within this period you will need to submit a new enquiry – this will ensure you have an up-to-date copy of our asset records.

PLEASE NOTE: Where drawings are large, these have been provided in smaller segments. A drawing index is provided as the first file listed for each network reference (example of a network reference: N1234567) shown below. This is intended to help you find the drawing relevant to you more quickly. Please take care to ensure that you use the relevant drawings for every network listed below as we may have multiple networks and multiple utilities in this area.

N0017623

Electric

- EN0017623-1_1_of_1.png
- EN0017623-1_1_of_1 Entire Site.png

Gas

- N0017623-1_1_of_1.png

This information is for guidance only and the precise position of the plant must be established, prior to your works, using hand-digging methods only. The contractor will be held responsible for any damage caused to our asset. Please note our assets now include those owned and operated by:

- GTC Pipelines Limited
- Independent Pipelines Limited
- Quadrant Pipelines Limited
- Electricity Network Company Limited
- Independent Power Networks Limited
- Independent Water Networks Limited
- Open Fibre Networks Limited
- Independent Community Heating Limited

If you have any queries or require any further information please do not hesitate to contact us.

All works in the vicinity of our networks should be undertaken in accordance with the attached document "GU-DPR-IG-0022: Safe working in the vicinity of utility networks". Reference should also be made to HSG47 Avoiding Danger from Underground Services.

Important: The area of your proposed works may contain gas mains operating at Medium and Intermediate Pressure tiers or electric cables operating at High Voltage – please refer to the network drawings included with this email. If your proposed works are likely to involve excavation within 10 metres of any of these assets, including but not limited to gas governors and electric substations you MUST inform GTC Plant Enquiries by calling 01359 240363 and quoting your Plant Enquiries Service Reference number.
Important: Drawings provided by this service may include utility assets not owned or managed by GTC. Conversely our drawings will NOT display assets from all third parties. It is your responsibility to ensure you have requested information from all utility asset owners.

Gas Escape or Damage MUST be reported on 0800 111 999. National Grid / DNGT will attend to make safe and repair.
Electricity Network Damage MUST be reported to ENC on 0800 032 6990.
Water Network Damage MUST be reported to IWNL on 02920 028 711
Fibre Network Damage MUST be reported to IFNL on 0845 051 1669

Thank you for using the GTC Plant Enquiries Service.

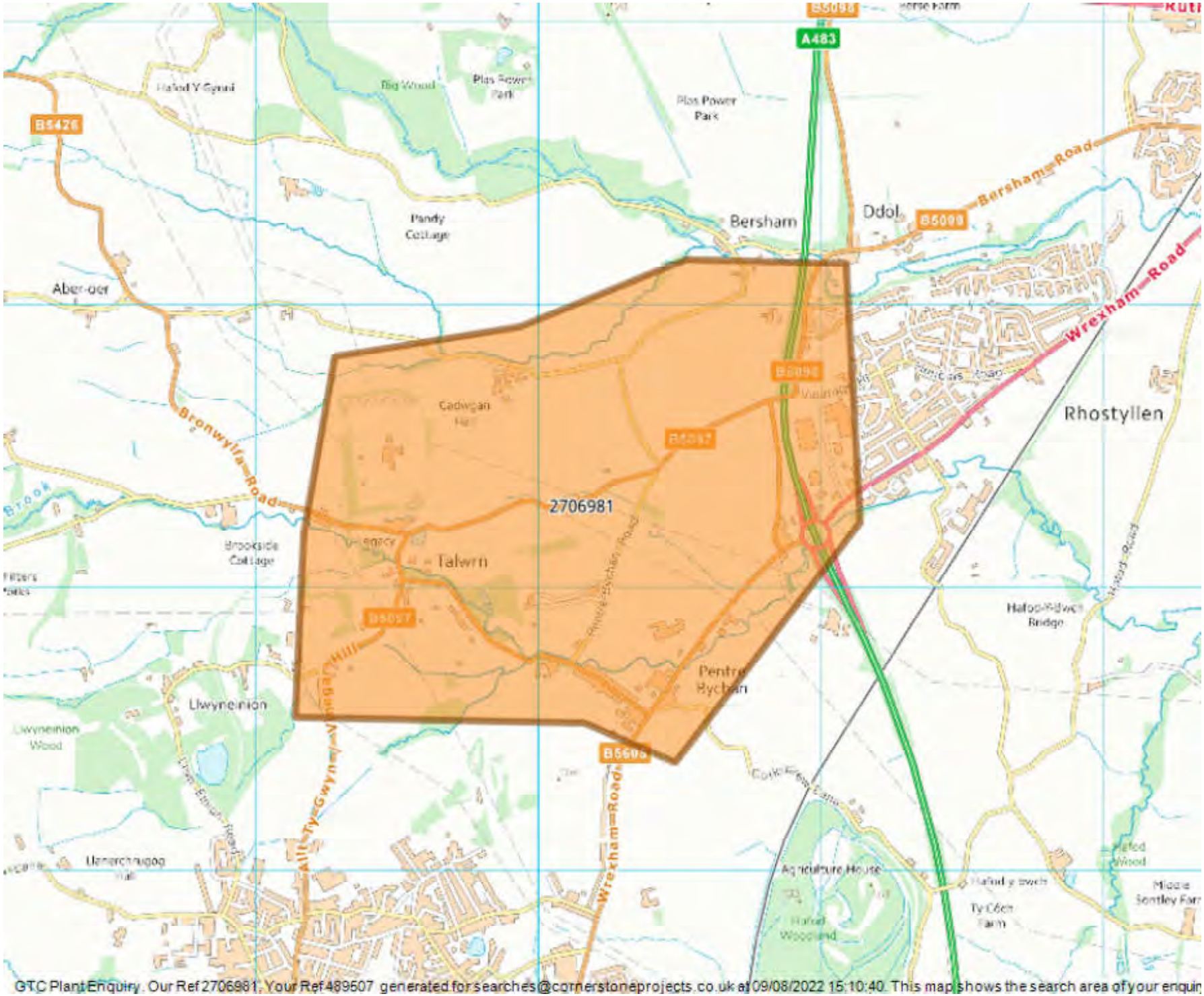
Your sincerely,

GTC Plant Enquiry Service

GTC
Synergy House
Woolpit Business Park
Woolpit
Bury St Edmunds
Suffolk, IP30 9UP
Tel: 01359 240363
plant.enquiries@gtc-uk.co.uk

NOTE:
This E-Mail originates from GTC, Synergy House, Woolpit Business Park, Woolpit, Bury St Edmunds, Suffolk, IP30 9UP
VAT Number: GB688 8971 40. Registered No: 029431.

DISCLAIMER
The information in this E-Mail and in any attachments is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your system and notify the sender immediately. You should not retain, copy or use this E-Mail for any purpose, nor disclose all or any part of its content to any other person. Whilst we run antivirus software on Internet E-Mails, we are not liable for any loss or damage. The recipient is advised to run their own up to date antivirus software.
Thank you



GTC Plant Enquiry. Our Ref 2706981. Your Ref 489507 generated for searches@cornerstoneprojects.co.uk at 09/08/2022 15:10:40. This map shows the search area of your enquir

AIDAN SUTCLIFFE 08.12.2017

Rev	Revision Note	Date	Drawn by	Approved
1-0	Original drawing - 7958/SP/01 Original design	02/03/17	ASU	N/A
1-1	Mains amended o/s plots 9-11	07/03/17	DWA	N/A
1-2	UIP Variation: POC position moved, BPID 74741	16/06/17	SH	N/A
1-3	UIP Variation: 4 x Streetlights added JPID:95013	27/09/17	ALH	N/A
1-4	UIP Data Added As Per MS - BPID 108226	08/12/17	ASU	N/A

Norbre

EN0017623-1
Dev: Malkin Construction
Enq: Megson Utilities
Drg Nr: 7958/SP/01

Packsaddle Bank

WREXHAM ROAD

Ch
C
B
H
R

SL1
SL2
SL3
SL4

95mm² LVWF

Existing DNO LV cable

SP TO UPGRADE SINGLE PHASE LINE
TO 95mm² ABC BUNCHED CONDUCTOR

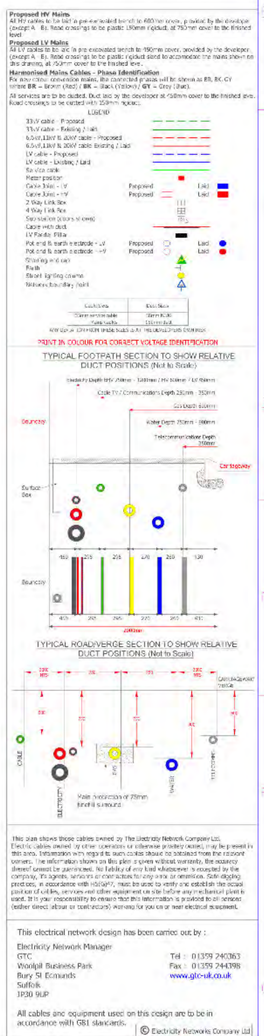
LV - POC
SP/ENC INTERFACE POINT
1x LV BREACH JOINT
3c-95mm² W/F ONTO A NEW 185mm²
LV POT END AT BASE OF SP POLE
FINAL JOINT COMPLETED BY SP
REF: S103530
LOAD: 30kVA

N

0 5 10 20 30 40
meters

THIS DRAWING SHOWS:

GTC NETWORK
CONTESTABLE



This drawing shows those cables owned by The Electricity Network Company Ltd. Electric cables owned by other operators or otherwise privately owned, may be present in this area. Information with regard to such cables should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. No liability of any kind whatsoever is accepted by the company, its agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of cables, services and other equipment on site before any mechanical plant is used. It is your responsibility to ensure that this information is passed to all persons (either direct labour or contractors) working on your or near electrical equipment.

This electrical network design has been carried out by :

Electricity Network Manager
GTC
Woodhall Business Park
Bury St Edmunds
Suffolk
IP30 9UP

Tel : 01359 240363
Fax : 01359 244788
www.gtc-uk.co.uk

All cables and equipment used on this design are to be in accordance with GB1 standards.

© Electricity Networks Company Ltd

Drawing Scale :	1:250
O.S.REF :	330544, 347786
Network Number :	N0017623-1
Project Number :	
Drawing Number :	EN0017623-1_R1-4_1_of_1
Developer :	Malkin Construction
Enquirer :	Megson Utilities
Location :	Wrexham Road PENTRE BYCHAN Nr Wrexham LL14 4DS

SHEET SIZE A1

GTC Plant Enquiry. Our Ref 2706981, Your Ref 489507 generated for searches@cornerstoneprojects.co.uk at 09/08/2022 15:10:47. This drawing is reproduced from our records archive at the time of enquiry.

N0017623 LL14 4DS

25-03-2022

POC Details

Name:
Capacity (kVA)80
DNO ref:
Voltage: LV
Volt drop (%): 0.71
Cut-out(): 0.079
Conn type: Branch joint

This design is across multiple crossings for details please refer to all those pgs

Electric Notes
All electric mains, services and ducts that shall contain electric cables must be overlaid with cerotic identifiable marker tape laid 215mm above the highest cable. Minimum horizontal clearance should have a minimum of 300mm separation to any other plant.

Backfill Specification
Onsite trench cables should be surrounded by cable sand bedded to BS EN 13139 - Aggregate size of 9/2mm to CAT 4. A 75mm layer should be placed on the bottom of the trench over a further 75mm above the top of the cable.

Ducting Specification
- Black ducting for mains shall be 150mm rigid plastic ducting compliant with the ENA TS 12-24
- Ducting for LV single phase services shall be 38mm outside diameter black polyduct compliant with ENA TS 12-24
- Ducting should be used when taking cables across roads and into buildings
- Ducts not shown on the drawing as a dash black line
- Only one cable is allowed per duct.

Cerotic cable	Outside Diameter
Single Phase	38mm
3 Phase LV	150mm
HV	150mm

Service Sizes
All service cables to properties are single phase 25mm² Al Cable terminated in 100A cutout (except where specified)

Service Cable Colours
For single connection mains, the connected phases will be shown as R,Y, BK, BY Where R/L = brown / BK = black / GY = grey

Material Specification
All cables, equipment and construction method on this network are to be in accordance with GE0 documentation.

Excavation Carried Out by BUUK
Any trenches highlighted in blue will be excavated and reinstated by BUUK contractors, the excavation and reinstatement of the white trenches will be the responsibility of the customer.

Wrexham Road

Wrexham Road

Wrexham Road

N0017623-1

	Proposed	Laid
415kV Cable		
11kV Cable		
33kV Cable		
66kV Cable		
132kV Cable		
Multi Cable		
LV 3 Core Cable		
Service Cable		
Unit/Cable		
Cable Joint		
Pot End		
Ducted Cable		
Undivided by BUUK Connection		
Asset Boundary		
3 Way Link Box		
4 Way Link Box		
Earth		
Streetlight		
Substation		

Internal
Meter Box
Mast
MEEB
Point Load
Bridge
Network Boundary
Poles
Shooting End Cut
Feeder Pillar

Plan Notes
This plan shows apparatus owned by the BUUK Group. Any third party apparatus shown on this plan relating to other utility companies is only. The information shown on the plan is given without warranty, the accuracy cannot be guaranteed. No liability of any kind whatsoever is accepted by the company. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on the site before any excavation is commenced. © Crown copyright and database right 2021. All rights reserved Ordnance Survey Licence number 0100031673.

Developers Responsibility
When apparatus have been laid it becomes the responsibility of the developer to ensure that adequate protection to the apparatus is carried out as soon as possible. Replacement and repair of damaged apparatus, including administrative costs will be fully recharged to the developer. It will be the developer's responsibility to keep the site free from the third parties.

Revision Notes
For a detailed history of the network design please see baseline revision history document.

gtc
GTC, Wolpit Business Park, Suffolk, IP24 2UP
Tel: 01953 248593
www.gtc-uk.co.uk

Last Edit By:	
Last Approved By TYM LAWRENCE 04-05-2022	
Approved	
OS Ref:	330488,347758
Location:	Packsaddle Bank, Wrexham Road, PENTRE BYCHAN, Nr Wrexham, LL14 4DS
Developer/Client:	Malkin Construction
Drawing Number/Title:	EN0017623-1_1_of_1_appendix
Network Number: N0017623	Project Number: N0017623-1
Scale: 1:500	Sheet Size: A3
	Revision:

GTC Plant Enquiry. Our Ref 2706981, Your Ref 489507 generated for searches@cornerstoneprojects.co.uk at 09/08/2022 15:10:45. This drawing is reproduced from our records archive at the time of enquiry.

Pentre Bychan Road

Wrexham Road

N0017633-1

WREXHAM ROAD

Wrexham Road

Smithy Lane

Wrexham Road

Coppenhall Lane

17-04-2020

Pipe Clearance Distances (mm)

Diameter of mains pipeline	Plan view clearance (mm)	
	Parallel to pipeline	Perpendicular to pipeline
Up to 300	4,000	1,000
301 to 600	5,000	1,000
601 to 900	6,000	1,000
Over 900	7,000	1,000

Excavation Safety Guidance

- Excavation must not start until permission and all relevant consents and licences have been obtained.
- Existing services must be confirmed by trial excavation.
- Safety and Health is covered in the CDM Regulations 2015.

Size Type External Diameter	Bend Inside Clearance
Up to 180mm	250mm
180mm	300mm
250mm	450mm
315mm	600mm
Over 315mm & 355mm	675mm
Over 355mm	750mm

Water Pollution

Any activity with a particular risk of polluting a watercourse must be carried out in accordance with the Environment Agency's guidelines. Such activities include:

- Use of Explosives
- Dewatering
- Refuelling
- Work in a watercourse

Pipeline Identification

For materials specification please refer to SD-750-CS-0002 Low Pressure Ductile - Standard & Gas Marking.

Pipeline identification shall be in accordance with IGEM/TD/3 Edition 5 Amendment 1 Table 1 Pipeline and Above Ground Installation Identification Colours.

RECOMMENDED POSITIONING OF UTILITY APPARATUS IN FOOTWAY (Not to Scale)

Typical road verge section indicating depth of cover for utility apparatus (not to scale)

Approved

OS Ref: 330425,347688

Location: Packsaddle Bank, Wrexham Road, PENTRE BYCHAN, Nr Wrexham, LL14 4DS

Developer/Client: Mallon Construction

Drawing Number/Title: N0017623-1 1 of 1 appendix

Network Number: N0017623

Project Number: N0017623-1

Scale: 1:2

Revision:

GTC Plant Enquiry. Our Ref 2706981, Your Ref 489507 generated for searches@cornerstoneprojects.co.uk at 09/08/2022 15:10:41. This drawing is reproduced from our records archive at the time of enquiry.

SAFE WORKING IN THE VICINITY OF UTILITY NETWORKS

(Refer to the HSE Guidance Document HSG47)

Introduction

This document should be issued to anyone intending on working in the vicinity of GTC and associated entities' utility networks and should be used in conjunction with HSG47, NJUG guidance and industry recognised practices.

Confirmation should be sought from the asset owner in any instance of ambiguity or if there is confusion.

Any querries regarding diversions, alterations, and disconnections for Gas, Water, Distributed Heat and Fibre please contact: Network_Variations@gtc-uk.co.uk

Any querries regarding diversions, alterations, and disconnections for Electric, please contact: Electricity.diversion@gtc-uk.co.uk

For more information please see the GTC website: https://www.gtc-uk.co.uk/ or alternatively contact plant.enquiries@bu-uk.co.uk

The Dangers

Damage to services can cause significant disruption and project delays and therefore incur considerable costs as well as the potential for severe or fatal injury to not only to those directly involved but also the general public.

Damages often have instantaneous reactions like explosive arcing with cables or leaks for gas and water mains however latent reactions due to damages that are ignored, consealed, or unnoticed can have much greater consequences.

General

1. It is imperative that all works are carried out in accordance with the guidance provided by the HSE (Health and Safety Executive) in their document HSG47 "Avoiding Danger from Underground Services", ISBN 978 0 7176 6584 6, 3rd Edition 2014. No party shall carry out any excavation works or other intrusive works such as piling, blasting or demolition without following the guidance in HSG47.

2. We own gas, electricity, water, waste water, fibre, and district heating apparatus located in the highway, private property and through the countryside. Some plant may be located in land for which a wayleave or easement has been granted and there may be no surface evidence of the presence of apparatus.

3. Ensure that you have obtained detailed plans of existing and proposed gas, electricity, water, waste water, fibre, and district heating networks before any works commence.

4. The position of the networks shall be pinpointed as accurately as possible by visually surveying the area for indications of apparatus, by means of a locating device, and reference the information gathered to the plans. Locating equipment must be tested and calibrated within the manufacturer's calibration date.

Excavation work should be carried out where applicable, carefully following recognised safe digging practices. Once a locating device has been used to determine position and route, excavation may proceed; trial holes should be dug using suitable hand tools to confirm the position of buried networks. During excavation the locating device should be reused to check position and route of buried apparatus.

Once the apparatus has been located, appropriate marking be made on the covering hard surface confirming location and any errors in plans identified, GTC should be advised to allow plans to be updated.

5. Hand-held power tools can damage buried apparatus and shall be used with care until the exact position of a utility has been determined. They may only be used to break a paved or concrete surface above the network, unless there are any indications that the network is particularly shallow; in such circumstances, accuracy of plant location is determined and excavation initiated adjacent to the apparatus.

6. No manhole, chamber or other structure shall be built over, around or under the network. Such structures, other pipes, ducts and cables should be laid to provide a minimum clearance from the existing network of 300mm or 1.5 times the diameter of the asset, whichever is the greater. No work should be carried out if this minimum clearance cannot be met or which results in a reduction of cover or protection over the network, without first consulting GTC, please seek advice from GTC.

7. Where an excavation uncovers any network apparatus the backfill shall be adequately compacted, particularly beneath the network, to prevent any settlement, which would subsequently damage the network. Backfill material adjacent to the network shall be selected fine material or sand, containing no stones, bricks or lumps of concrete etc. and shall be suitably compacted to give comparable support and protection to that provided before excavation. No power compaction shall take place until at least 200mm cover of selected fine fill has been suitably compacted by hand tools.

8. If the road construction is close to the top of the network, GTC shall be asked to identify whether any additional precautions are necessary. The road construction depth should not be reduced without permission from the local Highway Authority.

9. Costs incurred by GTC through direct or consequential damage shall be recharged.

10. Where utilities are within a duct the duct should be treated in the same manner as live utility cable/pipe/fibre and any work in the vicinity of the apparatus shall be carried out with caution.

Any damage caused no matter how insignificant or minor in appearance SHALL BE REPORTED to GTC as soon as possible.

Precautions for Gas Networks

11. Plans do not always show the presence of gas service pipes (from the gas main to premises) but their existence should be assumed with consideration given to the increased height of the service off-take fitting on the main.

12. The depth of cover for gas mains is typically 750mm in carriageways and grass verges, 600mm in footways and 1.1m in open field. The depth of cover for gas services is typically between 375mm and 600mm . Reference should always be made to the network drawing. Remember these covers are to finished level, you may be working in an area, which will be made up or lowered at a later date.

13. Gas pipes should be located by hand digging before mechanical excavation begins. When the positions and depth of the pipes have been determined, work can proceed.

14. If a gas leak is suspected, the following action should be taken immediately:

- Remove all people from the immediate vicinity of the escape. If the service connection to a building or the adjacent main has been damaged, warn the occupants to leave the building, and any adjoining building, until it is safe for them to return. It is important to note that a mechanical excavator may not only cause damage/leakage at the point of impact. For example, damage to a service connection outside the building may result in further, unseen damage to the connection inside the building. Gas leaking from the damage inside or gas travelling along the line of the service connection pipe from outside the building may cause a build-up of gas within the building.
- Prohibit smoking, and extinguish all naked flames and other sources of ignition i.e. stop excavator and compressor engines within at least 5.0m of the leak.
- Inform the National Gas Emergency Service immediately by dialling:

  0800 111 999

- Remain on site.
- Assist the Gas Emergency Service Provider staff, Police, Fire Services or other Statutory Authorities as requested.

15. Where gas pipes cross or are parallel and close to excavations, changes in backfill etc. may cause differential ground settlement and increased stress in the pipe. For pipes parallel and close to excavations, the degree of risk depends upon the depth of the excavation, the distance of the pipe from the excavation, the type of soil and any excessive loading from heavy construction plant and materials. Wherever excavation works may affect the support of the gas pipe or cause excessive loading over the gas pipe then GTC shall be consulted.

16. No concrete or other hard material should be placed or left under or adjacent to any gas pipe as this can cause pipe fracture at a later date. Concrete backfill should not be used within 300mm of a gas pipe.

17. Where an excavation uncovers a gas pipe with a damaged wrapping, GTC shall be informed, so that repairs can be made to prevent future corrosion and leakage.

18. Pipe restraints or thrust blocks close to gas mains shall not be removed or interfered with as they are a safety feature of the live gas network.

19. Anyone who carries out work near underground gas plant should observe any specific requirements made by the site manager, and ensure that access to the plant by the asset owners staff is available at all times. No unauthorised repairs to gas pipes should be made.

20. Where excavation is within 5m proximity to above or below ground pressure control equipment, ground workers must be aware of the possibility of encountering small auxilary pipework that is more susceptible to damage.

21. Where PE pipes and cables have been exposed and it is intended that hot work (e.g. welding, grinding, etc) be carried out, contact shall be made with GTC to confirm additional precautions and actions that may require to be undertaken.

22. GTC shall be consulted if it is intended to carry out any of the following activities:

- Using explosives within 30m of gas pipes or 400m of gas pressure reduction equipment.
- Piling or boring within 15m of gas plant.
- Excavating within 10m of pressure reduction equipment.
- Reducing the cover or protection of a gas pipe.
- Carrying out deep excavations nearby (minimum of 2m up to 15m).
- Working within 3m of GTC's intermediate pressure (IP) mains.

Precautions for Electricity Networks

23. Plans do not always show the presence of electric service cables (from the electricity main to premises) but their existence should be assumed.

24. In most cases there will be no permanent surface marker posts or other visible indication of the presence of a buried cable. Even if no cables are shown on plans or detected by a locator, there may still be cables present, which could be live and a close watch should be kept for any signs which could indicate their presence such as marker tape, tape tile, concrete tiles and wooden battens. Any marker which is disturbed by our excavations must be replaced once work is completed.

25. Typically underground cables are laid in trenches between 450mm and 1000mm deep, although some high voltage cables will be deeper, however, depths should never be assumed.

26. A cable is positively located only when it has been safely exposed. Even then, digging should still proceed with care as there may be other cables adjacent or lower down.

27. Occasionally, cables are terminated in the ground by means of a seal, sometimes with external mechanical protection. These "pot ended" or "bottle ended" cables should be treated as live and should not be assumed to be abandoned or disused. They can be difficult to detect with locators even when "live".

28. Where practicable, such power tools shall only be used 500mm or more away from the indicated line of a cable buried in or below a hard surface. Having done so, the cable shall then be positively located by careful hand digging under the hard surface. The hard surface should be gradually removed until the cable is exposed. If the cable is not exposed then it must be assumed to be embedded within the surface. Where possible a cable locator shall be used as a depth guide down the side of the excavation.

29. Because of the difficulty in confirming depth, hand held power tools shall never be used over the cable unless either:

- The cable has already been exposed by digging under the surface to be broken out and it is at a safe depth (at least 300mm) below the bottom of the hard surface material.

  or

- Physical precautions have been taken to prevent the tool striking the cable.

30. Excavating close to electricity cables buried in concrete is dangerous and shall not be undertaken unless the cable(s) have been isolated. For this reason alone electricity cables should not be buried in concrete.

31. Where mechanical excavators are used in the possible vicinity of underground cables, the work should be arranged so that damage to cables is avoided so far as is reasonably practicable. To minimise danger to operatives those onsite shall be outside of the reach of the excavator bucket and shall not enter the trench whilst digging is undertaken. Excavator operators shall be instructed to stay in the cab if a cable is struck. If excavator operators have to exit the cab they should jump clear. If excavator operators climb down from the cab the risk of electrocution is significantly increased. If a cable is struck, the machine involved shall be subject to continous observation and no one shall enter the excavation or approach the machine or the cable until GTC have been contacted and the damaged cable has been made safe.

32. Where cables have been exposed:

- Any damage shall be reported to GTC immediately on: **0800 032 6990**

  And work shall not be undertaken in the vicinity of a damaged cable until GTC has investigated its condition.

- For more than 1.0m and they cross a trench, support shall be provided. If the exposed cable length is shorter than 1.0m support shall still be considered if joints have been exposed or the cable appears otherwise vulnerable to damage. Where advice and help is needed contact GTC.

- Suitable precautions shall be taken to prevent damage from on-going work in the excavation. This may involve for example the use of physical means (e.g. timber boards, sandbags etc) to prevent mechanical damage. Materials or equipment which could damage or penetrate the outer sheath of the cable shall not be used. Cables lying in the bottom of an excavation are particularly vulnerable and shall be protected by nail free wooden planks, troughing or other suitable means.

- Cables shall not be moved aside unless the operation is supervised by GTC.

- Precautions shall be taken to prevent access by members of the public.

33. GTC shall be consulted if it is intended to carry out any of the following activities:

- Using explosives within 30m of plant or substations piling or boring within 15m of electric plant.

- Excavating within 10m of a substation.

- Carrying out deep excavations nearby (minimum of 2m up to 15m).

- Working near GTC's HV plant.

Precautions for Water Networks

34. Plans do not always show the presence of water service pipes (from the water main to premises) but their existence should be assumed with consideration given to the increased height of the service off-take fitting on the main.

35. The depth of cover for water mains are typically 900mm. The depth of cover for water services are typically 750mm. Remember these covers are to finished level, you may be working in an area, which will be made up or lowered at a later date.

36. Water mains shall be located by hand digging before mechanical excavation begins. When the positions and depth of the pipes have been determined, work can proceed.

37. The danger created by damaging a water pipe with an excavator is much greater than if the damage is done with a hand-held power tool. Water pipes may have projections such as valve housings, which are not shown on the plans and to allow for this mechanical excavators shall not be used within 500mm of a water pipe.

38. If a water leak is suspected, the following action should be taken immediately:

- Remove all people from the immediate vicinity of the damage. It is important to note that a mechanical excavator may not only cause damage/leakage at the point of impact. For example, damage to a service connection outside the building may result in further, unseen damage to the connection inside the building.
- Shut down all working plant and machinery in the vicinity of the damage
- Inform IWNL by dialling: **02920 442 716**
- Remain on site.
- Do not attempt to make a repair.
- Assist Approved Contractors, Police, Fire Services or other Statutory Authorities as requested.

39. Where water pipes cross or are parallel and close to excavations, changes in backfill etc. may cause differential ground settlement and increased stress in the pipe. For pipes parallel and close to excavations, the degree of risk depends upon the depth of the excavation, the distance of the pipe from the excavation, the type of soil and any excessive loading from heavy construction plant and materials. Wherever excavation works may affect the support of the water pipe or cause excessive loading over the water pipe then GTC must be consulted.

40. No concrete or other hard material should be placed or left under or adjacent to any water pipe as this can cause pipe fracture at a later date. Concrete backfill should not be used within 300mm of a water pipe.

41. Where an excavation uncovers a water pipe with a damaged wrapping, GTC shall be told, so that repairs can be made to prevent future corrosion and leakage.

42. Pipe restraints or thrust blocks close to water mains should never be removed.

43. Anyone who carries out work near underground water plant shall observe any specific requirements made by the site manager, and ensure that access to the plant by GTC staff is available at all times. No unauthorised repairs to water pipes should be made.

44. Where PE pipes and cables have been exposed and it is intended hot work (e.g. welding, grinding, etc) be carried out, contact shall be made with GTC to confirm additional precautions and actions that may require to be undertaken.

45. GTC shall be consulted if it is intended to carry out any of the following activities:

- Using explosives within 30m of plant.

- Piling or boring within 15m of water plant.
- Excavating within 10m of water asset structures.
- Reducing the cover or protection of a water main or service.
- Carrying out deep excavations nearby (minimum of 2m up to 15m).

Precautions for Fibre Networks

46. Plans may not always show the presence of fibre ducts but their existence should be assumed if GTC advise they have fibre services deployed in the given area. Any planned excavation work should only proceed with due care and attention.

47. Chambers with IFNL or OFNL marked lids can be used as an onsite indictor that GTC have fibre plant deployed in a given area however an exclusion of their presence does not necessarily mean there is no plant present.

48. In most cases there will be no permanent surface marker posts or other visible indication of the presence of a buried fibre duct. Even if no ducts are shown on plans there may still be ducts present which could have live fibre service installed. A close watch shall be kept for any signs which could indicate duct presence such as marker tape. Any marker which is disturbed by our excavations must be replaced once work is completed.

49. The depth of cover for fibre duct is typically between 350mm and 600mm in footways and grass verges, 600mm in carriageways and 1m in agricultural deployments. Remember these covers are to finished level, you may be working in an area, which will be made up or lowered at a later date.

50. Fibre ducts should be located by hand digging before mechanical excavation begins. When the positions and depth of the ducts have been determined, work can proceed. Even then, digging should still proceed with care as there may be other ducts adjacent or lower down.

51. If fibre duct damage is suspected, the following action should be taken immediately:

- Remove all people from the immediate vicinity of the damage. It is important to note that a mechanical excavator may not only cause damage at the point of impact. For example, damage to a fibre connection outside the building may result in further, unseen damage to the connection inside the building.
- Shut down all working plant and machinery in the vicinity of the damage.
- Inform GTC Fibre immediately on: **02920 028 726**
- Remain on site.
- Do not attempt to make a repair.
- Assist Approved Contractors, Police, Fire Services or other Statutory Authorities as requested.

52. Where fibre ducts cross or are parallel and close to excavations, changes in backfill etc. may cause differential ground settlement and increased stress on the duct. For ducts parallel and close to excavations, the degree of risk depends upon the depth of the excavation, the distance of the duct from the excavation, the type of soil and any

excessive loading from heavy construction plant and materials. Wherever excavation works may affect the support of the fibre duct or cause excessive loading over the fibre duct then GTC must be consulted.

53. No concrete or other hard material shall be placed or left under or adjacent to any fibre duct as this can cause damage to the duct at a later date. Any backfill should comply with the requirements of NRSWA. Concrete backfill should not be used within 300mm of a fibre duct.

54. Anyone who carries out work near underground fibre plant should observe any specific requirements made by the site manager, and ensure that access to the plant by GTC staff is available at all times. No unauthorised repairs to fibre ducts should be made.

55. Where fibre ducts have been exposed and it is intended hot work (e.g. welding, grinding, etc) be carried out, contact must be made with GTC to confirm additional precautions and actions that may require to be undertaken.

56. GTC shall be consulted if it is intended to carry out any of the following activities:

- Using explosives within 30m of plant or fibre asset structures.
- Piling or boring within 15m of fibre plant.
- Excavating within 10m of fibre asset structures (including the OSCP).
- Reducing the cover or protection of a fibre asset.
- Carrying out deep excavations nearby (minimum of 2m up to 15m).

Precautions for District Heating Networks

For information with respect to Dstrict Heating Networks this could also include District Cooling.

57. Plans do not always show the presence of District Heating service pipes (from the District Hearing main to premises) but their existence should be assumed.

58. The depth of cover for District Heating mains is typically a minimum of 600mm under normal light carriageways and during construction activities, additional temporary protective bridging should be placed over DHN pipe runs. The depth of cover for District Heating services is typically 6000mm. Remember these covers are to finished level, you may be working in an area, which will be made up or lowered at a later date.

59. District Heating mains shall be located by hand digging before mechanical excavation begins. When the positions and depth of the pipes have been determined, work can proceed.

60. The danger created by damaging a District Heating with an excavator is much greater than if the damage is done with a hand-held power tool. District Heating pipes may have projections such as valve housings, which are not shown on the plans and to allow for this mechanical excavators should not be used within 600mm of a District Heating pipe.

61. If a water leak is suspected, the following action should be taken immediately:

- Remove all people from the immediate vicinity of the damage. It is important to note that a mechanical excavator may not only cause damage/leakage at the point of impact. For example, damage to a service connection outside the building may result in further, unseen damage to the connection inside the building.
- Shut down all working plant and machinery in the vicinity of the damage.
- Inform Metropolitan by dialling: **02920 100 346**
- Remain on site.
- Do not attempt to make a repair.
- Assist Approved Contractors, Police, Fire Services or other Statutory Authorities as requested.

62. Where District Heating cross or are parallel and close to excavations, changes in backfill etc. may cause differential ground settlement and increased stress in the pipe. For pipes parallel and close to excavations, the degree of risk depends upon the depth of the excavation, the distance of the pipe from the excavation, the type of soil and any excessive loading from heavy construction plant and materials. Wherever excavation works may affect the support of the District Heating or cause excessive loading over the water pipe then Metropolitan must be consulted.

63. No concrete or other hard material should be placed or left under or adjacent to any District Heating as this can cause pipe fracture at a later date. Concrete backfill should not be used within 300mm of a District Heating.

64. Where an excavation uncovers a District Heating pipe with a damaged insulation, Metropolitan should be told, so that repairs can be made to prevent future corrosions and leakage.

65. Pipe restraints , Anchor blocks or foam padding close to district heating mains shall never be removed.

66. Anyone who carries out work near underground district heating plant shall observe any specific requirements made by the site manager, and ensure that access to the plant by the asset owners staff is available at all times. No unauthorised repairs to district heating pipes shall be made.

67. Where District Heating pipes have been exposed and it is intended hot work (e.g. welding, grinding, etc) will be carried out, contact shall be made with Metropolitan to confirm additional precautions and actions that may require to be undertaken.

68. Metropolitan shall be consulted if it is intended to carry out any of the following activities:

- Using explosives within 30m of gas pipes or 400m of gas pressure reduction equipment.
- Piling or boring within 15m of District Heating pipe.
- Reducing the cover or protection of a District Heating pipe.
- Carrying out deep excavations nearby.

Searches - Cornerstone Projects Ltd

From: Virtual Utilities <no-reply@virtual-utilities.co.uk>
Sent: 09 August 2022 15:17
To: Duncan Phillips
Subject: Your UK Power Distribution Order - #16258
Attachments: invoice-16258.pdf

Thank you for your order

Thanks for your recent enquiry to UK Power Distribution.

Please find attached your invoice. The details of your order are also below:

According to our database there are no UK Power Distribution records within your search area.

Please note that any recent additions or alterations to our network may not be shown. Cables or pipes owned by other network owners or private companies will not be shown.
Before any excavations are undertaken you should always verify exact locations of cables using a cable locator, and by careful use of hand tools in accordance with HSE guidance note HSG47 “Avoiding danger from underground services”
Other useful documents to read prior to undertaking any works are HSE GS6, “Avoiding danger from overhead power lines” and HSE “Avoiding concealed services and overhead power lines”

Order number: #16258

Description	Date	Qty	Amount (£)
Utility Records Search View Map	09-08-2022 14:16:55	1	62.50
		VAT (@ 20%)	12.50
		Grand Total	**75.00**

Your Details

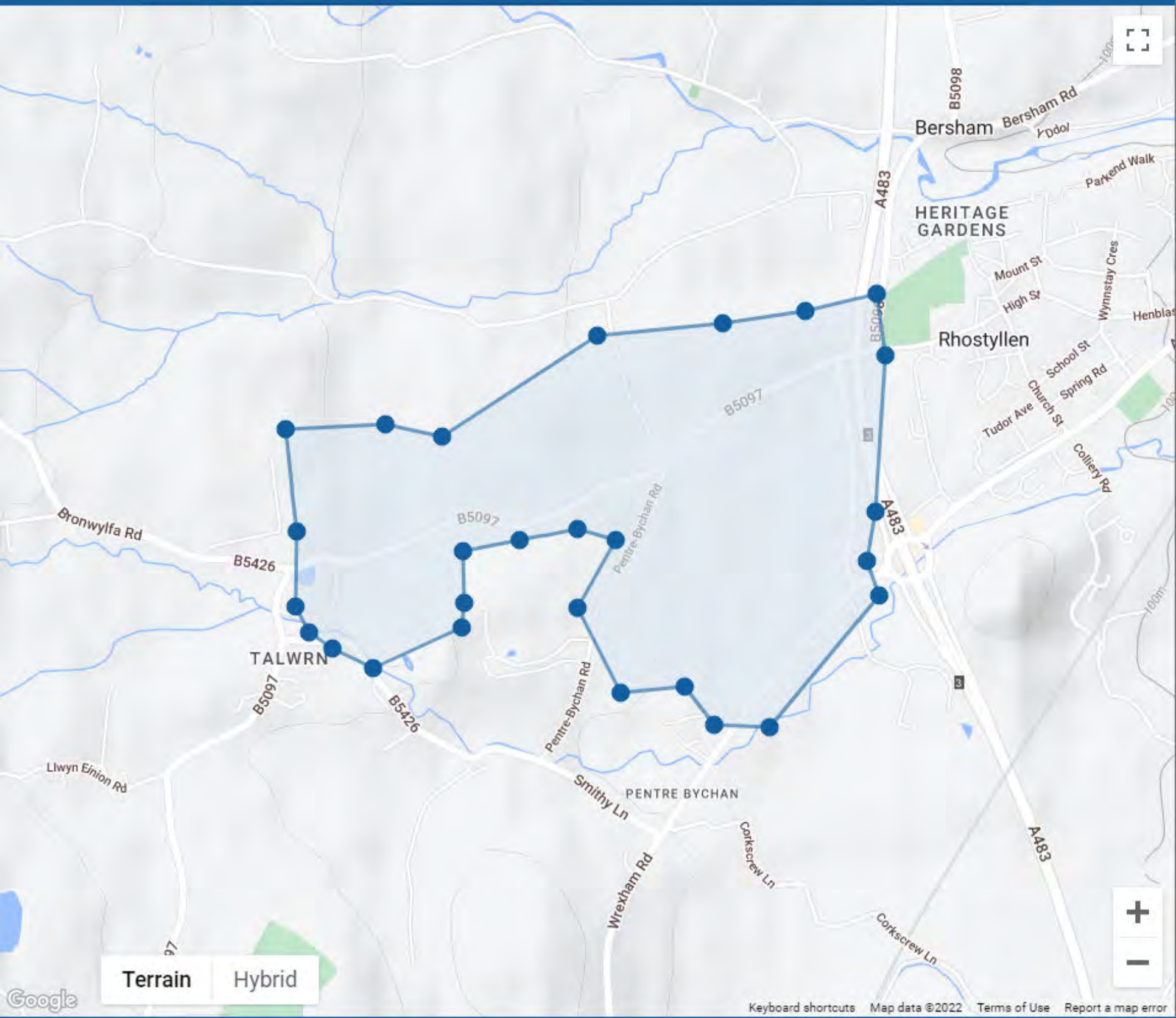
Duncan Phillips

searches@cornerstoneprojects.co.uk

Billing Address

91 Market Street,
Wirral,
Merseyside,
CH475AA

https://ukpd.virtual-utilities.co.uk



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Searches - Cornerstone Projects Ltd

From: Leep Electricity Networks <lenl@leeputilities.co.uk>
Sent: 10 August 2022 17:42
To: Searches - Cornerstone Projects Ltd
Subject: RE: Plant enquiry - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Leep Electricity Networks Ltd & Leep Utilities have no apparatus in this area.

Regards
Diane

Leep Electricity Networks
Take a look at our **website**

e: lenl@leeputilities.co.uk
w: **www.leeputilities.co.uk**
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From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:41
To: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Subject: Plant enquiry - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Dear Sir/Madam,

Searches - Cornerstone Projects Ltd

From: Eclipse Enquiries <enquiries@eclipsepower.co.uk>
Sent: 09 August 2022 15:02
To: Searches - Cornerstone Projects Ltd
Subject: RE: Plant enquiry - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Flag Status: Flagged

Hello Sir/ Madam,

Thank you for your email. I can confirm that we have no present projects in the illustrated area; as demonstrated in your email.

If you have any further queries, do not hesitate to contact me via this email domain name.

Kindest regards,
Harry Constantine
Eclipse Power
Office: +44 (0) 1234 486487
www.eclipsepower.co.uk
https://www.linkedin.com/company/eclipse-power-networks

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From: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Sent: 09 August 2022 14:41
To: Searches - Cornerstone Projects Ltd <searches@cornerstoneprojects.co.uk>
Subject: Plant enquiry - Site Ref. 489507 IAP LAND AT BRONWYLFA ROAD - LAND AT BRONWYLFA ROAD, RHOSTYLLEN - NGR E330229 N348316

Dear Sir/Madam,

QUALITY CHECK

Checked and issued by:	
Name:	N Jones
Date:	25/08/22
Plans are valid until:	23/11/22
Unless noted otherwise plans are valid for three months from date of issue - please note the date shown above is approximate. After the above date please contact us to arrange a refreshed utility search pack at www.cornerstoneprojects.co.uk Please refer to www.cornerstoneprojects.co.uk/terms.html for full Terms and Conditions.	

Cornerstone Projects Ltd is a UK wide desktop underground utility search expert:

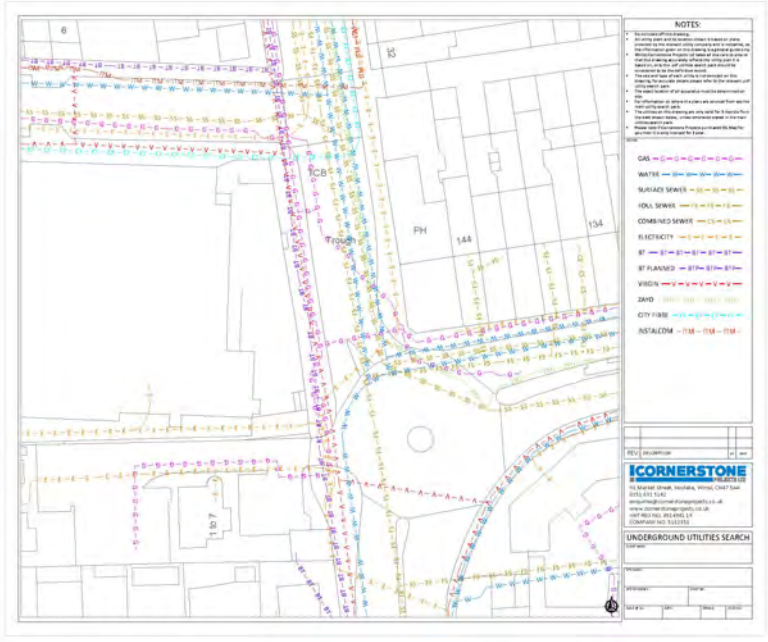
- Market leading pricing and response times
- Comprehensive utility database
- 15 Years plus experience
- Over 50,000 completed searches
- Over 2750 registered businesses
- Searches to PAS 128 survey level D
- ISO9001 certified company

91 Market Street Hoylake Wirral CH47 5AA
Tel. 0151 632 5142
enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

Want an easier way to interpret your utility search results?

Searching through your utility results can be time consuming and complex. Here at Cornerstone, we have the ability to produce one consolidated drawing which will allow you to view all your results on a single plan. Moreover, as the utilities are drawn in separate layers, you will also be able to turn different layers on and off to allow you to focus on individual utilities.



We can produce your consolidated drawing in .dwg (CAD) format from £60.00 + VAT.
We can also convert this into a Smart .PDF starting from £70.00 + VAT.

Call us on 0151 632 5142 or **email** enquiries@cornerstoneprojects.co.uk for a quote for this site. Please provide your site name/reference.

Need help with administering road opening licences, capacity checks or gaining quotes from the utility companies for connecting or diverting services?

Section 50 /Road Opening Licence – We will complete the application required to obtain the Section 50 and/or road opening licence on your behalf – our fee is from as little as £150.00+VAT plus Council charges.

Capacity check – We will complete an application to determine whether a utility has sufficient capacity for your proposed development and if not, what budget costs would be required to reinforce the network – our fee is from as little as £150.00+VAT per utility plus disbursements.

New Connections/Disconnections – We will complete the administration required to obtain quotes from the utilities to connect or disconnect from as little as £150.00+VAT per utility plus disbursements.

Diversions – We will complete the application required to obtain costs and suggested diversions required for your intended works from as little as £150.00+VAT per utility plus disbursements.

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enquiries@cornerstoneprojects.co.uk
www.cornerstoneprojects.co.uk
VAT Reg. No. 851 4941 19
Company No. 5132353

Registered in England. Registered Address : Cornerstone Projects Ltd, 91 Market Street, Hoylake, Wirral CH47 5AA

D Tree Survey

E GI Report

Infiltration Testing For:

Legacy substation,
Wrexham,
Lat/Long 53.027333, -3.035063

Prepared for: Stantec

REF: Wrexham #398

DATE: 21.05.2023

GibbsGeoTechnical

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Document Control

Project	**Legacy substation, Wrexham**
Client	**Stantec**
Ref:	**Wrexham #398**

Document Checking:

Prepared By: **Oliver Gibbs** **Signed:**

Issue	Date	Status
01	21/05/2023	Written and submitted
02		
03		

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1.2 Site Investigations 3
2 Site findings 4
2.1 Method of testing 4
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1 Introduction

1.1 Brief

Gibbs Geotechnical has been instructed by Stantec (the Client) to undertake 10 soil infiltration tests to BRE365 standard, at the legacy substation, located at Lat/Long 53.027333, -3.035063.

National Grid Reference: SJ306482– Easting 330677, Northing 348284

Latitude, Longitude: 53.027333, -3.035063

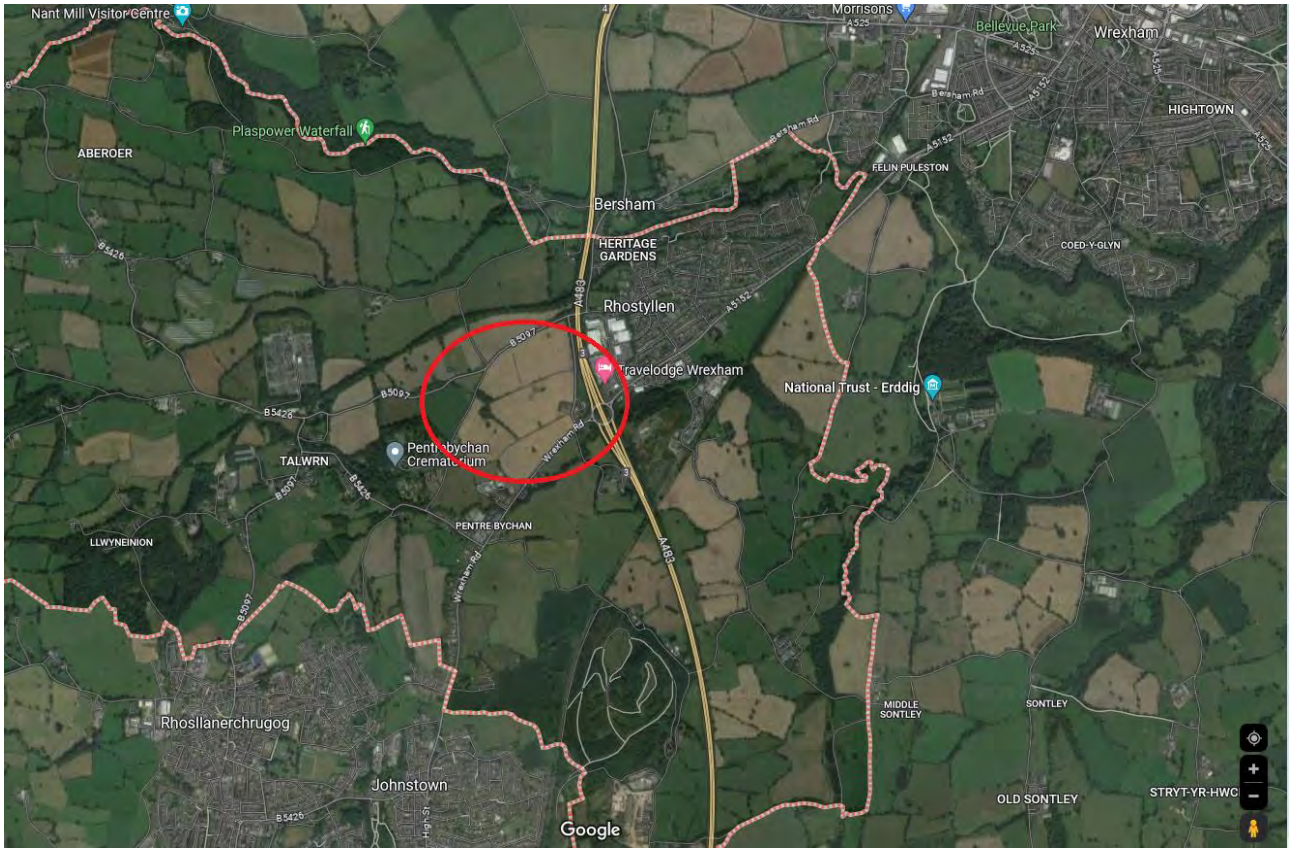

Figure 1 - Site location

Ten BRE365 infiltration tests have been proposed to determine the local geology and permeation rates on site. These test pits will be 0.5x1x0.5m minimum and tested a maximum of 3 times or as many as possible in the timeframe allowed. Refer to **Appendix A** – Site Test Plans

1.2 Site Investigations

The site was located to the South-West of the town of Rhostyllen, bordered to the East by the A483. The test pits were located evenly across the site, which consisted of 2x grassed fields, one to the North and one to the South. Both fields were level across their span.

The tests were performed by Gabriel Usher (of Gibbs Geotechnical) on the 9+10th of May 2023. Refer to **Appendix B** – Site photos

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2 Site findings

The following tests were performed to the best of the ability of those involved, subject to site constraints and weather conditions. All pits were successfully excavated to 1.0m depth, shown in the location on **Appendix A**. Grassed loam was present from surface level to 0.2m depth at which point a till/clay mix was encountered until the full 1.0m depth was attained. Due to the size of the bucket on the excavator (provided by the client), the test pits were dug 1.0m x 1.0m x1.0m in size.

2.1 British Geological Records

Local searches from the British Geological Survey (BGS) online records show the site to have the following superficial soils and bedrock:

Bedrock: Etruria Formation - Mudstone. Sedimentary bedrock formed between 319 and 308 million years ago during the Carboniferous period.

Superficial soils Glaciofluvial Deposits, Devensian - Sand and gravel. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

Refer to **Appendix C** for BGS records https://geologyviewer.bgs.ac.uk/

2.2 Trial pit soil conditions

Soils encountered were logged at the following approximate depths:

Pit 1

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 2

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 3 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 4 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

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Pit 5 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 6 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 7 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 8 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 9 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

Pit 10 -

Topsoil:	*0-0.2m*	*- Grassed loam*
Superficial soils:	*0.2-1.0m*	*- Till/clay mix*

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Results

Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**1**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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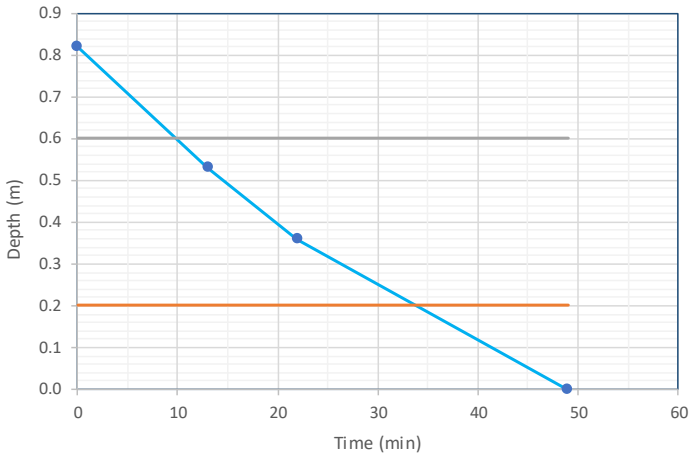
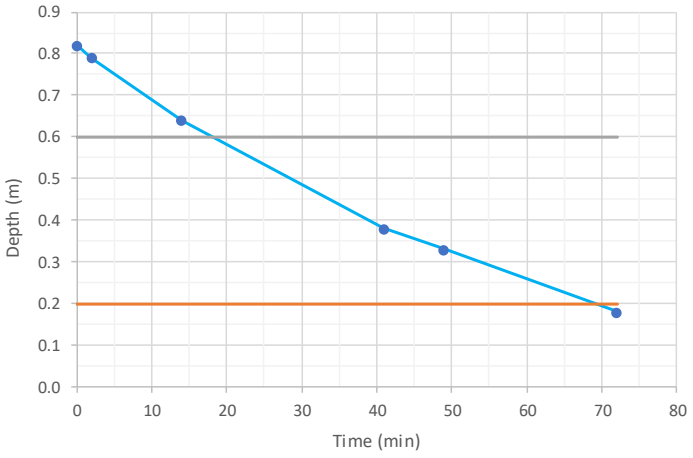
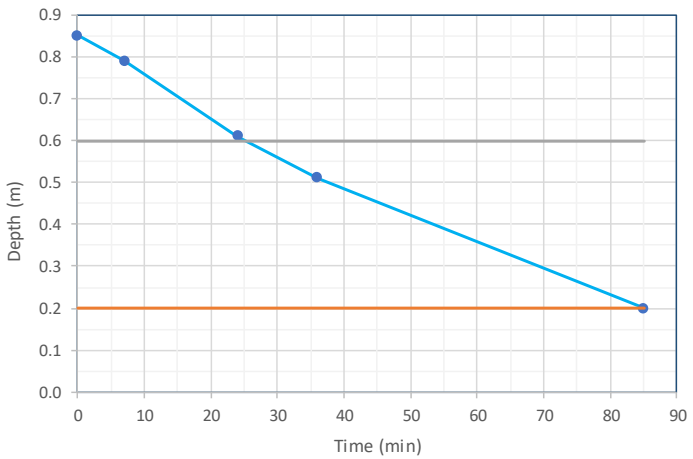
Test No.	Time (min)	Depth (m)			
1	0	0.82	time 75% =	10	
	13	0.53	time 25% =	34	
	22	0.36	Area =	1	
	49	0.00	Vp 75% =	0.6	
			Vp 25% =	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	1440	s
			f =	9.92E-05	m/s



Test No.	Time (min)	Depth (m)			
2	0	0.82	time 75% =	18	
	2	0.79	time 25% =	70	
	14	0.64	Area =	1	
	41	0.38	Vp 75% =	0.6	
	49	0.33	Vp 25% =	0.2	
	72	0.18			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	3120	s
			f =	4.58E-05	m/s



Test No.	Time (min)	Depth (m)			
3	0	0.85	time 75% =	25	
	7	0.79	time 25% =	85	
	24	0.61	Area =	1	
	36	0.51	Vp 75% =	0.6	
	85	0.20	Vp 25% =	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	3600	s
			f =	3.97E-05	m/s



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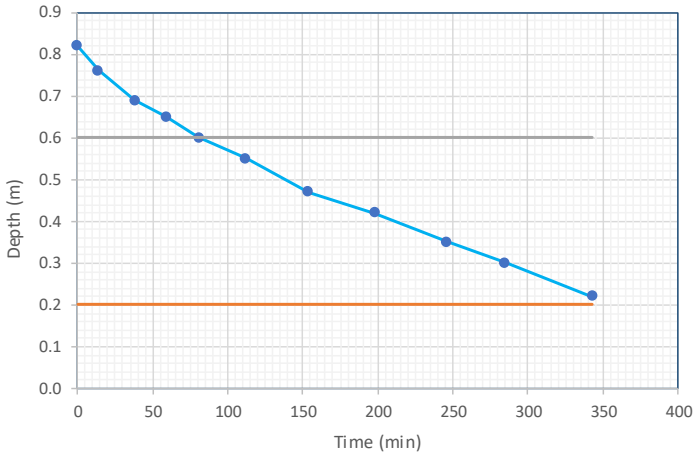
Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

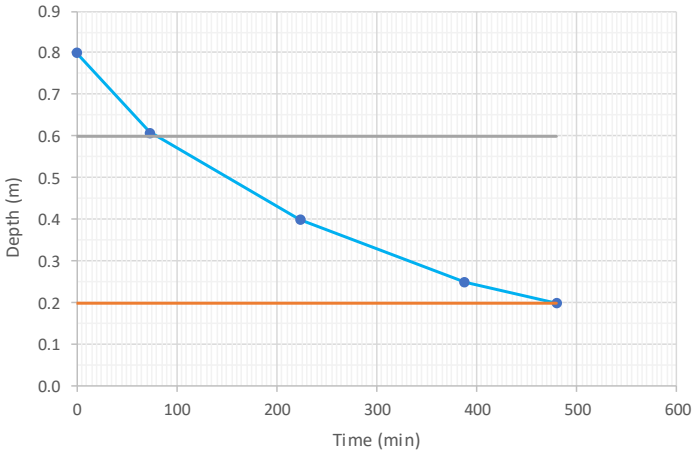
Trial Pit	**2**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

GibbsGeoTechnical

Test No.	Time (min)	Depth (m)			
1	0	0.82	**time 75% =**	10	
	14	0.76	**time 25% =**	34	
	38	0.69	**Area =**	1	
	59	0.65	**Vp 75% =**	0.6	
	81	0.60	**Vp 25% =**	0.2	
	112	0.55			
	154	0.47			
	198	0.42			
	246	0.35			
	285	0.30			
	343	0.22	**Vp75-25 =**	0.4	m
			As50 =	2.8	m²
			tp75-25 =	1440	s
			f =	**9.92E-05**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.80	**time 75% =**	70	
	73	0.61	**time 25% =**	480	
	224	0.40	**Area =**	1	
	388	0.25	**Vp 75% =**	0.6	
	480	0.20	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	24600	s
			f =	**5.81E-06**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**3**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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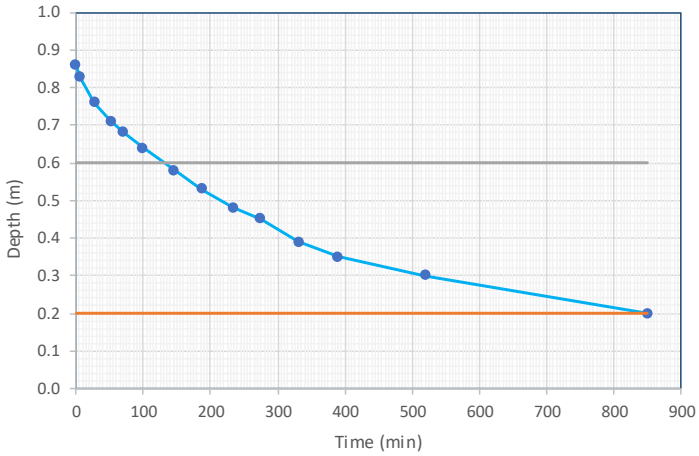
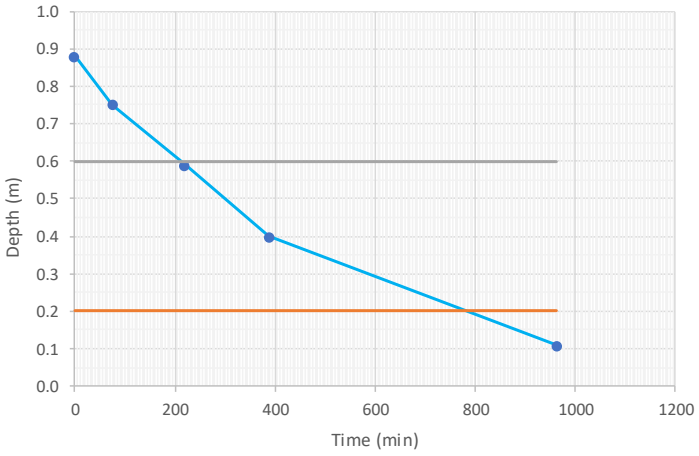
Test No.	Time (min)	Depth (m)			
1	0	0.86	**time 75% =**	125	
	6	0.83	**time 25% =**	850	
	28	0.76	**Area =**	1	
	52	0.71	**Vp 75% =**	0.6	
	71	0.68	**Vp 25% =**	0.2	
	100	0.64			
	146	0.58			
	187	0.53			
	234	0.48			
	275	0.45			
	332	0.39	**Vp75-25 =**	0.4	m
	390	0.35	**As50 =**	2.8	m²
	520	0.30	**tp75-25 =**	43500	s
	850	0.20	**f =**	**3.28E-06**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.88	**time 75% =**	230	
	76	0.75	**time 25% =**	790	
	220	0.59	**Area =**	1	
	388	0.40	**Vp 75% =**	0.6	
	963	0.11	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	33600	s
			f =	**4.25E-06**	**m/s**



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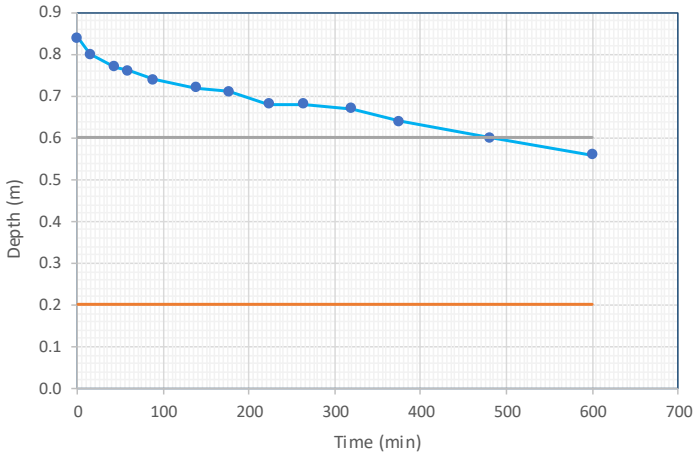
Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

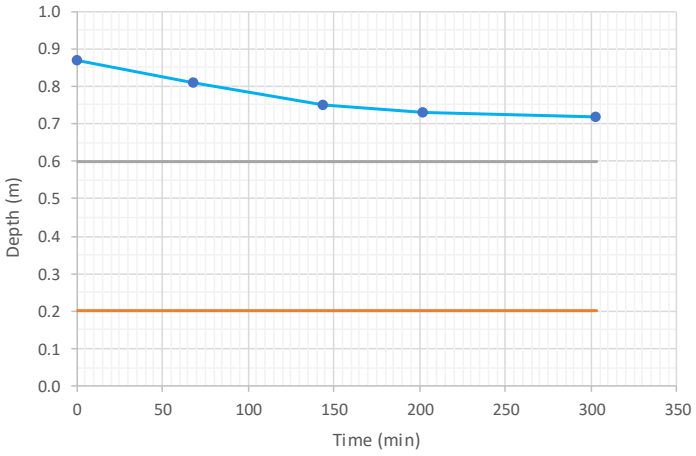
Trial Pit	**4**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

GibbsGeoTechnical

Test No.	Time (min)	Depth (m)			
1	0	0.84	**time 75% =**	125	
	15	0.80	**time 25% =**	N/A	
	43	0.77	**Area =**	1	
	59	0.76	**Vp 75% =**	0.6	
	89	0.74	**Vp 25% =**	0.2	
	138	0.72			
	176	0.71			
	223	0.68			
	264	0.68			
	320	0.67			
	375	0.64	**Vp75-25 =**	0.4	m
	480	0.60	**As50 =**	2.8	m²
	600	0.56	**tp75-25 =**	#VALUE!	s
			f =	**#VALUE!**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.87	**time 75% =**	N/A	
	68	0.81	**time 25% =**	N/A	
	144	0.75	**Area =**	1	
	202	0.73	**Vp 75% =**	0.6	
	303	0.72	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	#VALUE!	s
			f =	**#VALUE!**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site: Wrexham
Client: Stantec

Trial Pit	5	Date:	9+10th May 2023
Dimensions	(m)	Performed by:	Oliver Gibbs
Width	1	Weather:	Sunny
Length	1	Topsoil:	Grassed loam
Effective depth	0.9	Superficial soil:	Till/clay mix
Total depth of hole	0.9	Comments:	

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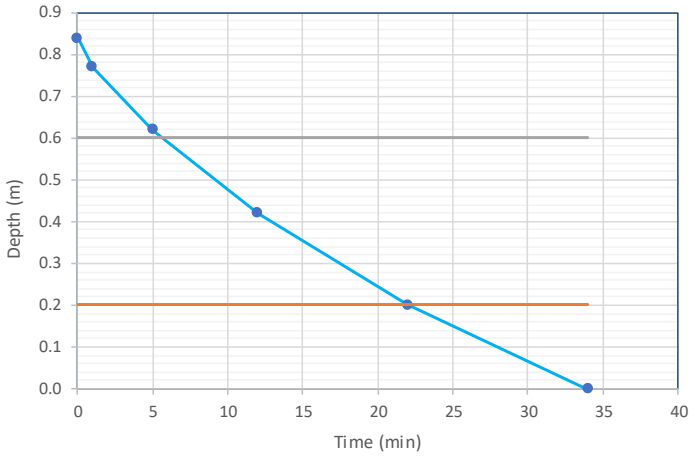
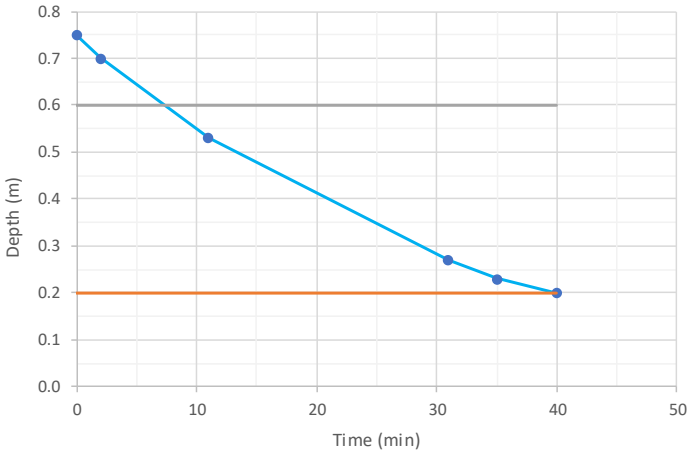
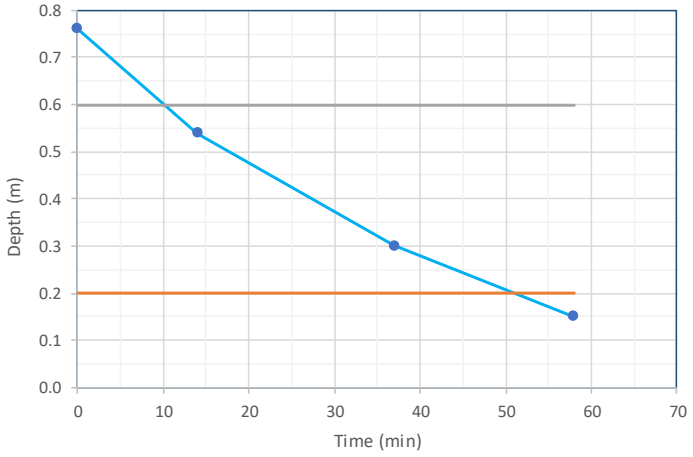
Test No.	Time (min)	Depth (m)			
1	0	0.84	time 75% =	6	
	1	0.77	time 25% =	22	
	5	0.62	Area =	1	
	12	0.42	Vp 75% =	0.6	
	22	0.20	Vp 25% =	0.2	
	34	0.00			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	960	s
			f =	1.49E-04	m/s



Test No.	Time (min)	Depth (m)			
2	0	0.75	time 75% =	7	
	2	0.70	time 25% =	40	
	11	0.53	Area =	1	
	31	0.27	Vp 75% =	0.6	
	35	0.23	Vp 25% =	0.2	
	40	0.20			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	1980	s
			f =	7.22E-05	m/s



Test No.	Time (min)	Depth (m)			
3	0	0.76	time 75% =	10	
	14	0.54	time 25% =	51	
	37	0.30	Area =	1	
	58	0.15	Vp 75% =	0.6	
			Vp 25% =	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	2460	s
			f =	5.81E-05	m/s



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Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**6**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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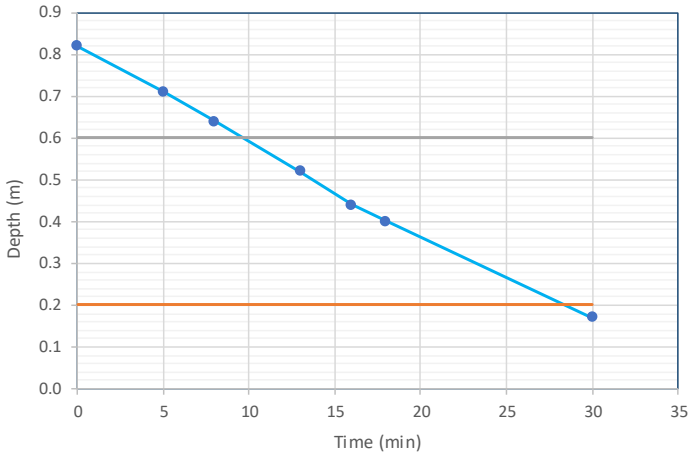
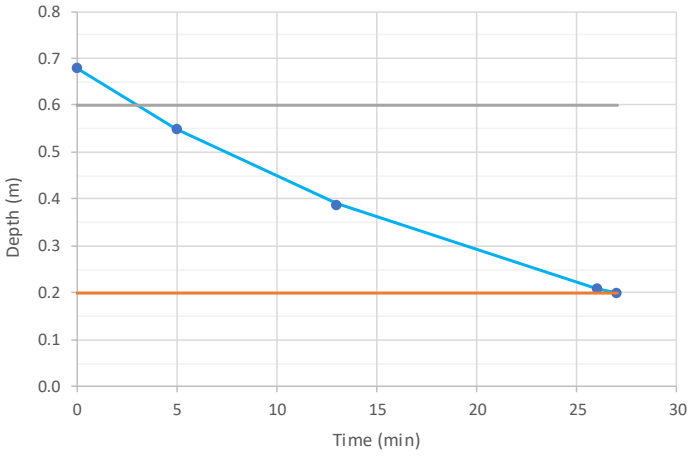
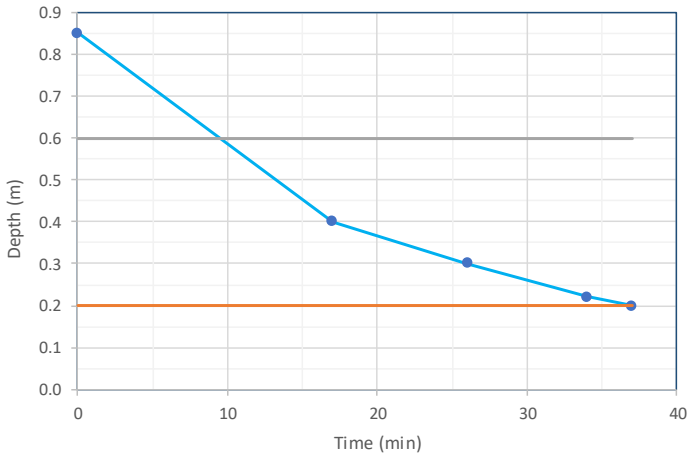
Test No.	Time (min)	Depth (m)			
1	0	0.82	**time 75% =**	9	
	5	0.71	**time 25% =**	28	
	8	0.64	**Area =**	1	
	13	0.52	**Vp 75% =**	0.6	
	16	0.44	**Vp 25% =**	0.2	
	18	0.40			
	30	0.17			
			Vp75-25 =	0.4	m
			As50 =	2.8	m^2
			tp75-25 =	1140	s
			f =	**1.25E-04**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.68	**time 75% =**	3	
	5	0.55	**time 25% =**	27	
	13	0.39	**Area =**	1	
	26	0.21	**Vp 75% =**	0.6	
	27	0.20	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m^2
			tp75-25 =	1440	s
			f =	**9.92E-05**	**m/s**



Test No.	Time (min)	Depth (m)			
3	0	0.85	**time 75% =**	9	
	17	0.40	**time 25% =**	37	
	26	0.30	**Area =**	1	
	34	0.22	**Vp 75% =**	0.6	
	37	0.20	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m^2
			tp75-25 =	1680	s
			f =	**8.50E-05**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site: Wrexham
Client: Stantec

Trial Pit	**7**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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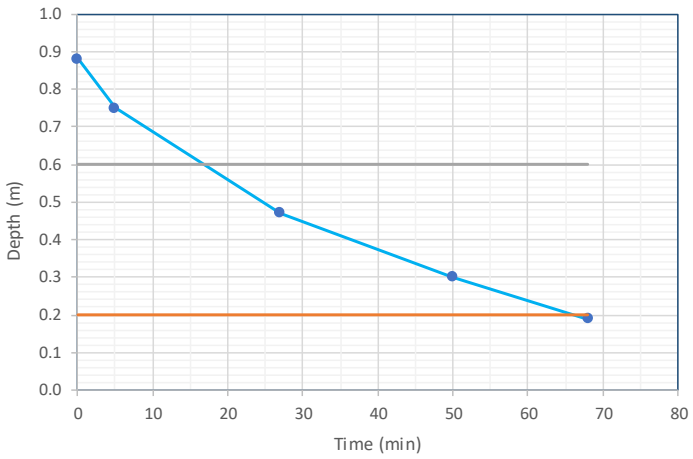
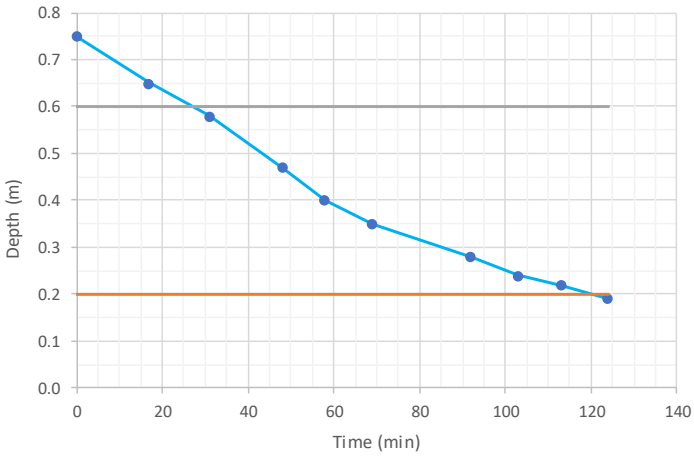
Test No.	Time (min)	Depth (m)			
1	0	0.88	**time 75% =**	17	
	5	0.75	**time 25% =**	66	
	27	0.47	**Area =**	1	
	50	0.30	**Vp 75% =**	0.6	
	68	0.19	**Vp 25% =**	0.2	
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	2940	s
			f =	**4.86E-05**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.75	**time 75% =**	26	
	17	0.65	**time 25% =**	120	
	31	0.58	**Area =**	1	
	48	0.47	**Vp 75% =**	0.6	
	58	0.40	**Vp 25% =**	0.2	
	69	0.35			
	92	0.28			
	103	0.24			
	113	0.22			
	124	0.19			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	5640	s
			f =	**2.53E-05**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**8**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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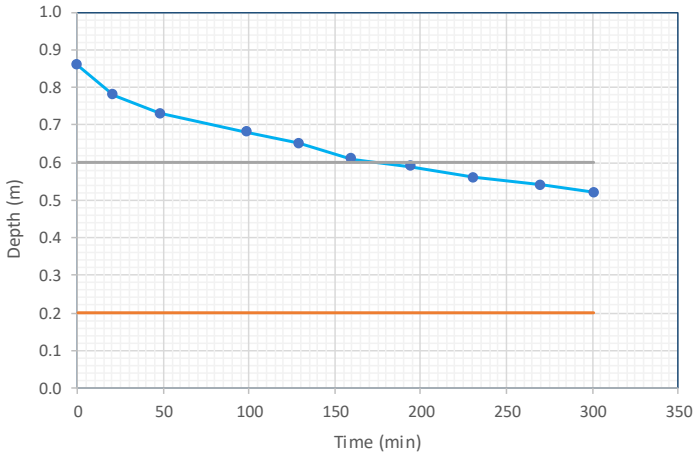
Test No.	Time (min)	Depth (m)			
1	0	0.86	**time 75% =**	175	
	21	0.78	**time 25% =**	N/A	
	48	0.73	**Area =**	1	
	99	0.68	**Vp 75% =**	0.6	
	129	0.65	**Vp 25% =**	0.2	
	160	0.61			
	194	0.59			
	231	0.56			
	270	0.54			
	301	0.52			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	#VALUE!	s
			f =	**#VALUE!**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**9**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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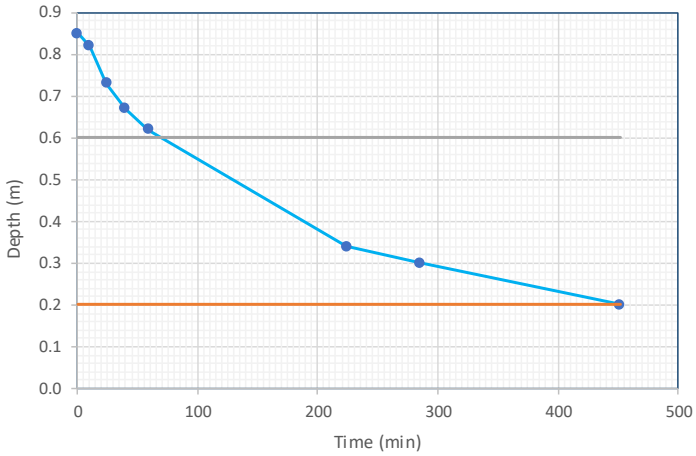
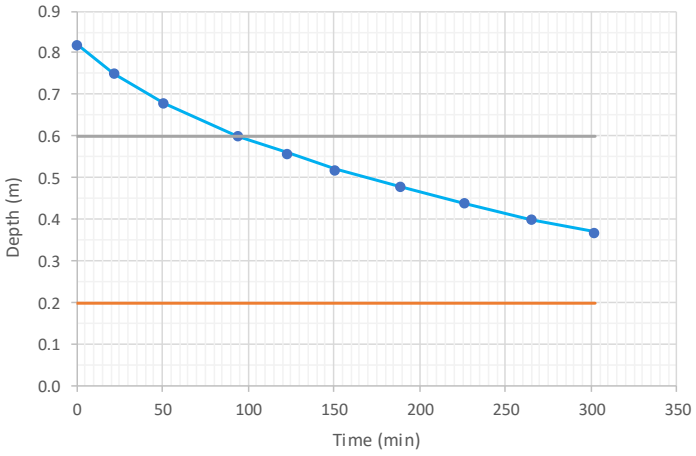
Test No.	Time (min)	Depth (m)			
	0	0.85	**time 75% =**	70	
	10	0.82	**time 25% =**	452	
	24	0.73	**Area =**	1	
	40	0.67	**Vp 75% =**	0.6	
	59	0.62	**Vp 25% =**	0.2	
	224	0.34			
	285	0.30			
1	452	0.20			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	22920	s
			f =	**6.23E-06**	**m/s**



Test No.	Time (min)	Depth (m)			
	0	0.82	**time 75% =**	95	
	22	0.75	**time 25% =**	N/A	
	51	0.68	**Area =**	1	
	94	0.60	**Vp 75% =**	0.6	
	123	0.56	**Vp 25% =**	0.2	
	151	0.52			
	189	0.48			
2	226	0.44			
	265	0.40			
	302	0.37			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	#VALUE!	s
			f =	**#VALUE!**	**m/s**



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Soakaway Test Results - BRE 365 Digest standards

Site:	Wrexham
Client:	Stantec

Trial Pit	**10**	**Date:**	9+10th May 2023
		Performed by:	Oliver Gibbs
Dimensions	(m)	**Weather:**	Sunny
Width	1	**Topsoil:**	Grassed loam
Length	1	**Superficial soil:**	Till/clay mix
Effective depth	0.9	**Comments:**	
Total depth of hole	0.9		

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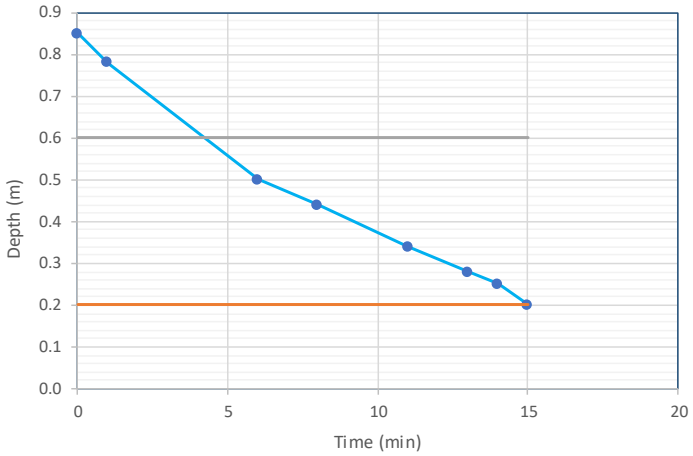
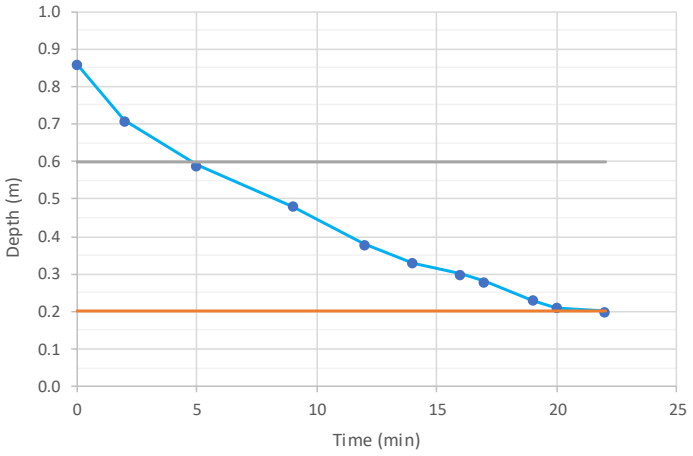
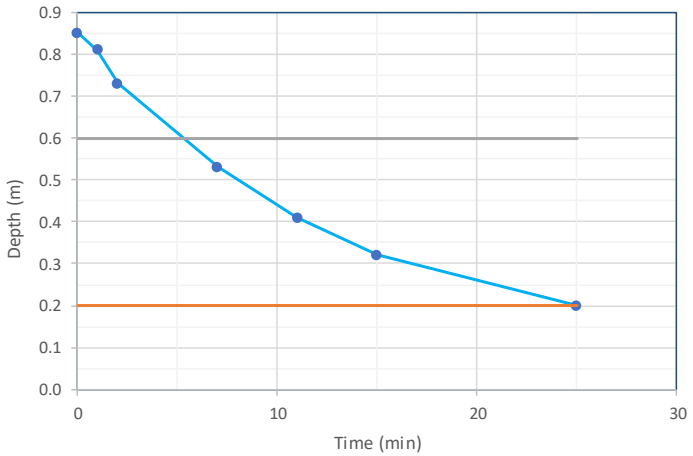
Test No.	Time (min)	Depth (m)			
1	0	0.85	time 75% =	4	
	1	0.78	time 25% =	15	
	6	0.5	Area =	1	
	8	0.44	Vp 75% =	0.6	
	11	0.34	Vp 25% =	0.2	
	13	0.28			
	14	0.25			
	15	0.20			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	660	s
			f =	**2.16E-04**	**m/s**



Test No.	Time (min)	Depth (m)			
2	0	0.86	time 75% =	5	
	2	0.71	time 25% =	22	
	5	0.59	Area =	1	
	9	0.48	Vp 75% =	0.6	
	12	0.38	Vp 25% =	0.2	
	14	0.33			
	16	0.30			
	17	0.28			
	19	0.23			
	20	0.21			
	22	0.20	Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	1020	s
			f =	**1.40E-04**	**m/s**



Test No.	Time (min)	Depth (m)			
3	0	0.85	time 75% =	5	
	1	0.81	time 25% =	25	
	2	0.73	Area =	1	
	7	0.53	Vp 75% =	0.6	
	11	0.41	Vp 25% =	0.2	
	15	0.32			
	25	0.20			
			Vp75-25 =	0.4	m
			As50 =	2.8	m²
			tp75-25 =	1200	s
			f =	**1.19E-04**	**m/s**



3 Conclusions

The tests which could be performed in the timeframe allowed found infiltration results of:

Test Pit 1: 3.97E-05m/s
Test Pit 2: 5.81E-06m/s
Test Pit 4: N/A – Test pit did not drain within the 6 hour timeframe allowed (2x tests performed)
Test Pit 5: 5.81E-05m/s
Test Pit 6: 8.50E-05m/s
Test Pit 7: 2.53E-05m/s
Test Pit 8: Test pit did not drain to 25% in timeframe allowed
Test Pit 9: Second filling test pit did not drain to 25% in timeframe allowed – reading of 6.23E-06 obtained for first fill
Test Pit 10: 1.19E-05m/s

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APPENDIX A: Site Test Plans

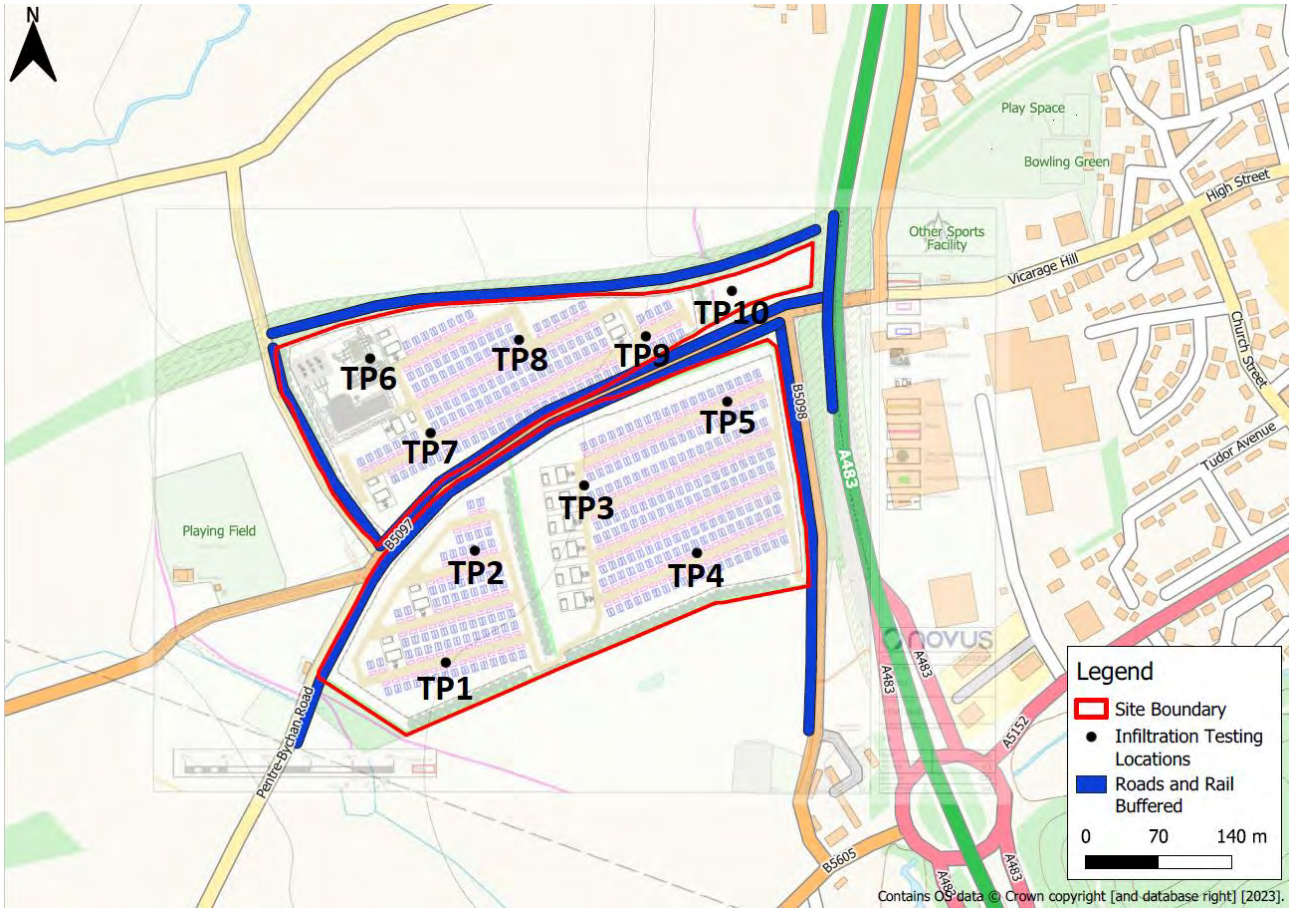

Figure 1- Test pit locations

Figure 2 - Drone pictures of test pit locations

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APPENDIX B: Site Photos

Figure 3 - Test pit 1 after filling

Figure 4 – TP2 draining

Figure 5 – TP3 during filling

APPENDIX C: BGS Records

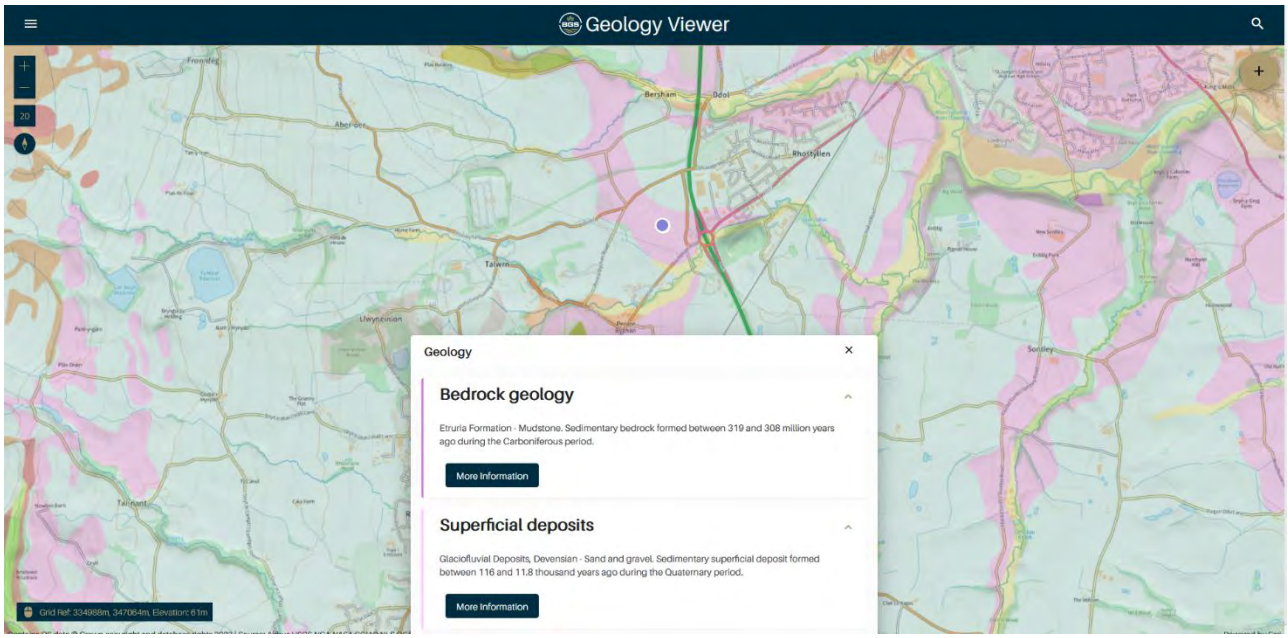


Figure 6 - British Geological Survey records of the site

F Greenfield Runoff Rates

hrwallingford

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	CHARLOTTE LICKMAN
Site name:	Legacy Substation
Site location:	Legacy Substation

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.03063° N
Longitude:	3.03569° W
Reference:	3686152790
Date:	Jun 27 2023 16:31

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	5.48

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.413
Q_{MED} (l/s):	
Q_{BAR} / Q_{MED} factor:	1.08

Hydrological characteristics

	Default	Edited
SAAR (mm):	823	958
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

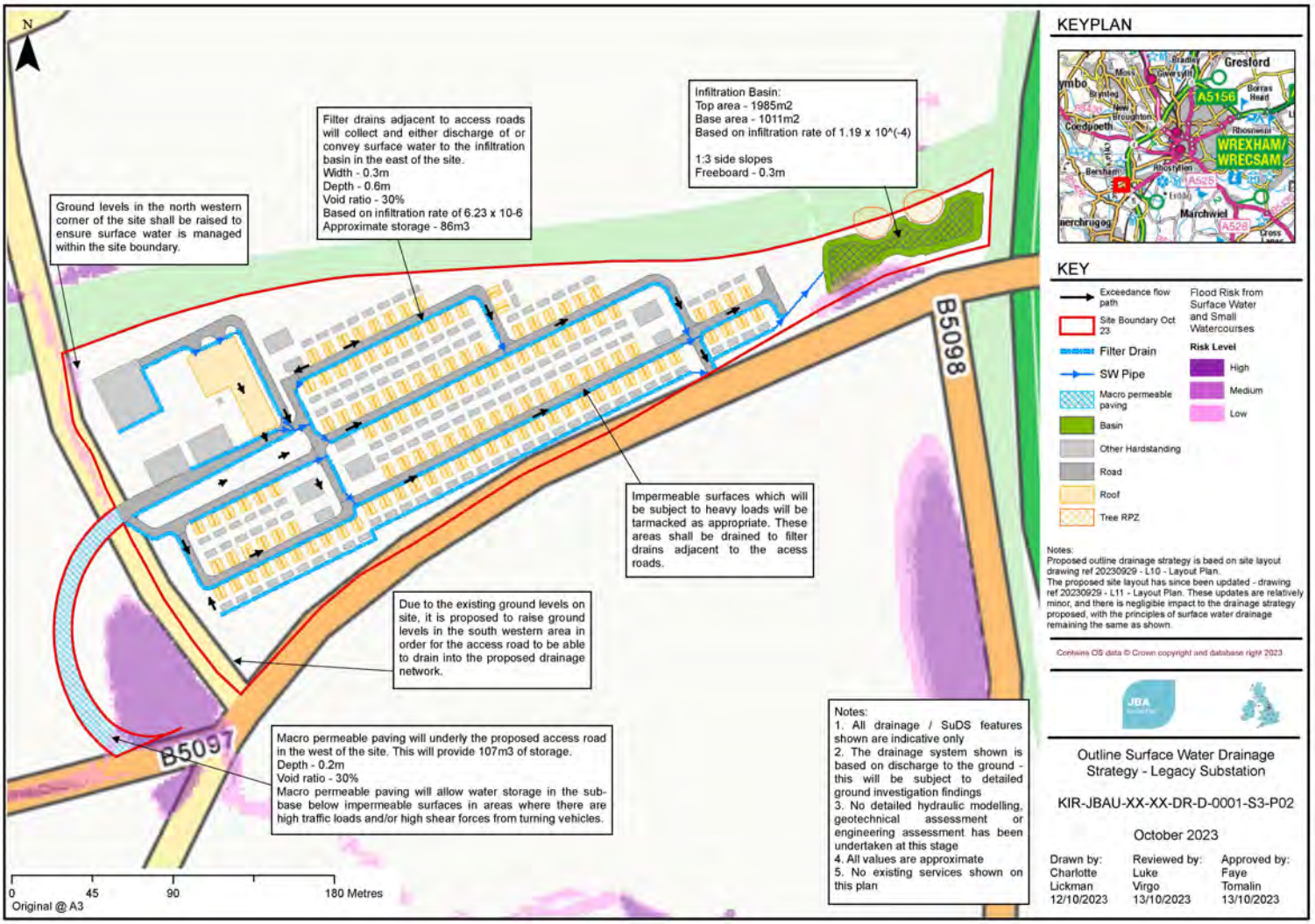
Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):		45.4
1 in 1 year (l/s):		39.95
1 in 30 years (l/s):		80.82
1 in 100 year (l/s):		98.98
1 in 200 years (l/s):		111.69

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

G Outline Drainage Strategy



H MicroDrainage Calculation Record

JBA Consulting		Page 1
The Library St Philips Courtyard Coleshill B46 3AD		Micro Drainage
Date 09/10/2023 17:21 File Legacy V4.SRCX	Designed by jflow_atherstone Checked by	
Micro Drainage	Source Control 2020.1.3	

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

Half Drain Time : 500 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	103.254	0.454	15.8	489.0	O K
30 min Summer	103.331	0.531	16.5	579.3	O K
60 min Summer	103.412	0.612	17.2	676.8	O K
120 min Summer	103.489	0.689	17.9	772.3	O K
180 min Summer	103.527	0.727	18.0	819.5	O K
240 min Summer	103.547	0.747	18.1	844.7	O K
360 min Summer	103.560	0.760	18.1	860.7	O K
480 min Summer	103.559	0.759	18.1	859.8	O K
600 min Summer	103.555	0.755	18.1	854.2	O K
720 min Summer	103.548	0.748	18.1	845.8	O K
960 min Summer	103.536	0.736	18.1	830.0	O K
1440 min Summer	103.505	0.705	18.0	791.4	O K
2160 min Summer	103.455	0.655	17.6	729.6	O K
2880 min Summer	103.404	0.604	17.1	667.0	O K
4320 min Summer	103.276	0.476	16.0	515.5	O K
5760 min Summer	103.170	0.370	15.1	393.9	O K
7200 min Summer	103.082	0.282	14.3	296.0	O K
8640 min Summer	103.011	0.211	13.7	218.8	O K
10080 min Summer	102.954	0.154	13.2	157.7	O K
15 min Winter	103.305	0.505	16.3	549.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	158.359	0.0	26
30 min Summer	95.039	0.0	40
60 min Summer	57.038	0.0	68
120 min Summer	34.231	0.0	126
180 min Summer	25.393	0.0	184
240 min Summer	20.544	0.0	242
360 min Summer	15.240	0.0	356
480 min Summer	12.329	0.0	410
600 min Summer	10.461	0.0	474
720 min Summer	9.146	0.0	536
960 min Summer	7.432	0.0	672
1440 min Summer	5.546	0.0	948
2160 min Summer	4.139	0.0	1364
2880 min Summer	3.363	0.0	1764
4320 min Summer	2.427	0.0	2552
5760 min Summer	1.926	0.0	3288
7200 min Summer	1.609	0.0	3976
8640 min Summer	1.390	0.0	4680
10080 min Summer	1.228	0.0	5360
15 min Winter	158.359	0.0	26

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	103.391	0.591	17.0	651.9	O K
60 min Winter	103.483	0.683	17.8	764.0	O K
120 min Winter	103.574	0.774	18.1	877.5	O K
180 min Winter	103.621	0.821	18.2	937.4	O K
240 min Winter	103.649	0.849	18.2	972.2	O K
360 min Winter	103.674	0.874	18.3	1003.3	O K
480 min Winter	103.677	0.877	18.3	1006.6	O K
600 min Winter	103.668	0.868	18.3	995.7	O K
720 min Winter	103.660	0.860	18.2	985.1	O K
960 min Winter	103.641	0.841	18.2	962.0	O K
1440 min Winter	103.590	0.790	18.1	897.9	O K
2160 min Winter	103.505	0.705	18.0	791.9	O K
2880 min Winter	103.425	0.625	17.3	692.4	O K
4320 min Winter	103.244	0.444	15.7	477.6	O K
5760 min Winter	103.098	0.298	14.4	312.9	O K
7200 min Winter	102.983	0.183	13.5	188.5	O K
8640 min Winter	102.897	0.097	12.7	98.7	O K
10080 min Winter	102.850	0.050	12.3	50.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	95.039	0.0	40
60 min Winter	57.038	0.0	68
120 min Winter	34.231	0.0	124
180 min Winter	25.393	0.0	182
240 min Winter	20.544	0.0	238
360 min Winter	15.240	0.0	350
480 min Winter	12.329	0.0	458
600 min Winter	10.461	0.0	548
720 min Winter	9.146	0.0	574
960 min Winter	7.432	0.0	728
1440 min Winter	5.546	0.0	1034
2160 min Winter	4.139	0.0	1472
2880 min Winter	3.363	0.0	1884
4320 min Winter	2.427	0.0	2684
5760 min Winter	1.926	0.0	3416
7200 min Winter	1.609	0.0	4112
8640 min Winter	1.390	0.0	4752
10080 min Winter	1.228	0.0	5144

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 331150 348300 SJ 31150 48300
C (1km)	-0.026
D1 (1km)	0.383
D2 (1km)	0.398
D3 (1km)	0.315
E (1km)	0.287
F (1km)	2.387
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.707

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.569	4	8	0.569	8	12	0.569

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Model Details

Storage is Online Cover Level (m) 104.000

Infiltration Basin Structure

Invert Level (m) 102.800 Safety Factor 10.0
Infiltration Coefficient Base (m/hr) 0.42840 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.42840

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1000.0	0.700	1249.3	0.701	1249.6

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

Half Drain Time : 188 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	102.913	0.113	3.7	48.8	O K
30 min Summer	102.933	0.133	3.7	57.3	O K
60 min Summer	102.951	0.151	3.8	65.4	O K
120 min Summer	102.965	0.165	3.8	71.2	O K
180 min Summer	102.967	0.167	3.8	72.3	O K
240 min Summer	102.968	0.168	3.8	72.4	O K
360 min Summer	102.965	0.165	3.8	71.2	O K
480 min Summer	102.960	0.160	3.8	69.1	O K
600 min Summer	102.954	0.154	3.8	66.5	O K
720 min Summer	102.947	0.147	3.8	63.7	O K
960 min Summer	102.935	0.135	3.7	58.4	O K
1440 min Summer	102.912	0.112	3.7	48.3	O K
2160 min Summer	102.883	0.083	3.7	35.7	O K
2880 min Summer	102.862	0.062	3.7	26.9	O K
4320 min Summer	102.844	0.044	3.2	18.8	O K
5760 min Summer	102.836	0.036	2.6	15.4	O K
7200 min Summer	102.830	0.030	2.2	13.2	O K
8640 min Summer	102.827	0.027	2.0	11.5	O K
10080 min Summer	102.824	0.024	1.7	10.2	O K
15 min Winter	102.927	0.127	3.7	55.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	158.359	0.0	25
30 min Summer	95.039	0.0	38
60 min Summer	57.038	0.0	66
120 min Summer	34.231	0.0	122
180 min Summer	25.393	0.0	160
240 min Summer	20.544	0.0	192
360 min Summer	15.240	0.0	258
480 min Summer	12.329	0.0	326
600 min Summer	10.461	0.0	394
720 min Summer	9.146	0.0	462
960 min Summer	7.432	0.0	596
1440 min Summer	5.546	0.0	854
2160 min Summer	4.139	0.0	1212
2880 min Summer	3.363	0.0	1556
4320 min Summer	2.427	0.0	2216
5760 min Summer	1.926	0.0	2944
7200 min Summer	1.609	0.0	3680
8640 min Summer	1.390	0.0	4408
10080 min Summer	1.228	0.0	5144
15 min Winter	158.359	0.0	25

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	102.950	0.150	3.8	64.7	O K
60 min Winter	102.972	0.172	3.8	74.3	O K
120 min Winter	102.989	0.189	3.8	81.6	O K
180 min Winter	102.993	0.193	3.8	83.4	O K
240 min Winter	102.992	0.192	3.8	82.9	O K
360 min Winter	102.987	0.187	3.8	80.9	O K
480 min Winter	102.979	0.179	3.8	77.4	O K
600 min Winter	102.969	0.169	3.8	73.2	O K
720 min Winter	102.959	0.159	3.8	68.7	O K
960 min Winter	102.939	0.139	3.8	60.0	O K
1440 min Winter	102.902	0.102	3.7	43.9	O K
2160 min Winter	102.861	0.061	3.7	26.2	O K
2880 min Winter	102.846	0.046	3.4	19.8	O K
4320 min Winter	102.834	0.034	2.5	14.5	O K
5760 min Winter	102.827	0.027	2.0	11.7	O K
7200 min Winter	102.823	0.023	1.7	9.7	O K
8640 min Winter	102.820	0.020	1.5	8.4	O K
10080 min Winter	102.817	0.017	1.3	7.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	95.039	0.0	38
60 min Winter	57.038	0.0	66
120 min Winter	34.231	0.0	120
180 min Winter	25.393	0.0	176
240 min Winter	20.544	0.0	208
360 min Winter	15.240	0.0	278
480 min Winter	12.329	0.0	356
600 min Winter	10.461	0.0	430
720 min Winter	9.146	0.0	502
960 min Winter	7.432	0.0	642
1440 min Winter	5.546	0.0	900
2160 min Winter	4.139	0.0	1224
2880 min Winter	3.363	0.0	1532
4320 min Winter	2.427	0.0	2252
5760 min Winter	1.926	0.0	3000
7200 min Winter	1.609	0.0	3672
8640 min Winter	1.390	0.0	4352
10080 min Winter	1.228	0.0	5152

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 331150 348300 SJ 31150 48300
C (1km)	-0.026
D1 (1km)	0.383
D2 (1km)	0.398
D3 (1km)	0.315
E (1km)	0.287
F (1km)	2.387
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.177

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.059	4	8	0.059	8	12	0.059

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Model Details

Storage is Online Cover Level (m) 104.000

Cellular Storage Structure

Invert Level (m) 102.800 Safety Factor 10.0
Infiltration Coefficient Base (m/hr) 0.09108 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.09108

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1440.0	1440.0	0.201	0.0	1501.6
0.200	1440.0	1501.6			

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I Designer's Risk Assessment

Appendix H - Preliminary CDM Design Risk Assessment

Project element	Hazard	Risk	Control measures
Health and Safety Considerations/ Design of the drainage system			
Health and Safety Considerations/ Construction and Operation Stage			
Plant / material delivery	Access to the site via B5097.	Collisions and injury. Damage to people / vehicles.	Traffic management to be prepared prior to construction activities commencing. Public to be notified of construction activities to take place.
Excavations	Underground services crossing the site. It is known that assets relating to gas, water, and electricity are not present across the site.	Services strikes Injury / death. Damage to existing infrastructure.	Detailed utility survey to be carried out prior to detailed design. Care to be taken when excavating around any existing services to minimise the risk of structural damage.
Excavations	Ground and groundwater conditions – unknown seasonal groundwater fluctuations.	Potential for instability and/or groundwater in excavations	Review the GI report findings and follow recommendations. Preliminary drainage design assumes largely shallow drainage / SuDS features
Excavations	UXO – Unexploded Ordnance	Explosion, injury, death, damage to infrastructure.	A regional 'unexploded bomb (UXB) risk map' for the area has been reviewed through www.zetica.com website. The map shows that the area has low UXO risk.
Design of above ground SuDS features	Risk of trips, falls, and drowning	End user	Detailed design should consider the use of appropriate kerbing where the basin could be located near to vehicular access routes to reduce the risk of vehicles entering SuDS assets. Maintenance schedule should be prepared.
Construction of drainage system	Striking of services Contamination Unstable excavation	Site personnel	Hazard cannot be eliminated by design. Limit the depth of excavation where possible.
Maintenance and inspection	Potential for failure of the	End users Maintenance	Design drainage to an appropriate design life and

of drainage systems	drainage system and flooding of the site.	personnel	design storm event. Regular maintenance in accordance with O&M manual, normal site safety controls, designated overland flow route away from proposed storage units.
Environmental Considerations			
Design of drainage system	Potential for ground contamination Risk of pollution	Pollution of groundwater	Ground investigation to be undertaken to assess the risk of ground contamination, and any remediation measures needed in order to mitigate risk of mobilisation on contaminants.
Design of drainage system	Oil spillage Pollution	Groundwater	SuDS including swales, infiltration basins, and filter drains have been used to treat flows. The Simple Index Approach has been utilised to demonstrate that the proposed SuDS features provide sufficient treatment to ensure there is no detrimental effect to water quality. Therefore, the SuDS measures are considered sufficient to control pollution within the development. Regular maintenance shall be required.
Inspection and clearance of manholes/basins	Oil/fuel, sediment Pollution	Environment Maintenance personnel	Regular maintenance in accordance with O&M manual, normal site safety controls. Materials/sediment removed to be treated as contaminated and disposed of to a licensed waste management facility.
Decommissioning Stage			
Risk and hazards largely as per the construction stage, with the exception that removal of the drainage systems will increase the risk of flooding and water quality deterioration. A replacement SuDS based system in line with the relevant guidance would need to be installed or the site returned to greenfield condition. Diversion of upstream sewer flows would be required, or replacement system installed.			

UNEXPLODED BOMB RISK MAP

SITE LOCATION

Map Centre: 330584,348621

LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

miltary	**industry**	**UXO find**
transport	**dock**	**Luftwaffe targets**
utilities	**Bombing decoy**	**other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

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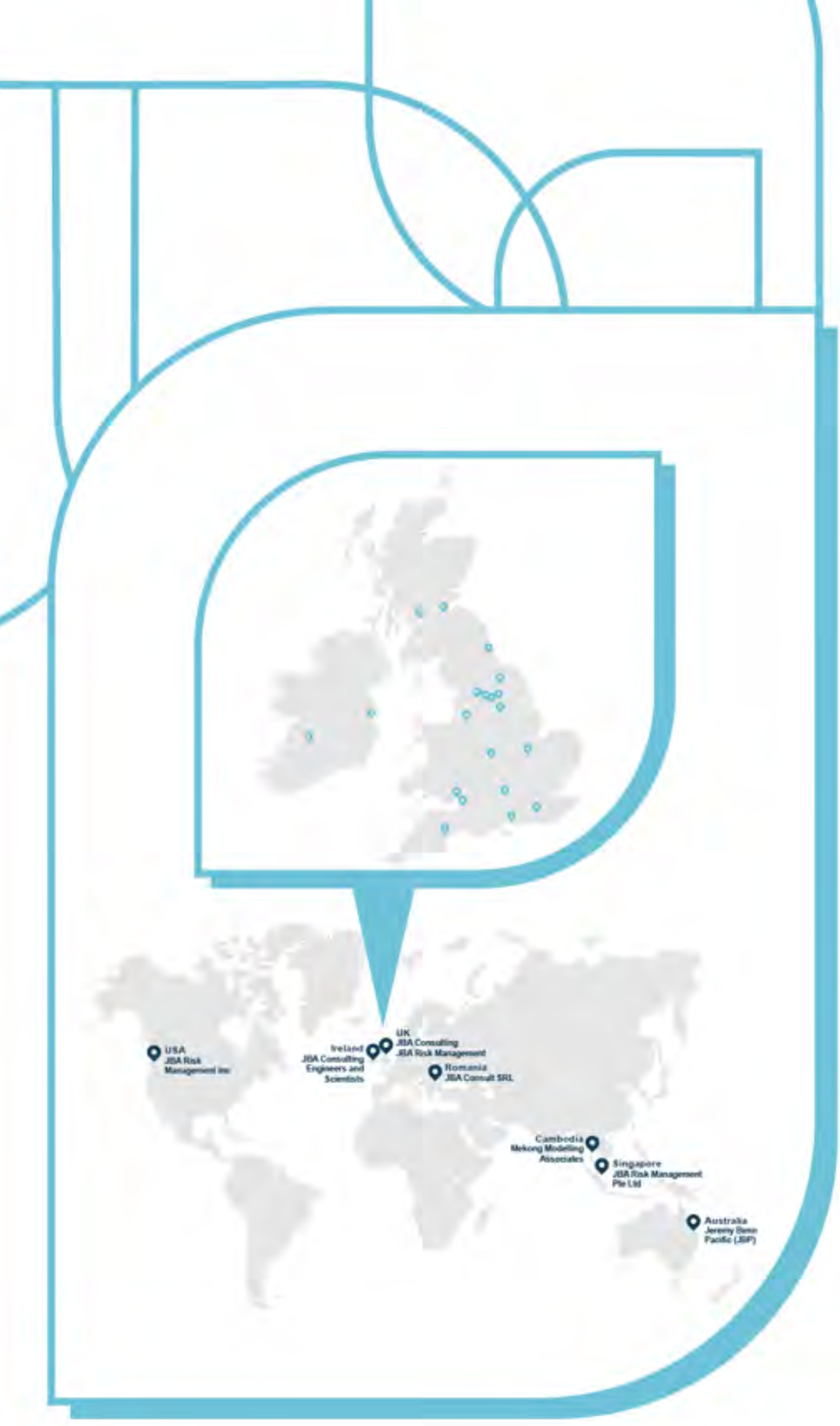
It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.



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