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Project No: 315341

# Drainage Strategy:
# BESS Bridge Road North, Wrexham

Prepared for:

## Hero Future Energies

Spaces-London Ealing Aurora,
71-75 Uxbridge Road,
London, UK
W5 5SL

**Contents Amendment Record**

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# Acknowledgement

## Appointment

This report has been prepared for the sole and exclusive use of Hero Future Energies in accordance with the scope of work presented in Mabbett & Associates Ltd (Mabbett) Letter Agreement (315341/LA/080524/1.0), dated 08 May 2024. This report is based on information and data collected by Mabbett. Should any of the information be incorrect, incomplete, or subject to change, Mabbett may wish to revise the report accordingly.

Mabbett was instructed to complete a Drainage Strategy (DS) on Land south of Bridge Road North, Wrexham Industrial Estate, Wrexham, LL13 9PS (the site) to inform a planning application for the development of a Battery Energy Storage System (BESS).

This report has been prepared by the following Mabbett personnel:

MABBETT & ASSOCIATES LTD



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Georgia Hirst, BSc (Hons) MSc GradCIWEM
Flood Risk and Drainage Consultant

This report has been reviewed and approved by the following Mabbett personnel:

MABBETT & ASSOCIATES LTD



_____
Josh Rigby, BSc (Hons) MCIWEM
Manager | Water Environment Team

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# 1.0 Introduction

## 1.1 Project Understanding

1.1.1 The site has received conditional approval stating that the site requires a Drainage Strategy (DS), a Drainage Design, a Drainage Maintenance Plan, Highways Design Works and a Construction Traffic Management Plan to support the application.

1.1.2 The aim of this report is to assess the potential flood risk to the site, the impact of the proposed development on flood risk elsewhere, and the proposed measures which could be incorporated to mitigate the identified risk (if required). This report has been prepared in accordance with the guidance contained in the National Planning Policy Framework (NPPF) revised in December 2023, the National Planning Practice Guidance (NPPG) Flood Risk and Coastal Change, and Schedule 3 of the Flood and Water Management Act (2010) implemented in January 2019.

1.1.3 Wrexham Council as the SuDS Approving Body (SAB) and Lead Local Flood Authority (LLFA) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all new developments of more than 1 house or floor space greater than 100m$^2$, a Drainage Strategy (DS) is to be attained and Sustainable Drainage Systems (SuDS) implemented. The aim of the Sustainable Drainage Strategy is to identify water management measures, to provide surface water runoff reduction and treatment.

1.1.4 This report takes into account the following national and local policies:

- National Planning Policy Framework (NPPF) (2023)[1];
- National Planning Practice Guidance (NPPG) (2022)[2];
- CIRIA Guidance: The SuDS Manual (C753) (2017)[3];
- Schedule 3 of the Water Flood Management Act (2018); and
- Wrexham Borough Council Local Development and Planning Policies.

## 1.2 Sources of Information

1.2.1 The following sources of information have been reviewed and assessed for the purpose of this DS:

- NRW online flood maps[4];
- British Geological Society (BGS) Interactive Map[5];
- MAGIC Interactive Map[6];
- Denbighshire Preliminary Flood Risk Assessment (2009 PFRA);
- Wrexham Local Flood Risk Management Strategy (2013 LFRMS); and
- Denbighshire Strategic Flood Consequence Assessment (2017 SFCA).

## 1.3 Project Limitations

1.3.1 The wider Mabbett limitations are contained within Appendix A.

1 https://assets.publishing.service.gov.uk/media/65829e99fc07f3000d8d4529/NPPF_December_2023.pdf
2 http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
3 https://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx
4 https://maps.cyfoethnaturiolcymru.gov.uk/Html5Viewer/Index.html?configBase=https://maps.cyfoethnaturiolcymru.gov.uk/Geocortex/Essentials/REST/sites/Flood_Risk/viewers/Flood_Risk/virtualdirectory/Resources/Config/Default
5 http://mapapps.bgs.ac.uk/geologyofbritain/home.html
6 http://www.magic.gov.uk/

# 2.0 Site Details

The aim of this section of the report is to outline key environmental information associated with the baseline environment.

| | | | |
|---|---|---|---|
| **Area (approx.)** | 0.53 Ha | **National Grid Reference (NGR)** | 338120, 349530 |

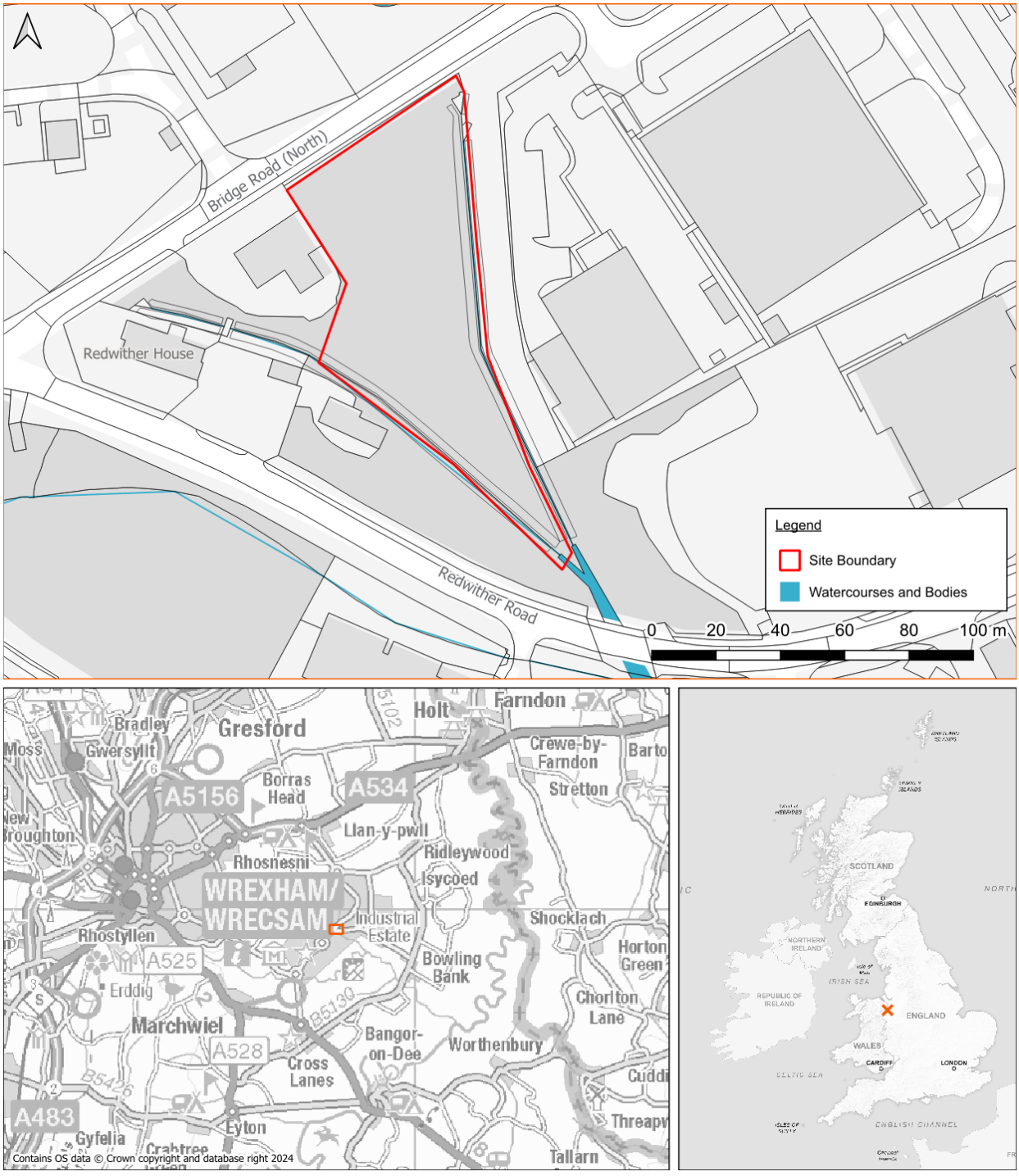



**Figure 1: Site Location Plan**

| | |
|---|---|
| **Site Location** | The site is located within Wrexham Industrial Estate, which is approximately 4km east of Wrexham, Wales. The closest train station is Wrexham situated approximately 5km west of the site. |
| **Existing Site Conditions** | Online mapping (including Google Maps / Google Streetview imagery, accessed 14/06/2024) shows that the site is comprises a wooded area. The site is surrounded by warehouses with associated parking and vegetation between units. There is also Redwither Brook which flows along the east and west boundaries before reaching the confluence in on the south boundary and flowing to the southeast. Access to the site is provided via Bridge Road North towards the north of the site. |
| **Topography** | Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows that the site slopes to the southeast from approximately 26m AOD in the north to approximately 24m AOD in the south (Figure 2). There is also an elevation of 24m along the western and eastern boundaries associated with Redwither Brook. |

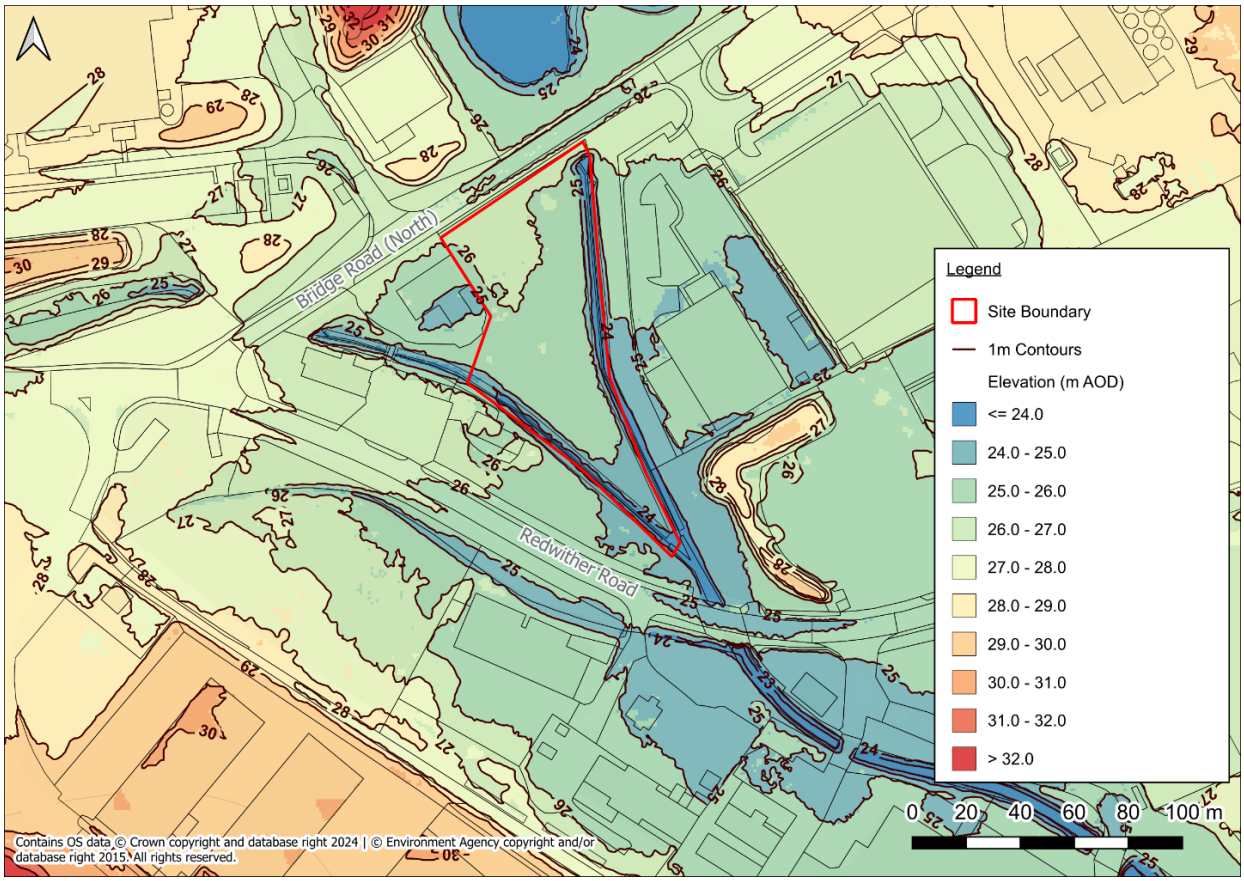



**Figure 2: LiDAR Plan**

| | |
|---|---|
| **Hydrology** | The nearest watercourse is the Redwither Brook which is located along the western and eastern boundaries of the site. The Redwither Brook flows in a southeasterly direction. Redwither Brook appears to be culverted with the outlet in the northeast corner of the site and the inlet situated approximately 45m north of the site boundary.<br><br>Redwither Brook along the eastern boundary appears to be a Main River, and the tributary along the western boundary indicated as an Ordinary Watercourse.<br><br>Main Rivers are the responsibility of NRW. Ordinary Watercourses the responsibility of the LLFA. |

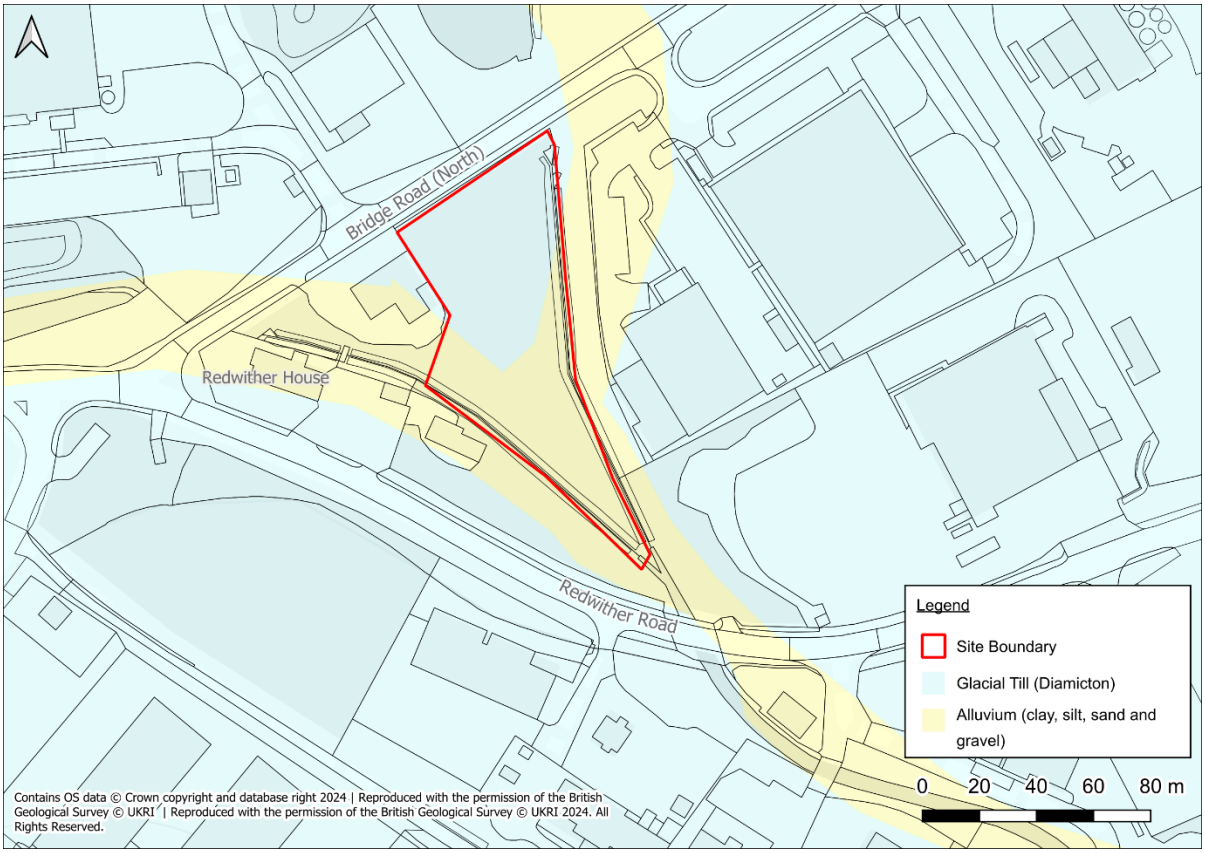



**Figure 3: Superficial Deposits**

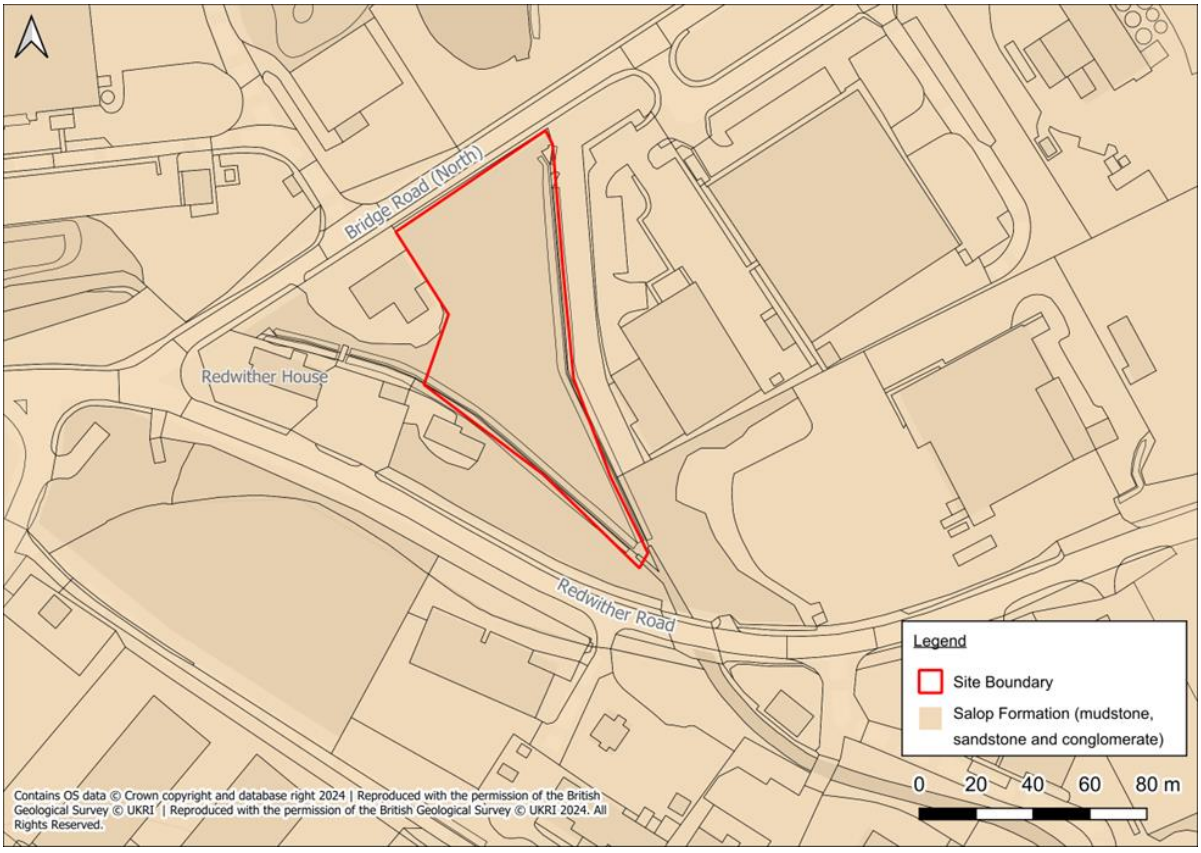



**Figure 4: Bedrock Deposits**

| | |
|---|---|
| **Geology** | Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is underlain by superficial deposits of mainly Alluvium comprising clay, silt, sand and gravel, with the exception of Glacial Till in the north generally comprising Diamicton. The superficial deposits are identified as being underlain by Salop Formation consisting of mudstone, sandstone and conglomerate.<br><br>The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.<br><br>The closest historical BGS borehole record (BGS Ref: SJ34NE130) is located approximately 20m east of the site (NGR 338150, 349550). The borehole record indicates the following geology was encountered:<br><br>• Made ground to 1.8m below ground level (bgl); and<br>• Clay from 1.8 to 6.0m bgl (end of borehole).<br><br>No water strikes were encountered. |
| **Hydrogeology** | According to the NRW's Interactive Map Aquifer Data, [accessed 14/06/24], the Glacial Till is classified as Secondary (Undifferentiated) and Alluvium is classified as a Secondary A Aquifer.<br><br>The underlying Salop Formation is described as a Secondary A Aquifer.<br><br>Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.<br><br>Secondary Undifferentiated Aquifers are assigned in 'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type'.<br><br>The NRW's 'Source Protection Zones' data, obtained from NRW's Interactive Map [accessed 14/06/24], indicates that the site is not located within a Groundwater Source Protection Zone. |
| **Local Drainage** | Public sewer records have been obtained from Dwr Cymru via a Groundsure Report which is included in Appendix B. The Dwr Cymru sewer records show that there is a 150mm combined public sewer crossing the north of the site from west to east, and a 300 and 375mm combined public sewer adjacent/along the eastern boundary of the site. The sewer records do not indicate the invert levels for these combined sewers. |
| **Development Proposals** | The proposed development is for a BESS site, the proposed development plan is included in Appendix C.<br><br>The proposed development will introduce hardstanding areas in the form of BESS buildings, access and associated infrastructure. Hardstanding will comprise approximately 930m$^2$ or 17.5% of the total site area. The remaining permeable, soft landscaped areas will occupy approximately 4,370m$^2$ or 82.5% of the total site area. This has been calculated using the landscape proposals and GIS. |

# 3.0 Relevant Planning Policy and Guidance

## 3.1 Introduction

3.1.1 The aim of this section of the report is to discuss the main aspects of the local and national planning policies that are relevant to any proposed development on the site and relevant guidance and legislation.

## 3.2 Planning Policy Wales

3.2.1 Given the nature and scale of the development, the proposed development is considered to be a 'less vulnerable' development in accordance with Figure 2 of the Welsh Government's Technical Advice Note 15 – Development and Flood Risk (TAN15).

3.2.2 The NRW Development Advice Map indicates that the site is shown within Flood Zone C2 in the north, east and south and Flood Zone B in the west. TAN15 states that less vulnerable development can be considered in Flood Zone C2 subject to the application of the TAN15 Justification Test and satisfying specific TAN15 acceptability criteria.

3.2.3 Schedule 3 is the new legislation which the Welsh Government implemented in January 2019. The main role of the legislation is to guarantee that SuDS are utilised to manage surface water on new developments in urban and rural areas. The following changes now apply in Wales:

- New developments of more than 1 house or where construction area is >100m$^2$ will require the implementation of SuDS;
- Drainage Systems must be designed and built with regards to the statutory SuDS standards;
- Local authorities will become the SuDS Approving Body (SAB);
- SuDS schemes require approval by the acting SAB before construction starts; and
- The SAB are responsible for adopting compliant SuDS as long as it is built in accordance with the approved proposals.

## 3.3 Local Policy

3.3.1 The Wrexham Council Local Plan contains the following policies relating to drainage:

"*Policy DM1: Development Management Considerations*

*3.3.2 Development proposals, where relevant, must:*

*3.3.3 viii. Not increase the risk of flooding but make adequate provision for sustainably dealing with foul and surface water drainage and not result in an unacceptable impact upon the water environment."*

## 3.4 Climate Change

3.4.1 The NRW 'Flood Risk Assessments: Climate Change Allowances' Guidance states that the central estimate or change factor should be used as a minimum for development proposals. This may not be applicable to every site depending on the scale and nature of the site. Where the assessment indicates significant flood risk then the upper estimate should be used.

3.4.2 The Peak River Flow Allowance[7] for West Wales within the central estimate is 25% for the 2050s epoch and 30% for the 2080s epoch.

3.4.3 The Peak Rainfall Intensity across all of Wales within the central estimate is 10% for the 2050s epoch and 20% for the 2080s epoch.

3.4.4 It is worth noting that for river catchments over 5km2, the climate change percentages for peak river flow should be used as the peak rainfall intensity

[7] https://www.gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf

## 3.5 Guidance

3.5.1 The 2015 CIRIA SuDS Manual involves guidance that covers “the planning, design, construction, and maintenance of SuDS to assist with effective implementation in both new and existing developments. The aim is to maximise amenity and biodiversity benefits and deliver the key objectives of managing flood risk and water quality.”

## 3.6 Consultation

3.6.1 A pre-planning opinion request was submitted to the NRW in June 2024, and their response has been included within Appendix D.

3.6.2 A consultation request was submitted to the LLFA in June 2024, a response is awaited.

3.6.3 A pre-development enquiry to request sewer plans from Dwr Cymru request was not submitted due to previous plans being provided within the Groundsure Report, which is included within Appendix B.

3.6.4 The site is not located within an Internal Drainage Board (IDB) District.

3.6.5 The site has attained planning permission (ref: ISY P/2022/0057) subject to the following drainage conditions which are addressed in this report.

*3.6.6 “10. No part of the development shall commence until a scheme for the comprehensive and integrated drainage of the site indicating provision for foul water, surface water and land drainage has been submitted to and approved in writing by the Local Planning Authority. Prior to the submission of those details, an assessment shall be carried out into the potential for disposing of surface water by means of Sustainable urban Drainage Systems (SuDS) in accordance with the principles of sustainable drainage systems set out in Technical Advice Note 15: Development and Flood Risk, and the results of the assessment shall be submitted in writing to the Local Planning Authority. Where a SuDS scheme is to be implemented, the submitted details shall:*

*i) Provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of receiving ground water and/or surface waters;*

*ii) Specify the responsibilities of each party for the implementation of the SuDS scheme, together with a timetable for that implementation; and,*

*iii) Provide a timescale for implementation, management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime*.

*11. No part of the development shall be occupied until the sustainable drainage scheme for the site has been completed in accordance with condition no. 10. The sustainable drainage scheme shall be managed and maintained thereafter in strict accordance with the agreed management and maintenance plan.*

*12. No development shall take place within 3 metres either side of the public sewer which crosses the site.*

*13. No land drainage run-off or surface water shall be permitted to discharge or connect to the public sewerage system, either directly or indirectly, and foul and surface water shall be drained separately from the site.”*

# 4.0 Drainage Strategy

## 4.1 Introduction

4.1.1 The site currently comprises undeveloped land which is not formally drained and is therefore considered to be 100% permeable.

4.1.2 The proposed development will introduce 930m² of hardstanding in the form of BESS buildings, access and associated infrastructure.

4.1.3 The increase in hardstanding area will result in an increase in surface water runoff rates and volumes. In order to ensure the proposed development will not increase flood risk elsewhere, surface water discharge from the site will be controlled.

## 4.2 Drainage Hierarchy

4.2.1 The recommended surface water drainage hierarchy (Paragraph 080 of the NPPG: Flood Risk and Coastal Change) is to utilise soakaway systems or infiltration as the preferred option, followed by discharging to an appropriate watercourse. If this is not feasible, the final option is to discharge to an existing public sewer.

**Surface Water Discharge to Soakaway**

4.2.2 The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces). As described above the site is underlain by superficial deposits of Alluvium with Glacial Till towards the north which is underlain by Salop Formation.

4.2.3 It can be concluded that soakaways may not be suitable for the discharge of surface water runoff.

4.2.4 Infiltration tests should be undertaken in accordance with the BRE365 specification to determine the suitability of soakaways. Soakaways should be located a minimum of 5m from habitable dwellings.

**Surface Water Discharge to Watercourse**

4.2.5 Where soakaways are not suitable a connection to watercourse is the next consideration.

4.2.6 The nearest watercourses are onsite along the western and eastern boundaries. The watercourse along the eastern boundary is a Main River and is at approximately 23m AOD. Discharge to Redwither Brook at a limited discharge rate appears to be feasible via gravity.

**Surface Water Discharge to Sewer**

4.2.7 As described above, a connection to Redwither Brook is feasible and therefore a connection to the public surface water sewer is not required.

## 4.3 Surface Water Discharge

4.3.1 The existing greenfield runoff rates have been estimated using the Revitalised Flood Hydrograph Model (ReFH2) method, provided in Table 2 below.

**Table 1: Runoff Rates**

| Return Period (Years) | Runoff Rate (l/s) |
|---|---|
| $Q_{BAR}$ | 0.09 |
| 1 in 1 | 0.08 |
| 1 in 30 | 0.15 |
| 1 in 100 | 0.19 |
| 1 in 1000 | 0.21 |

4.3.2 A flow rate of 1l/s is proposed for this site to ensure the drainage system is self-cleansing / betterment on brownfield.

## 4.4 Attenuation Storage

4.4.1 In order to achieve a discharge rate of 1l/s, attenuation storage will be required. Storage estimates have been provided using Causeway Flow and are included in Appendix E. Table 2 below provides the input parameters for the calculations and the estimated storage volumes:

**Table 2: Attenuation Storage Volume Parameters**

| | | |
|---|---|---|
| **Proposed Discharge Rate** | | 1l/s |
| **Total Proposed Impermeable Area** | | 930m$^2$ |
| **Design Head** | | 0.5m |
| **Flow Control Device** | | HydroBrake |
| **Estimated Storage Volume** | **1 in 100 + 40% CC** | 30.1m$^3$ |

4.4.2 The attenuation volumes are provided for indicative purposes only and should be verified at the detailed design stage.

## 4.5 Sustainable Drainage Systems

4.5.1 Attenuation storage should be provided in the form of Sustainable Drainage Systems (SuDS) where practical. The following SuDS options have been considered:

**Soakaways**

4.5.2 The As described above, the use of soakaways is not considered to be feasible.

**Swales, Detention Basins and Ponds**

4.5.3 Sufficient space is available on site to utilise a pond, basin or swale as an above ground attenuation feature. A basin has been proposed within the south of the site in order to facilitate gravity drainage (which can be seen in drawing 315341 RC003, Appendix F).

**Filter Drains/Strips**

4.5.4 Filter drains are trenches filled with stone/gravel that create temporary subsurface storage for the filtration, attenuation, and conveyance of surface water runoff. Ideally, filter drains receive lateral inflow from adjacent impermeable surfaces pretreated over a filter strip. Filter drains can help manage peak flows by naturally limiting rates of conveyance through the filter medium and by providing attenuation storage when the rate of flow at the outlet is controlled. A filter drain has been proposed within the central/southern area of the site, which can be seen in drawing 315341 RC003, Appendix F.

**Bioretention Systems**

4.5.5 Bioretention systems (including rain gardens and raised box planters) are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution. They also provide attractive landscape features and biodiversity. Bioretention systems can help reduce flow rates from a site by promoting infiltration / evapotranspiration and providing some attenuation storage. Bioretention systems can also provide very effective treatment functionality. Bioretention systems are a very flexible surface water management component that can be integrated into a wide variety of developments / densities using different shapes, materials, planting, and dimensions. Bioretention systems (including rain gardens) should be considered within the detailed drainage design.

**Rainwater Harvesting**

4.5.6 The attenuation benefits provided through the use of rainwater harvesting are considered to be limited and would only be realised when the tanks were not full. However, rainwater harvesting techniques could be incorporated within the final design.

**Green Roofs**

4.5.7 Green roofs are not identified on development plans. Given the nature of the proposed development, the significant additional cost involved in installing and maintaining green roofs and the additional works required to allow for the additional loading on the building, green roofs are not considered a practical option. The benefits achieved through installing a green roof would be disproportionate to the significant ongoing maintenance and construction costs involved.

**Porous/Permeable Surfacing**

4.5.8 Permeable paving could be incorporated within the new access road. Storage would be provided within the sub-grade material prior to controlled release to the receiving watercourse. The amount of storage offered by permeable paving is subject to sub-grade depth and site gradient. The use of permeable surfacing should be considered at the detailed design stage.

4.5.9 Additionally, the area where the BESS will be placed on should be constructed on a gravel bed (proposed area of 770m$^2$) at a minimum of 0.45m deep and have a void ratio of 30%. This will provide 103.9m$^3$ of attenuation storage within the sub-grade without surcharging and is sufficient to accommodate a 1 in 100 year +40% CC event

## 4.6 Preferred Drainage Scheme

4.6.1 Soakaways are not considered feasible, surface water runoff will be discharged to Redwither Brook located along the eastern boundary at a rate of 1l/s. Surface water runoff up to the 1 in 100 year plus 40% climate change allowance event will be attenuated on site. A total attenuation volume of 30.1m$^3$ will be required to achieve the discharge rate and will be provided in the form of permeable surfacing (gravel beds), a filter drain and a basin, which can be seen on drawing 315341 RC003, Appendix F.

4.6.2 The proposed surface water drainage scheme will ensure no increase in runoff over the lifetime of the development / will create betterment over the existing drainage.

## 4.7 Event Exceedance

4.7.1 Storage will be provided for the 1 in 100 year plus 40% CC event. Storm events in excess of the 1 in 100 year plus 40% CC event should be permitted to produce temporary shallow depth flooding within the car park / access road / landscaped areas. Finished floor levels will be set at a minimum of 150mm above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

## 4.8 Surface Water Treatment

4.8.1 In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs have a 'very low' pollution hazard level, with low traffic roads classified as having a 'low' pollution hazard level. Table 2 below shows the pollution hazard indices for each land use.

**Table 2: Pollution Hazard Indices**

| Land Use | Pollution Hazard Level | Total Suspended Solids (TSS) | Metals | Hydrocarbons |
|---|---|---|---|---|
| **Other Roofs (typically commercial/industrial roofs)** | Low | 0.5 | 0.2** | 0.4 |

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

* Indices values range from 0-1.

** up to 0.8 where there is potential for metals to leach from the roof

4.8.2 Where practical, runoff will be directed to Redwither Brook along the eastern boundary. Table 3 below demonstrates that permeable surfacing and a basin provides sufficient treatment.

**Table 3: SuDS Mitigation Indices**

| | Mitigation Indices | | |
|---|---|---|---|
| **Type of SuDS** | **Total Suspended Solids (TSS)** | **Metals** | **Hydrocarbons** |
| **Permeable Surfacing** | 0.7 | 0.6 | 0.7 |
| **Detention basin** | 0.5 | 0.5 | 0.6 |

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3

4.8.3 It can be concluded that the inclusion of a detention basin and permeable surfacing will provide sufficient treatment.

## 4.9 Maintenance

4.9.1 Maintenance of communal drainage features such as permeable surfacing, filter drains and basins will be the responsibility of the site owner. Maintenance of shared surface water drainage systems can be arranged through appointment of a site management company.

4.9.2 A Maintenance Plan has been included in Appendix G. Maintenance of the separator will be as per the manufacturer's guidance.

# 5.0 Conclusions and Recommendations

## 5.1 Conclusions

5.1.1 On the Natural Resource Wales (NRW) Online Flood Map, the site is shown to be within Flood Zone 3 along the boundaries of the site, meaning it has a 1% annual probability. On the Development Advice Map, the site is shown within Flood Zone C2 in the north, east and south and Flood Zone B in the west.

5.1.2 The proposed development will introduce impermeable drainage area in the form of BESS buildings and access. This will result in an increase in surface water runoff. In order to ensure the increase in surface water runoff will not increase flood risk elsewhere, flow control will be used, and attenuation provided on site to accommodate storm events up to and including the 1 in 100 year plus 40% climate change event.

5.1.3 All methods of surface water discharge have been assessed. Where soakaways are not possible, discharge of surface water to Redwither Brook at a rate of 1l/s appears to be the most practical option. It has been proposed that the BESS infrastructure will be placed on a bed of gravel and there will be a filter bed and a basin to attenuate the site.

## 5.2 Recommendations

**Drainage Strategy**

- Undertake BRE Digest 365 infiltration testing to determine the suitability of infiltration techniques; and
- Verify the attenuation volumes included in this report when undertaking detailed drainage design;

# Appendix A – Limitations

# Limitations

The recommendations contained in this Report represent Mabbett professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Mabbett does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions.

Mabbett obtained, reviewed and evaluated information in preparing this Report from the Client and others. Mabbett conclusions, opinions and recommendations has been determined using this information. Mabbett does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Mabbett has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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# Appendix B – Groundsure Report

Groundsure
LOCATION INTELLIGENCE

Premier Energy
specialists in utility infrastructure



# Groundsure Premier Utilities

## Unit R1 Bridge End North Wrexham Industrial Estate


**LOCATION INTELLIGENCE**
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# Unit R1 Bridge End North Wrexham Industrial Estate

**Cross Lanes**
**Marchweil**
**Wrexham**
**LL13 9QS**

**16/06/2020**

PROJECT NO.
**606801**

ISSUE NO.
**2**

STATUS
**For Information**

# Introduction

## This report assesses the potential constraints presented by the existing utility infrastructure both within the boundary and in the vicinity of the search area.

The report is based on the information provided by the client about the location of the search area and the information provided by the utilities about their existing plant and networks. The information contained in this report is based on desk research only.

## What is a utility constraint?

We use the term constraint to indicate that there may be limitations or prohibitions on designs and planned works due to the presence of utility apparatus. To overcome these can be costly and time-consuming. Depending on the legal rights and statutory powers of the utility the costs may have to be borne by the applicant/developer.

## Report interpretation

We have developed a simple traffic light mechanism to present site constraints based on a red/amber/green evaluation;



Red – site constraints exist due to the presence of utility apparatus.



Amber – site constraints may exist due to the proximity of utility apparatus.



Green – site constraints do not appear to exist.

This report confirms to QL-D of PAS 128:2014 - Specification for Underground Utility Detection, Verification and Location. To obtain further detail on utility locations consider site reconnaissance (QL-C), detection (QL-B) and verification (QL-A) as recommended under 'Important Information'.

| Prepared by | Signed off by |
|---|---|
| Hannah Stalley | Martin Darlison |

Cert No 6206
ISO 9001

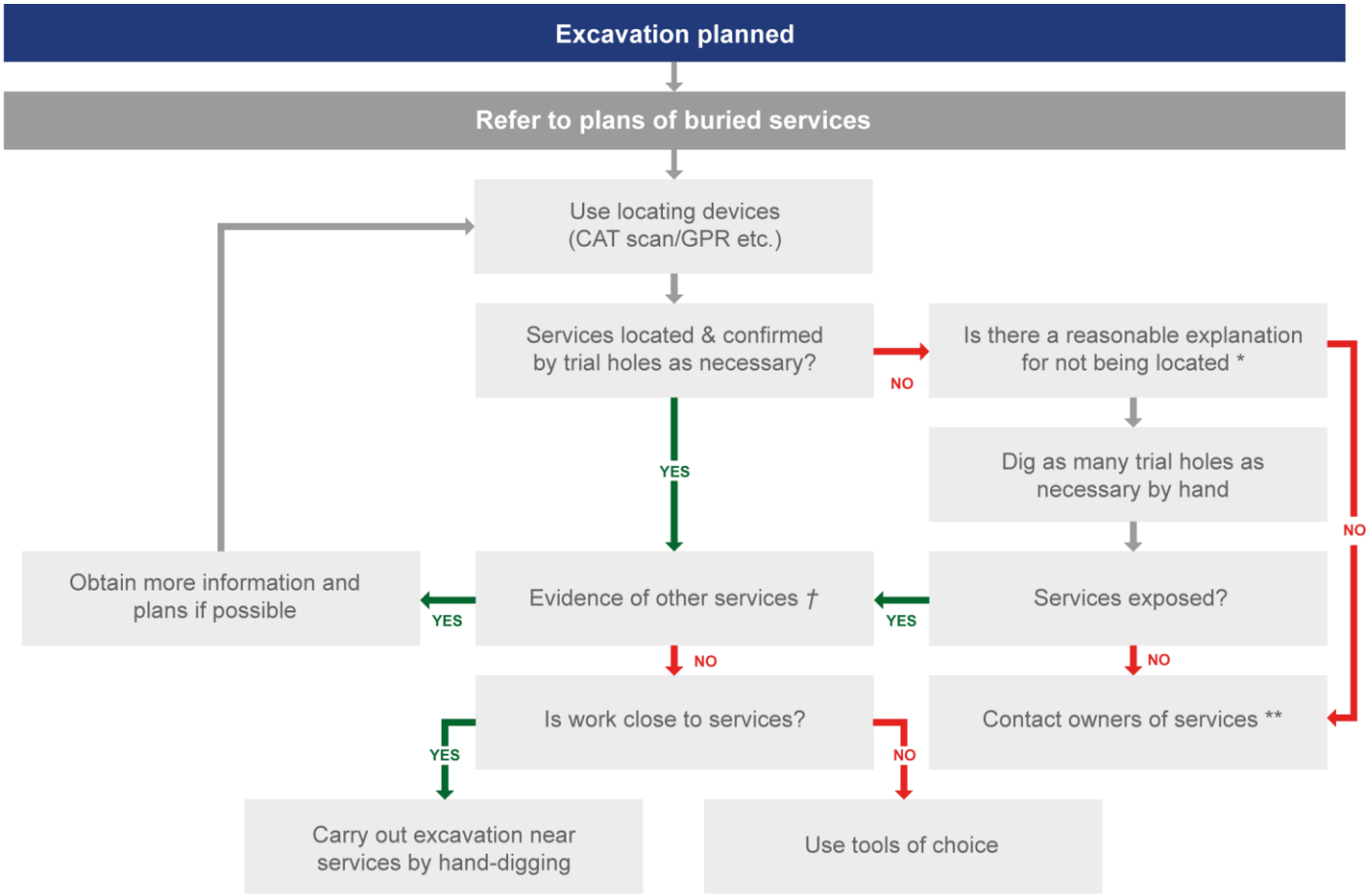
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# Important Information

This flow diagram is intended to help give an understanding of the process from referring to plans on-site through to the start of excavation, for example when excavating in a road or footway. However it:

- Describes only part of the process; it does not, for example, describe planning the work, including reference to plans at the design stage;
- Is a simplified picture and not a substitute for reading the text;
- Is not a substitute for a suitable and sufficient risk assessment;
- Does not take account of a number of other situations, e.g. cable embedded in concrete or those situations where resiting services is proposed.




* *For example, could services be non-metallic pipes? Please refer to HS (G) 47 text for further information.*

† *In particular; visual evidence. Ensure that the presence of services, which may be unmarked on plans or for which no plans are available, has been considered, for example service connections.*

** *If there is visual evidence of services, but owners cannot be traced, despite all reasonable attempts to do so, any excavation could proceed but using hand-dug trial holes and proceeding with great care.*

# Important Information

## Relevant Documents

The following documents must be referred to before work commences in the vicinity of existing services:

- Health and Safety Booklet HS (GS) 6 Avoidance of Danger from Overhead Electric Lines.
- General Safety Measures to Avoid Injury and Damage to Gas Apparatus.
- HSE Guidance Note HS (G) 47 Avoiding Danger from Underground Services.
- National Joint Utilities Group (NJUG) Publications Vol. 1.
- CDM Regulations 2015.
- PAS 128:2014 Specification for Underground Utility Detection, Verification and Location.

## Basic Risk Assumption for all Services

When dealing with existing services the following assumptions must always be accepted:

- All existing buildings have gas, water electric and telecoms supplies to them until proven otherwise.
- Any supply to an existing building, no matter how old the building is or how deteriorated the supply may appear, is taken to be 'live' until proven otherwise.
- All open land, vacant lots and derelict sites are deemed to have services beneath them until proven otherwise.
- The only acceptable proof that a service is 'dead' and can be removed is written confirmation from the owner of the service.
- *The quality and accuracy of information provided by utilities about their existing plant is indicative and no warranty is made as to its accuracy. Therefore, any utility asset maps and/or marked up drawings provided by each utility must only be used as a guide and the actual location of plant should be verified by EML/GPR survey or trial holes before construction works commence.*
  *Please note not all service connections are shown on the utility asset maps.*

## Plant Found Within Site Boundaries

Where utility plant is found within the site boundary, it is recommended for the client to check for legal easements or wayleaves.

Diversions of plant within site boundaries can be expensive and time consuming to relocate. Further investigation of costs and timescales are recommended. Please ask PES for further details.

## Desk Research

With several utility suppliers, PES use their own databases to check if assets are likely to be in the vicinity. These utilities are shown with a tick under the Desk Research column in the Enclosures list. Our utility contact schedule can be provided on request. It must be noted that certain utility companies do not respond if their plant is unaffected and we issue these with a green (unaffected) traffic light unless otherwise informed.

# Enclosures

| Type | Company | In Vicinity | Desk Research | Awaiting Response |
|---|---|---|---|---|
| Electricity | SP Energy Networks |  | | |
| Water | Hafren Dyfrdwy |  | | |
| Drainage | Welsh Water |  | | |
| Gas | Walles and West Utilities |  | | |
| Openreach | Openreach |  | | |
| Virgin Media | Virgin Media |  | | |
| Independents | GTC |  | | |
| | Energetics |  | | |
| Linesearch (LSBUD) | WWU see gas, Zayo in vicinity |  | | |
| | GTT (inc Vtesse & Interoute) |  | | |
| Comms. | Vodafone |  | | |
| | Colt |  | | |
| | KPN |  | | |
| | SKY Telecommunications |  | | |
| | Instalcom |  | | |
| | Verizon |  | | |
| | SOTA |  | ✓ | |
| | KCOM |  | ✓ | |

| Type | Company | In Vicinity | Desk Research | Awaiting Response |
|---|---|---|---|---|
| | TeliaSonera (Telent) |  | ✓ | |
| | euNetworks |  | ✓ | |
| | CityFibre |  | ✓ | |
| | Mast Data |  | | |
| **Tunnels & Pipelines** | Onshore Cables |  | ✓ | |
| | ENGIE |  | ✓ | |
| | ElecLink Interconnector |  | ✓ | |
| **Transport** | Network Rail |  | ✓ | |
| | HS 2 (High Speed Rail) |  | ✓ | |
| | Genesys |  | ✓ | |
| | Trafficmaster |  | ✓ | |

# Acronyms Key

| Apparatus | | | |
|---|---|---|---|
| Electric | | | |
| DNO | Distribution Network Operator | kVA | Kilo Volt Amperes |
| IDNO | Independent Distribution Network Operator | MVA | Mega Volt Amperes |
| ICP | Independent Connections Provider | AC | Alternating Current |
| LV | Low Voltage | S/S | Substation |
| HV | High Voltage | PMT | Pole Mounted Transformer |
| EHV | Extra High Voltage | | |
| Water | | | |
| SLO | Self Lay Organisation | WRAS | Water Regulation Advisory Scheme |
| Incumbent | Local Water or Water & Sewerage Company | | |
| Gas | | | |
| GDN | Gas Distribution Network | LP | Low Pressure |
| IGT | Independent Gas Transporter | MP | Medium Pressure |
| UIP | Utility Infrastructure Provider | IP | Intermediate Pressure |
| PRS | Pressure Reducing Station (Governor) | HP | High Pressure |
| Others | | | |
| PES | Premier Energy Services | CATV | Cable Television |
| PE | Polyethylene | FTTP | Fibre to the premise |
| DI | Ductile Iron | FTTC | Fibre to the cabinet |
| ST | Steel | l/min | Litres per minute |
| CI | Cast Iron | H&S | Health & Safety |
| SI | Spun Iron | HBF | House Builders Federation |
| HPPE | High Performance Polyethylene | TPO | Tree Preservation Order |
| MDPE | Medium Density Polyethylene | TBC | To be confirmed |
| GRP | Glass Reinforced Plastic | N/A | Not Applicable |




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**Request Ref:** 507142

Unit R1 Bridge End North Wrexham Industrial Estate,
Cross Lanes, Marchweil, Wrexham, LL13 9QS
**Eastings** 338121, **Northings** 349548

Imagery sourced from Open Street Maps

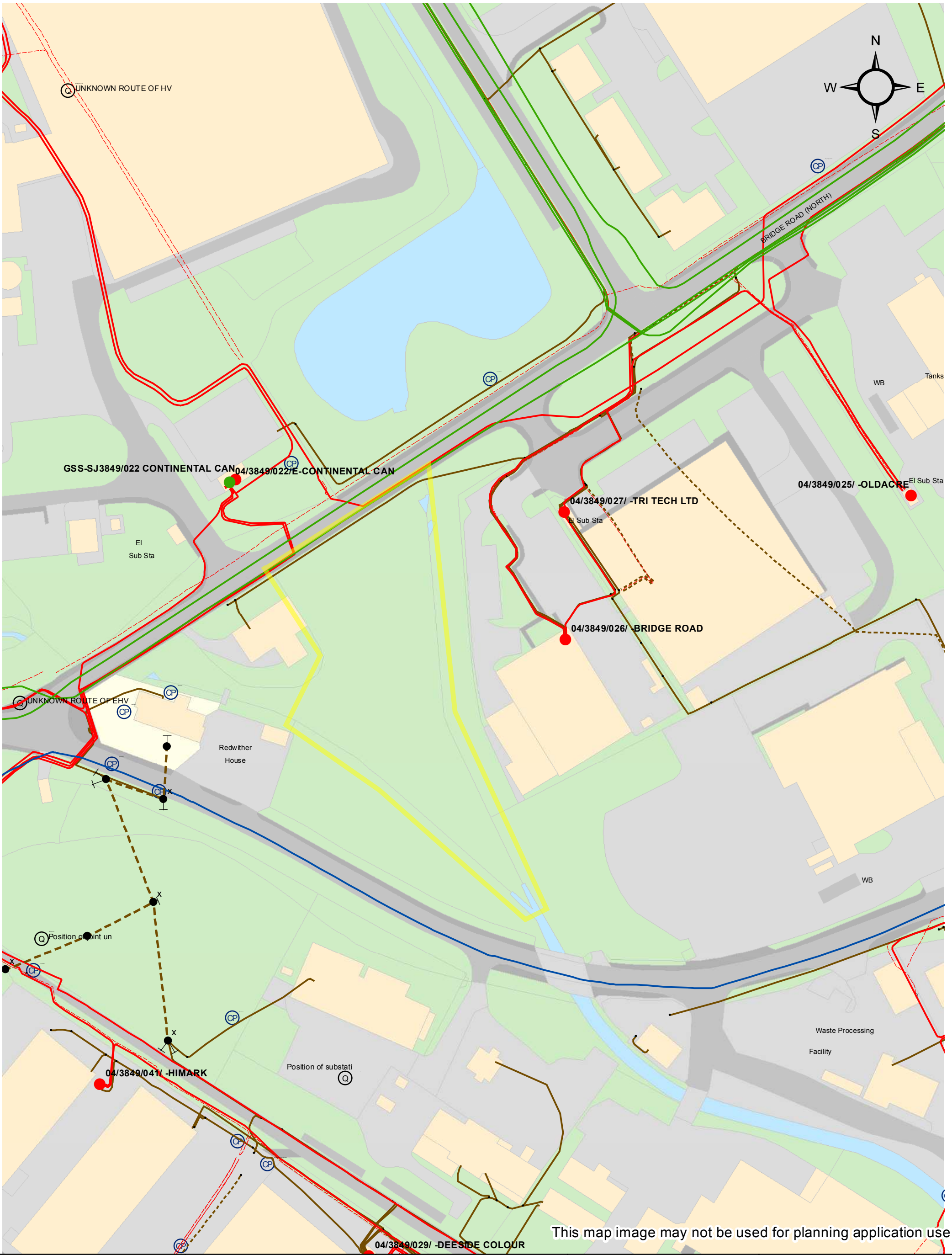


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Imagery sourced from ArcGIS World Imagery




The position and depths of underground and overhead apparatus as indicated on this plan are approximate and are intended for guidance only. The depths may have changed if the land surface levels have altered. You are also informed that the plan may not show, or may inaccurately show, individual property services and services to street lighting installations. The onus of locating the apparatus precisely before commencing any excavations or other works in the immediate vicinity therefore rests entirely upon the person undertaking or responsible for those works. Before any such works are undertaken the precise location of the apparatus and cables should therefore be ascertained by suitable means. In the event of an emergency or for further assistance please contact 0800-092-9290 (ScottishPower area) or 0800-001-5400 (SP Manweb area).

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SP ENERGY NETWORKS
On behalf of SP Manweb plc

SP Manweb plc
Registered Office: c/o PowerSystems
3 Prenton Way, Prenton, CH43 3ET
Registered in England and Wales No 2366937

OVERHEAD LINE

UNDERGROUND CABLES

In Use

Out of Use

Assumed route

VOLTAGE COLOUR KEY

| | | |
|---|---|---|
| EHV | 132kV | BLUE |
| | 33kV | GREEN |
| HV | | RED |
| LV | | BROWN |

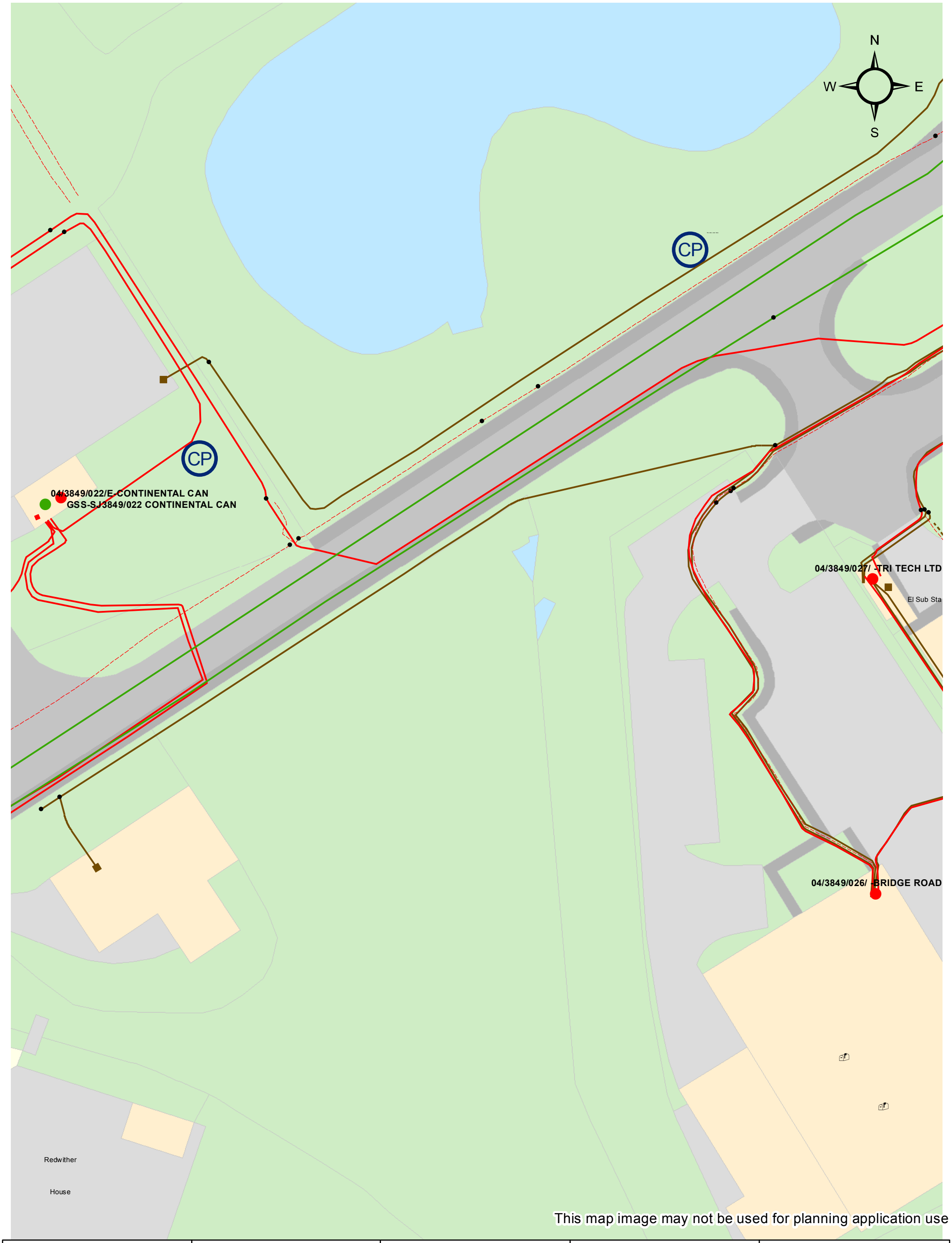
Where cables have been laid SINCE 1 OCTOBER 1988, the following depths in mm apply (to the tops of cables or ducts) UNLESS OTHERWISE SHOWN, but see comments.
(TO TOP OF CABLE, ADD 75mm FOR BOTTOM OF TRENCH)

| | EHV | HV | LV |
|---|---|---|---|
| IN FOOTPATHS : | 775 | 600 | 450 |
| ACROSS ROADS : | 775 | 700 | 600 |
| ALONG ROADS : | 775 | 700 | 600 |
| AGRICULTURAL : | 910 | 910 | 910 |

Your attention is drawn to the Health and Safety Executive Booklet HSG47, available from HSE.

| | |
|---|---|
| DATE | 05/06/2020 |
| SCALE | 1 : 1,250 |
| MAP REFERENCE | 338,151 349,543 |

0 4 8 16 24 32
Metres




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| | |
|---|---|
| DATE | 05/06/2020 |
| SCALE | 1 : 500 |
| MAP REFERENCE | 338,126 349,590 |

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