



**Shear Design**  
Consulting Civil and Structural Engineers

## **PROPOSED REDEVELOPMENT OF TY CAMBRIA HOUSE**

### **FLOOD CONSEQUENCE ASSESSMENT & DRAINAGE STRATEGY REPORT**

TY CAMBRIA

29 NEWPORT ROAD,

CARDIFF, CF24 0TP



**Date: 05 August 2026**  
**Ref: EL/DK/25050.02.03.D100**

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## **1.0 INTRODUCTION**

- 1.1** Shear Design Ltd has been instructed to prepare a Flood Consequence Assessment and Drainage Strategy report for a potential development at:

*Ty Cambria*

*29 Newport Road*

*Cardiff*

*CF24 0TP*

- 1.2** This report has been prepared on behalf of Elite Cask Limited and is intended to accompany a planning application for the development of residential student accommodation on the site of the existing Ty Cambria building. The site is a brownfield site in Cardiff city centre; the site area is approximately 850m<sup>2</sup> and is located at National Grid Reference ST 19051 76831. A site location plan is included in [Appendix A](#).
- 1.3** The proposal comprises the demolition of the existing office block the construction of a multi-storey (max. 24) building with circa 350 student bedspaces, student amenity spaces/site infrastructure and a proposed commercial unit on the ground floor.
- 1.4** Schedule 3 to the Flood and Water Management Act 2010 & The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2018 require all proposed developments greater than 100m<sup>2</sup> or more than one unit to be approved by the local SuDS Approving Body (SAB) prior to construction. This report is also intended to supplement the formal SAB approval application for SAB officers, planning officers and other consultees to review.
- 1.5** This report will also consider the flood risk to the site in accordance with the requirements of Technical Advice Note 15 (TAN 15).
- 1.6** The information within this report is indicative only and subject to detailed design.



## **2.0 TOPOGRAPHY & SITE DESCRIPTION**

- 2.1** The development site is situated on the corner of the junction between Newport Road and East Grove, in the city centre of Cardiff. The approximate site level varies between 11.00 & 11.60m AOD. The site is bounded directly by an access lane to the north, East Grove to the East, and Newport Road south. The existing building is detached from the buildings of Cardiff Sixth Form College along its western boundary.
- 2.2** The existing Ty Cambria building covers most of the site, with raised footways along the front perimeter and part of the eastern perimeter. There are steps up to the building entrance and an access ramp on the eastern boundary. The total site area is 0.085 hectares.
- 2.3** The existing building is to be demolished with a new mixed-height building constructed in its place of maximum 24 stories. See Appendix B for the topographical survey.
- 2.4** The proposed development will comprise student accommodation serving the universities nearby, and ground floor commercial space on Newport Road.
- 2.5** Based on the topographical survey, there are at least two inspection chambers to the rear of the site within the covered parking area, two at the front of the site, at the top of the steps by the doors on Newport Road, and one in the corner site at the junction of Newport Road and East Grove.
- 2.6** A drainage CCTV shall be undertaken to determine the current condition of the existing foul and surface water drainage network within the site and the existing discharge arrangements. Existing connections should be re-used where possible however if a connection is found to be damaged then a new connection may be required.
- 2.7** There are a series of combined manholes identified within Dŵr Cymru Welsh Water (DCWW) asset records along Newport Road.
- 2.8** It is not known whether there is an existing surface water drain or highway culvert running along Newport Road, however, no historical mapping tiles appear to indicate this.



### **3.0 REVIEW OF FLOOD RISK**

- 3.1** The following section outlines both applicable regulations and a consequence assessment of the site's risk of flooding.

#### **Flood and Water Management Act (2010) and Flood Risk Regulations (2009)**

- 3.2** The Flood and Water Management Act of 2010 sets out what should be included in the national flood and coastal erosion risk management strategies for England and Wales as well as local flood risk management strategies. It responds to recent pressure to introduce legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change. The Flood Risk Regulations of 2009 set out the duties regarding producing preliminary flood risk assessments, flood hazard maps and flood risk maps and flood risk management plans. Both Act and Regulation place responsibility on the local authority as Lead Local Flood Authority (LLFA) to manage and lead local flooding issues.

#### **Schedule 3 to the Flood and Water Management Act 2010 & The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2018**

- 3.3** As part of the advancement in Sustainable Drainage Systems (SuDS) design, legislature was implemented on 7th January 2019 in Wales to enforce Schedule 3 of the Flood and Water Management Act 2010. This led to the establishment of SuDS Approval Bodies (SABs) for each LLFA. In the case of this development and under requirements of the above legislature, Cardiff Council would look to review and approve any surface water drainage design proposed for the development. Any SuDS proposed would need to conform to CIRA C753, 'The SuDS Manual' and any additional guidance or information provided by the LLFA. Any drainage design previously proposed to connect to a surface water Dŵr Cymru Welsh Water or Highway asset would now be subject to a detailed application & formal approval process, prior to construction and/or communication of drainage flows from the development.
- 3.4** A SAB pre-application is to be submitted to the Cardiff Council SAB team and a full SAB application is to be submitted following feedback from the pre-application.

#### **Technical Advice Note (TAN) 15**

- 3.5** Planning Policy Wales sets out the land use planning policies of the Welsh Government and is



supplemented by a series of Technical Advice Notes, including Technical Advice Note (TAN) 15.

- 3.6** A revised version of the TAN15 document took effect from 31st March 2025 which includes updated Flood Zone Classifications, including the newer numerical Flood Zone references, which have been used within this report.
- 3.7** TAN15 notes that all residential premises are to be classified as “*highly vulnerable*” and provides guidance as to what the frequency threshold should be for different types of development described in terms of annual probability of occurrence for the development to be flood-free.
- 3.8** Therefore, for a development to meet the threshold requirements of TAN15 in terms of flood-free developments, the development must not exceed the probability indicated in the table below (TAN15 2025, Section 11.8, Figure 5).

Table 1: Guidance of TAN15 (*Targets for no flooding – Figure 5*)

**Figure 5 – Flood events in which development must be flood-free**

| Vulnerability Categories                                    |                                               | Flood event type        |                         |
|-------------------------------------------------------------|-----------------------------------------------|-------------------------|-------------------------|
|                                                             |                                               | Rivers                  | Sea                     |
| Highly vulnerable development                               | Emergency services (command centres and hubs) | 0.1%+CC<br>(1 in 1,000) | 0.1%+CC<br>(1 in 1,000) |
|                                                             | All other types                               | 1% +CC<br>(1 in 100)    | 0.5%+CC<br>(1 in 200)   |
| Less vulnerable development                                 |                                               | 1% +CC<br>(1 in 100)    | 0.5% +CC<br>(1 in 200)  |
| Water compatible development that may be occupied by people |                                               | (1 in 100)              | (1 in 200)              |

## Flood Risk Classification

- 3.9** The Natural Resources Wales Flood Map for Planning can be used to identify the flood risk for a site in the context of different types of flood risk. The flood map for planning shows the site as lying entirely within Flood Zone 1 for all sources of flooding.
- 3.10** Surface Water flood mapping shows a small portion of the footway, outside of the site extents, identified as Flood Zone 2, which is a risk of flooding between 0.1% and 1% (1 in 1000-years to 1 in 100 years). Based on the topographical survey and a review of the Google Maps StreetView, this is

considered to be due to a valley within the footway, which has a gully at the low point, likely placed to collect excess surface water runoff from the footway. Consideration will need to be given to setting the finished floor level at ground floor to ensure that it does not increase flood risk to the proposed building.

**3.11** The proposed development is to incorporate a SuDS drainage design which is to be vetted and approved by Cardiff Council under their role as SAB (SuDS Approval Body) prior to the commencement of works on site. All private paving and landscaping areas at ground floor and roof levels will incorporate improved treatment and attenuation of runoff, providing a reduction in peak drainage flows which will help to alleviate surface water flooding.

**3.12** The site is not identified by NRW as being with an area of a historic flood event. This site is also not within a TAN 15 Defended Zone (i.e. protected by physical flood defences).

### **Flood Mitigation Measures**

**3.13** Though the proposed site may not be inundated during a Fluvial or Tidal flood event, access to the property via local roads could be restricted. All future occupants of the property are recommended to follow all guidance provided by NRW. During extreme flood events the wider area surrounding the site may be affected by flooding. The flood water will rise at a relatively slow rate, and it is considered that the predicted flood scenario and peak flood conditions can be appropriately managed by the implementation of several mitigation measures which are identified as follows:

- Met Office Flood Warnings
- Residents/occupiers of the property are to sign up to Floodline (tel: 03459881188) and complete a NRW Personal Flood Plan.
- With the time afforded by advance warning, an evacuation of the property to a safe egress point and the removal any valuables from the building can be implemented
- The predicted depths, rise, speed of inundation and velocities are likely to satisfy the TAN 15 suggested tolerable conditions for more extreme events.
- However, a well-walked means of safe access and egress from the site is likely to be afforded at all times prior to even partial flooding of the surrounding areas. It is crucial to that all occupants of the site be aware of this inherent risk, and the planned egress



route.

A proposed safe emergency access and egress route during an exceedance flood event would be to exit the site on Newport Road, heading eastwards, until a flood free area is reached.

## **Flood Warnings**

- 3.14** Though the site is not predicted to be impacted by flooding the occupiers of the site are encouraged to sign up to the 'Floodline Warnings Direct' scheme so that they receive advanced warning of potential flooding and possible travel / access implications for the site. This can be done by telephoning the NRW on 0845 988 1188. Current flood warnings enforced can also be viewed online on NRW's home page at: <https://naturalresources.wales/>. Current Flood Warnings enforced by NRW can also be viewed on their web site; (<https://flood-warning.naturalresources.wales/>)

Both NRW & EA issue flood warnings using a four-stage system:-

1. Flood Alert
2. Flood Warning
3. Severe Flood Warning
4. Warnings No Longer in Force

For current meanings of these warnings refer to NRW online advice at <https://naturalresources.wales/flooding/flood-codes/?lang=en>

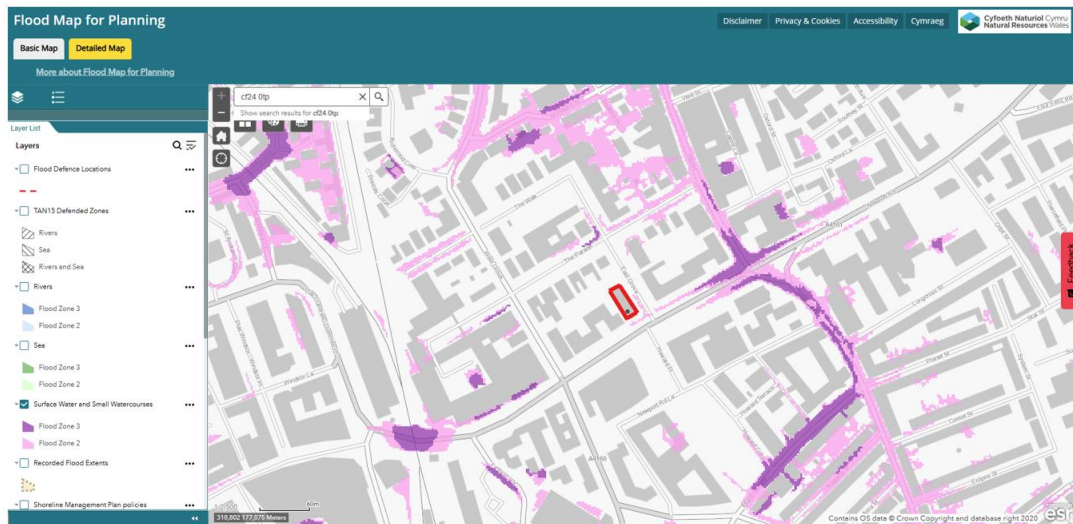


## 4.0 FLOOD CONSEQUENCE ASSESSMENT

- 4.1** The site is outside of Flood Zones 2 & 3. As such, the site is not in an area benefiting from physical flood defences. The site is not in an area identified by NRW to have previously flooded and no residential/sleeping accommodation is proposed to be constructed at ground floor level. The site is also located directly a short distance from Cardiff Royal Infirmary. Suitable flood mitigation measures for the proposed developments occupants have been highlighted in the previous section.
- 4.2** The installation of an attenuated and treated drainage system, with a reduction in peak discharge will aid in the prevention of flooding both onsite and areas immediately adjacent from pluvial sources.

### Surface Water Flooding

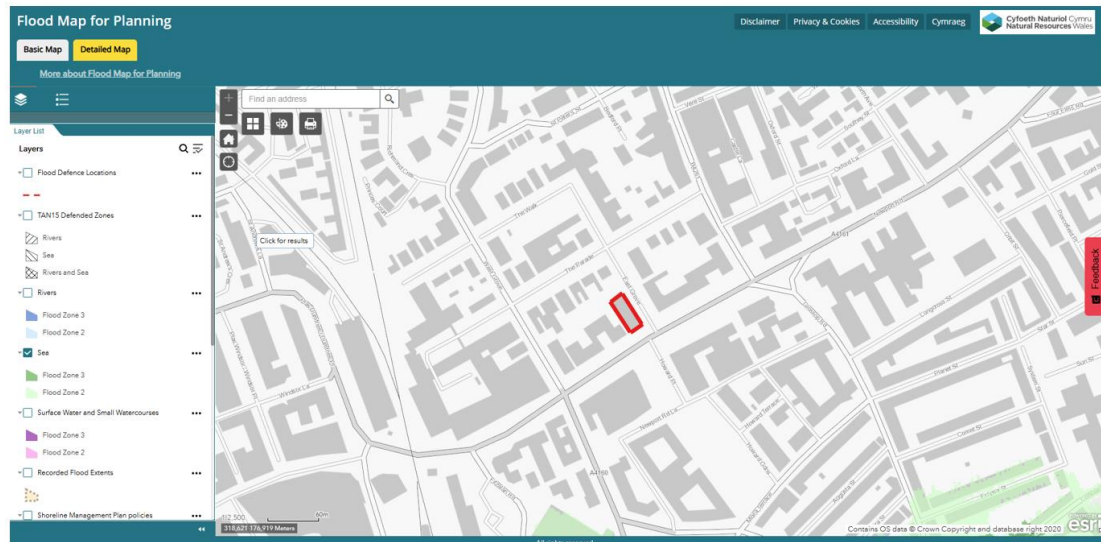
- 4.3** Surface water flooding, also known as pluvial flooding, can occur during an extreme rainfall event when surface water runoff cannot drain away.
- 4.4** The Natural Resources Wales flood maps show the risk of flooding from surface water and small watercourses:



- 4.5** As per the information from the Natural Resources Wales Flood Map for Planning (last accessed August 2026) the site is in Flood Zone 1 in relation to the risk from flooding from surface water, meaning that the site is at very low risk of flooding from rivers (a less than 0.1% chance of flooding from surface water each year).

### Flooding from Rivers

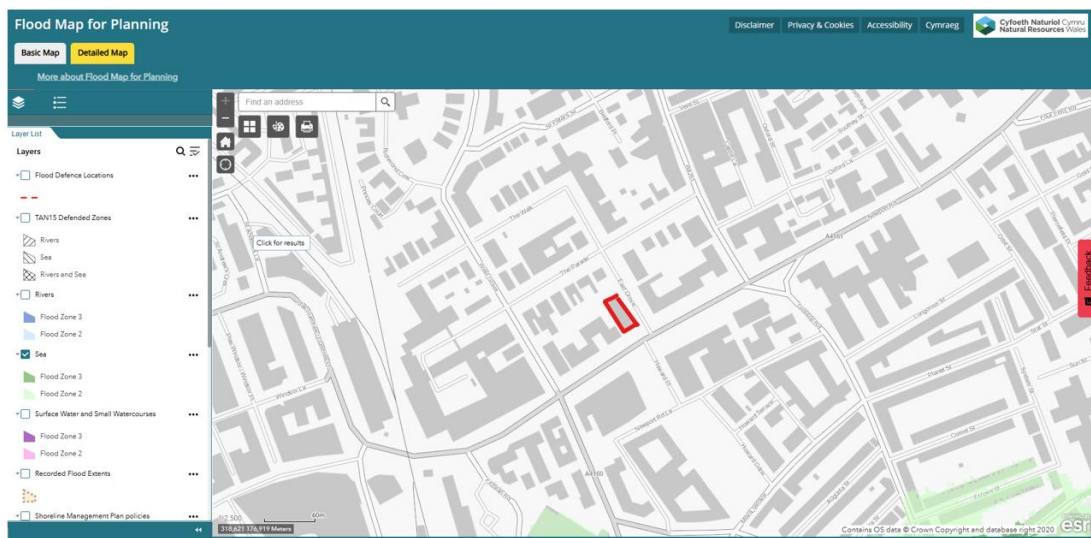
#### 4.6 The Natural Resources Wales flood maps show the risk of flooding from rivers:



#### 4.7 As per the information from the Natural Resources Wales Flood Map for Planning (last accessed August 2026) the site is in Flood Zone 1 in relation to the risk from flooding from rivers, meaning that the site is at very low risk of flooding from rivers (a less than 0.1% chance of flooding from rivers each year).

#### Flooding from the Sea

#### 4.8 The Natural Resources Wales flood maps show the risk of flooding from the sea:

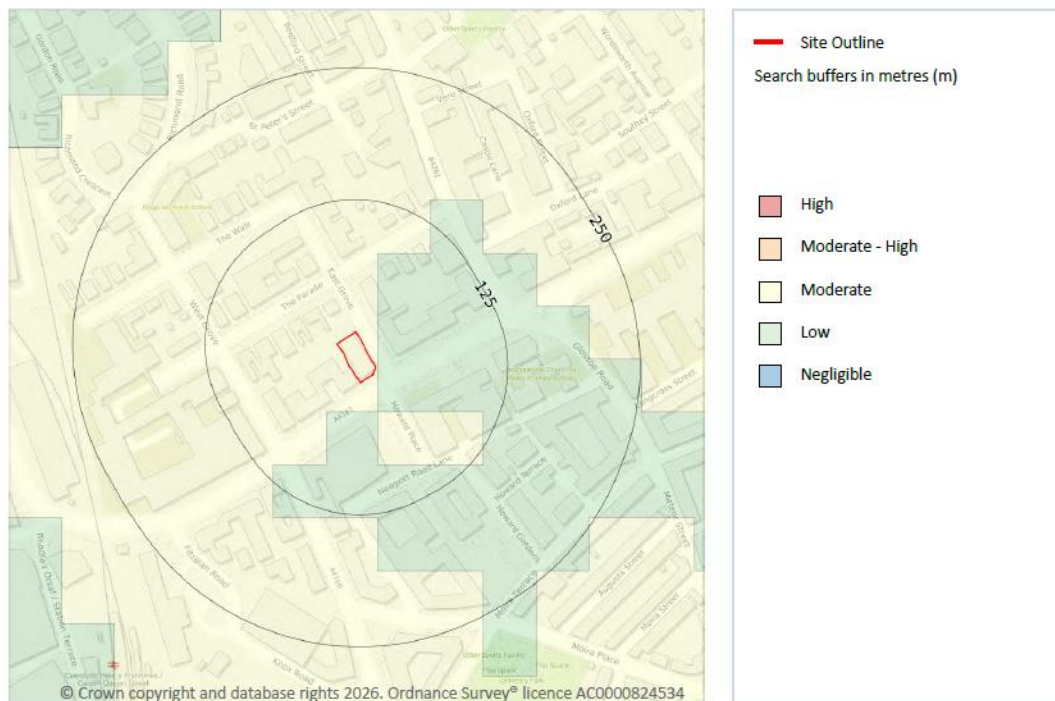


#### 4.9 As per the information from the Natural Resources Wales Flood Map for Planning (last accessed August 2026) the site is in Flood Zone 1 in relation to the risk from flooding from the sea,

meaning that the site is at very low risk of flooding from rivers (a less than 0.1% chance of flooding from rivers each year).

### Groundwater Flooding

- 4.10** Groundwater is water held below ground within soil and rock strata. Groundwater flooding occurs when groundwater levels rise to the surface. Groundwater flooding is generally uncommon and can be associated with, or exacerbated by, other flood mechanisms such as surface water and sewer flooding.
- 4.11** A desktop study for the site was completed by TEC (report reference: 260316.001.01). This identifies the site as being at moderate risk of groundwater flooding. The relevant mapping extract from the TEC report is provided below.



- 4.12** The moderate groundwater flooding classification is likely reflected by the site's geological setting, including glaciofluvial sheet deposits (superficial) and the Mercia Mudstone Group (bedrock). The TEC report further notes that there are no recorded groundwater abstractions within 500m of the development site.
- 4.13** There is no known site history, such as the presence of a former quarry, that would indicate an increased susceptibility to groundwater flooding.

- 4.14** The existing basement is proposed to be removed and infilled as part of the development. The finished site level will therefore be approximately 3m higher than the existing basement level, reducing the potential impact of any groundwater flooding on the completed development.
- 4.15** Overall, although the TEC report identifies a moderate risk of groundwater flooding, the site-specific factors set out above indicate that groundwater flooding is not expected to present an elevated risk to the proposed development, nor is the development expected to exacerbate groundwater flood risk.
- 4.16** The Cardiff Flood Risk Management Plan (Cardiff FRMP 2015) states “There is no information on historic groundwater flooding, which suggests that the risk of groundwater flooding is low in Cardiff”.
- 4.17** The LLFA, Cardiff Council, did not provide any information to inform this report. There has been no record found of groundwater flooding in the vicinity of the site. It is considered that, relative to other potential sources of flooding, the risk of flooding from groundwater at this location is low and it is reasonable to expect that it can be mitigated by means of industry standard methods without excessive cost or time implications e.g. by setting the finished floor levels within buildings above the surrounding ground levels.”

### **Sewer Flooding**

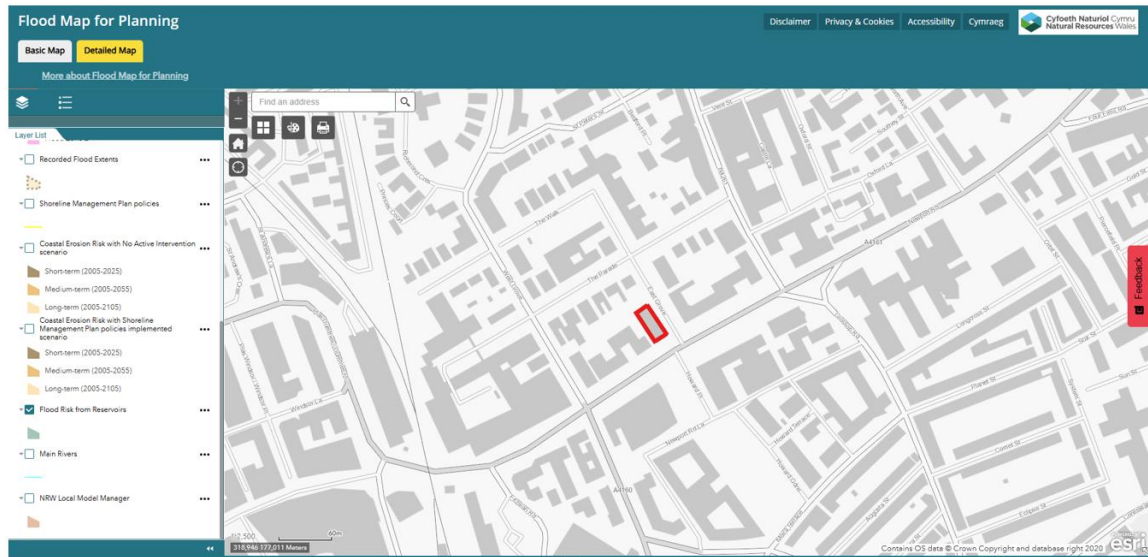
- 4.18** When stormwater or wastewater from a sewer network discharges directly onto streets rather than through the drainage network as intended, sewer flowing occurs. This can be caused by blockages or a drainage network being overwhelmed, such as in an extreme storm event.
- 4.19** The public combined sewers are believed to be approximately 2-3m deep (subject to survey confirmation). If flooding was to occur, then the raised floor level of the building relative to the road would cause flood water to fall away from the proposed building and along Newport Road, away from the site.
- 4.20** Therefore, the risk to the site from sewer flooding is considered to be low.

### **Reservoirs**

- 4.21** Reservoirs are lakes that are used to collect and store water, they can be natural or manmade. Dams and embankments are used to form the reservoir, if a dam or embankment were to fail then water would be able to flow out of the reservoir and flood the surrounding area.



**4.22** The Natural Resources Wales flood maps show the risk of flooding from reservoirs:



**4.23** As per the information from the Natural Resources Wales the site is in not in an area that is indicated to be at risk of flooding from reservoirs.

**4.24** The United Kingdom has an excellent record of reservoir safety with the last loss of life due to a reservoir failure occurring in 1925, more than 100 years ago.

**4.25** Therefore, the risk of flooding from reservoirs is considered to be low.

### Summary of Flood Risk

**4.26** This Flood Consequence Assessment considered all sources of flooding, including surface water, fluvial/tidal, groundwater, sewers and reservoirs. The Flood Consequence Assessment has determined that the proposed development site is at very low risk or low risk of flooding from all possible sources.

**4.27** In accordance with Table 1 above (Figure 5 – Flood events in which development must be flood-free – TAN15 Section 11.8) Figure5 notes that emergency services have their own sub-classification of highly vulnerable, with all other types of development requiring different criteria. The proposed site use is residential (student accommodation) and commercial and therefore falls under the category of “all other types”.

**4.28** The requirements of TAN15 in relation to flood-free developments for this site are the 1 in 100-year (1%) flood event for flooding from rivers and the 1 in 200-year (0.5%) flood event for

flooding from the sea.

- 4.29** The risk of flooding from rivers and the sea is less than 0.1% chance (1 in 1000-year event) for the proposed site
- 4.30** Therefore, the proposed site meets the frequency threshold requirements in which developments must be flood-free.
- 4.31** As a precautionary measure, it is recommended that the occupier(s) of the site sign up to the Flood Warning Service as noted in Section 3.0 of this report.
- 4.32** Based on all factors above, it is believed that the proposed redevelopment would not lead to an unacceptable flood risk for any future users and provides betterment over the existing building and access.



## **5.0 SURFACE WATER DRAINAGE STRATEGY**

### **Statutory Standards for Sustainable Drainage Systems**

- 5.1** In line with Statutory standards for SUDS Wales, 2018 discharging of surface water runoff should conform to the following hierarchy as detailed in Standard 1 (S1):

Priority 1: Surface water runoff is collected for non-potable use

Priority 2: Surface water runoff is infiltrated to ground

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

Priority 4: Surface water runoff is discharged to a surface water sewer, or another piped surface water drainage system

Priority 5: Surface water runoff is discharged to a combined sewer

- 5.2** Priority 1 is the highest and priority 5 is the lowest. Several SUDS are ideally used throughout a site, linked together to form a SUDS train that provides treatment, control and attenuation processes.

- 5.3** The options within the sustainable drainage hierarchy have been considered as follows:

#### **Priority 1: Rainwater Re-use**

- 5.4** Rainwater reuse has been discounted due to the relative cost of maintaining such a system to be prohibitively expensive in comparison to the benefit provided. Furthermore, due to the proposed use of the site being student accommodation, there would be extended periods of time such as semester holidays where the building would be virtually empty.

- 5.5** Therefore, any remaining water within a rainwater harvesting system would be vulnerable to developing harmful bacteria such as legionella. Due to the small size of the site, it would also be very difficult to place a rainwater harvesting system within the proposed plant areas due to much of these areas being taken up by essential building plant.

#### **Priority 2: Infiltration**

- 5.6** Infiltration into the ground was considered within the context of the proposed development. Best practice is to locate soakaways away from buildings and site boundaries. The area of the proposed development is relatively small, therefore, with the proposed building covering most of the site, it would not be possible to locate a soakaway far enough away from the proposed

building or the site boundary.

- 5.7** Therefore, infiltration/soakaways have been discounted as a drainage solution.

#### **Priority 3: Surface Water Body**

- 5.8** No watercourses are located within the site. There are also no known connections shown in the information provided from the site to an adjacent watercourse and no nearby surface water body (within 100m of the proposed site).

- 5.9** Therefore, Priority Level 3 (surface water body) is not a suitable drainage solution for the proposed site.

#### **Priority 4: Surface Water Sewer/Highway Drain**

- 5.10** Sewer records have been received from Dŵr Cymru Welsh Water which show no existing surface water sewers within the site or the roads that border the site.

- 5.11** Information has been requested from Cardiff Council Highways as to the possibility of there being an existing highway drain within one or more of the roads bordering the site.

- 5.12** Given that the presence or otherwise of an existing highways drain is unknown, further investigation may be required to determine whether a highway drain is present in any of the roads bordering the site.

- 5.13** If a highway drain exists, then this may be a suitable option for discharging surface water.

#### **Priority 5: Combined Sewer**

- 5.14** There is an adopted combined sewer in the road to the south of the proposed development. The presence of this sewer is confirmed by Dŵr Cymru WW sewer records.

- 5.15** A pre-development enquiry has been submitted to DCWW in which it is proposed that surface water is discharged to the existing combined sewer in Newport Road Street to the south of the site at a rate of 8.2 L/s but at the time of writing, no response has been received.

#### **Surface Water Drainage Strategy**

- 5.16** The proposed surface water drainage strategy is to discharge surface water flows at a rate of 8.2 L/s. For the 1 in 100-year storm with a 40% allowance for climate change.

- 5.17** The surface water flow rate was calculated using the Modified Rational Method and the value includes a 30% betterment on the existing brownfield runoff rate. Refer to [Appendix D](#) for

surface water brownfield runoff rate calculation.

- 5.18** Existing connections should be re-used where possible; any connection to the existing adopted sewer network remains subject to a S106 approval with DCWW as the statutory undertaker.
- 5.19** All surface drainage information noted herein is indicative and subject to detailed design.
- 5.20** Surface water runoff is proposed to be managed via a combination of SUDS roofs and permeable paving.
- 5.21** SUDS roofs are roofs that provide a sustainable drainage benefit, through providing either treatment, or storage (or both) to surface water runoff.
- 5.22** Green roofs provide treatment to surface water runoff and blue roofs provide storage. For the purposes of this report, a SuDS roof that provides both treatment *and* storage to surface water runoff will be referred to as a *blue/green* roof. However, it should be noted that other consultants/product providers may use different terminology.
- 5.23** It is proposed that all roof levels on this site will utilise a combination of blue and blue/green roofs to provide treatment and storage at source to surface water runoff.
- 5.24** Permeable paving provides treatment to surface water runoff that lands on it. Permeable paving can therefore provide treatment to surface water runoff at source.
- 5.25** The layout of SuDS roofs is subject to design by the architect/landscape architect.
- 5.26** The proposed drainage strategy is to split the proposed surface water flow rate, proportionally between the various site areas to allow for individual areas to combine into a singular surface water drainage system that leaves the site, with the peak surface water flow rate for all surface water SuDS features not exceeding the calculated value of 8.2 L/s.
- 5.27** It is proposed that all external paved areas will have permeable paving to collect and treat surface water runoff.
- 5.28** If the permeable paving is not sufficient to store surface water runoff that lands on these areas, then alternative options such as oversized pipes can be considered due to the lack of available space for conventional attenuation such as tanks. Alternative drainage options are subject to detailed design.
- 5.29** It is assumed that all roof areas will have some form of SuDS roof that will provide treatment



and storage to surface water runoff. Each SuDS roof should be assigned a flow rate proportional to the overall site area.

- 5.30** The extent/layout of the proposed SUDS roof system are the responsibility of the architect/landscape architect. The design for the SUDS roofs, including outlets and build ups is subject to detailed design by an external specialist consultant.
- 5.31** The surface water flow rate is to be restricted to 8.2 L/s using a flow control device such as a vortex flow control or orifice plate.
- 5.32** Non-return valves should be used for the discharges from permeable paved areas, to prevent high-level roof drainage surcharging the permeable paved areas.
- 5.33** Developments should aim to treat water pollution in line the CIRIA SUDS Manual C753 which can be calculated using the Simple Index Approach.
- 5.34** The proposed development follows the requirements for water quality in Section 26.2 of the CIRIA SUDS Manual; all site areas are classed as or “low” pollution risk. In addition to this, treatment is provided by the provision of permeable paving for the external areas at ground floor level and green/brown roofs at high level. Refer to the tables below showing the Simple Index Approach for the proposed development site.

#### Surface Water Landing on Permeable Paving

| Paved Roofs/External Areas<br>(Pollution Hazard Level: Low) | Pollution Hazard Indices<br>(minimum) | Mitigation Indices                        | Mitigated Value | Pass/Fail |
|-------------------------------------------------------------|---------------------------------------|-------------------------------------------|-----------------|-----------|
|                                                             |                                       | Bio-retention System (Permeable Pavement) |                 |           |
| Total suspended solids (TSS)                                | 0.5                                   | 0.7                                       | -0.2            | Pass      |
| Metals                                                      | 0.4                                   | 0.6                                       | -0.2            | Pass      |
| Hydrocarbons                                                | 0.4                                   | 0.7                                       | -0.3            | Pass      |

## Surface Water Landing on Green Element of Blue/Green Roofs

| Paved Roofs/External Areas<br>(Pollution Hazard Level: Low) | Pollution Hazard Indices<br>(minimum) | Mitigation Indices                         | Mitigated Value | Pass/Fail |
|-------------------------------------------------------------|---------------------------------------|--------------------------------------------|-----------------|-----------|
|                                                             |                                       | Bio-retention System<br>(Green/Brown Roof) |                 |           |
| Total suspended solids (TSS)                                | 0.5                                   | 0.8                                        | -0.3            | Pass      |
| Metals                                                      | 0.4                                   | 0.8                                        | -0.4            | Pass      |
| Hydrocarbons                                                | 0.4                                   | 0.8                                        | -0.4            | Pass      |

**5.35** There are no areas of the site that are at risk of oil/petrol spills, or similar sources of contamination. Therefore, there are no oil or petrol interceptors proposed for the site.

## **6.0 FOUL WATER DRAINAGE STRATEGY**

- 6.1** Foul water flows generated as part of the proposed development will be collected using above-ground pipework and are to be discharged to the proposed below-slab foul drainage network.
- 6.2** It is proposed to discharge all foul flows from the proposed site to the existing adopted sewer at a peak flow rate of 4.5 L/s. Refer to [Appendix D](#) for details of the foul flow rate calculation.
- 6.3** A pre-development enquiry was submitted to DCWW to agree a proposed foul discharge rate into the existing adopted combined sewer in Newport Road to the south of the site. Any connection to the existing adopted sewer network is subject to a S106 agreement with DCWW as the statutory undertaker.
- 6.4** Wherever possible, existing connections to the adopted sewer should be re-used.
- 6.5** All proposals involving connections to existing adopted drainage assets are subject to final approval from DCWW as the statutory undertaker. A connection to a public sewer will require a S106 agreement and, dependant on the nature of the connection and the construction methods, a S104 agreement may also be required, subject to DCWW confirmation.
- 6.6** All foul drainage information noted herein is indicative and subject to detailed design.

## **7.0 OPERATION & MAINTENANCE**

- 7.1** All SUDS features should be maintained according to the sitewide maintenance strategy and regularly inspected for damage, defects, or other maintenance issues. All relevant advice from product manufacturers should be followed to ensure that safe and continued operation of the drainage system.
- 7.2** The ongoing maintenance of the SUDS features on this site are to be the responsibility of the site owner/operator; the site owner/operator should appoint a management company as part of their overall sitewide maintenance strategy.



## **8.0 CONCLUSION**

- 8.1** The proposed development is a purpose-built student accommodation block. The existing site is a brownfield site and was formerly an office building.
- 8.2** The Flood Consequence Assessment determined that the site was at very low risk of flooding from all sources. All sources of flooding were considered, including surface water, fluvial/tidal, groundwater, sewers and reservoirs.
- 8.3** The surface water drainage strategy is to use attenuation with restricted discharge. Contact has been made with DCWW to confirm their acceptance of the proposed 8.2 L/s.
- 8.4** A flow control device is to be used to restrict the sitewide peak flow rate for the 1 in 100-year storm (plus a 40% allowance for climate change) to 8.2 L/s. Oversized pipes and permeable paving will be used to store excess surface water runoff and the permeable paving will also provide treatment to surface water runoff.
- 8.5** SuDS roofs are proposed at all roof levels and permeable paving will be provided to all external areas. The SuDS roofs and permeable paving will treat surface water runoff at source.
- 8.6** All foul water flows generated because of the proposed development are to be discharged at a rate of 4.5 L/s.
- 8.7** All proposals involving connections to existing adopted drainage assets are subject to final approval from DCWW as the statutory undertaker. A connection to a public sewer will require a S106 agreement and, dependant on the nature of the connection and the construction methods, a S104 agreement may also be required, subject to DCWW confirmation.
- 8.8** The information within this report is indicative only and subject to detailed design.





Report prepared by: -  
**ON BEHALF OF SHEAR DESIGN LTD**

**EDWARD LAW**  
**CIVIL ENGINEER**

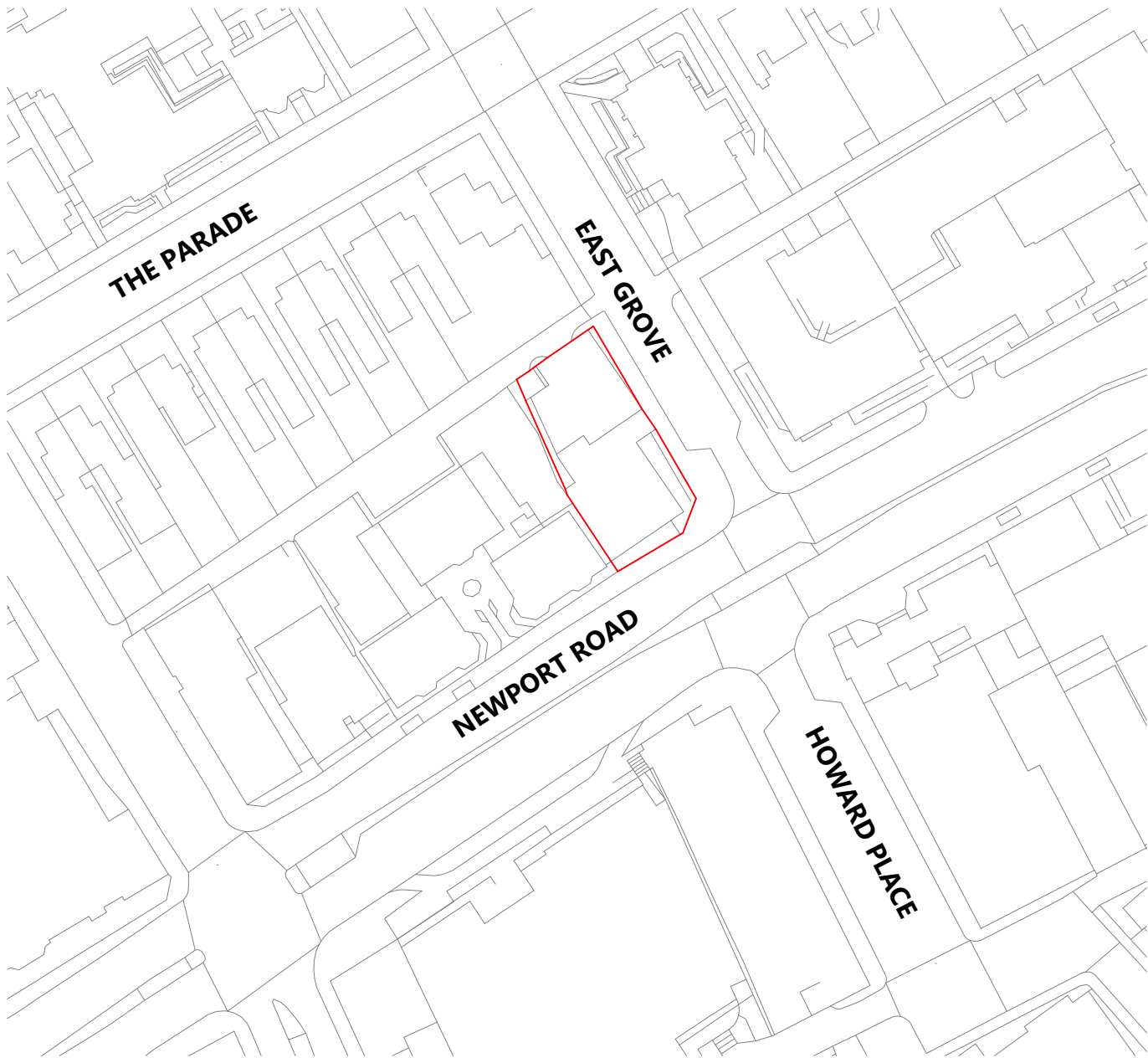
Approved by: -  
**ON BEHALF OF SHEAR DESIGN LTD**

**DAMEON KILGOUR**  
**ASSOCIATE DIRECTOR**

## ***APPENDIX A***

### **SITE LOCATION & ROOF PLANS**

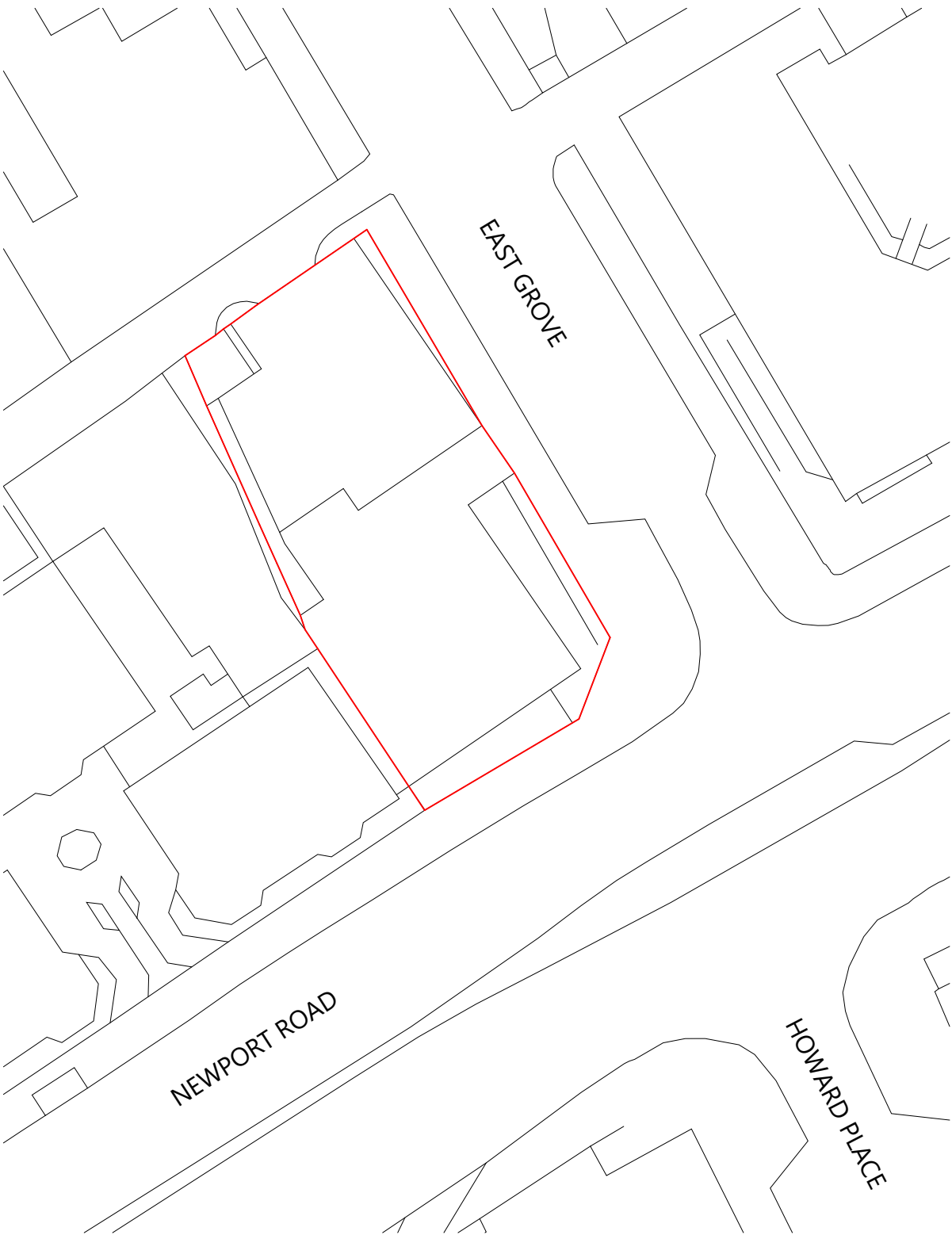




2 LOCATION PLAN 1:1250

1:1250

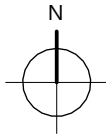
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1 SITE PLAN 1:500

1:500

0 5 10 15 25 m



Red Line Boundary

|     |          |    |             |
|-----|----------|----|-------------|
| P01 | DD.MM.YY | -- | FIRST ISSUE |
| Y   |          |    |             |
| Rev | Date     | Db | Notes       |

## PLANNING

- General Notes:
- This drawing is copyright, reserved and remains the property of Fletcher Joseph (Edinburgh) Ltd.
  - All levels and dimensions are to be checked on site by the contractor prior to fabrication, and any discrepancies must be reported immediately to the Architect.
  - All dimensions are to be read off this drawing and NOT scaled.
  - All work to be executed in strict accordance with the by-laws and regulations of the local authorities.
  - All work to conform to applicable codes of the British Standards.
  - Where indicated/required, all drawings are to be read in conjunction with all other documents issued by Fletcher Joseph and/or other professions.

**Fletcher  
Joseph**

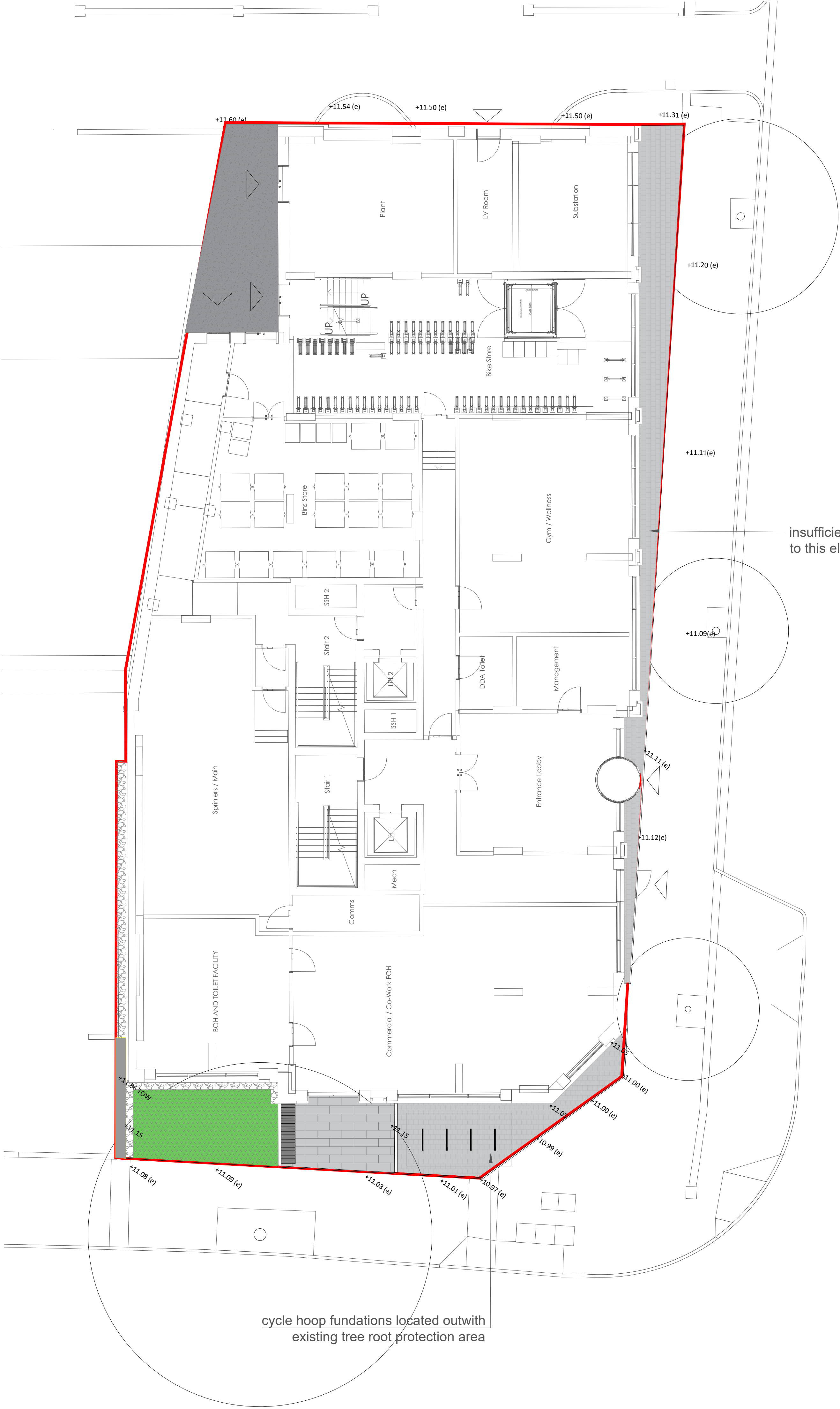
5 Millar Place,  
Edinburgh EH10 5HJ  
admin@fletcherjoseph.com

0131 447 5000  
fletcherjoseph.com

|         |                                          |
|---------|------------------------------------------|
| CLIENT  | ELITE CASK LTD                           |
| PROJECT | TY CAMBRIA<br>29 NEWPORT ROAD<br>CARDIFF |
| TITLE   | LOCATION AND SITE PLAN<br>SITE PLAN      |

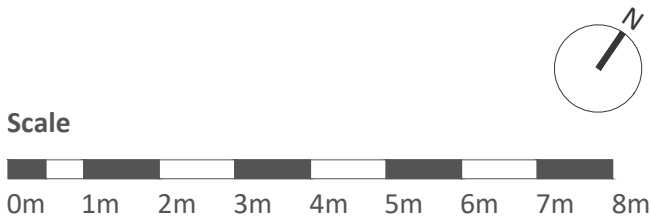
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| 24/07/26                  | -          | DD.MM.YY      |
| DRAWN BY                  | CHECKED BY | REVISED BY    |
| JF                        | SD         | --            |
| DRAWING NUMBER            | REVISION   |               |
| 25835-FJA-00-XX-DR-A-9000 | P01        |               |

00 XX



- Notes**
- All dimensions in mm, unless otherwise stated.
  - Scaling from drawing if printed incorrectly may lead to errors.
  - All information outside red line boundary shown for contextual purpose only.
  - All hatch patterns are indicative only unless stated otherwise.
  - This drawing is to be read in conjunction with the following R.B.L.A landscape architecture documentation:  
0009-RBL-XX-00-DR-L-0002  
0009-RBL-XX-00-DR-L-0003  
0009-RBL-XX-00-DR-L-0004  
0009-RBL-XX-00-DR-L-0005  
and all relevant documentation from the design team
  - Levels information on this drawing illustrates the design intent. The contractor is to check and verify all levels and dimensions against site survey information.
  - Any discrepancies in the design information are to be brought to the attention of R.B.L.A landscape architecture, in writing, prior to commencement of construction works.
  - All proprietary products shall be installed in strict accordance with manufacturers written instructions.
  - Refer to other consultants' drawings and specifications for the following design information:
    - Foundation details
    - Base course and/or sub bases design & specification
    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities
  - Plant quantities are to suit site areas in accordance with scheduled plant densities.
  - Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

- Planning application boundary
- Paving Type 1  
Granite aggregate setts  
100x100x80mm
- Paving Type 2  
Granite aggregate flags  
400x200x80mm
- Macadam surfacing
- Proposed kerb
- Proposed wall  
Height and extents to be coordinated with neighbouring property
- Proposed gravel margin
- Bike stands  
Sheffield cycle hoops  
Powdercoated steel
- Existing trees to be retained
- Proposed herbaceous planting
- Proposed levels**  
+1.100
- Existing levels**  
+1.100(e)
- Proposed bench  
Timber seating with steel support



| Date | Description of revision | Drawn by | Checked by | Approved by | Revision |
|------|-------------------------|----------|------------|-------------|----------|
|------|-------------------------|----------|------------|-------------|----------|

R.B.L.A

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rosebarton@rblandscape.uk

**Project**  
TY CAMBRIA  
RB26-0009

**Client**  
RHOMCO CONSULTING

**Document title**  
LANDSCAPE GENERAL ARRANGEMENT  
- GROUND FLOOR

**DRAFT**

**Paper size**  
A1

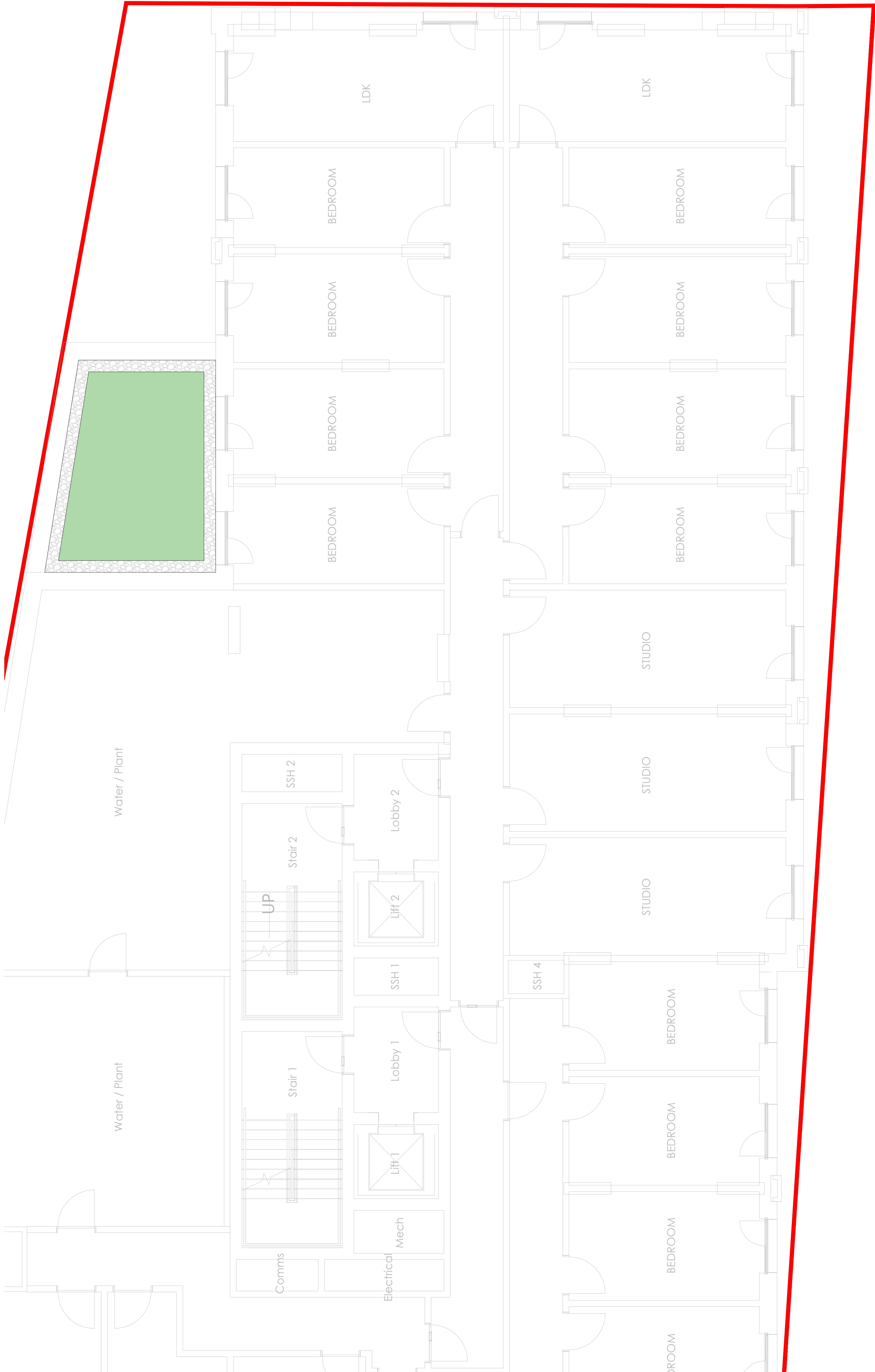
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**Status**  
FOR INFORMATION

S2

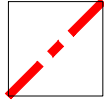
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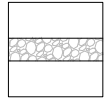
**Revision**  
P00



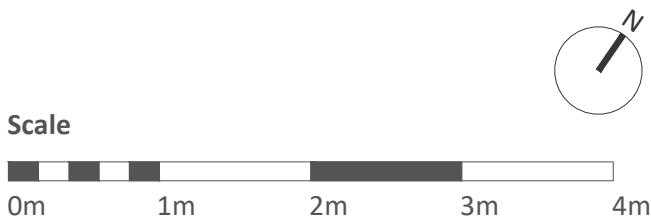
- Notes
1. All dimensions in mm, unless otherwise stated.
  2. Scaling from drawing if printed incorrectly may lead to errors.
  3. All information outside red line boundary shown for contextual purpose only.
  4. All hatch patterns are indicative only unless stated otherwise.
  5. This drawing is to be read in conjunction with the following R.B.L.A landscape architecture documentation:  
RBL-XX-00-DR-L-0001-General Arrangement Plan-Ground Floor  
& all relevant documentation from the design team
  6. Levels information on this drawing illustrates the design intent. The contractor is to check and verify all levels and dimensions against site survey information.
  7. Any discrepancies in the design information are to be brought to the attention of R.B.L.A landscape architecture, in writing, prior to commencement of construction works.
  8. All proprietary products shall be installed in strict accordance with manufacturers written instructions.
  9. Refer to other consultants' drawings and specifications for the following design information:
    - Foundation details
    - Base course and/or sub bases design & specification
    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities
  10. Plant quantities are to suit site areas in accordance with scheduled plant densities.
  11. Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

Key

**Planning application boundary**

**Gravel margin**

**Wildflower meadow**



| Date | Description of revision | Drawn By | Checked By | Approved By | Revision |
|------|-------------------------|----------|------------|-------------|----------|
|------|-------------------------|----------|------------|-------------|----------|

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**Document title**  
LANDSCAPE GENERAL ARRANGEMENT  
- 1ST FLOOR

**Paper size**  
A1

**Status**  
FOR INFORMATION

**Drawing number**  
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**DRAFT**

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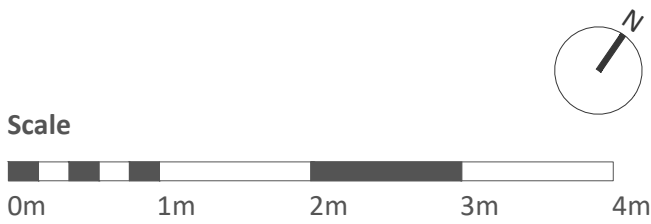
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**Revision**  
P00



- Notes
1. All dimensions in mm, unless otherwise stated.
  2. Scaling from drawing if printed incorrectly may lead to errors.
  3. All information outside red line boundary shown for contextual purpose only.
  4. All hatch patterns are indicative only unless stated otherwise.
  5. This drawing is to be read in conjunction with the following R.B.L.A landscape architecture documentation: 0009-RBL-XX-00-DR-L-0001 0009-RBL-XX-00-DR-L-0003 0009-RBL-XX-00-DR-L-0004 0009-RBL-XX-00-DR-L-0005 & all relevant documentation from the design team
  6. Levels information on this drawing illustrates the design intent. The contractor is to check and verify all levels and dimensions against site survey information.
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    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities
  10. Plant quantities are to suit site areas in accordance with scheduled plant densities.
  11. Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

- Key
- Planning application boundary
  - Paving type 1
  - Composite decking
  - Gravel margin
  - Raised metal planters
  - Incorporated timber benches
  - Proposed multistem trees
  - Proposed specimen shrubs
  - Proposed herbaceous planting
  - Proposed picnic bench



| Date | Description of revision | Drawn By | Checked By | Approved By | Revision |
|------|-------------------------|----------|------------|-------------|----------|
|------|-------------------------|----------|------------|-------------|----------|

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RB26-0009

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**Document title**  
LANDSCAPE GENERAL ARRANGEMENT  
- 7th FLOOR

**Paper size**  
A1

**Status**  
FOR INFORMATION

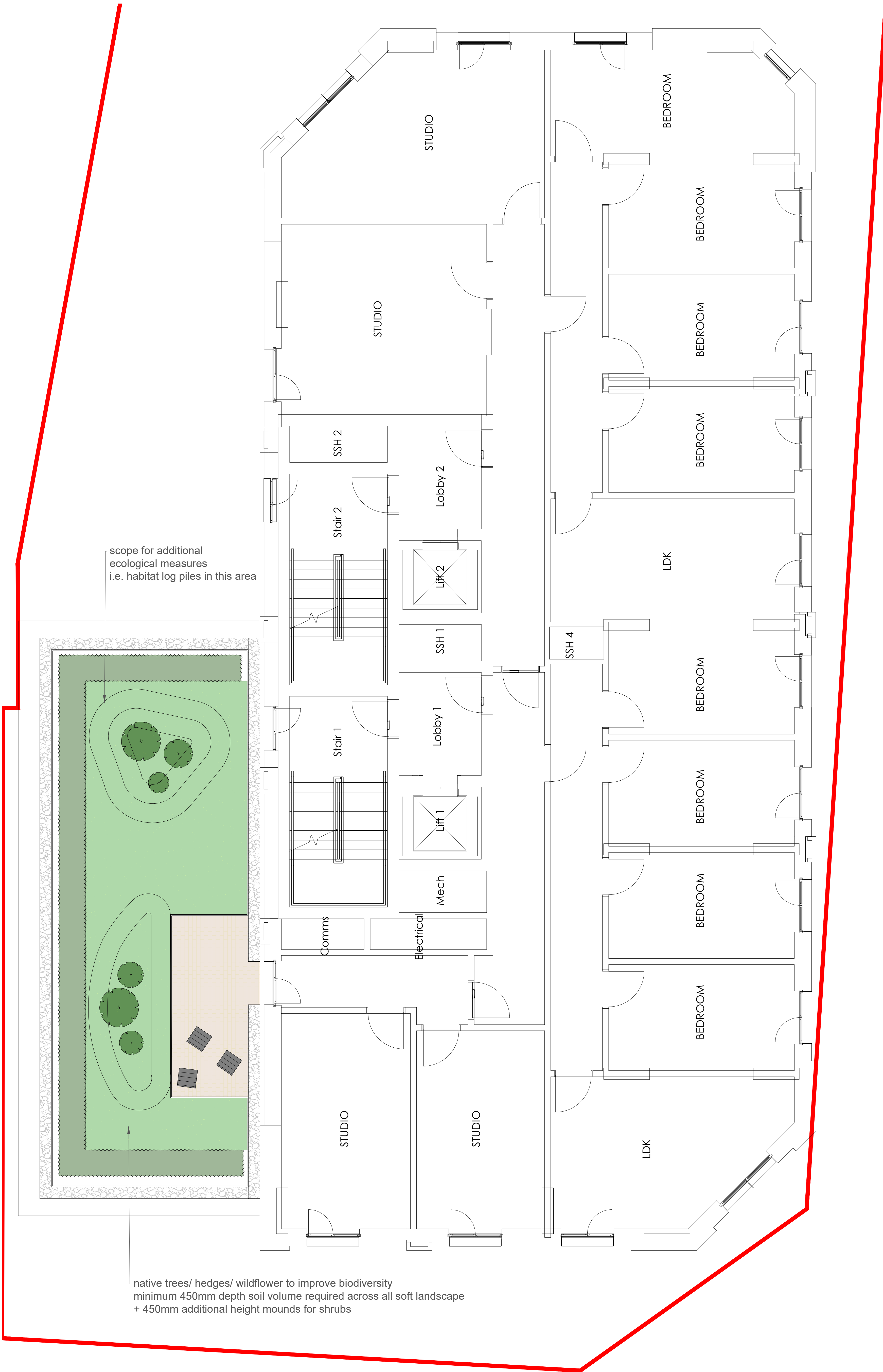
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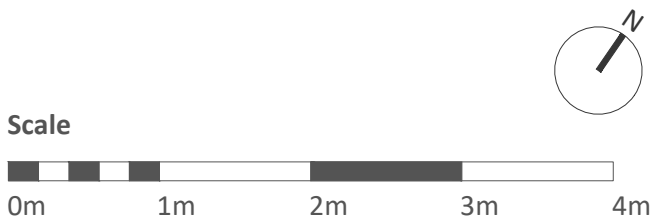
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**Revision**  
P00



- Notes
1. All dimensions in mm, unless otherwise stated.
  2. Scaling from drawing if printed incorrectly may lead to errors.
  3. All information outside red line boundary shown for contextual purpose only.
  4. All hatch patterns are indicative only unless stated otherwise.
  5. This drawing is to be read in conjunction with the following R.B.L.A landscape architecture documentation: RBL-XX-00-DR-L-0001-General Arrangement Plan-Ground Floor & all relevant documentation from the design team
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    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities
  10. Plant quantities are to suit site areas in accordance with scheduled plant densities.
  11. Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

- Key
- Planning application boundary
  - Paving type 1
  - Gravel margin
  - Wildflower meadow
  - Timber seating cubes
  - Proposed specimen shrubs
  - Proposed hedgerow
  - Proposed mounding- max height 900mm
  - Proposed metal upstand 300mm height



| Date | Description of revision | Drawn By | Checked By | Approved By | Revision |
|------|-------------------------|----------|------------|-------------|----------|
|------|-------------------------|----------|------------|-------------|----------|

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**Client**  
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**Document title**  
LANDSCAPE GENERAL ARRANGEMENT  
- 15th FLOOR

**Paper size**  
A1

**Status**  
FOR INFORMATION

**Drawing number**  
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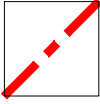
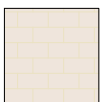
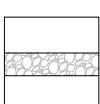
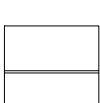
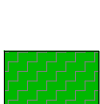
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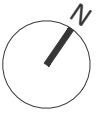
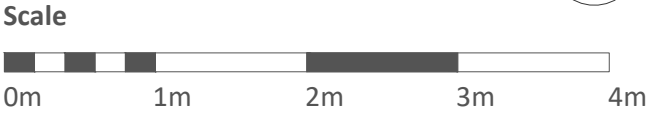


EXTERNAL PLANT

- Notes
1. All dimensions in mm, unless otherwise stated.
  2. Scaling from drawing if printed incorrectly may lead to errors.
  3. All information outside red line boundary shown for contextual purpose only.
  4. All hatch patterns are indicative only unless stated otherwise.
  5. This drawing is to be read in conjunction with the following R.B.L.A landscape architecture documentation: RBL-XX-00-DR-L-0001-General Arrangement Plan-Ground Floor & all relevant documentation from the design team
  6. Levels information on this drawing illustrates the design intent. The contractor is to check and verify all levels and dimensions against site survey information.
  7. Any discrepancies in the design information are to be brought to the attention of R.B.L.A landscape architecture, in writing, prior to commencement of construction works.
  8. All proprietary products shall be installed in strict accordance with manufacturers written instructions.
  9. Refer to other consultants' drawings and specifications for the following design information:
    - Foundation details
    - Base course and/or sub bases design & specification
    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities
  10. Plant quantities are to suit site areas in accordance with scheduled plant densities.
  11. Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

Key

-  Planning application boundary
-  Paving type 1
-  Gravel margin
-  Raised metal planters
-  Incorporated timber benches
-  Proposed specimen shrubs
-  Proposed herbaceous planting



| Date | Description of revision | Drawn By | Checked By | Approved By | Revision |
|------|-------------------------|----------|------------|-------------|----------|
|------|-------------------------|----------|------------|-------------|----------|

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**Project**  
TY CAMBRIA  
RB26-0009

**Client**  
RHOMCO CONSULTING

**Document title**  
LANDSCAPE GENERAL ARRANGEMENT  
- 23RD FLOOR

**Paper size**  
A1

**Status**  
FOR INFORMATION

**Drawing number**  
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**DRAFT**

**Scale**  
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**S2**

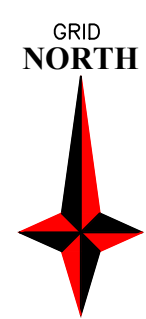
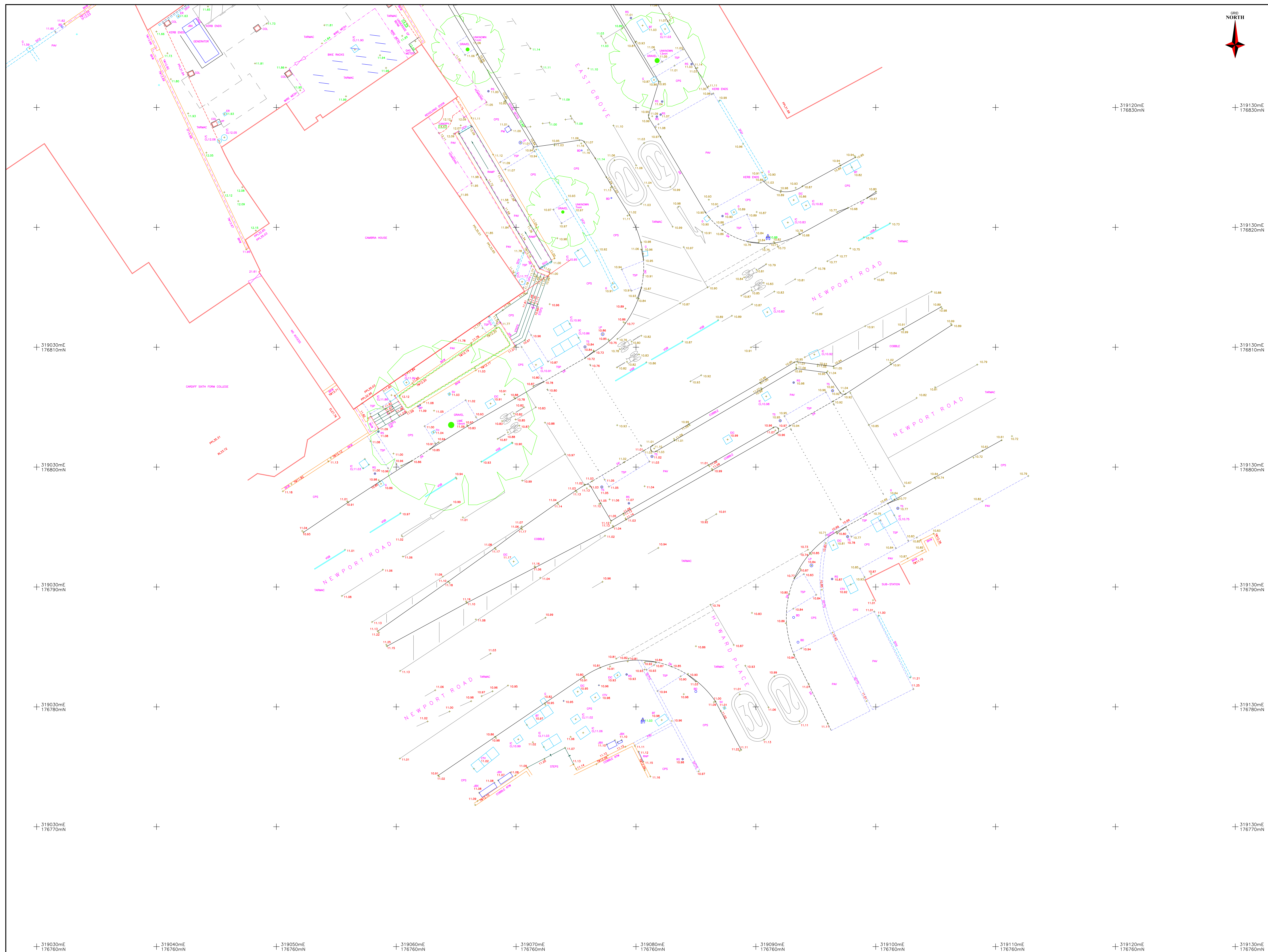
**Revision**  
P00

## ***APPENDIX B***

# **TOPOGRAPHICAL SURVEY**







Original Drawing Size: A0

NOTES:-

The accuracy and content of the drawing is commensurate with the graphical scale of reproduction of the original specification. The drawing should only be used for its original intended purpose.

Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only. Unless indicated otherwise connections between inspection covers are shown as direct.

Tree species (where shown) are indicative, if crucial expert identification by an arborist is required.

Boundary features may not represent the extent of legal ownership.

Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally awarded survey may not be able to achieve a 100% detection rate. Where an area of utilities is likely to affect client project requirements, it is strongly recommended that a PAS128 Quality Level A verification survey is carried out.

| LEGEND |              |    |                 |
|--------|--------------|----|-----------------|
| AB     | Air Brck     | PP | Paper Plate     |
| AD     | Adhesive Lin | PS | Polystyrene     |
| AE     | Air Valve    | RD | Reading Eye     |
| AF     | Aluminum     | RF | Radio Frequency |
| AG     | Aluminum     | RP | Radio Plate     |
| AI     | Aluminum     | RS | Radio Station   |
| AL     | Aluminum     | RT | Radio Table     |
| AM     | Aluminum     | RU | Radio Unit      |
| AN     | Aluminum     | RV | Radio Valve     |
| AO     | Aluminum     | SW | Switch          |
| AP     | Aluminum     | TA | Telephone       |
| AR     | Aluminum     | TB | Telephone       |
| AS     | Aluminum     | TC | Telephone       |
| AT     | Aluminum     | TD | Telephone       |
| AV     | Aluminum     | TE | Telephone       |
| AW     | Aluminum     | TF | Telephone       |
| AX     | Aluminum     | TH | Telephone       |
| AY     | Aluminum     | TI | Telephone       |
| AZ     | Aluminum     | TO | Telephone       |
| BA     | Aluminum     | TP | Telephone       |
| BB     | Aluminum     | TR | Telephone       |
| BC     | Aluminum     | TS | Telephone       |
| BD     | Aluminum     | TT | Telephone       |
| BE     | Aluminum     | TV | Telephone       |
| BF     | Aluminum     | TX | Telephone       |
| BG     | Aluminum     | TY | Telephone       |
| BH     | Aluminum     | UZ | Telephone       |
| BI     | Aluminum     | VA | Telephone       |
| BJ     | Aluminum     | VB | Telephone       |
| BK     | Aluminum     | VC | Telephone       |
| BL     | Aluminum     | VD | Telephone       |
| BM     | Aluminum     | VE | Telephone       |
| BN     | Aluminum     | VF | Telephone       |
| BO     | Aluminum     | VG | Telephone       |
| BP     | Aluminum     | VH | Telephone       |
| BQ     | Aluminum     | VI | Telephone       |
| BR     | Aluminum     | VJ | Telephone       |
| BS     | Aluminum     | VK | Telephone       |
| BT     | Aluminum     | VL | Telephone       |
| BU     | Aluminum     | VM | Telephone       |
| BV     | Aluminum     | VO | Telephone       |
| BW     | Aluminum     | VP | Telephone       |
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| BY     | Aluminum     | VR | Telephone       |
| BZ     | Aluminum     | VS | Telephone       |
| CA     | Aluminum     | VT | Telephone       |
| CB     | Aluminum     | VV | Telephone       |
| CC     | Aluminum     | VO | Telephone       |
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| CH     | Aluminum     | VT | Telephone       |
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| CJ     | Aluminum     | VP | Telephone       |
| CK     | Aluminum     | VQ | Telephone       |
| CL     | Aluminum     | VR | Telephone       |
| CM     | Aluminum     | VS | Telephone       |
| CN     | Aluminum     | VT | Telephone       |
| CO     | Aluminum     | VO | Telephone       |
| CP     | Aluminum     | VP | Telephone       |
| CQ     | Aluminum     | VQ | Telephone       |
| CR     | Aluminum     | VR | Telephone       |
| CS     | Aluminum     | VS | Telephone       |
| CT     | Aluminum     | VT | Telephone       |
| CU     | Aluminum     | VO | Telephone       |
| CV     | Aluminum     | VP | Telephone       |
| CW     | Aluminum     | VQ | Telephone       |
| CX     | Aluminum     | VR | Telephone       |
| CY     | Aluminum     | VS | Telephone       |
| CZ     | Aluminum     | VT | Telephone       |
| DA     | Aluminum     | VO | Telephone       |
| DB     | Aluminum     | VP | Telephone       |
| DC     | Aluminum     | VQ | Telephone       |
| DD     | Aluminum     | VR | Telephone       |
| DE     | Aluminum     | VS | Telephone       |
| DF     | Aluminum     | VT | Telephone       |
| DG     | Aluminum     | VO | Telephone       |
| DH     | Aluminum     | VP | Telephone       |
| DI     | Aluminum     | VQ | Telephone       |
| DJ     | Aluminum     | VR | Telephone       |
| DK     | Aluminum     | VS | Telephone       |
| DL     | Aluminum     | VT | Telephone       |
| DM     | Aluminum     | VO | Telephone       |
| DN     | Aluminum     | VP | Telephone       |
| DO     | Aluminum     | VQ | Telephone       |
| DP     | Aluminum     | VR | Telephone       |
| DQ     | Aluminum     | VS | Telephone       |
| DR     | Aluminum     | VT | Telephone       |
| DS     | Aluminum     | VO | Telephone       |
| DT     | Aluminum     | VP | Telephone       |
| DU     | Aluminum     | VQ | Telephone       |
| DV     | Aluminum     | VR | Telephone       |
| DW     | Aluminum     | VS | Telephone       |
| DX     | Aluminum     | VT | Telephone       |
| DY     | Aluminum     | VO | Telephone       |
| DZ     | Aluminum     | VP | Telephone       |
| EA     | Aluminum     | VQ | Telephone       |
| EB     | Aluminum     | VR | Telephone       |
| EC     | Aluminum     | VS | Telephone       |
| ED     | Aluminum     | VT | Telephone       |
| EE     | Aluminum     | VO | Telephone       |
| EF     | Aluminum     | VP | Telephone       |
| EG     | Aluminum     | VQ | Telephone       |
| EH     | Aluminum     | VR | Telephone       |
| EI     | Aluminum     | VS | Telephone       |
| EJ     | Aluminum     | VT | Telephone       |
| EK     | Aluminum     | VO | Telephone       |
| EL     | Aluminum     | VP | Telephone       |
| EM     | Aluminum     | VQ | Telephone       |
| EN     | Aluminum     | VR | Telephone       |
| EO     | Aluminum     | VS | Telephone       |
| EP     | Aluminum     |    |                 |

**Planning area**

**Urban/Land Use/soil profile**

**Survey Station**

**Fence**

**Gate**

**Painted Road Markings**

**Edge of Vegetation**

**Banks**

**Utilities**

**CITY Cables**

**CATV Cables**

**Electric Cables**

**Fire Cable**

**Water Main**

**Storm Water**

**Sewer**

**Undersized GPR**

**Undersized Trench**

**End of Trench**

**Unstable To Trench**

**Unstable To Piles**

**Taken from Records**

**Extent of utility survey**

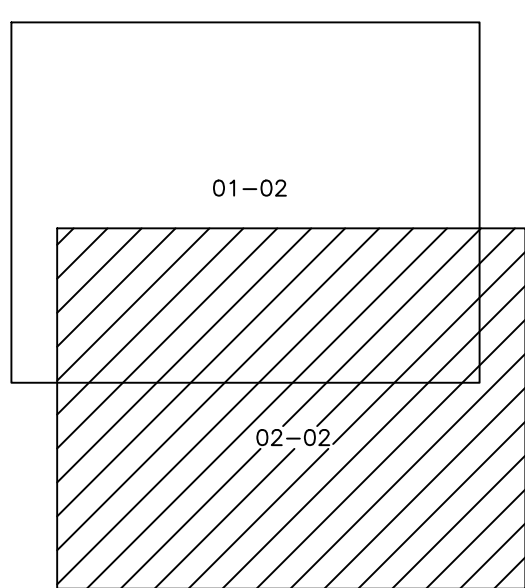
**Scale**

100m

**Control:** All levels and co-ordinates are related to the datum described.

| Station |            | Schedule   |        |          |
|---------|------------|------------|--------|----------|
| Station | Easting    | Northing   | Level  | Type     |
| 1       | 319080.567 | 176778.915 | 11.025 | HIS Nail |
| 2       | 319091.008 | 176819.347 | 10.836 | HIS Nail |
| 3       | 319062.879 | 176862.349 | 11.160 | HIS Nail |
| 4       | 319048.450 | 176850.185 | 11.441 | HIS Nail |
| 5       | 319026.489 | 176837.863 | 11.569 | HIS Nail |

SHEET LAYOUT



|            |      |  |                 |  |  |  |  |          |         |
|------------|------|--|-----------------|--|--|--|--|----------|---------|
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
|            |      |  |                 |  |  |  |  |          |         |
| --         | ---  |  | --/--           |  |  |  |  | ---      | ---     |
| Rev/Job No | Date |  | Revision Detail |  |  |  |  | Surveyor | Checker |

Rhomco Consulting Ltd  
3 Queen Street  
Mayfair  
W1J 5PA

PROJECT  
Topographic Survey  
Ty Cambria House  
Newport Road  
Cardiff  
CF24 0TP

|                  |                     |                  |                    |                |
|------------------|---------------------|------------------|--------------------|----------------|
| Job No.<br>22727 | Surveyor<br>E.Rolle | Checked<br>AR/TA | Date<br>Sept. 2025 | Scale<br>1:100 |
|------------------|---------------------|------------------|--------------------|----------------|



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163-165 Ranelagh Road, Ipswich, Suffolk IP2 2AH  
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|               |      |
|---------------|------|
| DRAWING No.   | REV. |
| 22727/T/02-02 | -    |

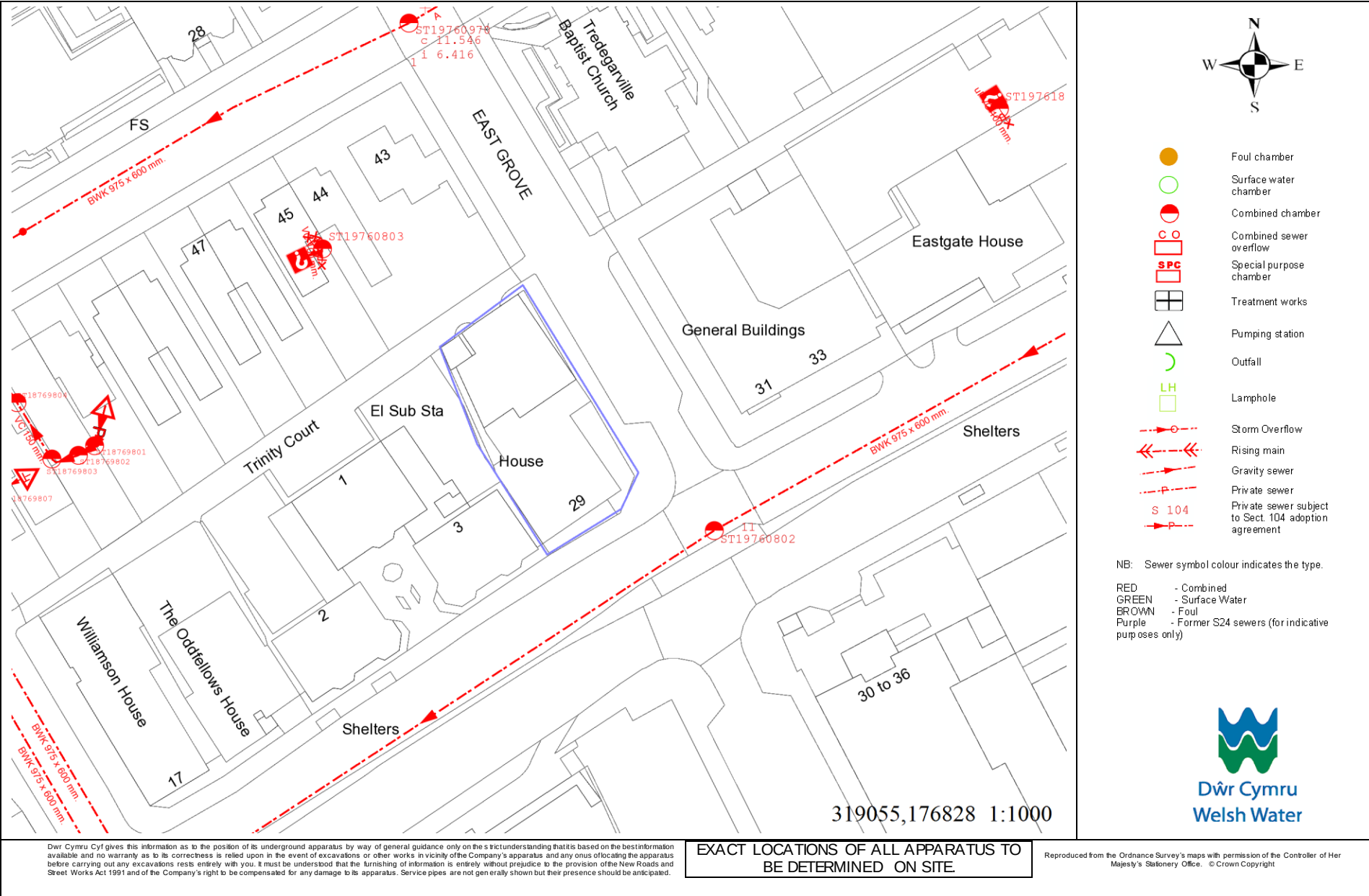
REV.

## ***APPENDIX C***

## **DŴR CYMRU WELSH WATER SEWER RECORDS**



Appendix 3 - Extract of the Public Sewer Map for the area surrounding the property/plot [14/11/2023]



Dwr Cymru Cyf gives this information as to the position of its underground apparatus by way of general guidance only 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 in vicinity of the Company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely with you. It must be understood that the furnishing of information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and of 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.

## ***APPENDIX D***

### **BROWNFIELD RUNOFF RATE CALCULATION**





**COMMENTS:** Estimation of run off rate of existing brownfield site

## Modified Rational Method

The existing brownfield runoff rate is given by the modified rational method:

$$Q = 2.78CiA$$

Where:

- Q : Surface Water Flow Rate (L/s)
- C : Dimensionless runoff co-efficient (1)
- i : Rainfall intensity (mm/hr) (50)
- A : Site area (Ha) (0.085)
- 2.78 : Unit Conversion Factor

Therefore, estimated run off rate:

$$Q = 2.78 \times 1 \times 50 \times 0.085$$

Therefore, the estimated runoff rate of the existing site is:

$$Q = 11.82 \text{ L/s}$$

It is proposed to provide 30% betterment on the existing brownfield runoff rate, therefore the proposed flow rate is:

$$Q = 11.82 \times 0.7 = 8.27 \text{ L/s}$$

Therefore, the proposed surface water flow rate for the site is:

$$\mathbf{8.27 \text{ L/s}}$$

## ***APPENDIX E***

### **FOUL FLOW RATE CALCULATION**





**Shear Design**  
Consulting Civil and Structural Engineers

**Project Title:**  
Ty Cambria

**Project No:**  
25050

**Element Title:**  
Flows and Loads Calculation

**Sheet No:**  
1 of 1

**Des'd by:**  
JG

**Date:**  
04/08/2026

**Chk'd by:**  
EL

**Date:**  
04/08/2026

## COMMENTS:

### Foul Drainage

The proposed development is a student accommodation with 350 student beds. 50 occupants will be added to account for any staff/guests/commercial use.

Flows and Loads Criteria:

- Occupants:  $350 + 50 = 400$
- Peak flow per person per day: 150 Litres
- Dry Weather Flow: Factor of 6
- Infiltration: 10%

Therefore, peak foul flow for the site is:

$$Q_{\text{Foul}} = \frac{400 \times 150 \times 6 \times 1.1}{86,400}$$

Therefore, the peak foul flow from the proposed site will be:

$$Q_{\text{Foul}} = 4.5 \text{ L/s}$$